Discussion of:

"Financial Conditions Indexes: A Fresh Look at the Crisis"

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U.S. Monetary Policy Forum

New York, New York

February 26, 2010

Introduction

In this paper, the authors construct a new *financial conditions index (FCI).* As its name suggests, an FCI is a summary statistic that gauges how well financial markets are working. Before I continue, let me make the usual disclaimer and stress that the following views are mine, and not necessarily those of my colleagues in the Federal Reserve. The FCI in this paper has three novel features relative to earlier indices. First, it is constructed from a large number (44!) of distinct data series. These different series cover different sample periods (different beginning and end dates). The authors are able to use all of these distinct sources of information because they exploit relatively novel unbalanced panel estimation techniques to construct their index.

Second, the authors purge their FCI of information related to current and lagged GDP growth and inflation. They do so to better isolate information in financial markets themselves, as opposed to other parts of the economy.

Finally, prior FCIs are constructed to be the principal component of a number of underlying data series. Implicitly, these constructions are assuming that the underlying data series are largely driven by a single factor. The authors allow for the possibility that their 44 data series are generated by multiple factors (specifically three).

The authors use pseudo-out-of-sample forecasting exercises to evaluate their new FCI in terms of its ability to predict future GDP growth. Generally speaking, they find that the new FCI does somewhat better than a basic autoregressive (AR) model (in which lags of past GDP growth are used to forecast future GDP growth) and prior FCIs. The superior performance is especially pronounced in the past five years. However, the new FCI does considerably worse than these alternative models in the latter part of the 1990s.

I enjoyed reading this paper. I was especially impressed by how the authors exploited high-powered econometrics to combine information from so many distinct sources.

The authors focus on the use of the FCI as a forecasting tool. This is indeed an important question, and we learn much from their analysis. In my remarks, I will focus on a related but distinct question: How should we measure financial market conditions so as to best guide monetary policymakers' decisions?

My discussion will begin with a brief—and certainly overly simplistic—description of three kinds of financial market frictions: collateral scarcity, asymmetric information, and illiquidity. (Admittedly, these terms are used in a variety of ways in the economics literature, and you will have to wait to hear how I'm using them.) Especially in light of the past two and a half years, it seems reasonable to think that the severity of these frictions may vary over time. I will argue, though, that the different frictions translate into different policy responses. As a result, economic theory strongly suggests that one needs more than a single variable to get a measure of financial market conditions that is useful for policymakers. I will try to provide some (crude!) guidance about how to parse the data to arrive at the relevant information.

Three Frictions

I discuss three frictions in asset markets and appropriate policy responses to their becoming more severe. Throughout, it is worth keeping in mind that government interventions typically have some administrative costs. These costs mean that interventions are certainly inappropriate when the frictions are relatively small in size.

Collateral

In frictionless credit markets, firms are fully able to capitalize their flow of future profits. In practice, lenders realize that borrowers may be able to hide or divert profits. As a result, a firm's borrowing capacity is generally affected by the market value of its holdings of *collateral*. Appropriate notions of collateral vary from context to context. However, whatever their form, collateral requirements impose a connection between a firm's ability to borrow and the market value of its collateral.

Thus, suppose that firms are using land as a form of collateral, and land falls in value by 20%. Then, some firms will be forced to forgo projects that they would have otherwise undertaken. The quantity of investment will fall. Perhaps more surprisingly, the equilibrium interest rate will fall. Intuitively, borrowers' demand for loans is capped by the market value of collateral. A fall in the market value of collateral leads to a fall in loan demand. To equilibrate markets, the supply of loans must also fall—and that can only happen if interest rates decline.

There are a number of useful policy responses to collateral shocks of this kind. The problem is that firms don't have enough collateral. Suppose that the government gives Treasury debt to all firms. Those with good projects now have a source of funding: They can sell their Treasury debt (or borrow against it). Of course, creating this new Treasury debt means that the government must tax in the future. However, as long as the credit constraint is sufficiently tight, the social losses created by this taxation are less than the gains generated by loosening the firms' borrowing constraints.[1]

On the other hand, some seemingly useful policy responses are ineffective. Lowering the fed funds rate (and thereby the real interest rate) cannot generate more investment. Loan demand is constrained by the availability of collateral, not by the cost of funds to borrowers. Indeed, the above policy response (handing out more government debt to firms) necessarily raises interest rates.

Banks are firms, and so a good response may well require handing out Treasury debt to banks. Nonetheless, it may not be effective to give Treasury debt *only* to banks (as opposed to all firms). Banks will not be able to use this source of funds to make loans if firms are collateral-constrained.

[1] These social gains exist because the government has a power that private lenders do not. The collateral constraint exists because borrowers can divert profits before repaying lenders. Governments can impose sales and other taxes that seize firm revenues before they can be diverted.

Asymmetric Information

Firms may have private information about their projects or their collateral. This private information confronts lenders with an extra form of risk and constrains their willingness to lend. Correspondingly, increases in private information lead to falls in the amount of lending and to spikes in the spreads between corporate lending rates and default-free Treasuries. Indeed, in extremis, private information problems can actually shut down lending entirely.

The government's ability to respond to this friction depends critically on its level of information. If a government has no more information than lenders, then the government must lose money on any program that seeks to expand the scope of lending. (If this were not true, then lenders would have adopted that same program.) At least in this sense, taxpayers are made worse off by government interventions.

However, in some markets, governments may well have superior information to lenders. For example, through the bank supervision process, the Federal Reserve acquires a great deal of information that is not shared with markets. With this extra information, the Federal Reserve can safely lend through the discount window to potential borrowers at a lower rate than the borrowers would receive in private markets. There is a valuable synergy between the Fed's role in bank supervision and its ability to intervene usefully in interbank lending markets.

Illiquidity

Financial markets vary in their *liquidity.* In liquid markets, a seller gets the same price per unit regardless of the quantity sold or the speed of sale. In illiquid markets, selling rapidly or selling a lot leads to large price per unit declines relative to selling slowly or selling little.

Liquidity shows up in asset prices and can influence allocations of real resources. For example, agency mortgage-backed securities (MBSs) issued by Fannie Mae and Freddie Mac are guaranteed against default risk. But they still contain prepayment risk. The buyers of agency MBSs can usually diversify much of this risk by selling the asset. Now imagine, though, that the secondary markets for agency MBSs become much less liquid. Buyers of agency MBSs cannot diversify away the associated prepayment risk, and so demand a higher yield per unit of risk held. (Technically, we say that the *market price* of agency MBS prepayment risk rises.) Agency MBS risk premia rise, and home buyers end up facing higher mortgage rates.

The government can respond usefully to such an event. Suppose that the government buys a large amount of MBSs. Their generated flow of income will not greatly affect the government's revenue stream, and so the government faces relatively little additional risk by buying the MBSs. However, buyers now have to hold a lot less risk in the form of agency MBSs. The market price of agency MBS prepayment risk declines. This form of government intervention is desirable because the government can cheaply diversify its position, while a private agent cannot.

If the market remains illiquid, then government sales of agency MBSs would lead to increases in their risk premium (because MBS buyers are forced to hold more risk). But eventually, the agency MBS market will become liquid once more. At this point, the government can reverse its operation and sell its MBSs in secondary markets without affecting their risk premium.

How Do We See the Frictions in the Data?

I have talked about three frictions and the associated policy responses. Admittedly, the frictions almost certainly overlap to a greater extent than my discussion implies. For example, markets may well become more illiquid when collateral constraints tighten and/or private information problems worsen.

But, in general, these are three distinct frictions with three distinct policy responses. A single FCI cannot capture their separate fluctuations. To understand appropriate policy responses, one needs to identify (at least) three distinct financial condition *factors* (FCFs).

I think that the authors do a useful first step in this direction. In Table 5.2, they distinguish several FCFs based on subsets of their 44 data series. They document that these FCFs do not have superior predictive performance relative to their preferred FCI. However, this exercise could be made even more useful by using theoretical considerations to map various kinds of credit market frictions into distinct choices of subsets of variables.

My discussion of the various frictions provides some initial insights into how we can determine their relative severity using financial markets data. For all of them, of course, we should see loan quantities decline. How else would they show up in financial markets data?

Friction 1 (collateral): Collateral prices fall, and interest rates decline. Credit market risk spreads do not change.

Friction 2 (private information): Credit market spreads increase, and loan standards tighten.

Friction 3 (illiquidity): The market price of a given asset's risk rises.

I have to say that separate frictions are probably not essential in thinking about the period from late 2007 through mid-2009. It seems clear—both from the authors' work and from more casual empiricism—that all three of these frictions increased greatly in severity during this period.

But the current picture is murkier. I would certainly say that at this point, credit market spreads are sufficiently low that friction 2 seems hardly relevant. It is harder to tell about friction 3. The market price of agency MBS prepayment risk has fallen, but this decline may well be due to the large Fed holdings of agency MBSs.

But net borrowing remains low. This indicates to me that friction 1—low borrowing capacity because of collateral constraints—may still be significant. Both short-term and medium-term real interest rates (as measured by TIPS bonds) are low relative to their historical averages. Land is an important source of collateral, and its price remains low. (More generally, as of 2009:3, nonfinancial noncorporate net worth

is down about 17% from 2007.) It is true that credit market spreads have vanished, but this is not a relevant consideration when thinking about friction 1.

It is exactly this kind of analysis that makes me think that using multiple FCFs to gauge financial market conditions might be so important. This point is reinforced by the recent behavior of the eight FCIs in the authors' paper. The first seven all rose in the second half of 2009, but the authors' own FCI fell. Clearly, there are at least two distinct factors responsible for these movements. My message is that knowing these distinct factors matters for understanding how policymakers should respond to worsening financial market conditions.

Conclusions

In many ways, my remarks parallel the sophisticated discussion of financial market imperfections in the introduction to this paper. To use their language, the authors point out that our modeling of such imperfections is still rudimentary. They argue that this state of play means that one has to use reduced-form statistical techniques to create FCIs.

I agree with them that the extant modeling is rudimentary, and it is likely to remain so for some time. Nonetheless, even these simple models have important insights. I hope that these model-based insights become more central in future attempts to construct measures of strains in financial markets.