

Commentary: Pass-Through Efficiency in the Fed's New Monetary Policy Setting

Minouche Shafik

I. Introduction

This paper brings together many of the themes of this timely and important conference. Interest in the pass-through of central banks' policy rates has enjoyed a resurgence recently, as the Federal Reserve begins to tighten policy in the presence of a vast amount of reserves created by quantitative easing, and as other central banks loosen further by moving their policy rates to record lows.

Of course the Bank of England is in the latter camp. This month, the Monetary Policy Committee (MPC), of which I am a member, voted to introduce a package of measures to support the necessary adjustments of the U.K. economy as it responds to the decision to leave the European Union. This package included a reduction in Bank Rate to a new low of 0.25 percent, and the launch of a Term Funding Scheme to reinforce the pass-through of this cut, alongside a 60-billion-pound-sterling increase in our stock of U.K. government bonds and the purchase of up to 10 billion pound sterling of investment grade nonfinancial corporate bonds.

As central bankers and money market enthusiasts know, the issue of pass-through is of utmost importance. The paper begins with the premise that a necessary condition for competitive money markets

is that any change in the Fed's policy rate is passed through, one for one, to all market transaction rates. In truth, one can make the much broader statement that the very efficacy of monetary policy and its usefulness as a tool for influencing the economy is premised on the pass-through of changes in policy rates to money market rates. And that's why some of us have endless appetite to discuss any wedge between them.

With that in mind, I'd like to pick up on two of the central themes of Darrell Duffie and Arvind Krishnamurthy's paper.

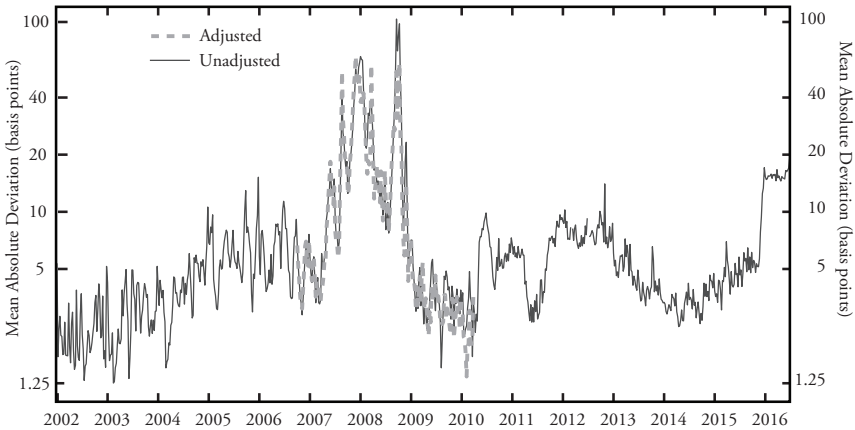
- The first is the impact of regulation—in particular the leverage ratio—on money market function. I will restate the case for having a leverage ratio, but will also argue that it can be much improved by the exclusion of central bank reserves from the exposure measure.
- The second is the role of central banks in money markets. Building on the paper's analysis of the Fed's Reverse Repo Facility (RRP), I will make the case that central banks are now more proactive in the influencing of market rates, the provision of liquidity insurance and the design of market infrastructure.

Finally, I'd like to say a few words about pass-through beyond the money markets. As interest rates decline toward zero, it becomes more difficult for banks to pass through changes in policy rates to those rates faced by households and businesses—hampering the transmission of monetary policy. The Term Funding Scheme is designed to mitigate this impact, and hence reinforce pass-through to the real economy. I'll end by briefly outlining how that works.

II. The Impact of Regulation on Money Market Function

Let me start with the impact of regulation on money market function. Duffie and Krishnamurthy's analysis of the dispersion of money market rates offers evidence of the impact of regulation on behavior and pricing. Their index of money market rate dispersion has risen since the introduction of the Supplementary Leverage Ratio, and has a tendency to increase around key regulatory reporting dates (Chart 1).

Chart 1
Dispersion in U.S. Money Market Rates

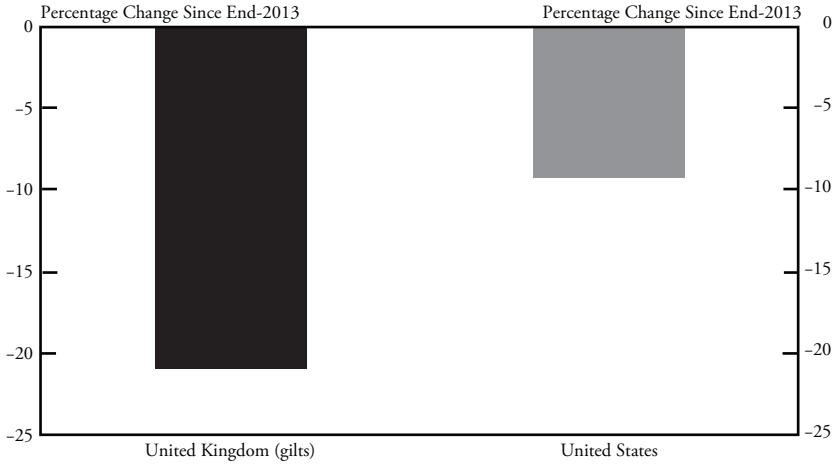


Notes: The dispersion index (solid line) is the weighted mean absolute deviation of the cross-sectional distribution of selected money market rates. The adjusted index (dashed line) is adjusted by subtracting the spread between an unsecured overnight benchmark rate and a secured overnight benchmark rate. See Duffie and Krishnamurthy (2016) for full and important details on data and calculation.

It is difficult to dispute the idea that regulation has had an impact on how markets function globally. The decline in repo market activity has actually been larger in the United Kingdom than in the United States and is about 20 percent below its 2013 level (Chart 2). And the price of repo in sterling markets has increased approximately in line with its U.S. counterpart, as measured by the increase in general collateral repo rates relative to three-month overnight index swaps (OIS) that carry similar economic risks (Chart 3). Alongside this, there has been deterioration in perceptions of overall sterling secured market function over the past year or so, which participants note has coincided with pressure to reduce balance sheet size due to regulatory reporting requirements—in particular the leverage ratio (Chart 4).

Some of this impact may be transitory: as dealers and others adjust to the new arrangements they may find ways to transact more efficiently while staying within the letter and spirit of the regulation. As the paper describes, opportunities for netting could be further increased were a greater proportion of repo transactions to be centrally cleared—about 10 percent of U.S. dollar repo transactions are currently cleared centrally, compared with 45 percent in sterling

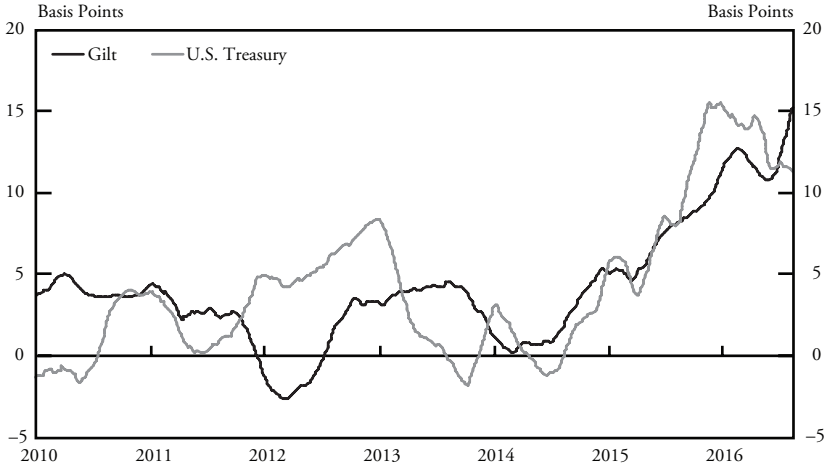
Chart 2
Change in Repo Market Activity since 2013



Notes: U.K. data show the percentage change between end-November 2013 and end-May 2016 (the latest data available) in outstanding gilt repo and reverse repo transactions of a sample of U.K. resident banks. U.S. data show percentage change between end-2013 and early-August 2016 (the latest data available) in U.S. primary dealers' repo and reverse repo financing.

Sources: Federal Reserve Bank of New York, Bank of England and Bank calculations.

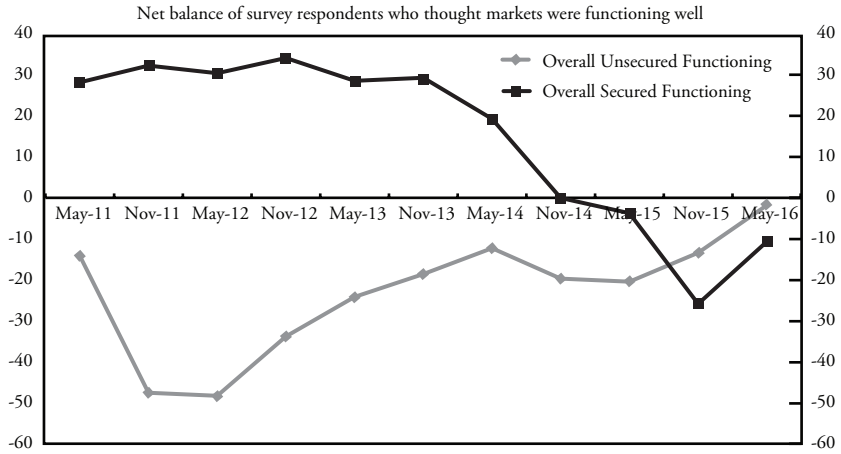
Chart 3
Spread Between Repo Rates and Swap Rates*



* Indicative three-month gilt repo and U.S. Treasury repo spread to three-month Overnight Index Swap (OIS) rate
 Notes: Three-month moving average. Gilt repo rates are indicative and based on internal rate collection. Data up to Aug. 16, 2016.

Sources: Bank of England, Bloomberg and Bank calculations.

Chart 4
Survey Respondents' Views of Sterling Money Market Functioning



Notes: "Net percentage balance" is calculated as the difference between the balance of lenders reporting that, on a scale of 1-5, the market was functioning very poorly (1) to very well (5). The net percentage balances are scaled to lie between ± 100 : more extreme responses (1 and 5) attract a weight of 100 percent, less extreme responses (2 and 4) attract a weight of 50 percent and central responses (3) attract a weight of zero.

Sources: Money Market Liaison Committee Sterling Money Market Survey and Bank calculations.

and 65 percent in euros.¹ Dealers may improve the optimization of their balance sheets across the whole group, better allocating leverage headroom in one part of the business to more leverage-constrained activity in other parts of the group. And over time, new approaches to intermediation could emerge—some exchanges are exploring platforms to allow end-users of the repo market (such as pension funds) to transact directly with one another.

However, such innovations and adjustments will only ever provide a partial offset to the underlying changes. And Duffie and Krishnamurthy are right to say that regulation bears a social cost by increasing segmentation and reducing incentives to compete, search and match in money markets. But it would not be right to then conclude that the framework of regulation that was introduced following the crisis represented a net cost to society. Would it really be desirable to return to a world in which, as Pozsar (2016) put it, the quantities traded were "endless," and the impact on balance sheet "an afterthought"?

III. The Role of the Leverage Ratio

Given that I am a member of the Financial Policy Committee (FPC), which has been one of the architects of the post-crisis regulatory framework in the United Kingdom and that put a leverage ratio in place in 2015, you probably won't be surprised that I support the existence of the leverage ratio. Remember that over the period from 2000 to 2007, about a quarter of dealers held less than enough equity to absorb losses worth 2 percent of their assets. That was facilitated by an overreliance on risk weighting, which tended to place too much weight on periods of stability and too little on periods of underperformance. It's now clear that in the years before the crisis, banks were underpricing the use of their balance sheet, and that the dispersion of rates in money markets probably underestimated the true real marginal cost of intermediation.

This view has been formalized in numerous studies that have found the leverage ratio was a better predictor of bank failure during the crisis than the risk-weighted capital ratio (Chart 5).² And recent studies (such as Fender and Lewrick 2015 and Grill, Hannes and Smith 2015) suggest that a calibration of 3-5 percent maximizes the benefits to society in the form of greater financial system resilience relative to the impact of higher bank funding costs.

However, despite my belief in the utility of the leverage ratio, I also recognize that no regulation is perfect. And, that if we policymakers spot opportunities to minimize regulation's adverse impact on the liquidity of core financial markets without compromising the positive effect on resilience, we should take them.

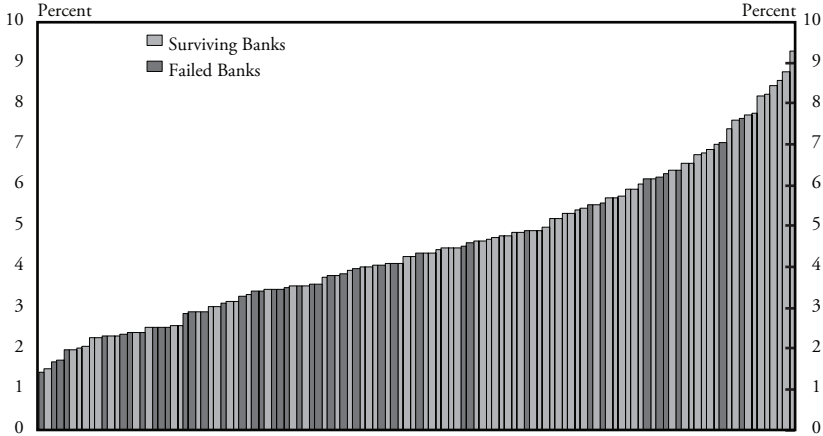
IV. Reducing Unintended Consequences

The FPC actively seeks out these improvements—a process we refer to as “snagging” in reference to the process by which a newly constructed building is checked for protruding nails and screws which could snag and tear one's clothing.

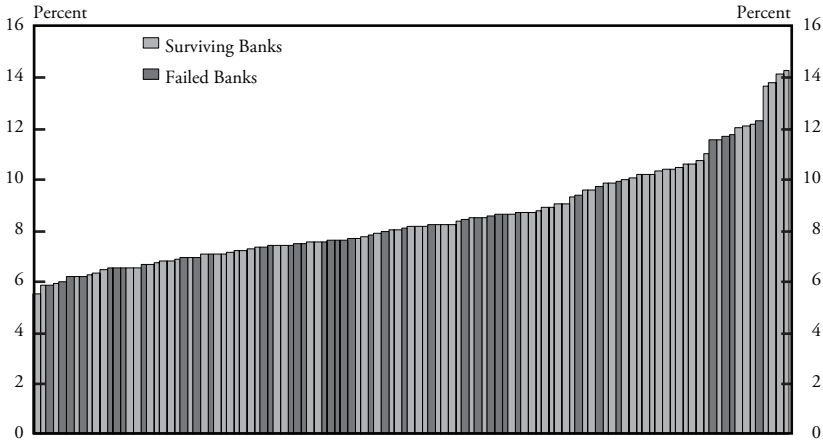
As a result of one such snagging exercise—our annual statutory review of the leverage ratio direction—this month we made the decision to exclude central bank reserves from the exposure measure

Chart 5 Comparison of Leverage Ratio and Risk-Based Capital Ratio as a Predictor of Firm Failure

Leverage Ratios of Major Global Banks and Subsequent Failure



Risk-Weighted Capital Ratios of Major Global Banks and Subsequent Failure



Note: Reproduced from Haldane (2010).
Sources: Capital IQ, SNL, published accounts and Laeven and Valencia (2010).

of the leverage ratio framework. This change was a good example of close co-ordination between macroprudential and monetary policy—without it a loosening of monetary policy through the creation of reserves by the MPC to purchase assets would have led to a deterioration in banks' leverage ratios at precisely the time we would like them to support credit growth in the economy.

In making this decision, we were comfortable that it wouldn't dilute the financial stability benefits of the leverage ratio because, as you know, central bank reserves are a unique asset class. So long as they are matched by liabilities in the same currency (which we have stipulated as a condition of their exclusion), they pose neither credit nor liquidity risk. And banks' holdings of them represent a buffer against unexpected events.

It is true that this change will mechanically reduce the nominal amount of capital required to meet the leverage ratio standard, other things equal. That is not the FPC's intention, and so we intend to recalibrate the standard to offset this impact as part of our planned 2017 review of the leverage ratio framework.

To be clear, removing central bank reserves from the leverage exposure measure will not neutralize all of the impact of the leverage ratio that Duffie and Krishnamurthy highlight—for example, repo will be unaffected by this change. However it should address some of the other issues around money market rate dispersion and pass-through efficiency raised in the paper.

- If central bank reserves are included in the leverage exposure measure, banks must think carefully before accepting a deposit. If it implies an increase in their overall asset size, their leverage capital requirement will increase commensurately, and that will bring a shadow regulatory cost of the same order of magnitude as those calculated in the paper. This disincentivizes competition for deposits, and drives a wedge between the central bank policy rate and rates that banks will pay on wholesale deposits.
- If central bank reserves are removed from the exposure measure it instantly gives banks somewhere to place cash without impacting their leverage ratio. They would therefore maximize

profits by competing for deposits at rates all the way up to the rate that can be earned on reserves at the central bank, thus improving pass-through to average bank deposit rates and strengthening the transmission of monetary policy to the real economy. And the early indication from market participants is that they do indeed expect this change to strengthen the link between money market rates and Bank Rate.

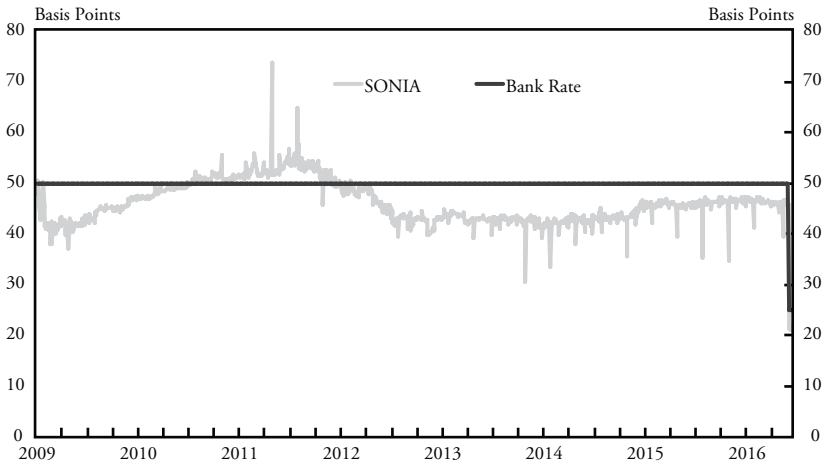
In short, although regulatory innovations such as the leverage ratio are here to stay, we can and should attenuate some of their impact on money market function where it is possible to do so without reducing the financial stability benefits. This process of reducing unintended consequences is made easier by close coordination of different policymakers, which at the Bank of England is facilitated by having monetary, macroprudential and microprudential policy all under one roof.

V. The Role of Central Banks in Money Markets

Let me turn to the role of central banks as a participant in money markets. Just as private market participants have grappled with new challenges in the post-crisis world, so too have central banks. And we have responded in three ways.

First, we have become more flexible in the way we implement changes in the policy rate. The frameworks we use to influence market rates need to recognize the fact that there are a lot more reserves in the system than before, and that regulation has reduced the incentive to arbitrage small differences in money market rates. As the paper sets out, the Fed's RRP is a good example of adapting to this new reality. The facility improves pass-through efficiency by offering a risk-free asset to a broad range of counterparties that extends beyond banks, thus strengthening the floor on money market rates more generally. The counterpart to this facility in the United Kingdom is our ability to issue Bank of England bills, though thus far we haven't had the need to do so: since we began paying Bank Rate on all reserves in 2009, the wedge between overnight unsecured money market rates and Bank Rate has averaged 4 basis points, and the standard deviation also been 4 basis points (Chart 6). Another example of changing the way we operate was our decision in 2014 to grant

Chart 6
Bank Rate and Sterling Overnight Unsecured Rate



Sources: Wholesale Market Brokers' Association and Bank of England.

broker dealers access to reserve accounts at the Bank of England for the first time.

Second, empowered by strengthened regulatory frameworks and resolution regimes, we have reaffirmed our commitment to abide by Bagehot's 19th century advice that the best way to avoid a panic is to "lend freely and vigorously ... on all good banking securities." For example, shortly after the result of the U.K.'s referendum on EU membership was declared we made clear that banks already had collateral positioned with us such that they could borrow more than 250 billion pounds sterling, and announced that our regular liquidity auctions would continue to run on a weekly basis throughout the summer. Coupled with banks' own strong internal liquidity positions, this has helped ensure the smooth functioning of money markets. And overnight market rates have stayed close to Bank Rate throughout the period since the referendum.

Third, we have taken steps to ensure that the vital infrastructure of money markets continues to remain effective. The work on risk-free benchmark rates being undertaken by both the Federal Reserve and the Bank of England is a good example of this. Building on recommendations made by the FSB—which drew on the findings of a

market practitioners group chaired by Duffie—both central banks have convened working groups of market participants with the aim of identifying benchmarks of nearly risk-free reference rates that could sit alongside Libor.^{3,4} And both have taken steps to improve the resilience and coverage of overnight unsecured benchmark rates—the Bank of England by taking over the administration and reform of the Sterling Overnight Index Average (SONIA) and the Fed by overseeing the creation of the Overnight Bank Funding Rate.⁵ Such benchmarks are a vital means of assessing the pass-through efficiency of changes in policy rates—meaning Darrell and Arvind will continue to be able to write papers on the topic long into the future.

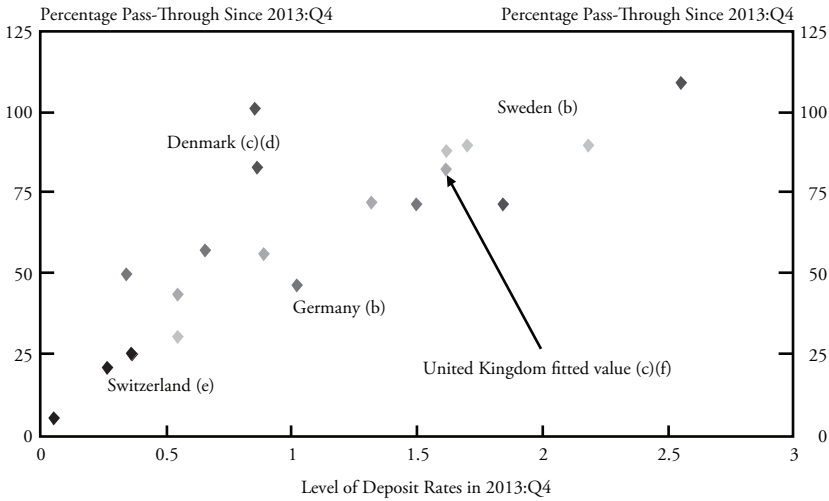
VI. Pass-Through Beyond Money Markets

Let me turn briefly to pass-through beyond money market rates. Deep structural forces affecting savings and investment preferences have combined with the ongoing legacy of the financial crisis to push the interest rate required to keep our economies in balance much lower than historical reference.

The resulting proximity of policy rates to what was once known as the zero lower bound has important implications for the pass-through of monetary policy. Specifically, once household and business deposit rates have reached a very low level, it becomes difficult for banks to reduce them further. Recent international experience seems to bear this out. Chart 7 shows that pass-through to retail deposit rates tends to be weaker when risk-free rates are very low. As a result, to protect their margins, banks may not reduce the rate they charge on lending, thus dampening the transmission of monetary policy.

The MPC was acutely aware of this when it decided at the beginning of this month to reduce Bank Rate to 0.25 percent. To reinforce the transmission of this change we also launched a Term Funding Scheme (TFS) through which central bank reserves will be lent to banks and building societies for four years. Should they maintain their lending to the real economy, the rate they will pay over this period will be Bank Rate. For each 1 percent that net lending by an institution falls, the cost of TFS funding will rise by 5 basis points to a maximum of 25 basis points. By tethering banks' term funding costs more closely to our official policy rate, this should create the capacity

Chart 7
Pass-Through of Risk Free Rates to Retail Deposit Rates



- a. Effective household deposit rate on new business, unless otherwise stated, and change between 2013:Q4 and the three months to May 2016 as a percentage of the change in the corresponding maturity of swap rate.
- b. Includes interest rates for overnight deposits, and deposits with a maturity of less than one year, between one and two years and greater than two years.
- c. Data are for the three months to June 2016.
- d. Outstanding interest rates for deposits with a maturity of less than three months, between three months and one year, between one and two years and greater than two years.
- e. Published rates for new sight deposits, and on two and three-year cash bonds.
- f. Percentage of pass-through is that implied by bivariate regression on the data for other European countries shown in this chart.

for them to pass the reduction in that rate through to households and businesses, thus strengthening the transmission to the real economy.

Since the MPC's decision, we have published further documentation, technical detail and guidelines for firms considering using this facility. We are now open to applications, and the scheme will be available to be drawn upon from the middle of September.

VII. Conclusion

Let me summarize. Duffie and Krishnamurthy's paper draws attention to some very important issues, namely the decrease in competitive forces and increase in frictions in money markets, which work to reduce the pass-through efficiency of the Federal Reserve's monetary policy setting. And the behavior of the index of dispersion of money market rates that they have created provides evidence that these developments are at least in part due to post-crisis changes in the regulatory framework.

Taking into account the improved resilience of the financial system, these regulatory changes are net beneficial to society, so they are not going to be rolled back. However, policymakers can and should be willing to attenuate some of their unintended consequences, and be open to challenge on their design.

As participants in money markets, central banks should be open to new ways to enhance pass-through efficiency by showing flexibility in their implementation of monetary policy. The Fed's RRP does this by making a risk-free asset available to a wider range of counterparties than would ordinarily be the case. And the Bank of England's recently launched TFS will help the pass-through of very low levels of Bank Rate to the rates faced by households and businesses in the real economy. Central banks can also contribute to the function of money markets more broadly, by being willing to act early to address potential liquidity needs, and to support money market infrastructure more generally.

I'll end with a word on central banks' "footprint." Many of the developments raised in the paper and that will be discussed over the course of this conference have been a response to the needs of the day: having more reserves in the system is a reflection of the monetary policy stance required by economic developments; the leverage ratio has been developed as a part of the response to failure of the pre-crisis capital framework; and our intervention in risk-free benchmark rates is intended to avoid a coordination failure in which the most appropriate and robust benchmarks would not be adopted by the market.

So, while it is true to say that central banks' footprint in money markets is larger now than in the days prior to the crisis, this has been out of necessity rather than design. As a tribe, central bankers retain a strong belief in financial markets' ability to facilitate price discovery, allocate capital efficiently and provide useful signals about the macro economy and financial stability.

Author's note: I would like to thank Grellan McGrath for assistance in preparing these remarks.

Endnotes

¹Source: Federal Reserve Bank of New York <https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2016/ARRC-roundtablesides.pdf>; Money Market Liaison Committee Sterling Money Market Survey; European Central Bank Euro Money Market Survey.

² For example, IMF 2009, Aikman et al. 2014 and others.

³Reforming Major Interest Rate Benchmarks—July 2014 http://www.fsb.org/wp-content/uploads/r_140722.pdf.

⁴In the United States, this is the Alternative Reference Rates Committee. In the United Kingdom, it is the Working Group on Sterling Risk-Free Reference Rates.

⁵SONIA is the weighted average of unsecured brokered transactions and it is the main reference rate in OIS contracts. Current daily volumes are about 7-10 billion pounds sterling, down from about 25 billion pounds sterling before the financial crisis. In July 2015, the Bank of England announced its plans to reform SONIA, including by broadening its coverage to encompass overnight unsecured transactions negotiated bilaterally as well as those arranged via brokers. For more information see <http://www.bankofengland.co.uk/markets/Pages/benchmarks/soniareform.aspx>.

References

- Duffie, Darrell, and Arvind Krishnamurthy. 2016. "Pass-through Efficiency in the Fed's New Monetary Policy Setting," in *Designing Resilient Monetary Policy Frameworks for the Future*, Federal Reserve Bank of Kansas City, Jackson Hole Economic Policy Symposium, Jackson Hole, Wyo., Aug. 25-27.
- Fender, I., and U. Lewrick. 2015. "Calibrating the Leverage Ratio," *BIS Quarterly Review*, December, pp. 43-58.
- Grill, M., J. Hannes Lang and J. Smith. 2015. "The Leverage Ratio, Risk-Taking and Bank Stability," preliminary version; www.eba.europa.eu/documents/10180/1018121/Grill,%20Lang,%20Smith+-+The+Leverage+Ratio,%20Risk-Taking+and+Bank+Stability+-+Paper.pdf.
- Haldane, A., and V. Madouros. 2012. "The Dog and the Frisbee," www.bankofengland.co.uk/archive/Documents/historicpubs/speeches/2012/speech596.pdf.
- IMF. 2009. *Global Financial Stability Report*, April.
- Laeven, L., and F. Valencia. 2010. "Resolution of Banking Crises: The Good, the Bad and the Ugly," IMF working paper, 10/146.
- Pozsar, Z. 2016. "Money Markets after QE and Basel III," Credit Suisse, June 2016.

