

Evaluating Targeted Liquidity Operations

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The last two years have brought a profound change in the way that monetary policy is implemented. Traditionally, the Federal Reserve defined its near-term objective in terms of the fed funds rate. The Fed sought to achieve this target by using purchases or sales of Treasury securities to control excess reserves and the money supply. Beginning in August 2007, the Fed came to see its objective instead in terms of maintaining market “liquidity,” which in practice might be measured by the spread between the fed funds rate and other interest rates to which the overnight rate had historically been closely linked.

Initially these new operations took the form of expanded use of repos, through which the Fed could effectively take the place of private repo lenders, offering short-term loans at terms more favorable than private lenders were offering. In December 2007, the Fed introduced a new Term Auction Facility for lending to banks and expanded currency swaps with other central banks. To prevent these measures from affecting the money supply and overnight rate, the Fed sterilized these operations by selling offsetting volumes of its Treasury holdings. In the fall of 2008, the Fed embarked on a huge expansion of these and other programs, simultaneously adopting measures to ensure that the newly created funds were held as excess reserves or idled Treasury balances so as

again to prevent any effect on the money supply. For purposes of this discussion, I will group together all of the Fed's assets other than Treasuries into a single composite, and describe the sum as a measure of "targeted liquidity operations."

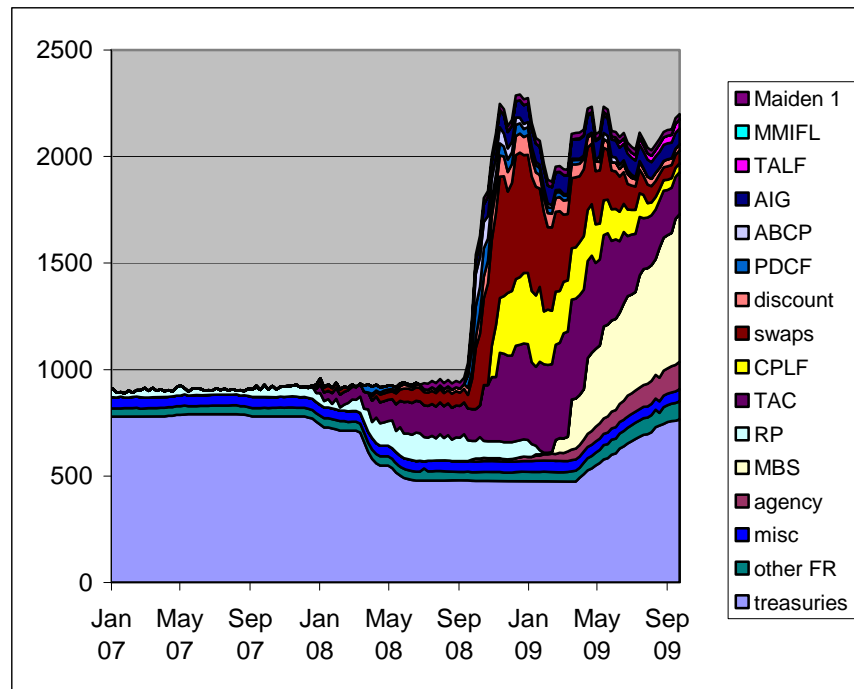


Figure 1. Federal Reserve assets, January 2007 to September 2009. Wednesday values, in billions of dollars, seasonally unadjusted, from Federal Reserve H41 release. Agency: federal agency debt securities held outright; swaps: central bank liquidity swaps; Maiden 1: net portfolio holdings of Maiden Lane LLC; MMIFL: net portfolio holdings of LLCs funded through the Money Market Investor Funding Facility; MBS: mortgage-backed securities held outright; CPLF: net portfolio holdings of LLCs funded through the Commercial Paper Funding Facility; TALF: loans extended through Term Asset-Backed Securities Loan Facility; AIG: sum of credit extended to American International Group, Inc. plus net portfolio holdings of Maiden Lane II and III; ABCP: loans extended to Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility; PDCF: loans extended to primary dealer and other broker-dealer credit; discount: sum of primary credit, secondary credit, and seasonal credit; TAC: term auction credit; RP: repurchase agreements; misc: sum of float, gold stock, special drawing rights certificate account, and Treasury currency outstanding; other FR: Other Federal Reserve assets; treasuries: U.S. Treasury securities held outright. "Targeted liquidity operations" at any date are measured by the sum of all entries other than treasuries.

Do these operations make sense, and did they help achieve the Fed's desired objectives? The answer depends in part on how you conceive of the causes of the financial stress to which the Fed was responding. In this discussion I describe two alternative views of what went wrong, and then review the evidence on what the effect of the targeted liquidity operations seems to have been.

Perspective 1: Everybody just panicked

The first interpretation of what went wrong is that financial markets were pricing risk correctly in 2006 but began to overprice risk in 2007. Keister and McAndrews (2008) analyzed a situation in which banks out-of-the-blue stop lending to each other, while Gorton (2009) interpreted events in terms of a classic bank run, in which the liquidation value of entities is feared to have fallen below their short-run liabilities, creating an incentive for lenders to refuse to renew short-term credit. In the benign version of this theory, the troubled entities would in fact be solvent if it were not for the "fire-sale" prices at which distressed assets must be sold in such an environment. If allowed to proceed unchecked, these fears could prove self-fulfilling and result in a rapid collapse of credit.

In terms of appropriate policy responses to this problem, I would distinguish between actions that might have helped if implemented earlier in the decade and options that were available if we begin the analysis in the fall of 2007. If we are looking at what might have been done years earlier that could have helped, the obvious answer is to consider regulatory reforms that might have prevented financial markets from reaching a point at which the liquidation spiral could be set off in the first place. Bank panics are

not an inevitable result of private financial intermediation. The key principle for avoiding them is to ensure that the liabilities of financial institutions consist not just of short-term borrowing, but also of equity contributed by the owners. As long as this equity cushion exceeds potential liquidation losses, there is no incentive for short-run creditors to rush to get their cash back, and no insolvency for the bank in the event that the bank does experience a run. It was a regulatory failure to allow an explosion of off-balance sheet entities that borrowed short and lent long but were immune from bank capital requirements.

On the other hand, if we ask what policy options were available after we had entered the fall of 2007, this particular policy prescription is of no help, as the horses were already out and the barn had no capital. Since there are profound negative externalities from simply watching asset prices and lending collapse, there would seem to be a clear case for the Fed to fulfill the function of lender of last resort, lending and buying assets where others won't until the panic subsides and rational valuations return, and trying to do so in such a way that otherwise solvent enterprises were shielded from a panic bankruptcy.

Perspective 2: The core problem in credit markets preceded the crisis

An alternative perspective is that risk was incorrectly priced in the years leading up to the crisis with rationality only returning in 2007-2008. During 2004-2006 there was \$2.7 trillion in new subprime and alt-A mortgage debt generated; (Ashcraft and Schuermann, 2008). Much of this was extended without documentation of the borrowers' income, little or no money down, negative amortization, and called for huge

increases in the borrowers' monthly payments a few years into the loan. Yet somehow through the magic of securitization, this debt was repackaged into tranches that overwhelmingly received AAA credit ratings.

Such massive capital flows only made sense if one believed that house prices would continue to expand rapidly. Because this process was funneling such huge sums into the U.S. housing market, for a while house prices did just that, more than doubling between 2000 and 2005 according to the Case-Shiller 20-city house price index. U.S. household mortgage debt tripled in a little over a decade. According to this second interpretation, when house prices inevitably came crashing down, they brought with them defaults not just on the hybrid subprime and alt-A mortgages, but also put many otherwise sound borrowers underwater.

If it is claimed that the run-up in house prices and mortgage debt were a horrible miscalculation, what were the market failures that produced it? There is a long list of contributing factors. The originate-to-distribute model left the loan originators and securitizers with profits and lesser-informed buyers with the losses, creating agency problems; (Ashcraft and Schuermann, 2008). Intra-firm compensation schemes left decision-makers personally with the upside and stockholders with the downside, inducing excessive risk-taking; (Diamond and Rajan, 2009; Bebchuk and Spamann, forthcoming). The public-private GSEs Fannie Mae and Freddie Mac were woefully undercapitalized, giving private players the upside and the taxpayers the downside, and perhaps emboldening private securitizers to take even bigger risks (Hamilton, 2008). Both the compensation and procedures of the ratings agencies may have contributed to inaccurate perception of the safety of MBS (Ashcraft and Schermann, 2008), as did the mistaken

perception that entities like AIG had the ability to insure against aggregate default risk. Moral hazard problems induced from the (ex post correct) belief that the U.S. government would absorb the downside on such gambles may have been another factor inducing excessive risk-taking.

If this perspective is the correct one, we can again distinguish between policies that would have made sense earlier in the decade and policies that were realistic options once we entered the crisis phase in 2008. If the above list of contributing market failures is correct, obviously addressing these with regulatory reforms before we reached the crisis point would have been the first-best option. On the other hand, if we condition on previous policy mistakes and ask what could have been done with options available in the fall of 2008, I disagree with those who reason that the way to correct the moral hazard problem is to hang tough in this situation and simply watch the losers go down. There are huge macroeconomic externalities from the resulting collapse of credit, which is why the government claiming it will not bail out the gamblers is not a credible strategy. Instead, this perspective suggests that the key policy question once we find ourselves in the fall of 2008 is how to allocate the necessary capital losses among lenders, stockholders, and the taxpayers in a way that minimizes the disruptive externalities of a credit collapse. If this is the correct perspective, the primary effect of targeted liquidity measures is simply to allocate these potential losses to the Federal Reserve. It is far from clear that this is the appropriate way for a democratic society to answer the question of who should bear the losses.

Finding the middle ground

I laid out the two perspectives above as diametrically opposed views. I nevertheless believe that the correct interpretation of events would acknowledge that each account contains some truth. It is hard to deny that there was some degree of misallocation of capital in the explosion of house prices and mortgage debt or that the resulting real estate price collapse was a key cause of the devaluation of securities and loss of bank equity that precipitated the banking panic phase. The remarks I presented at the Jackson Hole conference in August 2007 laid out precisely this scenario (Hamilton, 2008).

We might disagree on how much of that \$2.7 trillion in new subprime and alt-A debt represented a malfunctioning capital market, and characterize the middle ground between the two views in terms of choice of a number between 0 and 2.7. If that number is big enough, it may be that no realistically feasible level of bank equity would have been sufficient to assure solvency in the face of a deterioration of confidence, and there is certainly the potential for fire-sale asset price deterioration and a necessary role for the Federal Reserve to fulfill its role of lender of last resort. But obviously from this hybrid perspective, the Fed is performing a combination of liquidity provision and residual loss absorption through these operations, and would want to undertake the latter only with extreme care and thoughtfulness.

I next turn to what effects the measures seem to have had.

How much did the targeted liquidity measures accomplish?

For purposes of this discussion I will summarize the degree of financial stress by the gap between the 3-month LIBOR rate and the 3-month T-bill rate, often described as the TED spread. Figure 2 shows that this spread exhibited four dramatic waves over the last two years, which I treat as four potential case studies for the effects that targeted liquidity actions can have.

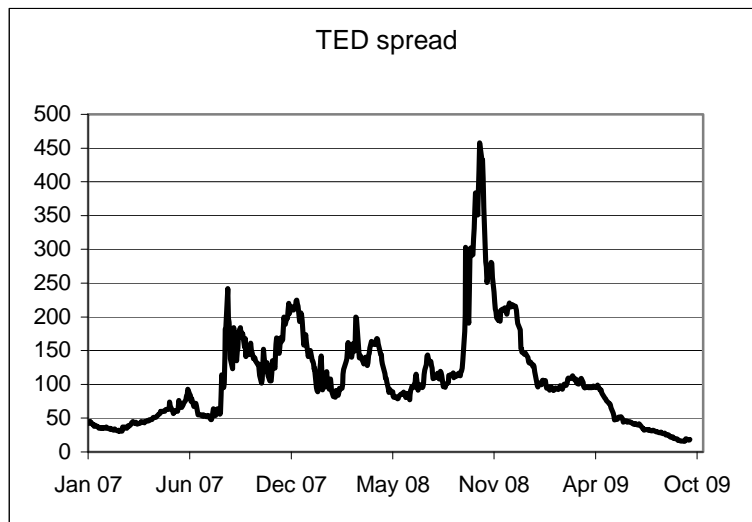


Figure 2. TED spread, January 2007 to September 2009. 3-month LIBOR rate minus 3-month T-bill rate, in basis points.

The first wave in Figure 2 began with the freezing of BNP Paribus assets on August 9, 2007, subsequent to which the TED spread reached a peak of 242 basis points on August 20. As seen in Figure 3, targeted liquidity operations consisted of a quite minor and temporary expansion of repos and discount borrowing. The sole special action by the Fed that made it onto the New York Fed's Financial Turmoil Timeline is an announcement by the Fed on August 10 that it would provide liquidity as needed. It seems safe to conclude that in this case, interest rate spreads rose in spite of the Fed

announcement, and eased for reasons other than an increase in the volume of targeted liquidity operations by the Fed.

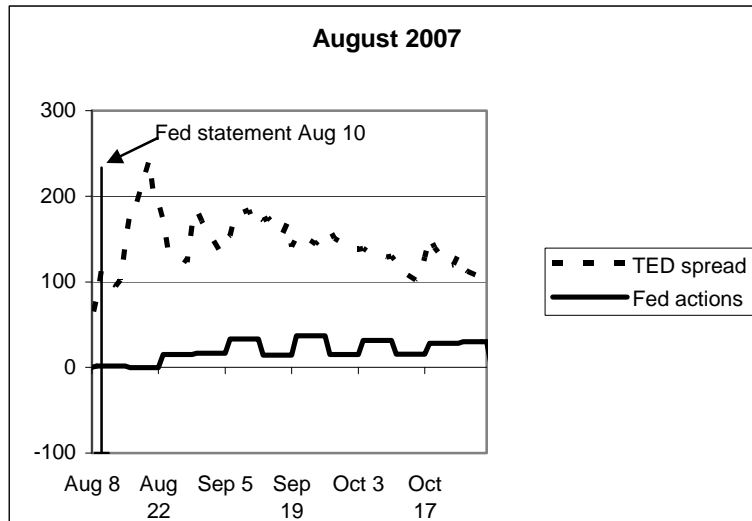


Figure 3. TED spread and targeted Fed liquidity actions, August 8 to October 30, 2007. Solid line: total Fed assets net of Fed Treasury holdings on Wednesday of indicated week minus total Fed assets net of Fed Treasury holdings as of August 8, in billions of dollars. Dashed line: TED spread at indicated date, in basis points.

The second episode, examined in Figure 4, occurred as problem bank assets became acknowledged in the fall of 2007. Taylor and Williams (2009) pointed to the fact that the TED spread turned down well before targeted liquidity operations were cranked up as evidence that the latter were not the cause of the former. However, Christensen, Lopez and Rudebusch (2009) noted that the Fed announced its intention to make aggressive use of the Term Auction Facility and currency swaps on December 12. The TED spread peaked at 225 basis points on December 12, and fell steadily after the Fed's announcement. This episode could thus be viewed as consistent with the claim that targeted Fed liquidity measures are a potentially powerful tool for changing this interest

rate spread, so much so that simply announcing their intended implementation can have dramatic effects.

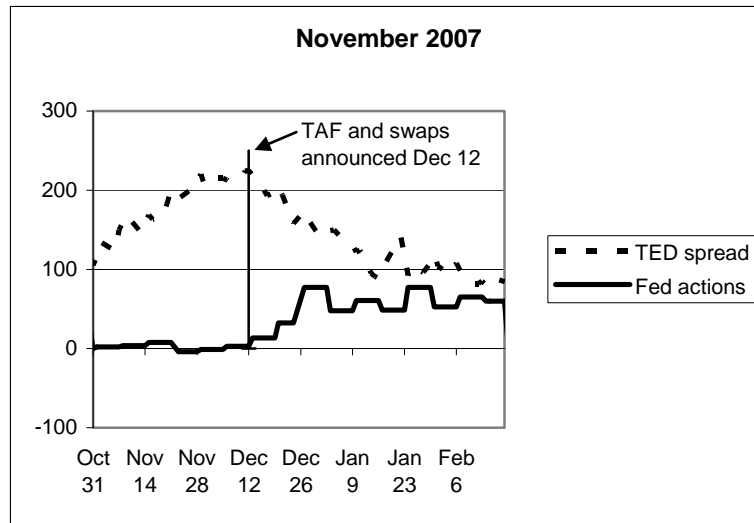


Figure 4. TED spread and targeted Fed liquidity actions, October 31, 2007 to February 19, 2008. Solid line: total Fed assets net of Fed Treasury holdings on Wednesday of indicated week minus total Fed assets net of Fed Treasury holdings as of October 31, in billions of dollars. Dashed line: TED spread at indicated date, in basis points.

Figure 5 follows the third surge in the TED spread in the spring of 2008. In this case the magnitude of the Fed's targeted liquidity operations eventually grew to three times the size of what it had implemented in December. The Fed announced its new Primary Dealer Credit Facility on March 16 and also significantly expanded its repo positions and Term Auction Credit over the next several weeks. The TED spread peaked at 200 basis points on March 19. Christensen, Lopez and Rudebusch (2009) chose March 24, the date of Bear Stearns' rescue, as the key turning point, after which risk spreads became significantly lower than their model predicts they otherwise would have been.

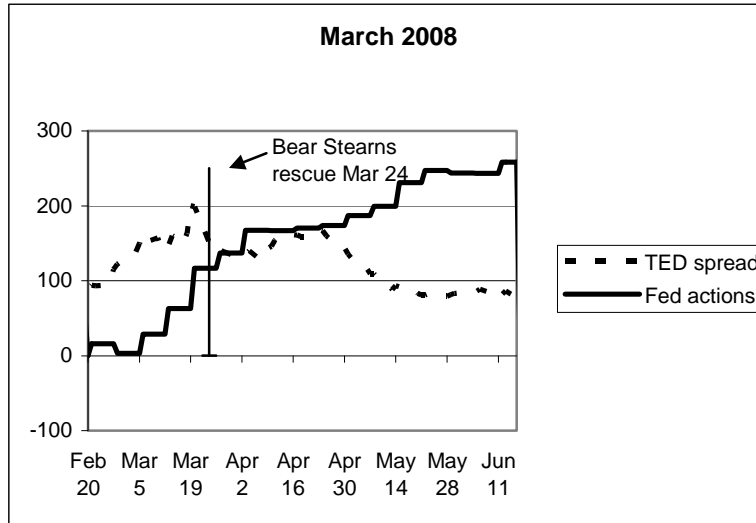


Figure 5. TED spread and targeted Fed liquidity actions, February 20 to June 16, 2008. Solid line: total Fed assets net of Fed Treasury holdings on Wednesday of indicated week minus total Fed assets net of Fed Treasury holdings as of February 20, in billions of dollars. Dashed line: TED spread at indicated date, in basis points.

These actions were in turn dwarfed by steps adopted in the fall of 2008. Note that the scale on the vertical axis in Figure 6 is five times that for the previous three graphs. There were so many new Fed measures adopted at this time that it would be hopeless to single one out. Targeted Fed liquidity operations increased by \$691 billion between September 3 and October 8, despite which the TED spread rose from 114 to 385 basis points and would continue to rise until peaking at 458 basis points on October 10. By November 12 nonstandard Fed assets had expanded by \$1312 billion.

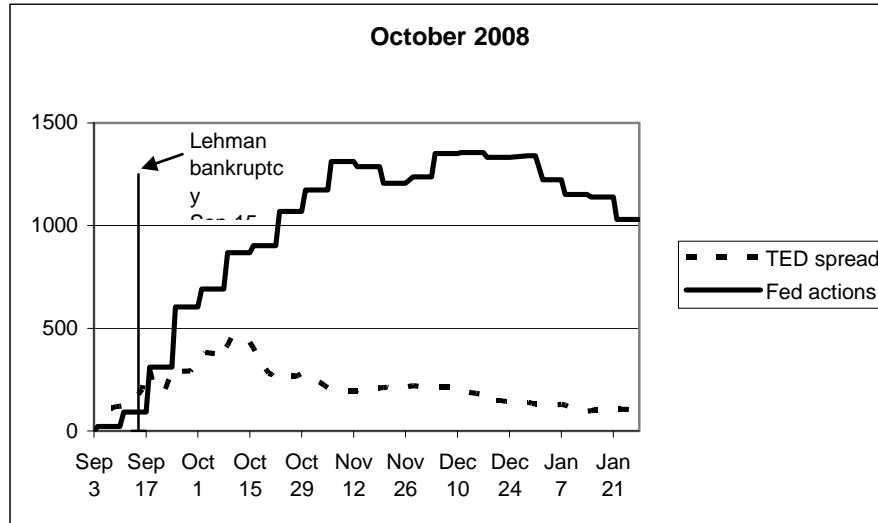


Figure 6. TED spread and targeted Fed liquidity actions, September 3, 2008 to January 28, 2009. Solid line: total Fed assets net of Fed Treasury holdings on Wednesday of indicated week minus total Fed assets net of Fed Treasury holdings as of September 3, in billions of dollars. Dashed line: TED spread at indicated date, in basis points.

To get a sense of the overall connection between targeted liquidity actions and the TED spread over this period, consider the scatter plot in Figure 7. Each square in this plot corresponds to a particular week over the period January 10, 2007 through September 16, 2009. The horizontal axis represents the change in targeted liquidity operations over that week, while the vertical axis records the change in the TED spread over that week. If we thought that the correlation between these two variables resulted from the effects of liquidity operations on the spread, we would have expected a negative correlation-- when the Fed expands its balance sheet, the intention is to bring the spread down rather than up. In fact the regression line relating the two variables has a positive slope-- if the Fed expanded its balance sheet in a given week, the TED spread was more likely to go up rather than down that week, though the slope is statistically indistinguishable from zero.

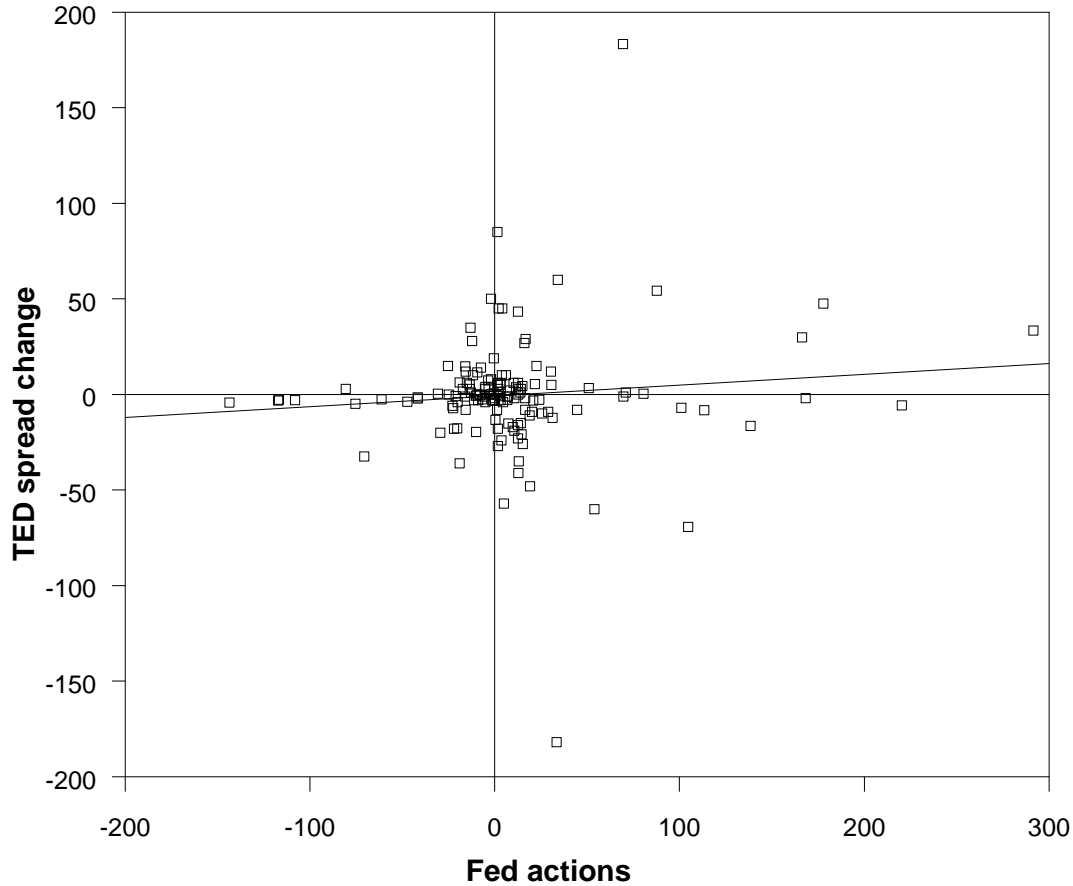


Figure 7. Change in TED spread and targeted Fed liquidity actions, January 10, 2007 to September 16, 2009. Horizontal axis: total Fed assets net of Fed Treasury holdings on Wednesday of a given week minus total Fed assets net of Fed Treasury holdings as of the previous Wednesday. Vertical axis: Wednesday-to-Wednesday change in TED spread for the same week. Straight line: regression relation

Of course, the reason that the line slopes up rather than down is that the correlation does not simply reflect the response of the economy to the Fed's actions. It also results from the response of the Fed to the economy. Specifically, when the TED spread increased, the Fed responded by increasing its targeted liquidity operations. Presumably it is this endogenous response by the Fed that produces the overall positive correlation in the data. This is a familiar problem in interpreting statistical correlations, and unfortunately it is difficult for any method to resolve. All we can say is that,

presumably because of this endogeneity of the Fed's response, a beneficial effect of targeted liquidity operations on credit spreads is not the dominant feature one sees in the data.

Or to put it another way, it's not that we saw that things got better whenever the Fed expanded its targeted liquidity operations. Instead the most we could claim that if the Fed had not implemented its actions, things would have been much worse.

McAndrews, Sarkar and Wang (2008) try to achieve identification using data at the daily frequency, finding that on the days of TAF operations or announcements, the LIBOR rate was lower than one would have otherwise predicted on the basis of simple forecasting models. Christensen, Lopez, and Rudebusch (2009) found that the TED spread was lower following the March 2008 Bear Stearns resolution than their affine term structure model would have predicted. Although these results are suggestive, the fundamental identification problem of whether these dates can reasonably be treated as unrelated to other important economic developments is difficult to resolve conclusively.

Conclusions

Participants in this session were asked to address two basic questions. The first is whether the Fed's targeted liquidity operations were necessary and effective. My answer is probably yes, though I would have a hard time persuading someone if they were not already convinced of that. The second question is whether such operations should be considered an important part of central banks' arsenal of tools in the future. To that my answer is categorically no. From virtually any perspective of our current problems, it would have made far more sense to address these problems with proper regulatory

supervision prior to the crisis instead of targeted liquidity operations after the crisis unfolds.

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