Journal of Banking & Finance 37 (2013) 5062–5072

Contents lists available at ScienceDirect

Journal of Banking & Finance

journal homepage: www.elsevier.com/locate/jbf

Corporate leverage and the collateral channel

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ARTICLE INFO

Article history:
Received 22 September 2012
Accepted 1 September 2013
Available online 19 September 2013

JEL classification:
G21
G32

Keywords:
Debt finance
Bank loans
Collateral
Asset structure
Financial crisis

ABSTRACT

We investigate whether and how corporate leverage depends on the structure of corporate assets. Based on a large panel dataset of US firms from 1990 to 2010, we show that property, plant and equipment are important drivers of the collateral channel, while inventories and receivables are less important. The collateral channel is more pronounced for firms that have to rely on banks and trade creditors to raise debt finance, but it has become weaker for these firms after the start of the financial crisis. Our study provides new evidence on the cross-sectional and time-varying importance of the collateral channel for corporate leverage.

1. Introduction

Debt is an important and very flexible source of external corporate finance. Firms can raise debt in various forms, such as public vs. private debt (bonds and commercial papers vs. bank loans and trade credit), long-term vs. short-term, senior vs. junior debt, secured vs. unsecured, or any combination of these dimensions. Frictions at the firm-level and the entire economy, especially asymmetric information between firms and lenders, are the key factors that influence the availability of debt finance to firms and its form (e.g., Gertler and Gilchrist, 1994; Kashyap et al., 1994; Bernanke and Gertler, 1995). Furthermore, lending technologies and country characteristics such as the financial system, the banking system and the legal environment, affect the scale and scope of debt finance (e.g., Berger and Udell, 2006; Djankov et al., 2007; Haselmann et al., 2010).

In this paper, we investigate the relation between corporate asset structure and leverage to provide new evidence on the collateral channel. Earlier theoretical and empirical research has shown that particular forms of debt finance, for example, lending against collateral, help mitigating ex ante and ex post informational problems, such as adverse selection and moral hazard (see, for example, Chan and Thakor, 1987; Boot et al., 1991; Rajan and Winton, 1995; Faulkender and Petersen, 2006; Leary, 2009; Berger et al., 2011). The main motivation for our study is, in addition to the general link between assets and debt as a source of finance for these assets, that certain assets are better suited to serve as collateral for debt finance than others. Originally, the corporate finance literature has focused on asset tangibility as major driver of the collateral channel, while recent research emphasizes that asset redeployability – which partly overlaps with tangibility – matters (e.g., Campello and Giambona, 2013; Hall, 2012; Campello and Hackbarth, 2012; Chaney et al., 2012). The collateral channel is one mechanism that helps explaining the cross-sectional variation in the access to debt finance and financing terms at the firm and industry level (e.g., Benmelech and Bergman, 2011). Indeed, the literature on corporate financial constraints has pointed out that limited access to credit and prohibitively high costs of credit are major determinants of financial constraints that prevent firms from funding all desired investments (e.g., Fazzari et al., 1988; Kaplan and Zingales, 1997; Almeida et al., 2004; Denis and Sibilkov, 2010; Hadlock and Pierce, 2010). In other words, asset redeployability strengthens the collateral channel, which in turn, reduces corporate financial constraints.

Next to the ex ante and ex post incentive effects, there is evidence that the use of redeployable collateral reduces the lender's expected and realized loss-given-default (e.g., Davydenko and Franks, 2008; Grunert and Weber, 2009; Calabrese and Zenga,

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http://dx.doi.org/10.1016/j.jbankfin.2013.09.001

2010; Khieu et al., 2012), and bank regulators and supervisors have recognized the risk-mitigation effect of collateral in the Basel II and III capital adequacy frameworks (Basel Committee on Banking Supervision, 2006; Basel Committee on Banking Supervision, 2011).

Moreover, the maturity structure of firms' assets might affect the maturity structure of corporate debt. Next to the trivial financing link between assets and liabilities, it is reasonable to expect that short-term assets are likely to serve as collateral for short-term debt (e.g., trade credit or lines of credit from banks), while long-term (fixed) assets are likely to serve as collateral for long-term debt (e.g., long-term investment loans, commercial real estate mortgages).

While the benefits of the collateral channel theoretically apply to all firms, they should be particularly relevant to firms that are subject to stronger frictions. Large, transparent and financially unconstrained firms typically have access to public and private debt, while small, informationally opaque and financially constrained firms typically have to rely on private debt as source of external finance (i.e., bank loans and/or trade credit). Given that private debt is more likely to be secured than public debt, we expect the collateral channel to be more relevant for firms that have to rely on private debt financing.

Another question that has not been extensively studied yet is whether and how the strength of the collateral channel varies over time. Ivashina and Scharfstein (2010) document a sharp decline in US bank lending during the global financial crisis, but there is little evidence on potential changes in the strength of the collateral channel, especially during the different stages of the crisis. The survey conducted by Campello et al. (2010) suggests that financially constrained firms suffered the most during the crisis. Moreover, Becker and Ivashina (2011) show that firms with access to bond markets are able to substitute the decrease in bank debt during economic downturns with corporate bond issues, while firms that depend on private debt cannot.

Based on a large panel dataset of US firms from 1990 to 2010, we investigate the cross-sectional and time-varying importance of the collateral channel. First, we find a strong and positive relation between firms' leverage at time t and their asset structure at time $t-1$. We show that property, plant and equipment are the major determinants of the collateral channel. Other redeployable assets such as inventories and receivables also matter, but to a lesser extent. We control for firms' growth and investment opportunities, bank-dependence, profitability, time fixed effects, and industry fixed effects. Moreover, we obtain similar results when we use first differences of the asset structure variables and leverage. Various robustness tests, including Granger causality tests (Granger, 1969), indicate that our results are not driven by autocorrelation or endogeneity problems. Second, we show that property, plant and equipment are significantly positively related to long-term leverage (but not to short-term leverage), and receivables are positively related to short-term leverage. Third, we document that the collateral channel is more important for firms that cannot access public debt markets but have to rely on banks and trade creditors to raise debt. Fourth, we provide new evidence that the collateral channel has become weaker for bank-dependent firms after the start of the global financial crisis, while it remained unchanged for firms that can access public debt markets.

The rest of the paper proceeds as follows. In Section 2 we develop our main hypotheses about the collateral channel. In Section 3 we describe the data and explain the methodology. In Section 4 we report the results of our analysis of the link between corporate asset structure and leverage, the influence of bank-dependence, changes during the global financial crisis, and further empirical checks. Section 5 concludes.

2. Hypotheses

Related studies suggest that the functioning of the collateral channel depends on the redeployability of the pledged assets (e.g., Campello and Giambona, 2013; Campello and Hackbarth, 2012; Chaney et al., 2012). Most obvious candidates for easily redeployable collateral are real estate, inventories and accounts receivable. It has been well-documented that certain assets frequently serve as collateral in the asset-based finance (e.g., Udell, 2004). While real estate and inventories are tangible assets, accounts receivable are financial claims on the firms' customers that emerge from standardized trade credit agreements. Despite their intangible nature, receivables are relatively liquid because they can be assigned to the bank and/or sold to factoring companies. Counter-examples of assets that exhibit a low redeployability are firm-specific machinery, and various types of (opaque) intangibles (e.g., goodwill, brand names, patents, etc.). Asset redeployability requires a low asset-specificity, low informational asymmetry about the asset value, and as a consequence of the first two characteristics, liquid asset markets. As a side note, we do not consider firms' cash holdings here since they do usually not serve as collateral; we will come back to the role of cash in Section 4.4. Following this reasoning we propose H1 to examine how corporate asset structure influences the functioning of the collateral channel.

H1. A higher fraction of redeployable assets (property, plant and equipment; inventories; and receivables) is associated with higher total leverage.

Conventional wisdom suggests that the life of corporate assets and the maturity of corporate liabilities are matched. Short-term assets (working capital: inventories and receivables) should be funded with short-term finance (e.g., trade credit or lines of credit from banks), and long-term assets (property, plant and equipment) should be funded with long-term finance (e.g., equity, long-term bonds, or long-term bank loans). This rationale is confirmed in many studies (e.g. Chung, 1993). However, this reasoning might differ in the case of secured debt finance. The borrower's risk of default and lender's collateral requirements might weaken the maturity match of assets and liabilities but strengthen the collateral channel. In other words, firms with a higher fraction of deployable assets exhibit a higher leverage independent of the asset-liability maturity structure. To investigate this issue, we test whether a higher fraction of short-term (long-term) assets is associated with a higher short-term (long-term) leverage.

H2a. Long-term assets (property, plant and equipment) are positively related with long-term leverage.

H2b. Short-term assets (inventories and receivables) are positively related with short-term leverage.

In a next step, we take firms' main sources of finance into account (i.e., issuing bonds vs. borrowing from banks and trade creditors). The existence of a bond rating indicates that the firm has access to public debt markets. Given that straight corporate bonds are typically unsecured, bond issuers are not or less dependent on the collateral channel. In contrast, firms without a bond rating have to rely on bank loans (and to a smaller extent on trade credit) to finance their business. Bank loans are often partially secured