



The leverage externalities of credit default swaps[☆]



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ABSTRACT

This paper provides the first empirical evidence of the externalities of credit default swaps (CDS). We find that a firm's leverage is lower when a larger proportion of its revenue is derived from CDS-referenced customers. This finding is robust to alternative samples and measures, placebo tests, and the selection of customers by suppliers. Moreover, firms affected by customer CDS trading issue equity to lower leverage, and their equity issuance costs are lower. These findings are consistent with the view that CDS trading on customers improves the information environment for suppliers. Therefore, while many firms are not directly linked to CDS trading, CDS trading on their customers has spillover effects on these firms' financial policies.

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1. Introduction

Credit default swaps (CDS) are among the most influential and controversial financial innovations in recent decades.² They provide opportunities for credit risk transfer, facilitating both risk-sharing and risk-taking. A burgeoning strand of literature shows that CDS have a pervasive impact on the reference firms, including their borrowing costs, capital structure, and bankruptcy risk. A large part of the Dodd-Frank Act provides new regulations of CDS, such as central clearing and measures aimed to improve market functioning and transparency. However, CDS exist only for a handful of large firms. For most firms, CDS seem to constitute a remote issue that is not directly relevant to them. Is the influence of CDS only limited to

² CDS are similar to insurance contracts. The buyer pays a periodic fee to the seller for a contingent payment linked to a reference entity's credit events. As of December 2012, there was a total of \$25 trillion in CDS notional value outstanding, as reported by the Bank for International Settlements. Stulz (2010) discusses the role of CDS in the credit crisis. Regulators in the U.S. and E.U. are currently implementing new rules for CDS.

those CDS-referenced firms? In this paper, we empirically examine potential spillover effects or externalities of CDS trading.

We focus on one key stakeholder of the CDS-referenced firms: their suppliers. Suppliers in the upstream of the supply chain are usually smaller firms without CDS trading, yet their direct economic interests in their customers provide an ideal setting for our analysis of CDS externalities. Suppliers should be concerned with their major customers regarding relationship-specific exposures such as trade credit and product market stability (Titman, 1984; Stulz, 1996). CDS signal changes in the creditworthiness of debtors much faster than credit ratings do (International Organization of Securities Commissions (IOSCO), 2012). CDS spreads can help chief financial officers (CFOs) and treasurers differentiate relative credit quality across a collection of entities, especially for nonfinancial companies. For many CFOs, CDS have become a standard tool for assessing the credit quality of customers.³

If the CDS market provides information about customers, then suppliers face a better information environment and can adjust their corporate policies accordingly. Because equity issuance is sensitive to information asymmetry, improved information can lower issuance costs and facilitate equity issuance, resulting in lower firm leverage. Moreover, as a new facility for price discovery, CDS trading can reflect information about a customer's bankruptcy risk that is otherwise not accessible to a supplier. Indeed, Bolton and Oehmke (2011) and Subrahmanyam, Tang, and Wang (2014) show that the advent of CDS trading can increase the bankruptcy risk of the reference firm. Therefore, a supplier may perceive customer CDS as signaling higher revenue risk going forward. As such, the supplier has an incentive to maintain lower leverage, especially when it is dependent on its customers. However, there are also plausible scenarios under which firms can have higher leverage after CDS trading on their customers. For example, when there are no CDS on the supplier itself, customer CDS can be used as a proxy hedging tool by lenders to manage supplier credit risk. Because hedged lenders are more willing to increase the credit supply, supplier leverage may increase. Therefore, the effect of customer CDS trading on supplier leverage is ultimately an empirical question.

Using linked data on both the supply chain relationship and CDS trading, we find that, all else equal, the leverage of suppliers is significantly lower if a larger proportion of the suppliers' revenue is derived from CDS-referenced customers. The effect is also economically meaningful: a one-standard-deviation increase in sales to CDS-referenced customers is associated with a 0.5–0.8 percentage point lower market leverage ratio, while the average market leverage ratio is 15% for our sample suppliers, which are relatively

small firms.⁴ The customer CDS effect is above and beyond the critical customer effect documented by Banerjee, Dasgupta, and Kim (2008), and it persists after controlling for customer characteristics such as credit quality and leverage. Our finding is also robust to variations in model specification, sample selection, and variable measurement.

In a first attempt to establish a causal relationship, we conduct a difference-in-differences analysis by matching treated and control groups of suppliers that are from the same industry, that are of similar size, and that are linked to customers with similar credit quality. The treated and control suppliers differ by their customer CDS status. In this matched sample, the customer CDS-treated firms experience significantly greater leverage decreases than the control firms. Furthermore, we run placebo tests by randomizing the CDS introduction time on customers, and there are no significant results from the placebo samples.

One potential selection issue hindering the causal interpretation of our findings is that suppliers may choose customers with or without CDS trading. The amount of sales derived from CDS customers therefore may be jointly determined with supplier leverage. To infer causality, we use the instrumental variable approach. We construct two instrumental variables for our key independent variable: the proportion of a supplier's sales to customers with CDS trading. The first instrument, the foreign exchange (FX) hedging position of customer firms' lenders and bond underwriters, follows Saretto and Tookes (2013). The use of FX hedging is related to lenders' general hedging strategy, including CDS trading, but the aggregate FX hedging interests of a bank are unlikely to be related to the credit quality of a particular borrower of the bank and the borrower's suppliers. The second instrument is based on lenders' loan portfolio concentration. Lenders typically have thousands of loans in their portfolio, and the concentration with respect to industry or location is largely determined by their business model. Therefore, loan portfolio concentration is exogenous to the leverage of the borrowing firms' suppliers. Moreover, lenders with more concentrated loan portfolios have stronger incentives to use CDS to diversify (Minton, Stulz, and Williamson, 2009). Both instruments seem valid, and our findings after the instrumentation remain significant.

We show that the CDS externalities are channeled through trade-relationship-specific exposure. Specifically, we find a stronger effect on supplier leverage when suppliers have more accounts receivable, when the customer-supplier relationship is long term, and when the products supplied to customers are more unique. Moreover, we demonstrate that the information improvement caused by customer CDS is likely to be a driving mechanism behind suppliers' leverage decrease.⁵ We find stronger effects for more opaque suppliers (with less analyst cov-

³ See, e.g., "Wrong price signals sent by CDS." *CFO Insight*, June 12, 2012 (retrieved from <http://www.cfo-insight.com/risk-management-it/hedging/wrong-price-signals-sent-by-cds/>), and "Do CDS spreads tell the truth?" *CFO Magazine*, May 19, 2011 (<http://www2.cfo.com/banking-capital-markets/2011/05/do-cds-spreads-tell-the-truth-2/>).

⁴ The CDS effect on suppliers is smaller than but at the same order of magnitude as the direct CDS effect on the leverage of referenced firms documented by Saretto and Tookes (2013).

⁵ Prior studies such as Acharya and Johnson (2007) show that CDS trading reveals insider information. Moreover, CDS trading can pressure firms to reveal more information. Kim, Shroff, Vyas, and Wittenberg-Moerman (2014) find that managers are more likely to issue earnings forecasts

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