

MONETARY POLICY THROUGH ASSET MARKETS: LESSONS FROM UNCONVENTIONAL MEASURES AND IMPLICATIONS FOR AN INTEGRATED WORLD

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The global financial crisis of 2008 and its aftermath have brought many new challenges for the world's central banks. These new challenges have, in turn, resulted in bold experimentation—not simply particularly vigorous use of traditional policy tools, but also the use of new tools or, if not entirely new, tools that had seldom been invoked in the decades immediately prior to the crisis. Now that the most urgent period of the crisis is past, central banks are taking stock of the lessons learned from this period of experimentation. Should the central bank's toolkit be larger than what was regarded as sufficient during the years of the Great Moderation, at least during times of crisis? Should the use of additional tools perhaps become routine aspects of the conduct of monetary policy, even when the financial sector is not subject to unusual stresses?

One of the more notable new developments in monetary policy since 2008 has been the greater use of central banks' balance sheets as a tool of policy. Central banks have always engaged in certain kinds of financial transactions to implement monetary policy, but prior to 2008, monetary policy was commonly viewed as involving solely a decision

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about a single short-term interest rate—generally an overnight rate at which banks lend to one another, such as the federal funds rate in the case of the U.S. Federal Reserve. In the transactions undertaken to implement changes in the operating target for this overnight rate, the particular assets acquired by the central bank were generally viewed as unimportant (the goal being to vary the supply of bank reserves). Consequently, prudence dictated that the central bank should only hold extremely riskless and very short-maturity securities (sometimes called a “bills only” doctrine in the United States). Moreover, the central bank’s balance sheet could be quite small under ordinary circumstances: controlling the overnight interest rate by varying the supply of reserves required only a small volume of reserves to support inter-bank payments, to the extent that significant percentage changes in the reserve supply could be achieved with quite modest transactions in terms of the quantity of assets purchased or sold.

As a result, central banks were not major players in asset markets, even if their policy decisions had important consequences for the market pricing of many assets. Monetary policy decisions affected longer-term bond prices through arbitrage relationships between the prices of longer-term bonds and the expected path of short rates, not through direct purchases or sales of long-term bonds by the central bank with a view to influencing their prices. Similarly, monetary policy decisions affected exchange rates, but again—under the doctrine of a floating exchange rate, which had come to be the standard for inflation-targeting central banks—this was expected to result purely from arbitrage relationships between the exchange rate and the expected path of short-term interest rates at home relative to those abroad, rather than from direct intervention by the central bank to control the exchange rate.

The financial crisis changed this picture dramatically, at least in the short run—with longer-term consequences that are yet to be determined. By the end of 2008, many central banks found that even cutting short-term nominal interest rates to the lowest feasible level (or to the lowest level that they were willing to contemplate) resulted in insufficient monetary stimulus to head off a severely contractionary shock. They were therefore forced to ask what other policy tools were available when further cuts in overnight interest rates would not be possible. This led to a reconsideration of the question of whether the central bank could usefully influence longer-term asset yields and foreign exchange rates through direct asset purchases, even in the absence of any change in the level of

the overnight rate (or in the path that it could be expected to follow, at least over the near term). In addition, especially in the period immediately following the onset of the crisis, many central banks faced situations in which the private financial sector could no longer be counted on to efficiently allocate credit in the economy, owing to distress or severe financial constraints in many key institutions. This raised the question of whether the central bank should not itself act as a financial intermediary, channeling credit to particular sectors that would otherwise face funding difficulties, while waiting for private financial institutions to repair their balance sheets and for the climate of panic to be dispelled.

For both of these reasons, the balance sheets of many central banks grew substantially in the years following 2008, and the categories of assets held changed to include many longer-term securities and securities involving risks to which the central banks were not previously exposed. For example, the U.S. Federal Reserve acquired the extensive holdings of mortgage-backed securities in this period. Policies with regard to asset purchases (including, in some cases, significant purchases of foreign exchange with a view to controlling exchange rates) have often been the focus of central bank policy deliberations and communication with the public, given that in many countries, short-term interest rate targets have changed relatively little since late 2008. While asset-purchase policies are not currently being used as actively by central banks like the U.S. Federal Reserve and the Bank of England as in the years immediately following the crisis, they continue to be a central focus of policy at the European Central Bank and the Bank of Japan, among others; and even banks like the Federal Reserve continue to operate with much larger balance sheets than they had prior to the crisis. Thus, the question of the appropriate size of the balance sheet remains an active topic of discussion.

But what do we know about the effects of using these new tools, and what role should they have in the future? The nineteenth annual conference of the Central Bank of Chile addresses these issues, bringing together a distinguished international group of scholars to discuss the latest research findings. The structure of the conference consisted of three sessions, which explored different aspects of the new issues raised by the unconventional monetary policies of recent years.

The first session considered the effects of central bank asset purchases, as well as announcements regarding the intended

future path of purchases, on both financial asset prices and the macroeconomy. The second session focused on a specific aspect of the effects of such policies, namely, the extent to which they alter the incentives for risk-taking by financial institutions. This risk-taking channel is found to significantly amplify the effects of policy. The third session explored the scope and magnitude of spillover effects from policies implemented by central banks like the U.S. Federal Reserve on other economies—in particular, emerging economies—with a focus on linkages between the longer-term bond markets of different countries. The conference concluded with a keynote address by Lawrence Summers, former U.S. Treasury Secretary and one of the keenest observers of current economic affairs, on the challenges for stabilization policy going forward, in a global environment in which conventional interest rate policy may have less scope than it had in the past. We now summarize each of these sessions in sequence.

Session 1: The Impact of Conventional and Unconventional Monetary Policies on Asset Prices

The three papers from the first session study, from both a theoretical and empirical perspective, the impact of the broader set of monetary policies discussed above, the so-called unconventional measures, on interest rates at different horizons and over a wide variety of securities.

In “Forward Guidance in the Yield Curve: Short Rates versus Bond Supply,” Robin Greenwood, Samuel G. Hanson, and Dimitri Vayanos characterize and compare the effects of so-called forward guidance policies (that is, pre-announcements about the future path of the federal funds rate) on short-term rates and the supply of bonds, using a model of yield curves and bond rates in which the monetary authority can pre-announce movements in future short-term bond rates or quantitative easing. The results indicate that pre-announcements about short-term bond rates, which operate via expectational hypotheses, have a direct impact on the announced short rates. In particular, if an explicit increase in a rate of specified maturity is pre-announced, this will have an impact of equal magnitude on the referenced short rate. Meanwhile, the pre-announcements of quantitative easing, operating through the expected future risk premium, achieve the maximum rate hikes in the yields of longer-term bonds. Thus, pre-announcements about short rates have direct effects on those rate, and pre-announcements

of quantitative easing have a stronger impact on rates at longer maturities.

In the second paper, “Bernanke’s No-arbitrage Argument Revisited: Can Open Market Operations in Real Assets Eliminate the Liquidity Trap?,” Gauti B. Eggertsson and Kevin B. Proulx show, in a closed-economy context with sticky prices and taxation costs, that open market operations of real asset purchasing by the government can mitigate a deflationary process. This intervention has effects even in a scenario of nominal short-term interest rates near the zero lower bound, since it allows the government to commit to having future inflation that will enable financing the purchase of assets (by either issuing nominal debt or creating money). This commitment prompts a change in private sector inflation expectations (from deflationary to inflationary) and stimulates aggregate demand. The purchase of real assets by the government potentiates other unconventional policies such as a deficit increase (augmenting nominal debt) or a reduced tax burden to boost aggregate demand.

Finally, in “Measuring the Effects of Unconventional Monetary Policy on Asset Prices,” Eric T. Swanson adapts the methods used by Gürkaynak, Sack, and Swanson (2005) to estimate the effects of unconventional monetary policies in the United States during the zero lower bound period between 2009 and 2015. In particular, the paper seeks to separately identify the effects of forward guidance and large-scale asset purchases (LSAP) in each Federal Open Market Committee (FOMC) announcement on the U.S. Treasury bill rates, asset prices, parities, and corporate rates. The results show that a one-standard-deviation change in forward guidance or LSAP measures affects equally the medium-term Treasury rates, asset prices, and exchange rates. However, forward guidance policies prove to be relatively more effective on short Treasury rates, while the LSAP policies have greater effects on long Treasury rates and corporate bond rates. Finally, the author stresses that in choosing one policy over the other, it is also necessary to consider the costs that each of them implies.

Session 2: The Risk-Taking Channel of Monetary Policy: Implications for Financial Fragility

The papers from the second session address a specific issue connected with the effects of monetary policy on asset markets: namely, the consequence of monetary policy decisions for financial

stability. This is an important general question for the theory of monetary policy, and it is particularly relevant at present, given the increased concern with reducing the risk of a financial crisis in light of the difficulties created by the recent one. Moreover, some analysts argue that the kind of unconventional policies implemented in response to the crisis distort financial decision-making to an unusual extent, in ways that might pose particular risks to financial stability.

“Risk Premium Shifts and Monetary Policy: A Coordination Approach,” by Stephen Morris and Hyun Song Shin, presents a theoretical analysis of a particular type of situation in which small changes in monetary policy can trigger an abrupt shift in portfolios and asset prices. A central bank that fears it may be in this situation may have good reason to tread carefully when even suggesting that it could change its policy. More generally, the paper shows how the effects of monetary policy can, to a large extent, result from its effects on market risk premiums, which change endogenously as a result of the effects of monetary policy expectations on the risk-taking behavior of market participants.

The paper presents a model of risk-neutral investors, who can be interpreted as asset managers, interacting with risk-averse households in the market for a risky long-term bond. Because of the differing degrees of risk aversion of the two types of investors, variation in the share of total issuance of the bond that asset managers are willing to hold results in endogenous variation in the risk premium. This decision by asset managers in turn involves a coordination problem, because asset managers care about their relative performance, making each one’s optimal degree of exposure to this type of risk dependent on the degree of exposure that other asset managers are expected to choose. As a result of the coordination problem, it is possible for abrupt changes in the aggregate portfolio decision of asset managers, and hence in the market risk premium, to occur in equilibrium in response to even a very small change in fundamentals, if the fundamental state variables cross a critical threshold that the authors characterize using global game techniques.

Morris and Shin use their model to discuss a possible danger associated with the use of commitments to keep short-term interest rates at an unusually low level for a long time as a tool of monetary stimulus, as practiced by the U.S. Federal Reserve and other central banks in the years immediately following the crisis. In their analysis, such a policy can be a source of stimulus by lowering long-term interest rates. However, an important channel through which this

occurs is by encouraging asset managers to increase their holdings of risky longer-term bonds, reducing equilibrium risk premiums. This increase in the share of risky assets held by asset managers who are concerned with their relative performance (and able to shift their positions rapidly) increases the ease with which a signal that interest rates will begin to rise can trigger an abrupt sell-off. Thus, a policy that has desirable effects in the short run can create a sort of trap, in which a central bank finds it difficult to unwind its unusually accommodative policies, even if they are no longer appropriate to current macroeconomic conditions.

In “Quantitative Easing and Financial Stability,” Michael Woodford also addresses potential consequences of monetary policy decisions for risks to financial stability. Here, the risks considered stem from financial intermediaries financing purchases of illiquid risky assets by issuing short-term riskless collateralized debt instruments, which creates the possibility of a roll-over crisis in which illiquid assets must be sold in a fire sale. The paper considers the effects of two alternative dimensions of monetary policy—both quantitative easing (that is, central bank asset purchases that result in large increases in the supply of safe central bank liabilities) and conventional interest rate policy (implemented without any large change in the central bank’s balance sheet)—on the incentives that banks and shadow banks have to engage in liquidity and maturity transformation of this kind and hence on the degree of risk to financial stability.

The paper embeds a simple model of endogenous intermediary capital structure in an intertemporal general equilibrium monetary model in which short-term safe instruments earn a money premium owing to their special role in facilitating transactions (for example, by being assets that are suitable for money market mutual funds to hold, which create liabilities that can in turn be used as means of payment). The “outside” supply of short-term safe instruments (both short-term bills supplied by the Treasury and safe liabilities of the central bank) then becomes an important determinant of the size of the equilibrium money premium and hence of the incentive for private intermediaries to supply short-term safe instruments such as asset-backed commercial paper or short-term repos (both of which played significant roles in the funding crises of 2007–08).

Woodford shows why conventional interest-rate policy and quantitative easing are logically independent dimensions of policy and how they jointly determine financial conditions, aggregate

demand, and the severity of risks to financial stability. While both interest rate cuts and quantitative easing are shown to have similar effects in the sense that either policy will simultaneously stimulate aggregate demand and increase financial risk, the model implies that quantitative easing policies actually increase financial stability risk less than an interest rate cut, relative to the magnitude of aggregate demand stimulus achieved; and a combination of expansion of the central bank's balance sheet with a suitable tightening of macroprudential policy can have a net expansionary effect on aggregate demand with no increased risk to financial stability. This suggests that quantitative easing policies may be useful as an approach to aggregate demand management not only when the zero lower bound precludes further use of conventional interest rate policy, but also when it is not desirable to further reduce interest rates because of financial stability concerns.

Finally, "Short-term Interest Rates and Bank Lending Terms: Evidence from a Survey of U.S. Loans," by Giovanni Dell'Ariccia, Luc Laeven, and Gustavo Suarez, provides an empirical assessment of the risk-taking channel for the effects of monetary policy—that is, the thesis that loose monetary policy generates expansionary effects largely by inducing banks to relax lending standards, which allows an expansion of credit (and hence more current spending to be financed), but at the cost of increased risks to financial stability. The importance of this channel is an important issue for assessing the degree to which a prolonged period of low nominal interest rates in the United States in the mid-2000s should be considered one of the important causes of the subsequent crisis and for determining the potential dangers of further prolongation of the current period of unusually low nominal rates as well.

The paper uses confidential data from the U.S. Federal Reserve's Survey of Terms of Business Lending to measure how bank lending terms in the United States are affected by monetary policy. The authors find that, controlling for the ex-ante riskiness of a given loan (as indicated by the internal risk rating of the loan, which banks report to the survey), the lending terms offered by banks are easier when interest rates are lower. Loan spreads are found to be lower, and loans are less likely to be secured, when the federal funds rate target is lower; the authors argue that this provides support for the risk-taking channel. The paper provides novel evidence on this important issue, which nicely complements previous studies that had instead emphasized changes in the composition of lending (that is,

increases in the fraction of lending to higher-risk borrowers), rather than on the terms of lending to a given borrower, in response to low interest rates. Taken as a whole, the papers of this session amply demonstrate, on both theoretical and empirical grounds, that effects on risk-taking decisions are among the effects that should be expected from monetary policy changes, and this should be taken into account when making decisions about such actions.

Session 3: Monetary Policy Interdependence through Long-term Rates

The third and last session of the conference focused on the effects of the monetary policy followed in the developed world on emerging market asset prices. Securities from emerging markets fit naturally into the category of riskier assets that are expected to be affected by investors' search for yield in an environment of low interest rates, as has been documented by a growing empirical literature. This topic is of particular concern for central bankers in emerging regions, which have reasons to be worried about the consequences of U.S. monetary normalization in an environment where further exchange rate pass-through will put increasing pressure on our inflation targets, while interest rate pass-through puts increased pressure on subpar levels of growth.

In "The Response of Sovereign Bond Yields to U.S. Monetary Policy," Simon Gilchrist, Vivian Z. Yue, and Egon Zakrajšek compare the impact on international sovereign bond rates of the U.S. conventional monetary policy (from 1992 to late 2008) with respect to unconventional measures used after the target policy rate reached the zero lower bound (ZLB), between late 2008 and early 2014. Using the changes in the two- and ten-year U.S. Treasury bills as a policy surprise, the authors find that U.S. monetary policy has a pronounced effect on the short- and long-term interest rates of developed economies. However, the short-term sovereign bond rate does not respond to U.S. monetary policy in emerging economies (with the exception of Mexico); only longer rates are more responsive. The results also show that the expansionary U.S. monetary policy steepens the yield curve during conventional periods and flattens it during unconventional periods (ZLB).

Finally, Elías Albagli, Danilo Leiva-Leon, and Diego Saravia, in "U.S. Monetary Spillovers to Latin America: The Role of Long-term Interest Rates," assess the impact of unexpected hikes in U.S. Treasury bill rates on some important economies in Latin America: namely,

Brazil, Chile, Colombia, Mexico, and Peru. Their results indicate that an increase in the longer-maturity Treasury bill rates (ten years) causes an increase in unemployment, inflation, and nominal exchange rates in the economies analyzed, while reducing the returns of domestic capital markets. The one exception is Mexico, whose behavior differs from the rest of Latin America. There, an increase in Treasury bill rates reduces unemployment and the exchange rate; this is mainly explained by Mexico's greater interaction with the United States relative to the rest of Latin America. The authors also find that a rise in the short-term rate (one year) has limited and less statistically significant effects. Finally, increases in U.S. long-term rates triggered an increase in local bond rates during the zero lower bound period, which was transmitted mainly through the rates' risk premium component.