Discussion of "Monetary Policy, Macroprudential Policy, and Banking Stability: Evidence from the Euro Area"*

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1. Introduction

The staggering economic and social costs left behind by the near collapse of the global financial system in the autumn of 2008 have led to much soul searching among economists. What were the factors that contributed to the massive buildup of risks and imbalances in the financial system in the years prior to the 2007–09 financial crisis—many of which went undetected or were poorly understood at the time—is a question of immense importance in both academic and policy circles and one that will occupy our profession for many years to come.

Contemporary narratives of forces that roiled financial markets in recent years (Brunnermeier 2009 and Gorton 2009) have identified the following main culprits: (i) a growing tendency of banks to repackage loans and pass them on in the form of securitized products to other investors—the so-called originate-to-distribute model—which allowed banks to off-load risks from their balance sheets; and (ii) a move by banks to finance their asset holdings with shorter-term maturity instruments, which left them vulnerable to the drying up of funding liquidity. These two factors, along with investors' enormous appetite for securitized products in the years

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leading up to the crisis, led to a flood of cheap credit that was associated with a significant erosion of lending standards, especially in the housing market (Keys et al. 2010). The excessive expansion of credit ended abruptly with the bursting of the housing bubble in the summer of 2007, leaving banks with hundreds of billions of dollars in mortgage-related losses, which, through the mechanisms of leverage and overreliance on short-term funding, were amplified into a full-blown financial crisis.

At the same time, a growing chorus of observers has argued that a prolonged period of accommodative monetary policy in many advanced industrialized countries that preceded the crisis has contributed importantly to the buildup of risks in the global financial system; see, for example, Borio and Zhu (2008), Gambacorta (2009), and Adrian and Shin (2010a). The proponents of this "risk-taking" channel of monetary policy argue that a low interest rate environment induces financial intermediaries to take on excessive risk for at least two reasons. First, low levels of risk-free rates associated with accommodative monetary policy may incentivize financial intermediaries to take on more risk for contractual or institutional reasons—for example, to meet (sticky) nominal return targets. And second, a low level of interest rates will boost asset values, incomes, and cash flows—in effect increasing the amount of pledgeable collateral—which may reduce risk perceptions, thereby increasing risk tolerance in the financial sector. A combination of increased risk appetite and the presence of moral hazard in the financial system can lead to a socially sub-optimal risk shifting in the credit intermediation process, a phenomenon that is an essential feature of the boom-bust nature of credit-driven cyclical fluctuations.[1]

The paper by Maddaloni and Peydró (M-P hereafter) contributes to the growing empirical literature seeking to quantify the strength of the risk-taking channel. It does so by analyzing the extent to which the changes in the stance of monetary policy have influenced the evolution of bank lending standards in the euro area over the 2002–08 period. The main contribution of the paper is that it presents evidence showing that low policy rates that characterized the financial landscape of that period contributed significantly to the softening of

[1]See Allen and Gale (2007) for various theoretical treatments of how the presence of moral hazard in the banking sector can affect risk shifting in lending.

lending standards in the euro area, a shift in lending posture that importantly reflected increased risk taking by the banking sector.

The combination of the institutional setting for the conduct of monetary policy in the euro area and the country-specific responses to the European Central Bank's (ECB's) Bank Lending Survey allows the authors to employ an innovative identification strategy when parsing out the effects of low policy rates on the changes in bank lending standards from other factors that simultaneously influence the supply of, and demand for, bank-intermediated credit. Nevertheless, I view their evidence as largely suggestive, though quite intriguing, and hope that it will spur significantly more research into this important topic.

2. Main Comments

Because of data availability reasons, M-P focus their analysis on the period from late 2002 onward.[2] As a result, their sample period contains, in effect, only "one" observation, the period of highly accommodative monetary policy—at least in retrospect—between mid-2003 and the end of 2006, when the ECB kept its main refinancing rate at 2 percent. To get around this problem, M-P cleverly exploit the fact that common monetary policy is set by the ECB for all countries in the euro zone. This institutional feature of the euro area induces cross-sectional variation in the stance of monetary policy for the dozen countries that were in the monetary union as of the end of 2002, variation that is key to their identification strategy.

Formally, M-P estimate a panel version of an interest rate rule, in which a common indicator of the stance of monetary policy that is controlled by the ECB—that is, the Euro OverNight Index Average (EONIA) rate (i_t)—is regressed on the country-specific real GDP growth (Δy_{it}) and the corresponding inflation rate (π_{it}):

$$i_t = \emptyset_{\Delta y} \Delta y_{it} + \emptyset_{\pi} \pi_{it} + \eta_i + \varepsilon_{it}.$$

By letting the policy rate respond to output growth—as opposed to the output gap—M-P implicitly assume that the ECB follows a

[2]The ECB launched the Bank Lending Survey in January 2003.

first-difference interest rate rule of the type proposed by Orphanides (2003). In this context, a positive residual $\hat{\varepsilon}_{it}$ is associated with relatively tight monetary conditions in country i in quarter t; conversely, a negative residual implies a stance of policy that is "too accommodative," given the macroeconomic conditions of that country.

These country-specific "Taylor-rule" residuals are combined with the corresponding country-level aggregate responses to the ECB's Bank Lending Survey (BLS), a quarterly qualitative survey that queries banks in each euro-zone country about changes in lending standards and terms on loans to businesses and households as well as about changes in the corresponding loan demand. The resulting variation within and across countries in monetary conditions gives the authors greater power to identify the effect of the stance of monetary policy on the changes in bank lending standards across the twelve countries in their sample.

The credibility of this identification strategy hinges importantly on the extent to which these interest rate rule residuals accurately capture the variation in monetary conditions across countries in the euro area. There are at least two potential problems with this approach. First, although such a first-difference rule has a number of attractive features (see, e.g., Orphanides and Williams 2006), it does not allow for interest rate smoothing, a feature of the monetary policy decision process that is known to improve significantly the empirical fit of simple interest rate rules. Second, the interest rate rule is estimated by simple OLS, which treats the twelve countries in the sample equally, irrespective of their economic importance in the euro area—it would make more sense to estimate the interest rate rule using weighted least squares, using real GDP of individual countries as weights.

It is difficult to know a priori how these factors distort their localized measure of the stance of monetary policy. However, any systematic (time-varying) bias in assessing the stance of common monetary policy within each country is likely correlated with the propensity of banks to change their lending standards, which would lead to biased estimates in the second stage. It is worth noting that the inclusion of country and time fixed effects in the second-stage regressions (see table 3) suggests that the results reported by M-P may be quite robust. Indeed, I find the authors' approach in exploiting cross-country variation in the stance of monetary policy within

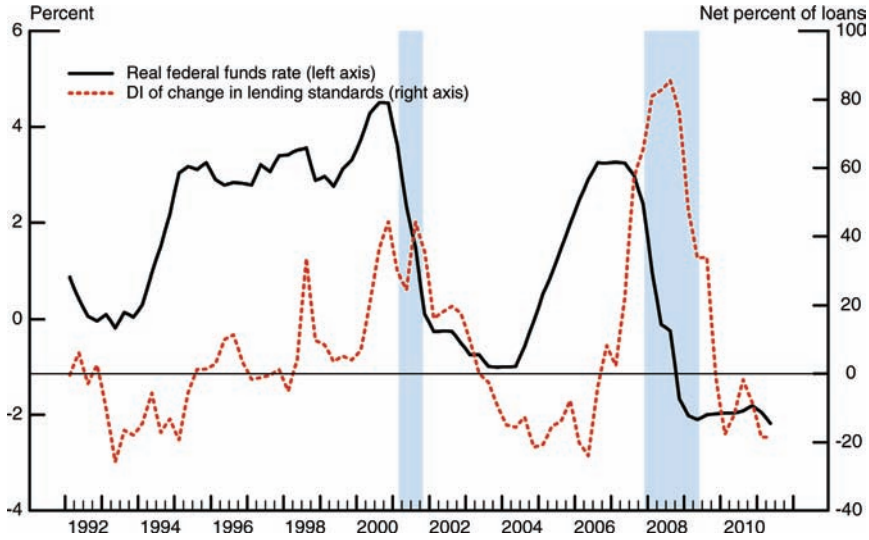
the euro area very appealing, but would welcome additional research using more sophisticated measures of localized monetary conditions.

Given the limited availability of data in the euro area, it would seem instructive to see how the analysis performed by M-P pertains to the United States. After all, a number of influential observers have blamed the Federal Open Market Committee (FOMC) for keeping short-term interest rates too low for too long—relative to the path prescribed by simple interest rate rules—following the bursting of the dot-com bubble at the beginning of the last decade (Taylor 2010). Another advantage of looking at the U.S. experience is due to the fact that the Federal Reserve's version of the ECB's BLS—the Senior Loan Officer Opinion Survey on Bank Lending Practices (SLOOS)—goes back to the early 1990s, thereby covering a greater number of monetary policy phases.

The solid line in figure 1 depicts the stance of U.S. monetary policy—as measured by the real federal funds rate—while the dotted line shows the diffusion index of the change in bank lending standards, a SLOOS-based indicator of supply conditions in bank-intermediated credit markets constructed recently by Bassett et al. (2012). The figure clearly illustrates the same phenomenon as that pointed out by M-P: The highly accommodative stance of monetary policy assumed by the FOMC at the end of 2001 has by the middle of 2006 led to a persistent easing of lending standards in the U.S. commercial banking sector. Over a somewhat longer period, however, the relationship between the stance of monetary policy and the change in banks' lending posture is a lot murkier. For example, although monetary policy was notably less accommodative during the "jobless recovery" of the early 1990s, banks nevertheless eased their lending standards significantly by the middle of that decade. On the other hand, the exceptionally low level of the real federal funds rate since the end of 2008 has thus far produced a relatively modest amount of easing in credit conditions faced by households and businesses.

Of course, these simple co-movements fail to take into account the myriad other factors that are affecting both monetary policy and banks' credit policies. With regards to the latter, theoretical work of Rajan (1994) and Ruckes (2004) argues that banks ease their lending standards in response to competitive pressures in order to grow loan books during economic expansions; Berger and Udell (2004)

Figure 1. Bank Lending Standards and the Stance of Monetary Policy



Notes: Sample period: 1992:Q1–2011:Q3. The solid line depicts the real federal funds rate, defined as the effective (nominal) federal funds rate less average annual CPI inflation over the next ten years, as reported by the Survey of Professional Forecasters. The dotted line depicts the diffusion index of the change in composite bank lending standards; see Bassett et al. (2012) for details. The shaded vertical bars represent the NBER-dated recessions.

present empirical evidence showing that banks tend to tighten lending standards in response to rising loan loss reserves and associated reductions in profitability; and a related literature focuses on the relationship between banks' access to stable funding sources (i.e., core deposits) and their willingness to extend loan commitments (Kashyap, Rajan, and Stein 2002, Gatev and Strahan 2006, and Pennacchi 2006).

In a recent paper, Bassett et al. (2012) (BCDZ hereafter) utilize bank-level SLOOS data to decompose the reported changes in lending standards into a component that captures the change in banks' lending posture in response to bank-specific and macroeconomic factors that also affect loan demand and a residual component, which they argue provides a better measure of fluctuations in the effective supply of bank-intermediated credit. Importantly, they include

the *change* in the real federal funds rate among the macroeconomic factors that could influence the propensity of banks to change their lending policies.[3]

Although BCDZ are concerned with a fundamentally different question than M-P, their panel-data specification is considerably richer in terms of explanatory variables—both at the micro and macro level; utilizes bank-level, as opposed to country-level, data; and is estimated over a longer sample period. According to their results, the coefficient on the change in the real funds rate is *negative* and highly significant in both statistical and economic terms. The negative coefficient indicates that an easing of monetary policy—as evidenced by the decline in the real federal funds rate—is associated with an increased propensity of U.S. banks to tighten lending standards, a finding contrary to that reported by M-P for the euro area. One possibility is that this different result reflects institutional differences in financial systems and/or monetary policy frameworks between the euro area and the United States. Alternatively, it could be due to the mismeasurement of localized monetary conditions in the euro-zone countries, omitted variables, or specification differences between the two approaches.

The analysis of BCDZ, however, does yield a result that is closely related to the question investigated by M-P. When responding to the SLOOS questions on the changes in loan supply and demand conditions, banks are also asked about the reasons that led them to change their credit policies. Among possible reasons, banks very frequently point to the changes in risk tolerance as an important reason for changing their lending standards and terms, a reason that lies at the heart of the risk-taking channel of monetary policy.

To capture these shifts in risk attitudes, BCDZ include the change in the excess bond premium (EBP) in the set of macroeconomic factors that can affect the propensity of banks to change their lending standards. The motivation behind the EBP—an indicator of the effective risk aversion in the financial sector developed

[3]The dynamic fixed-effects specification used by Bassett et al. (2012) includes the difference in the real federal funds rate among the explanatory variables because the dependent variable measures the change in lending standards. In contrast, M-P regress the change in lending standards on the *level* of short-term interest rates. Arguably, it makes more economic sense that a change in the stance of monetary policy will induce a change in banks' credit policies.

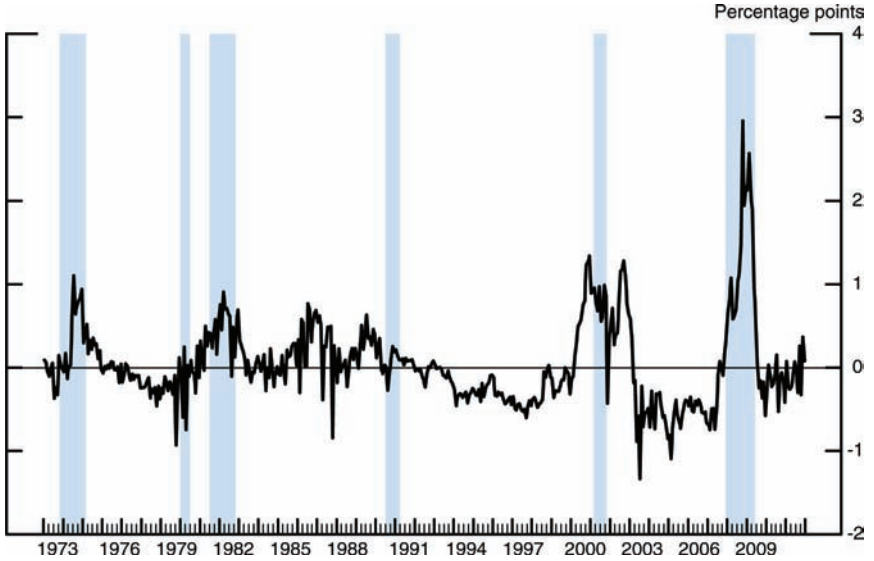
recently by Gilchrist and Zakrajšek (2012)—is motivated in part by the existence of the "credit-spread puzzle," the well-known result from the corporate finance literature that shows that a surprisingly small portion of the variation in corporate bond credit spreads can be attributed to the financial health of the issuer (Elton et al. 2001). A significant portion of the unexplained variation in credit spreads appears to reflect fluctuations in a default-risk factor that captures compensation demanded by investors, above and beyond expected losses, for bearing exposure to corporate credit risk.

Building on this observation, Gilchrist and Zakrajšek (2012) apply a flexible empirical credit-spread pricing model to a large panel of unsecured corporate bonds issued by U.S. non-financial firms and decompose the associated credit spreads into two components: a default-risk component capturing the usual countercyclical movements in expected defaults, and a non-default-risk component that captures the cyclical fluctuations in the relationship between default risk and credit spreads—that is, the EBP. Importantly, they show that, in addition to being a highly informative predictor of macroeconomic outcomes, the EBP is closely related to the financial condition of broker-dealers, highly leveraged financial intermediaries that play a key role in most financial markets (Adrian and Shin 2010b). Taken together, their evidence strongly supports the notion that deviations in the pricing of long-term corporate claims relative to the expected default risk of the underlying issuer reflect shifts in the effective risk aversion of the financial sector.

Indeed, according to the result of BCDZ, the changes in the EBP are a highly significant predictor—both statistically and economically—of the bank-specific changes in lending standards. A decline in the EBP, a signal of increased risk appetite in the financial sector, implies a softening of banks' lending policies and vice versa. Figure 2 shows the estimate of the EBP updated through the end of 2011. Note that the EBP fell to a historically low level in the latter part of 2003 and remained low during the following several years, the period that, at least in retrospect, has been characterized by lax credit standards, excessive credit growth, and unsustainable asset-price appreciation.

To examine whether monetary policy affects this proxy for the risk appetite of the financial sector, I regressed the EBP in month t on six lags of itself and six lags of an indicator of the stance of

Figure 2. The Excess Bond Premium



Notes: Sample period: 1973:M1–2011:M12. The solid line depicts the estimate of the excess bond premium, a measure of the effective risk appetite of the financial sector; see Gilchrist and Zakrajšek (2012) for details. The shaded vertical bars represent the NBER-dated recessions.

monetary policy, measured either by the real federal funds rate or the slope of the Treasury yield curve (that is, the difference between the ten-year constant-maturity yield and the three-month constant-maturity yield). The results of these simple Granger causality tests are summarized in table 1.[4]

Over the entire sample period (columns 1–3), neither indicator of the stance of monetary policy has any predictive power for this measure of the effective risk aversion in the financial sector. The *p*-values reported in rows 1–2 of the table overwhelmingly indicate that we cannot reject the null hypothesis that the coefficients associated with lagged indicators of the stance of monetary policy are jointly equal to zero; moreover, the associated sums of coefficients

[4] All the results reported in table 1 were completely robust to both shorter and longer lag lengths.

Table 1. Financial Intermediary Risk Appetite and the Stance of Monetary Policy

	1973:M1–2011:M12			1985:M1–2011:M12		
	(1)	(2)	(3)	(4)	(5)	(6)
Exclusion: RFFR	0.581	—	0.453	0.849	—	0.926
Exclusion: 10y/3m	—	0.294	0.190	—	0.564	0.644
Sum: RFFR	0.009	—	0.010	0.008	—	0.010
	(0.005)	—	(0.080)	(0.007)	—	(0.012)
Sum: 10y/3m	—	−0.008	0.008	—	−0.008	0.004
	—	(0.010)	(0.013)	—	(0.011)	(0.017)

Notes: The dependent variable in each Granger causality test is the excess bond premium in month t, a proxy for the risk appetite of the financial sector. Indicators of the stance of monetary policy: RFFR = real federal funds rate; and 10y/3m = the difference between the ten-year and the three-month Treasury yields. The entries in rows labeled "Exclusion" are p-values for the robust test of the null hypothesis that the coefficients associated with monetary policy indicator(s) in months $t-1$ through $t-6$ are jointly equal to zero. The entries in rows labeled "Sum" are the sums of coefficients associated with monetary policy indicator(s) in months $t-1$ through $t-6$; robust standard errors are reported in parentheses.

reported in rows 3–4 are economically negligible and statistically indistinguishable from zero. In light of the well-documented changes in the monetary policy operating procedures that took place during the late 1970s and the early 1980s, columns 4–6 repeat the exercise for the 1985–2011 subperiod. As evidenced by the entries in the table, neither indicator of the stance of monetary policy has any predictive power for future EBP, a highly informative proxy for the risk appetite of the financial sector.

All told, M-P present us with compelling evidence that monetary policy plays a significant role in shaping banks' credit policies and therefore influences the supply of bank-intermediated credit. Their claim that a prolonged period of accommodative monetary conditions that persisted in the euro area during the middle of the previous decade led to a significant erosion in bank lending standards is intriguing and certainly provocative, but much more work needs to be done before this paper will elicit a cry of "mea culpa, mea maxima culpa" from the ECB (or any other major central bank).

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