Mosser Remarks Jackson Hole Symposium 23 August 2024

Policy panel: The Monetary Transmission Mechanism

Good morning. I want to thank the Kansas City Fed for inviting me to join this panel. It's a pleasure to be here.

In my day job, I train many current and future central bankers from all around the world. One of the things I try to impress on them is that the monetary transmission mechanism -- how monetary policy "works", how it alters financial opportunities for financial institutions, businesses, households and governments (and thus influences output and inflation) -- is not static. The global financial system is dynamic, and the ways that central bank policies influence financial conditions change frequently. Our macro models often ignore most of that as financial noise – and frankly it is sometimes noise -- right up until the moment that it is not financial noise anymore. At that point, central bankers can be surprised that the impact of monetary policy is not what they predicted.

So today I want to talk about three forces that I believe have been particularly important in shaping how monetary policy works: regulation, financial innovation including digitalization and fast payments, and the impact of persistent massive excess liquidity provision by central banks since the Global Financial Crisis. I will give a few examples as I go along. I will also raise quite a few questions that I don't have answers to, but which I think are important for central bankers to consider in order to better understand how the monetary transmission mechanism has changed -- and may change in the future.

Let me start with regulation.

We've known for a very long time that the structure of financial regulation is critical to the monetary transmission mechanism. Paul Volcker regularly noted that in the 70s and early 80s Regulation Q was the most effective monetary policy transmission mechanism ever invented. (Regulation Q is the former US bank regulation that set caps on deposit interest rates paid by banks). As soon as the FOMC raised the policy rate above the deposit cap, deposits flowed out of the banking system, credit formation collapsed and the economy slowed down.

More recently, here is a quite sizable literature on the interaction of monetary policy and macroprudential policies. The overall conclusion is that when monetary policy and macroprudential policies are complements, rather than substitutes, that is when they reinforce each other, they are both more effective. The opposite is true if they work against each other. But many of the studies looking at this topic have taken a macro approach to measuring the impact of policies without identifying specific pieces of the monetary transmission mechanism.

I want highlight two very recent studies which directly focus on the interaction of regulation with the bank credit channel of monetary policy. Both studies look at the impact of rules which allow

banks apply historical cost accounting to their securities portfolios. One study uses detailed data on US banks; the other uses similar confidential data from the Euro Area (Italy). The bottom line of both studies is the same: greater allowance for historical cost accounting of securities, Held to Maturity (HTM) or Available for Sale (AFS), weakens the bank credit channel of monetary policy very significantly.

The paper[1] on the Euro System examines the impact of European Central Bank's asset purchase programs on individual bank lending decision using micro banking and supervisory data from the Bank of Italy. In the Euro Area, the accounting treatment of sovereign bonds was used as macro-prudential tool during the European debt crisis. So during the ECB's first asset purchase program in 2015, AFS sovereign bonds held at banks were treated like HTM to protect banks from volatility. By the time of the ECB's 2019 asset purchase program, AFS sovereign bonds held by banks were marked to market. The impact of ECB's bond purchases on bank credit in 2019 was orders of magnitude larger. The paper also looked at the impact of forward guidance on credit formation and found that it too was larger during the later period.

The second paper[2] uses US Federal Reserve Y-14 data to look at the same accounting treatment issue, but during a period of monetary policy tightening (2022-23) So it studies a different country, different banking structure, different monetary policy regime and a different monetary policy tool -- but it comes to a surprisingly similar conclusion. Allowing banks to shield large portions of their securities portfolios from the capital implications of market fluctuations significantly blocks the impact of monetary policy on credit formation. So in 2022, the FOMC's intent – that higher policy rates would tighten financial conditions -- was thwarted to some extent by the very large holdings of HTM securities at US banks, and by the treatment of AFS securities at some large regional banks. As an aside – this study also notes that US banks (large and small) massively increased their HTM portfolios just prior to the Fed raising rates. So by 2022, the monetary transmission through banks was particularly small – and likely contributed to the relatively small tightening in financial conditions.

The results of both studies make intuitive sense. If a large proportion of bank securities portfolios are shielded from market pricing, then loosening or tightening monetary policy is unlikely to have large impacts on the banks' lending decisions, at least in the short run. Of course that's not a situation that can go on indefinitely, as we all (re)discovered in March 2023.

Another example of the importance of regulatory structure is the impact of capital regulation on dealer-intermediated fixed income markets. This is a story that everyone here is familiar with. Significantly higher capital requirements such as Basel III, and US's higher leverage ratio requirements were designed to limit risk taking behavior in the trading book -- which is a desirable outcome from a safety and soundness perspective. However such regulations have

[1] Orame, Andrea and Ramcharan, Rodney and Robatto, Roberto (2024), Macroprudential Regulation, Quantitative Easing, and Bank Lending , June. Available at SSRN: http://dx.doi.org/10.2139/ssrn.3802634.
[2] Greenwald, Daniel, John Krainer, Pascal Paul (2024), Monetary Transmission through Bank Securities Portfolios, NBER working paper #32499, May. https://www.nber.org/papers/w32449.

consequences. They also limit the capacity and more importantly the flexibility of securities dealers and banks to use their balance sheets to intermediate and fund arbitrage in debt markets, including those for government securities. The net result is more fragile sovereign debt markets, and consequently the interest rate channel of monetary policy transmission is also more fragile and potentially more volatile. In extremis, if the interest rate channel of monetary policy breaks, as it did in 2020, central banks need to be much more aggressive with respect to their monetary policy actions, whether it is via interest rate or balance sheet policies.

I can't emphasize enough how important I think this issue is for monetary policy making. Central banks rely on sovereign debt markets to work efficiently – to be deep and liquid -- in order to transmit monetary policy changes from short rates to long rates, to provide information on term premia, risk premia and inflation expectations, and to assess the impact of forward guidance. In turn all of those are key pieces of information used to determine the future stance of MP. So if the interest rate channel is more unpredictable – and prone to "breaking" --- then central banks have a problem on their hands.

Now let me turn to the impact of policy stance on transmission mechanisms. For more than a decade, the global economic and financial environment was unusual by historical standards: weak economic growth, too-low inflation, near-zero interest rates, suppressed volatility and risk premia, and extraordinary amounts of excess liquidity provision by central banks. Did that affect monetary policy transmission mechanisms?

Since 2010, financial institutions, both banks and nonbanks around the world, restructured their balance sheets, business mix, risk management, and liquidity management very profoundly. Some of those adjustments were due to regulatory changes, but other changes reflect the fact that for more than a decade monetary policy intentionally pushed financial flows into riskier assets. At the same time, the long-standing trend of financial risk taking and credit formation shifting from banking and into financial markets (via nonbanks and banks) accelerated. But greater use of markets for credit formation also requires greater use of dealer/bank balance sheets to intermediate in these markets, like sovereign debt markets. This begs the question whether the broad credit channel of monetary transmission is also more fragile and potentially unpredictable in the future.

One thing we certainly know: central bank balance sheet policies have changed the structure of money markets and so altered the first stage of monetary transmission mechanism. Unsecured interbank markets are a shadow of their former selves and seem to be either feast or famine. Because of large amounts of central bank liquidity, there are very limited transactions during normal times nearly all of them near the policy rate. These periods of stability are punctuated by occasional small bursts of trading activity and high volatility in money markets. The sort of "day to day" arbitrage movements in money markets that were normal 15 years ago (noise if you like) don't happen anymore. How much does that matter for the transmission of monetary policy? In normal times probably not much. But during the short periods of extreme volatility it certainly

matters because the monetary policy responses to that volatility can be very large. The US experience in 2019 is an example.

Finally I want to turn to how financial innovation may impact the monetary transmission mechanism: Again there is a long history of financial innovations -- financial derivatives, nonbank financial intermediation, securitization – changing the ways that monetary policy impacts financial markets and the economy. The agency mortgage-backed securities (MBS) market in the US is a classic example. Since the 1990s, the MBS market has – occasionally – caused temporary but large distortions to the interest rate channel of monetary policy. These distortions are particularly common for monetary policy changes that occur when many US home mortgages are "in the money" to be refinanced (such as in 1994, 2003, 2009).

Innovations and digitalization of payments are the more recent developments that are likely to affect transmission mechanism. In the last few years, the speed with which funds can flow in and out of financial institutions, as well as in and out of countries has increased dramatically. Speeds will almost certainly continue to increase in the future. The potential for ever faster flows of funding may lead to greater volatility in asset prices, exchange rates, etc. An open question is whether faster flows/payments will strengthen transmissions via interest rates, exchange rates and credit conditions, or weaken them. My concern is that significantly faster flows may make transmission mechanisms less stable and predictable. If so central banks may have difficulty calibrating how a particular monetary policy action will impact financial conditions and thus the real economy.

Innovations in payments, and faster speed, seem particularly important for the balance sheet part of monetary policy. Specifically, the interaction of payments innovation with liquidity regulation may significantly impact the size of reserves. Whether it is the Fed's "ample" regime – or the (smaller) excess reserves regimes outlined by the Bank of Canada, Bank of England, the ECB or the Reserve Bank of Australia, bottom line is that the amount of reserves supplied by central banks will be the same or larger than the amount banks' demand.

If I were a bank Treasurer, what would I be doing in response to faster payment flows (and the lessons of March 2023)? Well I'd be thinking very seriously about how much intra-day liquidity my institution needs, ie. how much do I need by 5 pm each day (T+0 liquidity)? Do I need more? Very likely. The only truly reliable way for a bank to self-insure intra-day liquidity (as required by the Liquidity Coverage Ratio) is to hold central bank reserves Other types of high quality liquid assets won't do. So how large a quantity of reserves will central banks need to supply in a world of real-time gross settlement of payments for everyone? Potentially very big. Relatedly this raises the issue of the effectiveness of central bank backstop liquidity facilities (lender of last resort, repo facilities, etc.) But that is an important topic for another panel.

Looking further forward: will other channels of monetary policy transmission change as the speed of financial payments and transactions accelerates, for example if central banks move

toward central bank digital currencies? It seems to me that entering a world of instantaneous payments raises a host of important issues around financial structure. How and when will intraday borrowing and lending be handled. How will securities transactions settle? How will financial contracts (loans, derivatives, securities) be changed to handle real-time payments? How will international funding flows adjust to simultaneously allow for fast payments and manage across the global day? In short, how will the plumbing of the financial system -- financial instruments, infrastructures and market conventions -- adapt to support such a system. What does this have to do with monetary transmission? Our understanding of the monetary transmission mechanism today is predicated on a particular design (and plumbing) of the global financial system. That design is already changing and will likely change in very fundamental ways in the coming years. And it will in turn almost certainly alter how monetary policy "works".

I realize that I have taken a scatter shot approach in my remarks today. But I hope you will take my comments as a reason to explore how monetary transmission channel has changed --and likely will change. As I suggested at the beginning, I have asked a lot of questions I don't know the answers to, but I think they are worth careful consideration by central banks. Thank you.