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## Journal of Monetary Economics

journal homepage: [www.elsevier.com/locate/jme](http://www.elsevier.com/locate/jme)Moral hazard and adverse selection in the originate-to-distribute model of bank credit<sup>☆, ☆ ☆</sup>Antje Berndt<sup>a,\*</sup>, Anurag Gupta<sup>b</sup><sup>a</sup> *Tepper School of Business, Carnegie Mellon University, Pittsburgh, PA 15213, USA*<sup>b</sup> *Weatherhead School of Management, Case Western Reserve University, Cleveland, OH 44106, USA*

## ARTICLE INFO

*Article history:*

Received 25 February 2009

Received in revised form

26 March 2009

Accepted 24 April 2009

Available online 9 May 2009

*JEL classifications:*

G12

G18

G21

G32

*Keywords:*

Syndicated loans

Secondary loan market

Originate-to-distribute

Moral hazard

Adverse selection

## ABSTRACT

Bank credit has evolved from the traditional relationship banking model to an originate-to-distribute model. We show that the borrowers whose loans are sold in the secondary market underperform their peers by about 9% per year (risk-adjusted) over the three-year period following the initial sale of their loans. Therefore, either banks are originating and selling loans of lower quality borrowers based on unobservable private information (adverse selection), and/or loan sales lead to diminished bank monitoring that affects borrowers negatively (moral hazard). We propose regulatory restrictions on loan sales, increased disclosure, and a loan trading exchange/clearinghouse as mechanisms to alleviate these problems.

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## 1. Introduction

The historic credit crisis of 2007–2008 brought an important question sharply into focus—to what extent should bank credit be allowed to evolve from its traditional relationship banking model to the transaction-oriented model that has largely emerged over the last two decades? This fundamental shift in banking has been due to the explosive growth in the secondary syndicated loan market.<sup>1</sup> The presence of this market transforms bank credit to an “originate-to-distribute” model, where banks can originate loans, earn their fees, and then distribute them to other investors in a largely opaque manner.

<sup>☆</sup> Media coverage: a full article on our paper in the Wall Street Journal on November 19, 2008; the author interviewed on CNBC squawk box on November 20, 2008; featured in NPR market place, Bloomberg news, Reuters, and others.

<sup>☆☆</sup> We thank the Loan Pricing Corporation and the Loan Syndication and Trading Association for providing us with the data for this study. We are grateful to Viral Acharya, Ed Altman, Mark Carey, Marvin Goodfriend, CNV Krishnan, Duane Seppi, and especially our discussant and referee Greg Duffee for useful discussions and comments. We thank participants at the Carnegie-Rochester conference, and seminar participants at the Federal Reserve Board.

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<sup>1</sup> From 1997 to 2007, the secondary syndicated loan market has grown from \$60b to \$342b in annual trading volume, fueled by securitization and the tremendous growth in collateralized debt obligation (CDO) and collateralized loan obligation (CLO) funds.

This shift to the originate-to-distribute model of bank credit has important implications for all market participants, including the originating banks, the participating loan investors, the borrowing firms and the regulators. The banks' superior information about their borrowers gives rise to concerns about adverse selection—are the banks selling off loans about which they have negative private (unobservable) information? In a perfect market, this should lead to a breakdown of the secondary loan market due to the classic “lemons” problem. The issue of adverse selection is important from the perspective of the participating loan investors as well—can they trust that the bank selling the loan is doing so due to legitimate motives (like capital relief and risk management) rather than due to negative private information? Alternatively, does it lead to moral hazard in terms of an impairment in the monitoring function of banks, thereby having a negative effect on the borrowers?

There are several policy questions that arise from this debate. Should the regulatory authorities restrict the originate-to-distribute activities of banks? Should they enforce enhanced disclosure of the banks' activities in the loan sales market? How are the borrowing firms being affected, in the long run, by banks moving from relationship banking to the originate-to-distribute model of credit? Does this shift lead to value creation or value reduction in the corporate sector? These questions are, ultimately, empirical ones. Using extensive data from the syndicated loan market, this paper is the first empirical investigation of these important but as yet unanswered questions.<sup>2</sup>

Banks could sell loans in the secondary market due to negative private information about the borrower, or for legitimate reasons such as capital relief, risk diversification, improving balance-sheet liquidity, and reducing financing frictions and their cost of capital. The positive effects of loan sales on banks have led to a point of view that the originate-to-distribute model of bank credit is “socially desirable”.<sup>3</sup> There is also a vast literature on banks being “special”, since they generate proprietary information about the borrowers in the course of lending to them.<sup>4</sup> The loan buyers who do not have a lending relationship with the borrowers are then likely to be at an information disadvantage when buying a loan originated by a relationship bank. This could lead to moral hazard and adverse selection problems (Gorton and Pennacchi, 1988; Pennacchi, 1988). Banks that sell loans would have a reduced incentive to engage in costly screening and monitoring of the borrowers. In addition, they would have an incentive to sell the loans of the borrowers about whom they have negative private information. Duffee and Zhou (2001) examined these issues in a theoretical setting with bank loans and the presence of credit risk mitigation via the default swap market or the loan sales market.

From a borrower's perspective, there are potentially positive as well as negative consequences of their loans being sold in the secondary market. The positive effects include a lower cost of capital (Gupta et al., 2008), increased access to debt capital (Drucker and Puri, 2008), and information effects (Gande and Saunders, 2008). The negative effects include a breakdown of lending relationships, reduced monitoring which could lead to suboptimal investment and operating decisions, harsher covenants (Drucker and Puri, 2008), and difficulties in renegotiation (Carey et al., 1993).<sup>5</sup> Parlour and Plantin (2008) presented a theoretical model which embeds some of the bank and borrower incentives and effects outlined above. However, from an empirical standpoint, it is not clear which of these effects dominate. Furthermore, if the originate-to-distribute model of credit creates incentives for banks to originate bad loans and then sell them off in the secondary market, such borrowers should underperform their peers in the long run. Since theoretical arguments on this issue can go either way, it needs to be resolved empirically. Our paper is the first one in the literature to empirically examine the long-run performance of borrowers with and without an active secondary market for their loans.

The existing empirical literature has largely focused on the impact of bank loan *announcements* on the borrowers' stock returns. Most studies have shown that loans are “special”—their announcements elicit positive short-term abnormal returns for borrowers, in contrast to the announcement effect of most other forms of corporate financing such as common stock, preferred stock, straight debt and convertible debt.<sup>6</sup> This result has been somewhat reversed by Billett et al. (2006), who show that firms announcing bank loans suffer negative abnormal returns in the long run. The literature on the effects of loan sales on the borrower's stock price is rather sparse. While Dahiya et al. (2003) documented a negative *announcement* effect of the sale of a borrower's loans by its lending bank, Gande and Saunders (2008) documented the opposite (positive) announcement effect. However, none of these studies has measured the long-run performance of the borrowers whose loans trade in the secondary loan market.

We study a large sample of 1054 borrowers, the largest sample analyzed in this literature thus far. Our results show that borrowers with an active secondary market for loans significantly underperform their peers by about 9% per year on a risk-adjusted basis over the three-year period subsequent to their loans first being traded in the secondary market. This result is robust to most techniques of measuring long-run abnormal returns. The underperformance is stronger for small, high-leverage, speculative-grade (SG) borrowers, which is intuitive since these are precisely the firms where moral hazard

<sup>2</sup> The risk of these loans can also be distributed via the credit default swap (CDS) market. During our sample period, the CDS market was liquid primarily for investment-grade obligors, while more than 75% of the syndicated loan market activity has been concentrated in the speculative-grade segment. Therefore, the overlapping sample between the syndicated loan market and the CDS market is statistically too small to analyze.

<sup>3</sup> These concepts have been explored in prior literature, for example, Stein (1998), Kashyap and Stein (2000), Greenspan (2004), Schuermann (2004), and Diamond and Rajan (2006).

<sup>4</sup> See Diamond (1984), Ramakrishnan and Thakor (1984), Fama (1985), Rajan (1992), and others.

<sup>5</sup> Lending relationships have been shown to be valuable for borrowers since they enhance the availability of credit, reduce the requirement for collateral, and reduce the costs of financial distress, as shown by Hoshi et al. (1990, 1991), Petersen and Rajan (1994), Berger and Udell (1995), etc.

<sup>6</sup> See, for example, James (1987), Lummer and McConnell (1989), Best and Zhang (1993), Billett et al. (1995), etc.

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