William C Dudley: Financial conditions indexes – a new look after the financial crisis

Remarks by Mr William C Dudley, President and Chief Executive Officer of the Federal Reserve Bank of New York, at the annual US Monetary Policy Forum, University of Chicago Booth School of Business, New York, 26 February 2010.

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Thank you for having me to speak as a panelist today. As always my views are my own and do not necessarily reflect those of the Federal Open Market Committee (FOMC) or the Federal Reserve System.

I am glad that Narayana Kocherlakota is here as well as I don't think I qualify as the most "objective" person to be a panelist on this particular topic. After all, I have long been a proponent of using a financial conditions framework to think about the economic outlook and monetary policy. When I was working as the chief U.S. economist at Goldman Sachs, we built one of the earliest financial conditions indexes, the Goldman Sachs Financial Conditions Index (GSFCI).

I am going to divide my remarks today into two parts. First, I will discuss why a financial conditions framework is useful when thinking about the economic outlook and monetary policy. Second, I will discuss the paper, "Financial Conditions Indexes: A New Look after the Financial Crisis," by Jan Hatzius, Peter Hooper, Frederic Mishkin, Kermit L. Schoenholtz and Mark W. Watson, in some detail – evaluating its considerable strengths and pointing out some areas where additional work would be useful.

There are a number of reasons that a financial conditions framework is likely to be useful when evaluating the economic outlook and the conduct of monetary policy. Most important, monetary policy works its magic through its effect on financial conditions; it does not operate directly on real economic variables. That is because the level of the federal funds rate influences other financial market variables such as money market rates, long-term interest rates, credit spreads, stock prices and the value of the dollar, and it is these variables that influence real economic activity.[1] This means that if the linkage between the fed funds rate and this broader constellation of financial indicators is not stable or completely predictable, then knowing what is happening to the fed funds rate is not sufficient to predict economic activity. The instability of the linkage between the fed funds rate and financial conditions indicators means that these indicators provide additional information about real activity and also are relevant in deciding the appropriate fed funds rate target. In contrast, if the transmission mechanism from the fed funds rate to financial conditions and onward to real economic activity were completely predictable, then there would be no need to focus on financial conditions as an intermediate target variable. The level and path of the fed funds rate matters, but it also matters how this gets transmitted to the real economy through the financial sector.

Over the past 15 years, there have been two important instances in which the relationship between the fed funds rate and financial conditions have diverged significantly. The first was the late 1990s technology stock market bubble and its aftermath. The second was the mid-2000s credit market bubble that culminated in the recent financial crisis. During these episodes, the relationship between the fed funds rate and financial conditions was particularly unstable. As a result, developments in the financial markets became very important in the conduct of monetary policy.

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[1] In my comments, I am going to assume that inflation expectations are always well anchored so that I do not need to distinguish between the real and nominal fed funds rate.

In this respect, I would note that financial conditions indicators have implications for "Taylor Rule" formulations for monetary policy. As you all know, Taylor-type rules provide a short-hand metric for the appropriate stance of monetary policy. In such rules, the fed funds rate is set at a level equal to the equilibrium real fed funds rate, plus the inflation objective, plus the weighted deviation of output from its potential and of the inflation objective from actual or, if forward looking, expected inflation. Often, analysts and economists assume that the equilibrium real fed funds rate is equal to 2 percent, its long-term historical value. Although, in principle, such rules allow the equilibrium rate to be time varying, it typically is assumed to be constant.

I have always been uncomfortable with this usage of a 2 percent equilibrium real rate assumption because it ignores the possibility that the equilibrium rate changes in response to technology shocks or in response to changes in how monetary policy is transmitted via the financial system to the real economy. For example, in the late 1990s, when trend productivity growth shifted upward, it seemed logical that this would also push up the equilibrium short-term real interest rate. That is because higher productivity growth, by raising the return on capital, spurs greater investment, thereby driving the equilibrium rate higher. Similarly, if stock prices rose sharply in response to higher productivity growth, this should also lead to a higher equilibrium real rate through the effect of greater stock market wealth on consumer spending. Higher stock prices meant that financial conditions were easier. This needed to be offset by a somewhat higher fed funds rate target.

Financial conditions also appear to have become more important in terms of their influence on business cycles. On the one hand, the fed funds rate has been more stable and the range of the fed funds rate over the cycle has been smaller. However, on the other hand, relative to what has happened to the fed funds rate target, financial conditions have become more volatile. The hypothesis that Ed McKelvey and I put forward in 1997 in response to evidence of the so-called "Great Moderation" seems to be well supported by the past two economic downturns and their aftermaths:

Put simply, longer stretches of economic growth imply greater leverage and complacency and thus, greater financial problems when recessions do occur. In brief, longer U.S. business cycles logically lead to four linked consequences – more financial leverage, longer bouts of balance sheet repair, more subdued recoveries and longer periods of decline in inflation and interest rates during the early stages of recovery.[2]

If the economy is more stable, then market participants will have more appetite for risk. This works fine during the expansion stage, when growth is relatively stable. However, when a recession finally arrives, it is a bigger shock than when recessions were more frequent. This surprise results in a more substantial adjustment in financial conditions. Ironically, the increased stability of the business cycle during the expansion phase appears to increase the volatility and importance of financial conditions when recessions do occur.

At this stage, incorporating indicators of financial conditions into forecasting and into evaluating the conduct of monetary policy probably requires relying on constructing a "rough and ready" index. Macroeconomic models – especially dynamic stochastic general equilibrium models – do not incorporate robust financial sectors. Instead, these models have implicitly assumed that the monetary transmission mechanism and the financial intermediation process always works smoothly and predictably.[3]

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[2] See *The Brave New Business Cycle: No Recession in Sight*, William Dudley and Edward McKelvey, January 1997, Goldman Sachs Economic Research Group.

[3] Adding financial intermediation to these models has become a very active area of research. See, for example, the recent work of Vasco Curdia and Michael Woodford in "Credit Spreads and Monetary Policy," Federal Reserve Bank of New York Staff Report No. 385.

Events of the past decade confirm that financial conditions matter and that the fed funds rate is not a sufficient statistic with which to assess the impact of monetary policy on the real economy. Of course, this is not news to the Federal Reserve, which has explicitly taken financial conditions into account in its conduct of monetary policy. This is evident in the transcripts of the FOMC meetings that are publicly available and the numerous references to financial conditions in the FOMC minutes that go back more than a decade.

An analysis of the FOMC minutes over the past decade indicates that references to financial conditions have been frequent, especially recently. Exhibit 1 illustrates the percentage of paragraphs in the minutes (excluding the directive and some other paragraphs associated with administrative matters such as the election of the chairman) that mention the phrase "financial conditions." As can be seen, there have been frequent references over the past decade. One peak occurred in 2000 when the stock market peaked and began to deflate. Thereafter, references fell off a bit until rising sharply again recently. Clearly, the recent financial crisis has underscored the importance of financial conditions.

Today's paper makes clear the importance of financial conditions. The paper's analysis of the many financial conditions indexes that have been constructed as proxies for overall financial conditions finds that many of these indexes have done better than the fed funds rate or other single-variable financial indicators as predictors of real economic activity.

However, as the paper also makes very clear, the indexes that have been developed are still very rudimentary. In particular, most financial conditions indexes are *ad hoc* and incomplete. In their review of the existing financial condition indexes, the authors find considerable differences across the indexes in the way that they are constructed and in terms of the variables included.

In addition, there is another difficulty. As the financial system changes over time, both in terms of structure and in terms of financial products, the financial variables that we might determine to be important are also changing. For example, in the wake of the recent financial crisis, the variables that the paper's authors call "neoclassical" – such as the yield curve and stock market prices – appear to have become less important relative to the variables that the authors term "non-neoclassical" – such as quantity and survey measures of credit availability. Variables that would work best 10 years ago as forecasting tools may no longer be very useful. As the structure of the financial system changes, the identity of variables that capture financial conditions naturally changes.

Let me now discuss the paper in more detail. I will do this in two steps. First, I will discuss the considerable contributions of the paper. Second, I will talk about where the paper might be extended and other areas of future research that might seem appropriate.

In general, I liked the paper. I think it makes some important contributions in how to construct a more complete and robust financial conditions index. In particular, I thought the paper makes two important points:

- Financial conditions should measure financial innovations, not changes in financial variables that are due to past changes in economic activity. The endogenous components of financial conditions should be removed in the construction of a financial conditions index.
- Both neoclassical (yield curve and stock prices) and non-neoclassical (credit availability) variables should be included. The GSFCI that I helped to develop only included neoclassical indictors and I think that was (and is) a shortcoming.

The authors deserve considerable credit for constructing a financial conditions index (FCI) that is more rigorous and complete than any that have been developed in the past – 44 financial variables divided across five categories. Moreover, this is not just innovation for its own sake. The new FCI does a better job than single-factor models in forecasting real gross domestic product (GDP).

So what are the shortcomings of this approach? First, including 44 variables may generate good results more because the additional variables add greater flexibility to soak up variability in real GDP, rather than providing a more solid theoretical underpinning. As the authors note, the variables were selected, in part, on the basis of what we know today about which variables are likely to be important. But this type of selection process – even if conducted on a pseudo real-time basis – introduces selection bias, which the authors do admit could be important.

Second, despite the inclusion of a large number of variables, some important ones may still be missing. In particular, leverage variables – such as the leverage ratio of the major securities dealers – may be an important component of financial conditions. The work of Tobias Adrian and Hyun Shin suggests that the increase in leverage of the major securities was a major factor that fueled the asset bubble preceding the recent crisis. If this was indeed the case as seems likely, this type of variable should also be included in a financial conditions framework.[4]

Third, as the authors note, the resulting FCI is complex; it is difficult to estimate, update and to communicate what the results mean. I think FCIs have value as heuristic devices in highlighting what is important. One loses that benefit when the number of variables becomes large and the indexes become complex.

Fourth, it would be interesting to know how financial conditions indexes for other countries and regions would differ. The authors focus only on the United States. Thus, it is difficult to know whether the value of financial conditions indexes are specific to the United States or should be applied more broadly.

Fifth, I thought the paper could have gone further in exploring the implications of its results. The focus of the paper is on how to construct a financial conditions index that does a good job of forecasting economic activity. The paper does not tackle the implications for monetary policy stemming from developments in financial conditions as measured by the new FCI. If financial conditions evolve in an unanticipated way, how should this influence the conduct of monetary policy?

In particular, the authors note that during the 2003–06 period, financial conditions tightened less than expected given the rise in the fed funds rate and, during the 2007–08 period tightened even as the Federal Reserve slashed its fed funds rate target. These results raise a number of interesting questions. In particular, does the behavior of the new FCI imply that the Federal Reserve should have tightened more aggressively during the 2003–06 period or eased more aggressively during the 2007–09 period? The paper's results seem to imply this, but it would be interesting to see whether this is the case or not.

It also would be useful to know how qualitatively important these differences are. If the differences are worth only a few basis points on the fed funds rate, then having a good indicator of financial conditions is not going to be a very important input in the formulation of monetary policy. In contrast, if a shift in financial conditions implies that the fed funds rate path was "off" by a hundred basis points relative to what actually occurred, then this obviously has big implications for monetary policy. The development of equilibrium models that incorporate financial conditions in a meaningful manner might prove helpful in answering these types of questions.[5]

In addition, I would like to know how the various linkages have changed over time. Is the linkage between the fed funds rate and financial conditions as measured by the new FCI

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[4] See, for example, Tobias Adrian and Hyun Shin, manuscript in preparation for the forthcoming *Handbook of Monetary Economics*, volume 3, currently circulated as Federal Reserve Bank of New York Staff Reports, No. 398, October 2009.

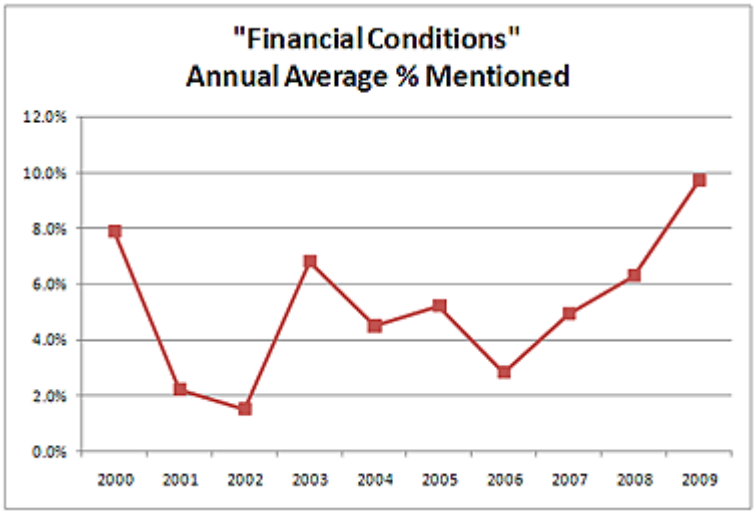
[5] The work of Vasco Curdia and Michael Woodford referenced above is one step in this direction.

loosening over time or not? If so, why is this happening? Is it due to financial market innovation or the growth in share of the non-bank financial sector? I also would like to know how the linkage between financial conditions and the real economy is changing over time. If this is happening, what are the implications for macroeconomic stability and monetary policy?

Finally, I would like to know about the dynamic properties of the new FCI. Are particularly high (expansive) readings dangerous and should they be taken as suggestive of asset bubbles? Should the Federal Reserve try to prevent such occurrences because loose financial conditions precede episodes of financial instability? In this respect, when financial conditions become unusually expansive, is the fed funds rate the right tool to use to constrain or counteract such expansiveness? Or would it be better to use macroprudential tools such as leverage limits or loan-to-value requirements on residential real estate to keep financial conditions from becoming unusually expansive in the first place? I could imagine circumstances in which macroprudential tools might be used to tighten up the relationship between the fed funds rate and financial conditions. Would the use of such tools be helpful in achieving greater macroeconomic stability?

At this stage, there are many more questions than answers. I would strongly encourage the authors and others to continue their work on financial conditions and in exploring how developments in the financial sector influence both the real economy and monetary policy. The financial crisis has demonstrated that financial market developments matter greatly. The paper successfully makes the case that it would be useful to have a good set of summary statistics to serve as benchmarks to keep track of such developments. It also would be useful to have a better understanding of how shifts in financial conditions should be considered in the ongoing conduct of monetary policy.

Exhibit 1



The percentage of paragraphs in the FOMC minutes that mention the phrase “financial conditions,” excluding the directive and paragraphs associated with administrative matters such as election of the chairman.