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Undermined Market Discipline: The Role of Bank Rescues and Bailout Expectations*

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Market discipline is a key element for efficient prudential regulation of financial institutions and at the core of most financial regulatory frameworks, such as Basel III or Solvency II. Basically, the mechanism consists of two components - *monitoring* and *influence* (Bliss and Flannery, 2001). Before investing in bonds, market participants *monitor* the risk profile of financial institutions and charge different prices depending on the likelihood of a default. The resulting link between excessive risk-taking behavior and increased funding costs (or even a loss of funding) translates into an incentive for financial institutions to limit their risk of default, for example by holding larger capital buffers (*influence*).

Assuming appropriate market mechanisms are in place, there are mainly two crucial conditions for effective market discipline. First, all relevant information needs to be publicly available and accessible. This assures that market participants can appropriately assess the risk of default and hence charge prices that represents the actual condition of a financial institution. Second, investors need adequate incentives to monitor and control the risk-taking behavior of financial institutions. In this respect, expectations about future support to troubled financial institutions (and its bond holders) are one of the main drivers that dilute investors' incentives and hence might erode market discipline. As a consequence, bailing out financial institutions may impose indirect costs to financial stability if market participants adjust their bailout expectations in response to such measures. Evaluating the influence of government interventions on bailout expectations is therefore crucial to assess the functioning of market discipline and critically important for policy makers worldwide.

Method

Until now, there has been a lack of academic consensus regarding theoretically and empirically sound methods to measure changes in market discipline. The underlying study (Hett and Schmidt, 2017) aims

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to address this gap. To maintain a maximum level of robustness, the method relies on a minimal set of structural assumptions that are unlikely to be violated even during periods of severe market turmoil.

The first assumption is derived from a general firm value model[1] and states that the debt-to-equity hedge ratio, a specific measure of how debt prices react to relative changes in stock prices, unambiguously increases for declining firm values and generally increases when a firm becomes riskier. Intuitively, if a financial institution is very healthy, a drop in asset values mainly affects the residual claims, i.e. its stock price, but only marginally affects its risk of default and hence its bond prices. For riskier firms the effects on bond prices will outweigh the effects on stock prices, and hence the debt-to-equity ratio increases ceteris paribus.

The second assumption refers to the nature of potential public support measures. The starting point is the realization that the pivotal characteristic of a bailout is the rescue of bondholders as a necessity to prevent default. In that sense, public bailouts favor debt over equity such that the effective debt-to-equity hedge ratio increasingly diverges from its fundamental value for high bailout probabilities and converges to zero if bailouts are assumed to be certain[2]. Connecting these results, it can be shown that the debt-to-equity hedge ratio and individual firm risk depends on the strength of market participants' bailout expectations, an effect that is independent of any particular assumption regarding the modeling of the firm value. For this reason it is possible to infer changes in bailout expectations and hence market discipline by empirically assessing structural changes of debt-to-equity sensitivities.

After verifying the validity of these theoretical insights[3], government interventions during the recent financial crisis can be exploited to quantify their influence on market discipline, both across time and banks' characteristics. The following key events are thereby crucial for the analysis: the outbreak of turmoil in the asset backed commercial paper market in August 2007, the rescue of Bear Stearns in March 2008, the failure of Lehman Brothers and subsequent support measures during the autumn of 2008 and the implementation of the Dodd-Frank Act in July 2010[4]. The empirical analysis focuses on US financial markets and uses a dataset that compiles information over the period January 1, 2004 to September 30, 2014 from various sources, including CDS quotes, daily equity prices, equity option quotes, interest rate data, and balance sheet information.

[1] The derivation builds upon the seminal work of Merton (1977) and insights from Schaefer and Strebulaev (2008).
[2] An insight that extends the work by Schaefer and Strebulaev (2008) and Campello et al. (2008).
[3] Evidence is provided that the presumed link between firm risks and the hedge ratio is indeed significant and in line with previous empirical literature (see section 5.1 of Hett & Schmidt, 2017).
[4] Please refer to Hett & Schmidt (2017) for more detailed description of the empirical analysis.

Results

Evaluating the cross-sectional differences in market discipline, one finds the perceived default risk and thus market discipline to be almost negligible for government sponsored enterprises, such as Fannie Mae, Freddie Mac, or Sally Mae. The estimated bailout probabilities of systemically important financial institutions are lower but still above those of other financial institutions. In turn, perceived bailout probabilities for investment banks are substantially lower than for other financial institutions. These findings are in line with the theoretical predictions and show that perceived bailout probabilities are indeed connected to the systemic relevance of the respective institution.

As can be seen in Figure 1, perceived bailout probabilities increased largely during the recent financial crisis. The hike started with the outbreak of the asset backed commercial paper (ABCP) crisis in August 2007 and subsequent support activities like the introduction of the Term Auction Facility (TAF) by the Federal Reserve, indicating a clear commitment of the authorities to support the financial system in times of crises. Perceived bailout probabilities increased by roughly 30 percentage points compared to the pre-crisis level.

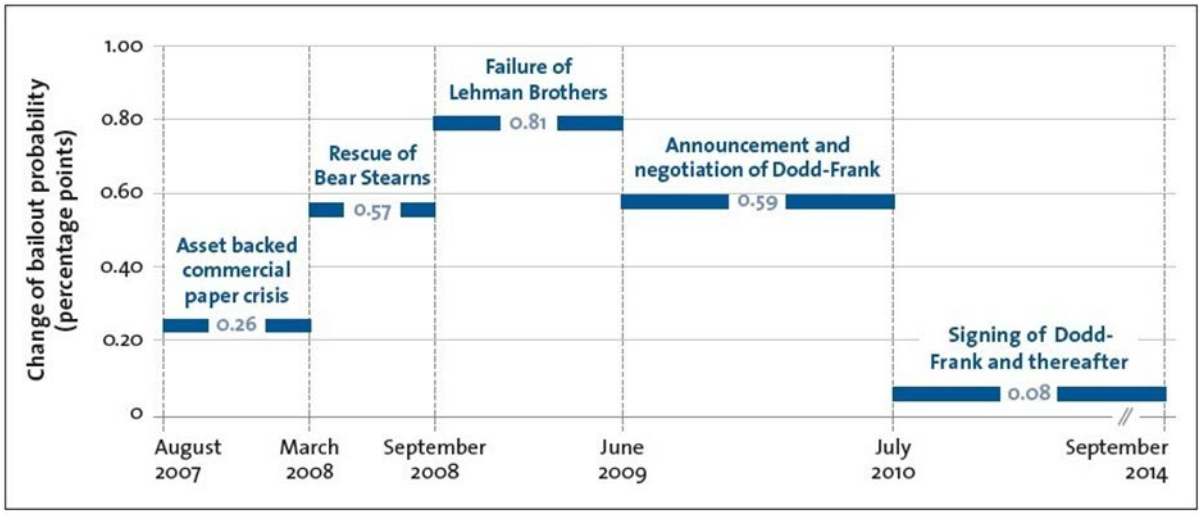

Figure 1: Change of bailout probabilities relative to pre-crisis period.

Bailout expectations further increased after the rescue of Bear Stearns, the first investment bank that was explicitly supported by the government. As one would expect, the informational content of this event is particularly important for investment banks. In line with this argument, we see a substantially larger increase of bailout probabilities for investment banks compared to other financial institutions during this period. However, these sub-sample differences vanish after the pivotal event of the crisis - the failure and non-rescue of Lehman Brothers.

Despite refusing public support for Lehman Brothers, this date also marks the starting point for a series of government interventions to stabilize the economy by supporting other financial institutions of high systemic relevance, such as the bailout of AIG, the introduction of TARP (Troubled Asset Relief

Program) and other financial rescue packages around the globe. According to the empirical analysis, the implied commitment of the government to support troubled (systemic relevant) institutions outweighs the effect of the non-rescue of Lehman Brothers, inducing a further decline in general market discipline. Overall, perceived bailout probabilities were around 80 percentage points higher compared to the pre-crisis period.

Perceived bailout probabilities started to decline after the release of the first blue-print of the Dodd-Frank Act in June 2009, addressing the regulation and resolution of financial institutions. While market discipline was still below pre-crisis level during the drafting process of the reform, signing the Dodd Frank Act in July 2010 eventually restored pre-crisis market discipline levels. In that sense, the results suggest that the Dodd-Frank Act was successful in establishing a credible framework for resolving financial institutions and restoring market discipline.

Policy Implications

Overall, the results suggest that market participants adjusted their bailout expectations in response to US government interventions. Given these findings, policymakers need to take into account the potential effects on market discipline when deciding about public support to troubled financial institutions. This insight most likely also applies to European financial markets, particularly considering the parallelism of events during the financial crisis and the common characteristics of the EU's Bank Recovery and Resolution Directive (BRRD) and the Dodd-Frank Act[5].

The rescue of Monte dei Paschi di Siena (MPS) serves as a good example demonstrating the potential implications of the findings and application of the empirical method. The results by Hett and Schmidt (2017) suggest that as MPS was bailed out by public authorities, market participants most likely responded by adjusting their bailout expectations and changing their pricing behavior accordingly. The rescue of MPS may thus have led to a decline in market discipline for (systemically important) banks, at least in Italy. Furthermore, if the BRRD was similarly successful as the Dodd-Frank Act in reverting market discipline to pre-crisis levels, undermining the reforms by assisting troubled institutions and laxly interpreting bail-in rules may have mitigated the improvements in market discipline, thereby making the financial system more vulnerable to crises in the future[6]. The recent rescues of two Venetian banks, but also the orderly resolution of Banco Popular in Spain are further examples that may have changed investors' bailout expectations. It therefore seems generally promising to apply the empirical approach by Hett and Schmidt (2017) to European data. This would allow to evaluate the

[5] The Financial Stability Board's Key Attributes of Effective Resolution Regimes for Financial Institutions, endorsed by the G20 in 2011, served as guidance for both the Dodd-Frank Act and the BRRD.
[6] Götz, Krahnen & Tröger (2017) argue on similar lines.

hypothesized effects explicitly, as well as to thoroughly understand the dynamics of market discipline in Europe or the effectiveness of the BRRD. In particular, the potential existence and strength of spillovers between countries in the EU (as for instance in the case of MPS) should be of first-order relevance for policymakers.

This letter builds upon insights from the paper "Bank Rescues and Bailout Expectations: The Erosion of Market Discipline During the Financial Crisis" (Hett and Schmidt, 2017), which is accepted for publication in the Journal of Financial Economics and available as SAFE Working Paper No. 36.

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