Customer Concentration of Targets in Mergers and Acquisitions*

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Abstract

We study how customer base concentration at a target firm impacts the occurrence and structure of M&A deals. We hypothesize that customer concentration increases information asymmetry and adverse selection between bidders and targets, such that (1) firms with greater customer concentration are less likely to receive a bid and (2) bidders for targets with greater customer concentration share the risk by using more stock payment in their offer. Using data on customer concentration and M&A deals from 1985 to 2016, we find consistent evidence supporting our predictions. Our findings extend the literature by systematically documenting an important factor in M&A decisions and by quantifying the economic consequences of customer concentration.

Keywords: customer concentration; business risk; mergers and acquisitions

JEL Classification: M41; G34

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1. Introduction

Customer concentration captures how a firm's revenue is distributed across its customers and the extent to which the firm relies on a small set of large customers. It is one of the most important firm characteristics of a firm's customer base.[1] Because of the importance of customer concentration to the firm's risk and opportunities, Accounting Standards Codification 280-10 (formerly SFAS No. 131) requires firms to disclose information about their reliance on major customers which make up 10 percent or more of total firm sales. Customer concentration occurs frequently and can be significant. Approximately 45 percent of public firms report at least one major customer, and on average among manufacturing firms, one-third of sales is attributed to major customers (Ellis, Fee, and Thomas 2012; Campello and Gao 2017). Anecdotal evidence in M&A literature suggests that customer concentration of potential targets is a significant risk factor for acquirers (Nead 2017; River's Edge 2014). However, there is little empirical evidence on how customer concentration of potential targets affects firms' investment decisions. In this study, we fill this void by systematically studying how target customer concentration impacts the occurrence and structure of M&A deals.

Prior studies provide mixed views of the effects of customer concentration. On one hand, customer concentration signals heightened business risk and has been shown to increase the cost of equity and cost of debt (Kolay, Lemmon, and Tashjian 2016; Dhaliwal, Judd, Serfling, and Shaikh 2016; Campello and Gao 2017). On the other hand, some studies find that concentrated firms have higher rates of return due to greater operating efficiencies (Kalwani and Narayandas

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[1] Forbes Magazine has noted that customer concentration risk is one of the biggest risks to business (Sutton and Nelson 2009).

1995; Patatoukas 2012). In the M&A setting, risk assessment of the target company is a key consideration for the acquiring firm (Dunn, Fontenot, and Loew 2018; Kohers and Ang 2000). Customer concentration increases uncertainty about a firm's future cash flows because a major customer may stop purchasing from the firm because of poor financial health or because of a decision to switch suppliers. Also, the change of control associated with a merger may heighten the risk of customers switching suppliers by disrupting customer-supplier relationships (Krug and Hegarty 2001).[2] This uncertainty creates the potential for information asymmetry between the target and acquirer. Through interactions with major customers, the target acquires private relationship-specific information that improves its ability to forecast cash flows relative to the outside acquirer. This customer concentration-related asymmetry represents a risk to a potential acquirer who may alter the terms of the offer (including declining to make an offer) to decrease their exposure to this risk. With information asymmetry between the parties, the acquirer faces an adverse selection problem and may decide not to make an offer. We therefore first hypothesize that acquirers are less likely to make a bid offer for firms with greater customer concentration because of the information asymmetry regarding this risk.[3]

When deciding to make an offer, the acquiring firm obtains private information and assesses various aspects of target risks (Perry and Herd 2004). The information gathered via due diligence may to some degree decrease information asymmetry but does not fully eliminate information

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[2] For example, Intintoli, Serfling, and Shaikh (2017) find that a change in a customer's CEO disrupts the customer-supplier relationship such that suppliers lose substantial sales following the change.
[3] Our predictions are based on information asymmetry which arises through asymmetric uncertainty related to customer concentration. For several reasons, uncertainty on its own does not necessarily lead to the same predictions. First, if customer concentration-related uncertainty represents a risk that is apparent to both the target and the acquirer, the risk can be priced and the deal can occur. Second, the direction of the effect of demand uncertainty on an acquirer's investment decision is theoretically ambiguous and depends on many assumptions, including the risk attitudes of the acquirer, competition in product markets, and the anticipated costs of adjusting to a demand shock. (Guiso and Parigi 1999).

asymmetry or the uncertainty related to concentrated customers.[4] Conditional on a bid being offered, an acquiring firm has incentives to decrease its exposure to information asymmetry-related risks. Hansen's (1987) adverse selection model suggests that when a target firm knows its value better than the acquirer does, the acquirer is more likely to pay with stock than cash, since payment in stock allows future declines in target value to be shared between the target firm and the acquirer. We therefore hypothesize that the proportion of payment offered in stock increases with the concentration of the target's customer base.

To test for the effects of target customer concentration on M&A deals, we gather data on mergers and acquisitions over the years 1985 – 2016. We follow prior studies to define major customers as those that account for at least 10 percent of a supplier firm's total sales and measure customer concentration in three ways: an indicator variable for having at least one major customer, a sales-based Herfindahl Index, and the percentage of total sales attributable to major customers (Dhaliwal, Judd, Serfling, and Shaikh 2016; Huang, Lobo, Wang, and Xie 2016).[5] We find that after controlling for other determinants of receiving a bid, potential target firms with a more concentrated customer base are less likely to receive a bid. Specifically, a firm with at least one customer that represents greater than ten percent of total sales has a 9 percent lower likelihood of receiving a bid than those that do not. Firms in the top decile of customer concentration have a 16 percent lower likelihood of receiving a bid than those in the bottom

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[4] In addition to analyzing documents like customer agreements and customer satisfaction scores or related data, major customer due diligence can include conducting interviews and/or surveys of customers. We do not expect such due diligence to fully eliminate information asymmetry for several reasons. First, some deals include non-disclosure agreements that restrict the buyer's ability to contact customers (Harroch 2015). Second, even if contact does occur, major customers do not have incentives to disclose proprietary information about their supply chain relationships to a third-party. Third, the subjectivity of the relationships themselves makes them difficult for a third-party to ascertain or verify.
[5] We use the 10 percent cut off because Statement of Financial Accounting Standard No. 131 requires disclosure when sales to a customer account for 10 percent or more of the firm's total sales. In robustness tests, we also use a 20 percent cutoff, and find qualitatively similar results.

decile of customer concentration. Furthermore, we find in the sample that receives bids, the proportion of payment offered in stock is higher when acquirers purchase targets with high customer concentration. Specifically, the proportion offered in stock is 12 percent higher (relative to the mean) for firms with at least one major customer. Stock-based payment is 22 percent higher for firms in the top decile of customer concentration compared to the bottom decile.

We conduct cross-sectional tests to provide further support for the impact of customer concentration on M&A outcomes. First, we examine whether the effects of customer concentration differ when major customers are governmental or corporate. Compared to corporate customers, government entities are less likely to default and more likely to negotiate long-term contracts. These attributes of government entities decrease the uncertainty and information asymmetry regarding future cash flows. Consequently, we find that the effects of overall customer concentration on bid likelihood and payment method are driven mainly by corporate customer concentration. In contrast, governmental major customers have no impact on these M&A outcomes.

Second, we expect that when a target's customers have low switching costs, the uncertainty and information asymmetry about losing the cash flow from those major customers is higher. Following prior studies, we measure switching costs using both the target firm's market share and the duration of the target's major customer relationships (Dhaliwal, Judd, Serfling, and Shaikh 2016; Irvine, Park, and Yildizhan 2016). We find evidence consistent with this prediction. When customers of potential target firms have low switching costs, the likelihood of receiving a bid is even lower and the proportion of payment offered in stock is higher.

Third, acquiring a firm with stock is a viable risk-sharing strategy only when the acquired firm is sufficiently large relative to the bidder (Hansen 1987). Thus, we predict and find that the method of payment effects become more pronounced when the size of the target increases relative to that of the bidder. We find that the payment method effects are present only when customer concentration represents a salient risk (i.e., low switching costs) and when the risk sharing mechanism is available (i.e., the target is sufficiently large relative to the bidder).

Finally, we follow Dhaliwal, Judd, Serfling, and Shaikh (2016) in performing instrumental variable tests to alleviate the endogeneity concern that our results are driven by other target firm characteristics that correlate with measures of customer concentration. In two-stage tests, we find that predicted customer concentration remains negatively associated with bid likelihood and positively associated with payment method in stock.

Our study contributes to two streams of literature. First, we extend the M&A literature by systematically documenting another important risk factor in M&A decisions. Other risk factors that have been shown to affect M&A deals include the target's country of domicile, culture, workforce stability, investment opportunities, etc. (Martin 1996; Bryson 2003; Cartwright and McCarthy 2005; Huang et al. 2016). Prior studies also find that target-firm financial reporting quality is significantly associated with various M&A outcomes (Skaife and Wangerin 2013; Marquardt and Zur 2015). Our study extends this line of literature by documenting that target customer concentration reflects an important uncertainty about the firm with implications for information asymmetry and adverse selection. We extend prior M&A literature on how information asymmetry affects the form of payment and the probability of receiving a bid (Dhaliwal, Lamoreaux, Litov, and Neyland 2016; Faccio and Masulis 2005; Palepu 1986; Uysal 2011).

Second, our findings extend prior studies that examine the economic consequences of customer concentration. While several papers suggest that firms with a concentrated customer-base can have higher profits because of improved efficiencies (Kalwani and Narayandas, 1995; Patatoukas 2012), our findings suggest that the risk considerations manifest prominently in the M&A market. Our paper relates to prior studies that document that customer concentration is associated with higher cost of equity, cost of debt and crash risk (Dhaliwal, Judd, Serfling, and Shaikh; Campello and Gao 2017; Chen, Hu, Meng, and Yao 2018). Our findings quantify the economic consequences of customer concentration in M&A markets and may be of interest to practitioners who seek to understand how attributes of their customer bases impact their firms' prospects in M&A markets.

The remainder of the paper proceeds as follows. The next section reviews the relevant literature and develops the hypotheses. Section 3 describes the research design and sample. Section 4 presents empirical results. Finally, Section 5 summarizes and concludes.

2. Literature Review and Hypothesis Development

2.1. Prior Literature

Prior literature takes two views of customer concentration. A supplier's relationships with major customers, while conventionally viewed as impeding supplier performance, may in some ways stimulate performance. The traditional 'impediment' viewpoint considers that major customers may exercise their relative bargaining power to extract concessions from suppliers, in the form of favorable trade terms including low prices (Galbraith 1952; River's Edge 2014). Major customers may also require significant relationship specific investments of their suppliers (Titman and Wessels 1988). On the other hand, recent literature also proposes an efficiency viewpoint. Suppliers with major customers may enjoy operating efficiencies that come with

selling to major customers (Kalwani and Narayandas 1995) and may reap benefits by

coordinating supply chain logistics with major customers (Kinney and Wempe 2002). Patatoukas

(2012) investigates the net effect of customer concentration on suppliers' performance and finds

some evidence of a causal link between customer concentration and higher accounting rates of

return. Irvine et al. (2016) extends Patatoukas (2012) by showing empirical evidence that the

effect of customer concentration on firm profitability depends on the life cycle of the

relationship.

SFAS No. 131 (Codification 280-10) requires firms to disclose major customers because they

signal high uncertainty about the supplier's future cash flow, and because firm-specific shocks

along a supply chain can impact the performance of nearby firms in the chain (Hertzel, Li,

Officer, and Rodgers 2008; Kolay et al. 2016). Prior research studies how equity and credit

markets evaluate firms' customer concentration. These studies estimate investors' perceptions of

the net effect of all implications of customer concentration, including operating efficiency and

risk. Dhaliwal, Judd, Serfling, and Shaikh (2016) document a positive association between

customer concentration and cost of equity, suggesting that on average, equity investors perceive

the risks associated with major customers as outweighing potential operating efficiencies.[6]

Campello and Gao (2017) find similar effects in bank lending: customer concentration increases

interest rates and the number of restrictive covenants while reducing maturities. Chen et al.

(2018) report a positive association between customer concentration and stock price crash risk.

They find that firms with high customer concentration are more likely to disclose bad news. In

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[6] Dhaliwal, Judd, Serfling, and Shaikh (2016) also find a positive association between customer concentration and
bond yield spreads.

summary, the literature provides not only evidence of customer concentration-related operational efficiencies, but also evidence of customer concentration-related risk consequences.

In a relevant paper, Harford, Schonlau, and Stanfield (2018) examine whether direct and indirect economic links between firms explain which firms are more likely to be involved in mergers.[7] While the tests of Harford et al. (2018) are designed to capture the M&A effects of economic relationships in supply chains, we examine the effects of customer concentration *per se* and how the information asymmetry and adverse selection problems that come with it manifest in bid likelihood and deal structure.

2.2. Hypothesis Development

Practitioner literature consistently highlights target customer concentration as one of the most important risk factors in M&A. An undiversified customer base is viewed by potential acquirers as a significant risk for several major reasons. First, exposure to major customers brings potential for extreme cash flow problems after the deal is done (Nead 2017). Not only might major customers experience idiosyncratic shocks that disrupt liquidity at the potential target, but acquirers also worry that a change in ownership increases the likelihood that major customers defect entirely. Prior literature documents that many top managers depart shortly after an acquisition (Krug and Hegarty 2001). To the extent that personal connections facilitate major customer relationships, a change in control might lead to major customer turnover. Second, powerful major customers such as Walmart and P&G often dictate terms of the supply relationship, shrinking their suppliers' margins, and delaying payments.[8] Both of these factors increase the uncertainty surrounding target firms' future cash flows. Finally, even if the acquirer

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[7] Harford et al. (2018) find that firms with major customers are (1) more likely to receive bid offers from firms with direct or indirect trade relationships and (2) less likely to receive bid offers from firms without any trade relationship.

[8] A Wall Street Journal Article "Small firms' big customers are slow to pay" discusses these behaviors (Loten 2012).

perceives a positive reward/risk tradeoff and is willing to pursue a deal with a potential target, there is no guarantee that equity sources and debt sources of financing will agree to facilitate the deal (River's Edge 2014). Together these concerns make customer concentration a first-order issue and potential deal-breaker as acquirers evaluate potential targets.

Prior literature shows that information asymmetry can influence acquisitions, including valuations, acquirer returns, payment method, and bid likelihood (e.g., Eckbo, Giammarino, and Heinkel 1990; Officer, Poulsen, and Stegemoller 2009; Krishnaswami and Subramaniam 1999; Officer 2004). Additionally, several papers show that the likelihood of being acquired increases when mechanisms to reduce information asymmetry function. For example, auditor quality is associated with a higher likelihood of a firm being acquired (Xie, Yi, and Zhang 2013) and firms are more likely to receive a bid from a firm that has the same auditor (Dhaliwal, Lamoreaux, Litov, and Neyland 2016). We believe that the uncertainty surrounding future major customer cash flows introduces information asymmetry that is also likely to affect the likelihood of receiving a bid.

Specifically, information asymmetry between the target firm and the acquiring firm causes the acquirer to estimate a wider range of expected future cash flows than the target. The target firm has a reservation price, which effectively creates a lower bound for a zone of possible agreement between the target and acquirer (Fishman 1989; Sebenius 1992). Any offer made by the acquirer must meet or exceed this threshold for a deal to occur. Information asymmetry may lead the acquirer to price protect and potentially fail to make an offer price that meets the target's reservation price. This price protection is exacerbated in the case where a firm has concentrated customers because the uncertainty of losing major customers increases the variance of future cash flows and the potential for information asymmetry. Therefore, we expect that all else equal,

9

price discounting will be greater in the concentrated customer case. Because deeper price discounting decreases the likelihood that a bid will meet the target's reservation price, we expect that the likelihood of getting a bid will be lower.[9]

Furthermore, the empirical evidence of Dhaliwal, Judd, Serfling, and Shaikh (2016) and Campello and Gao (2017) suggests that debt and equity investors perceive customer concentration as a net risk. This evidence, along with the arguments above and anecdotal evidence suggesting that acquirers (and their sources of finance) carefully consider potential targets' customer concentration, leads us to hypothesize the following:

> *H1: The likelihood that a firm receives a bid decreases with the concentration of its customer base.*

We note that the operating efficiency view of customer concentration can possibly lead to the opposite prediction. Specifically, if the acquirers weigh improved future profitability more than risk considerations, then they may prefer target firms with concentrated customers. This possibility adds tension to the hypothesis.

One important decision in structuring a merger or acquisition deal is the choice of exchange medium. Payment to target stockholders can be made in cash, in securities, or some combination thereof. Extensive prior literature examines the determinants of this choice, including tax and corporate control considerations, leverage, growth opportunities, corporate governance concerns, financing constraints, etc. (Amihud, Lev, and Travlos 1990; Carleton, Guilkey, Harris and Stewart 1983; Martin 1996; Uysal 2011; Faccio and Masulis 2005). The risk perceived by the acquirer also plays an active role in determining payment method. For example, Huang et al.

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[9] It is natural to expect that acquirers of targets with customer concentration may systematically offer lower price premiums. However, the discounting may already be present in the stock price—that is, the stock price prior to the bid offer. We therefore do not focus on examining the price premium in the M&A setting.

(2016) find that acquirers are more likely to pay in stock when risk associated with cross-border mergers increases. The increased use of stock under risky conditions is consistent with acquirers sharing risk by using a payment method that is contingent upon the value created (Chi 1994).

Hansen (1987) models the transaction process of a merger or acquisition as a bargaining game with imperfect information. An adverse selection problem arises because the target knows its value better than the potential acquirer. This information asymmetry leads the acquirer to prefer stock as payment instead of cash, because of the contingent pricing characteristics of a stock payment. In other words, when the acquirer is less certain of the target's value (i.e. its future stream of cash flows), the acquirer is more likely to share the risk of acquiring the target by paying with stock, making the value of the consideration paid to the target contingent on the ongoing performance of target assets.

Because the uncertainty associated with customer concentration makes it harder for acquirers to assess the future cash flows of the target and its value, the acquirer is likely to protect against overpayment by paying with more stock relative to cash. Doing so effectively reduces the acquirer's exposure to risk because both acquirer and target share in the possible mispricing (Hansen 1987; Huang et al. 2016). We hypothesize the following:

> *H2: The proportion of the bid offer comprised of stock payment increases with the concentration of the target's customer base.*

3. Data and summary statistics

3.1. Sample selection

We begin by obtaining bids and deal characteristics from Securities Data Corporation's Mergers and Acquisitions Database (SDC) from the beginning of 1985 through the end of 2016. We limit the sample to bids on public targets because we require stock returns and financial

11

statement data for targets in our analysis. We also require that bidders own less than 50 percent

prior to making an offer and seek to own more than 50 percent after the deal is completed

(Dhaliwal, Lamoreaux, Litov, and Neyland 2016). These restrictions result in a base sample of

21,069 bids.

The unit of analysis for tests of our bid probability hypothesis is the firm-year. We obtain a

sample of Compustat firm-years from 1985 – 2016, which we augment with data on stock returns

from CRSP and institutional ownership from Thomson Reuters. We drop utilities (SIC 4900-

4999) and financial firms (SIC6000 – SIC6999) and require data to calculate the target firm

financial characteristics. These procedures yield a final sample of 108,430 firm-years, 8,448 of

which exhibit a bid received. We refer to this sample as the 'bid sample' and use it to test our bid

probability hypothesis.

The unit of analysis to test our payment method hypothesis is the bid offer. To craft a sample

for these tests, we begin with the full sample of 21,069 bids described above, supplemented with

the same set of financial characteristics of the target firm as well as additional deal-level data

from SDC, including the method of payment used in the deal (i.e., the percent paid with stock).

Requiring these data reduces the sample of bids available for payment method tests to 6,215. We

refer to this sample as the 'payment method sample'. Some tests require a measure of the size of

the target relative to the acquirer. To accommodate these tests, we further restrict the sample of

bids by requiring that the bidder be a public firm so that we can include a measure of relative

size, along with other variables based on bidder financial characteristics. This requirement results

in a sample of 2,310 bids. This we call the "public acquirer sample".

3.2. Measures of customer concentration

We follow prior literature in using multiple measures of customer concentration. Specifically, we capture the degree to which sales to a small set of customers of a target (or potential target) firm is large relative to total sales (e.g., Dhaliwal, Judd, Serfling, and Shaikh 2016; Campello and Gao 2017; Patatoukas 2012). Beginning in 1976, accounting regulation required public companies to disclose if they supply customers that account individually for 10 percent or more of the supplier's revenue (ASC 280-10, FAS 131).[10] We obtain customer concentration data from Compustat's segment customer files. Our first measure of customer concentration is an indicator variable that is set to one if the target (or potential target) firm i discloses a major customer in year t, and zero otherwise ($MajorCustomer_{it}$). Our second measure is based on an application of the Herfindahl-Hirschman Index, calculated following Dhaliwal, Judd, Serfling, and Shaikh (2016).[11] This index takes values between 0 and 1, where higher values represent greater concentration of customers. We use the decile rank of the HHI index ($CustomerHHI_{it}$) as our second measure of customer concentration. We calculate our third measure ($TotalMajorCustomerSales_{it}$) as the decile rank of the proportion of a target's (or potential target's) total annual sales that is accounted for by its major customers.

3.3. Measures of bid probability and payment method

We measure bid activity by specifying the variable $BidIndicator_{it}$, which is equal to one if firm i is announced as a target in a bid offer in year t, and zero otherwise. We measure payment method by specifying the variable $PercentStock_k$, which, for each deal k is equal to the portion of

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[10] Some supplier firms voluntarily disclose major customers that account for less than 10% of sales. Because this voluntary choice could introduce self-selection bias, we do not include these customers in the various calculations of customer concentration.

[11] Specifically, The Herfindahl-Hirschman Index captures target i's customer concentration in year t across its n major customers, as follows: $CHI_{it} = \sum_{n=1}^{N}(\frac{s_{it}}{S - s_{it}})^2$.

the deal value offered in bidder common stock divided by total deal value. Bids and payment method data are obtained from SDC, as described in Section 3.1.

3.4. Summary statistics

Table 1 Panel A presents descriptive statistics for the bid sample. The descriptive statistics for our customer concentration measures are similar to prior studies.[12] In 37 percent of our observations, the target (or potential target) reports having at least one major customer. *CustomerHHI* and *TotalMajorCustomerSales* (in their unranked form) average 0.06 and 0.16, respectively. Among the set of observations with major customers, *CustomerHHI* and *TotalMajorCustomerSales* average 0.16 and 0.43, respectively (untabulated). The average firm-year in our sample exhibits growth, slightly positive abnormal returns, MTB of 2.68, and a PE Ratio of 13.78. *BidIndicator* takes a mean value of 0.078, which is comparable to prior studies (e.g., Cremers, Nair, and John 2008; Billett and Xue 2007). For detailed definitions of all variables, see the appendix.

Table 1 Panel B reports descriptive statistics for the payment method sample. The distributions of the customer concentration measures in this sample are similar to those in the bid sample. On average, 27 percent of deal value is offered in stock of the bidding firm, while 60 percent is offered in cash, which is comparable to prior studies (e.g., Martynova and Renneboog 2009; Karampatsas, Petmezas, and Travlos 2014).[13] Relative to the total sample of firm-years in Panel A, firm-years with bids in Panel B tend to exhibit lower abnormal returns, MTB and PE

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[12] Other studies using these measures include Patatoukas (2012); Dhaliwal, Judd, Serfling and Shaikh (2016); Huang et al. (2016); Irvine et al. (2016); and Campbell and Gao (2017).

[13] The remaining 13 percent of deal value is labeled by SDC as "other" (6 percent) and "unknown" (7 percent). Our variable *Percent_Stock* is the proportion of total deal value that is categorized as stock. In untabulated robustness tests, we define *Percent_Stock* as the proportion offered in stock scaled by the sum of the proportions offered in stock and cash. Our main payment method results are not sensitive to this choice.

Ratios. For nearly half (47 percent) of bids in our sample, bidders and targets are in the same industry, and 13 percent of bids are contested, meaning multiple bids were received.

In Table 2, we report correlations among our measures of customer concentration, dependent variables and controls. In the bid sample (Panel A), the different measures of customer concentration are correlated with each other (Pearson correlations range from 0.51 to 0.83) and each measure is negatively correlated with the probability of receiving a bid. In the payment method sample, (Panel B), we observe no significant univariate correlation between customer concentration measures and the percent offered in stock. We examine these relations more fully in the following multivariate analysis.

4. Multivariate analysis

4.1. Customer concentration and bid probability

Our first tests address the relation between a firm's customer concentration and its likelihood of receiving a bid. We implement Logit regressions of the following general form:

$$\Pr(B \qquad r_{it} = 1) = \alpha_0 + \alpha_1 Cu\mathsf{s} \qquad n_{it} + X_{it}\beta + \beta_j + \beta_t + \varepsilon_{it} \qquad (1)$$

In this model, *BidIndicator*$_{it}$ is equal to one for a firm-year if the firm received a bid as reported by SDC (and zero otherwise), and *CustomerConcentration*$_{it}$ is one of three measures discussed in Section 3.2: *MajorCustomer, CustomerHHI*, or *TotalMajorCustomerSales*. Customer concentration measures and financial control variables are calculated using the most recent financial statement data disclosed prior to the bid announcement date. X_{it} is a set of controls for additional determinants of the probability of receiving a bid, as implemented by Dhaliwal, Lamoreaux, Litov, and Neyland (2016) and Palepu (1986). We include *AbnormalReturn* and *ROE* to proxy for managerial effectiveness because acquisitions can be a market mechanism to replace inefficient managers. Palepu (1986) also suggests that firms are

likely targets when they exhibit mismatch between their growth and resources at their disposal. The indicator *GrowthMismatch* is equal to one when a firm is low-growth but resource rich, and when a firm is high-growth but resource poor.[14] We also control for *Growth*, measured using a three-year average change in sales. Because the costs associated with an acquisition increase with the size of the target, we control for target *Size* using total assets. We include *Liquidity* and *Leverage* to proxy for financial constraints of the target. *MTB* and *PERatio* proxy for the value of the target. We also include *InstitutionalOwnership* to control for ownership of the target as a determinant of bid likelihood. Finally, we include industry ($_j$) and year ($_t$) fixed effects to control for variation in bids by industry and over time. See the appendix for specific variable definitions.

Table 3 presents the results of this analysis. Columns 1-3 report the results of Logit regressions of *BidIndicator* on each of the three customer concentration variables and controls. To aid interpretation, we transform *CustomerHHI* and *TotalMajorCustomerSales* into decile-ranked variables in all multivariate analyses.[15] In each column, the coefficient on *CustomerConcentration* is negative and statistically significant ($p < 0.01$), suggesting a reliably negative relation between a potential target's customer concentration and its likelihood of receiving a bid. These results are consistent with the hypothesis that the information asymmetry associated with a potential target's customer concentration decrease the likelihood of receiving a bid.

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[14] We follow Dhaliwal, Lamoreaux, Litov, and Neyland (2016) in calculating this variable. Specifically, *Growth-Mismatch* equals one for firm-years that exhibit either (1) above-median leverage and growth, but below-median liquidity, or (2) below-median leverage and growth, but above-median liquidity.
[15] *CustomerHHI* and *TotalMajorCustomerSales* are ranked in deciles so that for each observation, these variables take a value of an integer from 0 to 9.

In un-tabulated analysis, we compute marginal effects to provide economic significance of these results. The marginal effect of *MajorCustomer* (having at least one major customer) is -0.0073. Relative to the sample mean of *BidIndicator*, this represents a 9.4 percent decrease in the probability of receiving a bid. We compute the economic significance of *CustomerHHI* and *TotalMajorCustomerSales* by comparing the bottom decile to the top decile. Relative to the sample mean of *BidIndicator*, a shift from decile 1 to 10 represents a decrease in the probability of receiving a bid of 17.9 percent and 16.6 percent, respectively.[16]

4.2. Customer concentration and method of payment

The negative relation between customer concentration and the likelihood of receiving a bid suggests that bidders perceive potential targets' customer concentration as a risk. We next examine whether bidders seek to share the risk with the target by adjusting their method of payment. By financing the deal with common stock, bidders can effectively apportion the riskiness of the deal among the shareholders of the bidder and the target.[17] To provide evidence on whether bidders employ this risk-sharing mechanism, we examine the relation between our measures of a target's customer concentration and the proportion of the deal value the bidder offers in common stock. We implement versions of the following general OLS regression:

$$ P \qquad k_{ii} \;=\; \alpha_0 + \alpha_1 C \qquad\qquad n_{ii} + X_{ii}\beta + X_k\beta + \beta_j + \beta_t + \varepsilon_{ii} \tag{2} $$

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[16] The marginal effect (un-tabulated) of *CustomerHHI* is -0.0016. Since *CustomerHHI* is decile-ranked, this is multiplied by 9 to obtain the marginal effect of a shift from decile 1 to decile 10 (-0.0016 * 9 = -0.0140). We compare this total marginal effect to the sample mean of *BidIndicator* to determine economic significance (-0.0140 / 0.078 = -0.179). The same methodology is used to calculated economic significance of *TotalMajorCustomerSales*.

[17] Bidders can address the risk of mis-valuation using other contractual measures, including earnout clauses, which defer a portion of the merger payment and make it contingent on the target meeting prespecified performance standards. However, earnout clauses are much more feasible and prevalent in acquisitions of private firms than public firms, because negotiating a contract on *ex post* performance is much easier when there are one or a few sellers (Kohers and Ang 2000). In our sample of 6,215 bids for public targets, we observe only 27 with earnout values (less than 0.5 percent) and thus do not test whether customer concentration increases the occurrence of earnouts.

In this model, *PercentStock$_{itk}$* is the portion of the value of deal *k* offered using bidder

common stock. *CustomerConcentration$_{it}$* for target firm *i* is measured as of the fiscal year-end (*t*)

immediately preceding the announcement of deal *k* using one of the three measures described

previously. X_{it} and X_k represent target-level and deal-level control variables, respectively. Since

the factors driving the decision to place a bid may also affect the terms of the bid, we include in

Equation (2) each of the control variables from Equation (1). We augment these controls with

additional variables that have been shown to affect the method of payment in acquisitions,

following the payment method model of Uysal (2011). Specifically, we include *ReturnVolatility*,

SameIndustry, and *CompetedBid*.[18] Finally, we include industry ($_j$) and year ($_t$) fixed effects.

Table 4, Panel A presents the results of OLS regressions of *PercentStock* on target customer

concentration measures. When using the sample of 6,215 bids obtained as described in Section

3.1, we observe positive and significant coefficients on all three measures of target customer

concentration ($p < 0.01$). These results are consistent with the hypothesis that the information

asymmetry and mis-valuation risk associated with a target's customer concentration lead

acquirers to prefer stock payment. In terms of economic significance, the proportion of the deal

paid in stock is 3.2 percentage points higher when the target has at least one major customer.

This represents an increase of 12.2 percent relative to the sample mean of *PercentStock*. In

column two, the coefficient on *CustomerHHI* is 0.617, representing the average effect on

payment method of a one-decile increase in *CustomerHHI*. A shift from decile 1 to 10 of

CustomerHHI represents an increase of 20.9 percent relative to the sample mean of *PercentStock*

(the corresponding estimate for *TotalMajorCustomerSales* is 22.6 percent).

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[18] In the smaller sample of bids (in Table 4, Panel B) from public bidders we also include *AcquirerSales, AcquirerROA, AcquirerMTB*, and *RelativeSize*.

Notwithstanding the on-average results in Table 4, Panel A, we expect the relation between target customer concentration and the proportion of the deal paid in stock to vary based on the size of the target relative to the size of the acquirer. For the value of stock consideration to be contingent on the performance of the combined firm (and thus for stock payments to function as a viable risk-sharing mechanism), the assets and operations acquired must amount to a significant portion of the new, combined firm. As such, we expect the overall effect of customer concentration in Panel A of Table 4 to be stronger when the relative size of the target is greater. To test this expectation, we supplement Equation (2) with *RelativeSize* and its interaction with *CustomerConcentration*.[19] Since the calculation of *RelativeSize* requires assets of the bidder, the sample for these tests is restricted to 2,310 deals with public bidders for which we have financial data. In these tests, we also control for additional bidder characteristics, following Uysal (2011).

Relative size results are reported in Panel B of Table 4. The main effect of customer concentration (i.e., when *RelativeSize* = 0) is insignificant in all three tests, suggesting that when targets are very small relative to bidders, customer concentration shares no relation with the method of payment. Coefficients on *RelativeSize* are positive and significant in each column, consistent with the size of the target impacting payment method when customer concentration is negligible. The interactions between *RelativeSize* and *CustomerConcentration* measures are all positive and significant ($p < 0.05$), which is consistent with bidders using payment in stock as a mechanism to share customer concentration-related risk when the option is viable (i.e., when targets are sufficiently large). *CustomerConcentration* has a much greater economic impact on the percent paid in stock when interacted with *RelativeSize*. In column 1, the total effect of

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[19] *RelativeSize* is calculated as the ratio of target assets to bidder assets, then ranked in deciles and scaled to range from 0 to 1.

CustomerConcentration is 7.582, which represents a 28.6 percent increase relative to the sample

mean of *PercentStock*. In columns 2 and 3, a shift from decile 1 to 10 of *CustomerHHI*

represents an increase of 51.7 percent relative to the sample mean of *PercentStock* (the

corresponding estimate for *TotalMajorCustomerSales* is 55.9 percent).

4.3. Cross-sectional tests

In this section, we report the results of cross-sectional tests showing variation in the relation

between (potential) targets' customer concentration and bid outcomes. Specifically, we examine

whether the main relations we document in Table 3 and Table 4 are stronger when customer

concentration results in greater uncertainty and information asymmetry. We do this in two sets of

tests. First, we identify the major customers of targets in our sample as government and non-

government entities so that we examine the two components of customer concentration

separately (e.g., Dhaliwal, Judd, Serfling, and Shaikh 2016). Second, we examine the effect of

target customer concentration given variation in the major customers' switching costs. We proxy

for switching costs using the target firm's market share (e.g., Dhaliwal, Judd, Serfling, and

Shaikh 2016) and the length of major customer relationships (e.g., Irvine et al. 2016).

4.3.1. Governmental and non-governmental concentration

The concentration of a firm's customer base is important in assessing the risks inherent in the

target firm's future cash flows, affecting uncertainty and thus the information asymmetry

between a bidder and target. We expect this concentration-related uncertainty and information

asymmetry to vary with the stability and predictability of cash flows from major customers. Our

first cross-sectional tests consider the possibility that governmental major customers represent a

more stable stream of cash flows than do non-governmental major customers. Government

entities are less prone to financial distress that disrupts their purchasing and often deal in long-

term contracts which provide assurance around near-term cash flows. Furthermore, the bureaucracy of government entities makes them less likely to switch suppliers. For these reasons, we expect less uncertainty and information asymmetry vis-à-vis a target's customer concentration if the target's major customers are government entities. To test this question, we estimate bid probability and payment method models replacing the overall customer concentration measures with its components: *Govt_Concentration* and *NonGovt_Concentration*.[20]

The results in Panel A of Table 5 show that the negative on-average relation between customer concentration and bid probability documented previously is concentrated among potential targets with non-government concentration ($p < 0.01$). In contrast, each of the coefficients on *Govt_Concentration* is statistically indistinguishable from zero. In each column, the coefficient on *NonGovt_Concentration* is significantly more negative than the coefficient on *Govt_Concentration* ($p < 0.10$).

A similar story emerges in the payment method tests reported in Panel B of Table 5. The positive relation between customer concentration and the proportion of bid offers consisting of stock payment is concentrated among bids for targets with non-government concentration ($p < 0.01$). In contrast, each of the coefficients on *Govt_Concentration* is statistically indistinguishable from zero. The results of t-tests comparing the coefficients on *NonGovt_Concentration* and *Govt_Concentration* indicate that *NonGovt_Concentration* has a

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[20] Customers are identified as government entities if Compustat categorizes them as such (i.e., if customer type equals GOVDOM, GOVFRN, GOVLOC, or GOVSTATE). We also consider observations with customer type equal to "COMPANY" but whose names contain one or more of the following key words: Army, Govts, Govt, Government, Governments, Federal, Defense, Department, Dept, Medicaid, Medicare, United States, and US. We manually verify that sixty-five of these organizations are fully-owned by governmental entities and identify them as such in our analysis.

significantly greater impact on payment method than *Govt_Concentration* (at marginal statistical significance ($p = 0.11$)).

As discussed in Section 4.2, the size of the target relative to the bidder determines the degree to which stock payment is a significant risk sharing mechanism. To further examine the effects of government and non-government customer concentration on payment method, we interact *Govt_Concentration* and *NonGovt_Concentration* with *RelativeSize* (using the public acquirer sample of 2,310 bids). As reported in Panel C of Table 5, we observe much stronger effects when relative size is high. Specifically, when *RelativeSize* = 1 (i.e., in the top decile), the total effect of *NonGovt_Concentration* on payment method is significantly greater than the total effect of *Govt_Concentration* ($p < 0.05$).

We interpret the results of Table 5 as evidence that the overall negative (positive) relation between customer concentration and bid likelihood (payment method) is driven exclusively by corporate, non-governmental major customers. The reduced uncertainty and information asymmetry surrounding future cash flows of major government customers appear to minimize bidders' concerns.

4.3.2. Switching costs using target market share

Our second set of cross-sectional tests examine the implications of the barriers that major customers face to switching suppliers. When costs to a customer of switching suppliers are lower, the likelihood that the customer will switch is higher. This higher customer switch risk makes cash flows from major customers less reliable. We expect bidders to consider switching costs of major customers when evaluating the uncertainty associated with targets' customer concentration. Specifically, when switching costs are low, we expect a stronger negative (positive) relation between customer concentration and bid likelihood (payment with stock).

To test these predictions, we first follow Dhaliwal, Judd, Serfling, and Shaikh (2016) in capturing customer switching costs by using supplier sales to measure industry market share.[21] We measure *SwitchingCosts* as the fraction of the supplier's total industry sales that is captured by the supplier. Higher market shares (higher values of *SwitchingCosts)* indicate situations when customers face more difficulty in switching suppliers. We supplement Equations (1) and (2) with the *SwitchingCosts* variable and its interaction with *CustomerConcentration* and report results in Panels A and B of Table 6.

Results in Panel A of Table 6 show that switching costs play a significant role in our bid probability setting. The interaction of *CustomerConcentration* and *SwitchingCosts* (β_3) is positive and significant in each model ($p < 0.01$). This finding suggests that when potential targets have captive major customers, the uncertainty and information asymmetry vis-à-vis the associated cash flows is low, which attracts bidders. On the other hand, when switching costs are low, customer concentration exhibits a strong negative relation with *BidIndicator*. Furthermore, the sum of coefficients on customer concentration and the interaction (i.e., the total effect of customer concentration, or $\beta_1 + \beta_3$) is consistently positive and significant ($p < 0.01$). This result suggests that when uncertainty and information asymmetry surrounding cash flows from major customers attenuate (when the major customers are highly unlikely to switch suppliers), the stability of major customer cash flows makes firms attractive targets.

We report switching cost analyses in our payment method setting in Table 6, Panel B. When switching costs are low we observe a strong positive relation between customer concentration and stock-based payment (i.e., a positive main effect of *CustomerConcentration* [β_1], $p < 0.01$).

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[21] We use market share as a proxy for switching costs on the intuition that when a supplier has low industry market share, more alternative suppliers are available to its customers.

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However, inconsistent with our prediction, both the interaction of *CustomerConcentration* and *SwitchingCosts* (β_3) and the total effect of *CustomerConcentration* when switching costs are high ($\beta_1 + \beta_3$) are insignificant. Given the importance of the target's relative size in determining payment method, we next augment the model with *RelativeSize* and its two- and three-way interactions with *CustomerConcentration* and *SwitchingCosts* (using the public acquirer sample of 2,310 bids). As reported in Panel C of Table 6, we observe that conditional on relative size being high, the relation between *CustomerConcentration* and *PercentStock* is positive when switching costs are low (e.g., the total effect of *MajorCustomer* when relative size is in the top decile but switching costs is in the bottom decile [$\beta_1 + \beta_4$] is 17.842, $p < 0.01$) and negative and insignificant when switching costs are high (e.g., the total effect of *MajorCustomer* when relative size is in the top decile and switching costs is also in the top decile [$\beta_1 + \beta_4 + \beta_5 + \beta_7$] is -3.301, $p = 0.65$). Furthermore, when relative size is high, the difference between the effects of customer concentration under high and low switching costs is statistically significant (e.g., in column 1, [$\beta_5 + \beta_7$] = -21.143, $p < 0.10$).

In summary, our target market share analyses yield evidence that the negative relation between target customer concentration and bid probability is strengthened when the targets' customers face low barriers to switching suppliers. Also, the positive relation between target customer concentration and the proportion of payment made in stock is concentrated in the sample where switching costs are low and relative size is high.

4.3.3. Switching costs using relationship age

Irvine et al. (2016) argue that the effects of customer concentration vary with the maturity of major customer relationships, reporting evidence that the relation between customer concentration and profitability is negative in the early years of the relationship but positive in

later years. In related literature, supplier-customer relationship age is also used as a proxy for relationship specific investment (RSI) and switching costs (e.g., Banerjee, Dasgupta, and Kim 2007; Brown, Fee, and Thomas 2009; Intintoli, Serfling, and Shaikh 2017). Customers and suppliers in long-term relationships are more likely to have made investments specific to the relationship, which increases the costs to the customer of switching to a new supplier.

If switching costs indeed increase with the maturity of major customer relationships, we expect the likelihood of receiving a bid to vary negatively with target customer concentration in the early years of the relationship and less negatively as the relationship matures.[22] To test this prediction, we estimate the bid probability method models replacing the overall customer concentration measures with its components: *CustomerConcentration_Long* and *CustomerConcentration_Short*.[23]

The results in Panel A of Table 7 show that the negative on-average relation between customer concentration and bid probability documented previously is concentrated among potential targets with short major customer relationships ($p < 0.05$). In contrast, each of the coefficients on *CustomerConcentration_Long* is significantly positive ($p < 0.10$). In each column, the coefficient on *CustomerConcentration_Short* is significantly more negative than the

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[22] Relationship age may also proxy for the degree of information asymmetry between bidder and target that derives from major customer relationships. In the early years of a supply relationship, the public (and any potential acquirer) has very little information regarding the longevity of the major customer relationship, while the target's information set includes private communications and agreements with the major customer as to the RSIs undertaken by each party. As the relationship matures however, RSIs are incurred and the likelihood that the relationship fails decreases. The public infers relatively more information regarding the future stability of the relationship from its historical stability. This improvement in public inference reduces the information asymmetry between bidder and target (which results in the same prediction for our tests as the switching costs approach).

[23] To calculate *CustomerConcentration_Long* and *CustomerConcentration_Short* we measure the number of consecutive years that the target has disclosed a relationship with each major customer. Customers that have had a relationship for an above median number of consecutive years are used to calculate *CustomerHHI_Long*, *MajorCustomer_Long*, and *TotalMajorCustomerSales_Long*, else they are used to calculate *CustomerHHI_Short*, *MajorCustomer_Short*, and *TotalMajorCustomerSales_Short*.

coefficient on *CustomerConcentration_Long* ($p < 0.01$). This pattern of results suggests that when major customer relationships are new, firms are less likely to receive a bid, but as those relationships mature, the negative association between customer concentration and bid likelihood attenuates. When major customer relationships are mature and customer concentration is high, the uncertainty and information asymmetry surrounding major customer cash flows is low and the stability of these significant cash flows makes firms attractive as targets.

A similar pattern emerges in the payment method tests reported in Panel B of Table 7. The positive relation between customer concentration and payment in stock is concentrated among bids for targets with short major customer relationships ($p < 0.01$). In contrast, each of the coefficients on *CustomerConcentration_Long* is statistically indistinguishable from zero. The results of t-tests comparing the coefficients on *CustomerConcentration_Short* and *CustomerConcentration_Long* indicate that directionally, short major customer relationships have a greater impact on payment method than mature major customer relationships (albeit only statistically significant under one-tailed tests in column 1).[24]

4.4. Instrumental variables regressions

In this section we address the possibility that unobserved omitted variables drive the relations we observe. For example, targets with high customer concentration may tend to also exhibit other business risks which themselves could drive some of our results. We address this concern by controlling for endogeneity in an instrumental variables framework, instrumenting for customer concentration using two- and three-year lagged industry averages of customer

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[24] In untabulated analyses we augment the model with *RelativeSize* and its two- and three-way interactions with *CustomerConcentration* and *SwitchingCosts.* In this triple-interaction model, the difference between the total effects of long and short customer concentration is statistically insignificant.

concentration.[25] In utilizing these instrumental variables, we apply the intuition of Dhaliwal, Judd, Serfling and Shaikh (2016), who argue that, in their setting, the lagged industry averages of customer concentration satisfy both the relevance condition and exclusion restriction required of valid instruments. Analogously, in our M&A models, validity of these instruments hinges on (1) their relevance to the customer concentration variables and (2) their correlation with bid probability and payment method *only* through the customer concentration variables (i.e., not correlated with the error terms).

By capturing the structure of customers by industry, average industry customer concentration should be highly correlated with an individual target's customer concentration, satisfying the relevance condition. Furthermore, lagged industry customer concentration is unlikely to be correlated with current bid probability and payment method (except through an individual target's customer concentration) because acquirers value potential targets and structure their bid offers based on estimates of future cash flows. Thus, lagged industry values likely satisfy the exclusion restriction.

Panel A of Table 8 presents the first-stage of the instrumental variables approach in our bid likelihood tests. Specifically, we report results of regressing each of our customer concentration variables on its two- and three-year lagged industry averages, including the controls from Table 3. We conduct several tests of the validity of our instruments. Low *p*-values in the Hausman specification tests ($p < 0.01$) reject the null that the customer concentration variables are exogenous on their own. High partial R^2s and *F*-statistics indicate the strength of our instruments (relevance to customer concentration). High *p*-values in the Sargan-Hansen tests ($p > 0.23$)

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[25] We follow Dhaliwal, Judd, Serfling, and Shaikh (2016) in using lagged industry averages of customer concentration as instrumental variables and in calculating industry averages using 3-digit SIC. The target's customer concentration is excluded from the calculation.

indicate that we are unable to reject the null that our instruments are uncorrelated with the error term (exclusion restriction). Results of the second stage regressions, presented in Panel B of Table 8, indicate a strong negative relation between predicted customer concentration and the likelihood of receiving a bid.

Panel A Table 9 presents the first-stage regressions of the instrumental variables approach in our payment method tests. We again observe high partial R^2s and F-statistics, along with insignificance in the Sargan-Hansen tests. These results bolster the validity of our instruments. In the Wu-Hausman tests, we observe p-values marginally higher than 0.10 (but less than 0.22) and cannot reject the null that customer concentration variables are exogenous to begin with. However, to address remaining concerns that our results are driven by endogeneity we proceed with second-stage analysis. The results, presented in Panel B, indicate a strong positive relation between predicted customer concentration and the proportion of the deal paid for using stock.

In summary, to the extent that our instrumental variables satisfy the validity requirements, we interpret our results as evidence of a causal negative (positive) relation between target customer concentration and the probability of receiving a bid (the proportion of the deal offered in acquirer common stock).

5. Conclusion

Anecdotal evidence suggests that in M&A markets, acquirers carefully consider the customer concentration of potential target firms, counting information related to customer concentration as "crucial and telling" (e.g., Wagner 2017). Acquiring a target with major customers can potentially bring operating efficiencies and significant cash flows, but such a target also comes with significant uncertainty, as major customers may elect to switch suppliers or experience distress that disrupts their buying behavior. This uncertainty introduces information asymmetry

between the acquirer and target, because the target amasses private information through its relationships with major customers. Consistent with this asymmetry, we report evidence that firms with greater customer concentration are less likely to receive a bid, and that conditional on making a bid offer, bidders for targets with greater customer concentration share the risk by paying more with stock (so that the value of the offer is contingent on the long-run success of the deal). Our findings are robust to endogeneity tests using instrumental variables.

We also find that our results vary in cross-sections of firms for which customer concentration results in more or less uncertainty and asymmetry. First, the negative (positive) relation between target customer concentration and bid likelihood (proportion paid in stock) only exists for corporate major customers – relatively more stable government customers have no impact on these M&A outcomes. Second, the effect of customer concentration on payment method is stronger when the target is sufficiently large relative to the acquirer, making stock payment viable as a risk-sharing mechanism. Third, the bid likelihood and payment method results are even stronger when the target's customers have low costs of switching suppliers. By quantifying the economic consequences of customer concentration, our findings provide useful insights to practitioners who seek to understand how attributes of their customer bases impact their firms' prospects in M&A markets.

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The appendix
Variable definitions

Variable		Definition
Test Variables		
CustomerConcentration	=	one of *CustomerHHI*, *MajorCustomer*, and *TotalMajorCustomerSales*, defined as follows:
CustomerHHI	=	the squared sum of the ratio of major customer sales to total sales. Summed across all major customers within a firm and decile ranked.
MajorCustomer	=	one if the firm has a major customer; zero otherwise.
TotalMajorCustomerSales	=	the sum of all sales to major customers divided by total sales, decile ranked.
Govt_Concentration	=	one of *CustomerHHI*, *MajorCustomer*, and *TotalMajorCustomerSales*, defined as above, except that only governmental customers are included in the calculation.
NonGovt_Concentration	=	one of *CustomerHHI*, *MajorCustomer*, and *TotalMajorCustomerSales*, defined as above, except that only non-governmental customers are included in the calculation.
CustomerConcentration_Long	=	one of *CustomerHHI*, *MajorCustomer*, and *TotalMajorCustomerSales*, defined as above, except that only customers that have had a disclosed relationship with the firm for an above median number of consecutive years are included in the calculation.
CustomerConcentration_Short	=	one of *CustomerHHI*, *MajorCustomer*, and *TotalMajorCustomerSales*, defined as above, except that only customers that have had a disclosed relationship with the firm for a below median number of consecutive years are included in the calculation.
Dependent Variables		
BidIndicator	=	one for a firm-year if the firm received a bid prior to the disclosure of the subsequent 10-K; zero otherwise.
PercentStock	=	the percent of payment that was offered in stock.
Control Variables		
AbnormalReturn	=	market adjusted monthly returns cumulated over the twelve months prior to year-end.
AcquirerMTB	=	acquirer market value of equity divided by acquirer book equity.
AcquirerROA	=	acquirer net income divided by acquirer assets.
AcquirerSales	=	acquirer sales in billions.
CompetedBid	=	one if SDC identifies the bid as a challenged bid; zero otherwise.
Growth	=	the average percent change in sales over the previous three years.
GrowthMismatch	=	one if there is a growth-resource mismatch, zero otherwise. There is a growth-resource mismatch if a firm has high leverage, low liquidity, and high growth or low leverage, high liquidity, and low growth. Low and high indicate below and above median, respectively. (Dhaliwal et al., 2016)
InstitutionalOwnership	=	the percent of shares held by institutional investors.
Leverage	=	total long-term debt divided by common equity.
Liquidity	=	net liquid assets divided by book assets averaged between periods t through t-3. Net liquid assets equals (cash + marketable securities - current liabilities).
MTB	=	market value of equity divided by book equity.
PERatio	=	share price divided by earnings per share.
RelativeSize	=	target assets divided by acquirer assets, decile ranked and scaled to between zero and one.
ROE	=	net income divided by total stockholder's equity.
ReturnVolatility	=	the standard deviation of daily returns over the twelve months ending five days prior to the bid announcement date.
SameIndustry	=	one if the target and acquirer have the same two-digit SIC code; zero otherwise.
Size	=	total assets in billions
SwitchingCosts	=	Industry market share, decile ranked and scaled to between zero and one. Industry market share is total target sales over total target industry sales, using Fama-French 48 industries.

Table 1
Descriptive Statistics

Variable	Mean	Std.	P25	Median	P75
Panel A: The bid sample (N = 108,430)					
Customer Concentration Measures					
CustomerHHI	0.060	0.153	0.000	0.000	0.045
MajorCustomer	0.372	0.483	0.000	0.000	1.000
TotalMajorCustomerSales	0.160	0.263	0.000	0.000	0.250
Dependent Variable and Controls					
BidIndicator	0.078	0.268	0.000	0.000	0.000
AbnormalReturn	0.024	0.550	-0.272	0.006	0.283
Growth	0.669	26.486	0.014	0.100	0.239
GrowthMismatch	0.307	0.461	0.000	0.000	1.000
InstitutionalOwnership	0.222	0.318	0.000	0.000	0.000
Leverage	0.596	1.814	0.001	0.220	0.715
Liquidity	0.121	0.223	-0.008	0.059	0.218
MTB	2.677	4.217	1.053	1.791	3.148
PERatio	13.740	52.612	-2.082	12.166	21.517
ROE	-0.048	0.822	-0.056	0.077	0.152
Size	3.580	20.999	0.051	0.236	1.165
SwitchingCosts	0.012	0.044	0.000	0.001	0.005
Panel B: The payment method sample (N = 6,215)					
Customer Concentration Measures					
CustomerHHI	0.057	0.150	0.000	0.000	0.040
MajorCustomer	0.360	0.480	0.000	0.000	1.000
TotalMajorCustomerSales	0.153	0.258	0.000	0.000	0.226
Dependent Variable and Controls					
PercentStock	26.546	41.105	0.000	0.000	60.010
AbnormalReturn	-0.031	0.531	-0.312	-0.034	0.242
CompetedBid	0.131	0.337	0.000	0.000	0.000
Growth	0.299	1.883	0.015	0.100	0.237
GrowthMismatch	0.322	0.467	0.000	0.000	1.000
InstitutionalOwnership	0.196	0.303	0.000	0.000	0.336
Leverage	0.128	0.222	-0.006	0.058	0.229
Liquidity	0.678	1.894	0.001	0.222	0.809
MTB	2.350	3.572	1.019	1.625	2.668
PERatio	11.980	53.602	-2.225	11.298	20.576
ROE	-0.063	0.794	-0.063	0.069	0.138
ReturnVolatility	0.039	0.025	0.023	0.032	0.047
SameIndustry	0.470	0.499	0.000	0.000	1.000
Size	1.215	4.214	0.063	0.196	0.728
SwitchingCosts	0.006	0.025	0.000	0.001	0.003

This table presents descriptive statistics for variables used in our analyses. Panel A includes the variables and sample used for bid probability tests. Panel B includes the variables and sample used for payment method tests. See the appendix for all variable definitions. *CustomerHHI* and *TotalMajorCustomerSales*, while decile-ranked in all further analyses, are presented in their raw form in this table for descriptive purposes.

Table 2

Correlations

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Panel A: The bid sample (N = 108,430)															
1	*CustomerHHI*	1.00	**0.51**	**0.83**	-0.01	0.00	0.00	-0.01	-0.01	-0.04	0.12	0.02	-0.03	-0.05	-0.05	-0.05
2	*MajorCustomer*	**0.97**	1.00	**0.79**	-0.01	0.01	0.00	0.00	0.01	-0.05	0.08	-0.01	-0.02	-0.05	-0.09	-0.06
3	*TotalMajorCustomerSales*	**1.00**	**0.97**	1.00	-0.01	0.01	0.00	0.00	0.01	-0.05	0.13	0.01	-0.03	-0.06	-0.08	-0.06
4	*BidIndicator*	-0.01	-0.01	-0.01	1.00	-0.03	0.00	0.01	-0.03	0.02	-0.01	-0.02	-0.01	-0.01	-0.03	-0.03
5	*AbnormalReturn*	-0.01	-0.01	-0.01	-0.03	1.00	-0.01	-0.01	0.07	-0.02	0.05	0.20	0.06	0.10	0.00	0.00
6	*Growth*	0.06	0.05	0.06	0.00	0.03	1.00	-0.01	-0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00
7	*GrowthMismatch*	0.00	0.00	0.00	0.01	-0.01	-0.11	1.00	-0.04	-0.01	0.01	-0.07	-0.01	-0.01	-0.03	-0.02
8	*InstitutionalOwnership*	0.02	0.02	0.02	-0.04	0.08	0.01	-0.02	1.00	-0.01	0.12	0.07	0.04	0.07	0.03	0.09
9	*Leverage*	-0.12	-0.11	-0.12	0.02	-0.01	-0.01	-0.04	-0.02	1.00	-0.15	0.43	-0.01	-0.18	0.04	0.05
10	*Liquidity*	0.09	0.07	0.09	-0.01	0.04	0.13	-0.01	0.14	-0.42	1.00	0.15	-0.02	-0.08	-0.07	-0.10
11	*MTB*	-0.02	-0.02	-0.02	-0.04	0.32	0.23	-0.07	0.15	0.11	0.22	1.00	0.03	-0.20	0.00	0.03
12	*PERatio*	-0.08	-0.07	-0.08	-0.02	0.19	0.07	-0.01	0.11	0.03	-0.01	0.23	1.00	0.07	0.01	0.02
13	*ROE*	-0.09	-0.08	-0.09	-0.02	0.22	0.10	-0.04	0.10	0.01	-0.09	0.21	0.40	1.00	0.04	0.06
14	*Size*	-0.25	-0.24	-0.25	-0.01	0.07	-0.04	-0.04	0.27	0.33	-0.11	0.10	0.24	0.29	1.00	0.35
15	*SwitchingCosts*	-0.17	-0.15	-0.17	-0.01	0.05	-0.06	-0.05	0.18	0.28	-0.19	0.08	0.25	0.32	0.72	1.00

Table 2, Cont.
Correlations

Panel B: The payment method sample (N = 6,215)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1	*CustomerHHI*	1.00	**0.51**	**0.83**	0.00	-0.01	**-0.05**	**0.04**	-0.02	**0.03**	-0.01	**0.11**	0.02	-0.01	-0.01	**0.06**	-0.02	**-0.07**	**-0.02**
2	*MajorCustomer*	**0.97**	1.00	**0.79**	-0.01	**-0.04**	**-0.05**	0.01	-0.01	**0.03**	**-0.04**	**0.09**	-0.01	-0.01	**-0.03**	**0.13**	**-0.04**	**-0.10**	**-0.02**
3	*TotalMajorCustomerSales*	**1.00**	**0.97**	1.00	0.00	**-0.02**	**-0.06**	**0.03**	-0.01	**0.05**	**-0.03**	**0.13**	0.01	-0.01	**-0.03**	**0.11**	-0.02	**-0.09**	**-0.03**
4	*PercentStock*	-0.01	-0.02	-0.01	1.00	**0.05**	**-0.12**	**0.03**	**-0.05**	**-0.05**	0.00	**0.02**	**0.10**	**0.02**	-0.01	0.02	**0.26**	**0.11**	0.00
5	*AbnormalReturn*	**-0.05**	**-0.05**	**-0.05**	0.06	1.00	**0.02**	-0.02	**0.03**	**0.05**	0.02	0.01	**0.21**	0.02	**0.15**	**-0.19**	**0.04**	**0.03**	0.01
6	*CompetedBid*	**-0.06**	**-0.05**	**-0.06**	**-0.11**	0.03	1.00	0.01	0.02	**-0.04**	-0.01	**-0.06**	**-0.04**	-0.02	**0.05**	**-0.07**	**-0.03**	**0.06**	**0.05**
7	*Growth*	**0.06**	**0.05**	**0.06**	**0.13**	-0.01	**-0.08**	1.00	**-0.05**	0.01	**0.09**	**0.03**	-0.02	**-0.06**	**0.05**	0.01	**-0.02**	**-0.02**
8	*GrowthMismatch*	-0.01	-0.01	-0.01	**-0.05**	0.03	0.02	**-0.12**	1.00	**-0.04**	-0.01	**0.02**	**-0.06**	0.02	**0.03**	**-0.03**	**-0.03**	**-0.03**	**-0.03**
9	*InstitutionalOwnership*	**0.05**	**0.05**	**0.05**	0.00	**0.04**	**-0.07**	**0.02**	-0.02	1.00	-0.01	**0.20**	**0.10**	0.01	**0.03**	**-0.14**	**0.07**	**0.10**	0.03
10	*Leverage*	**-0.11**	**-0.11**	**-0.11**	0.03	**0.04**	**0.04**	0.01	**-0.06**	**-0.07**	1.00	**-0.16**	**0.46**	0.00	**-0.11**	**-0.04**	0.01	**0.06**	0.03
11	*Liquidity*	**0.09**	**0.08**	**0.09**	0.01	0.00	**-0.05**	**0.13**	0.00	**0.20**	**-0.45**	1.00	**0.14**	**-0.04**	**-0.12**	**0.07**	**0.07**	**-0.09**	**-0.10**
12	*MTB*	-0.01	-0.02	-0.02	**0.15**	**0.31**	**-0.06**	**0.25**	**-0.07**	**0.12**	**0.15**	**0.20**	1.00	0.00	**-0.11**	**-0.05**	**0.06**	0.03	0.02
13	*PERatio*	**-0.04**	**-0.04**	**-0.04**	0.05	**0.18**	0.00	**0.07**	0.01	0.02	**0.03**	**-0.03**	**0.21**	1.00	**0.07**	**-0.11**	-0.02	0.01	0.00
14	*ROE*	**-0.05**	**-0.05**	**-0.05**	0.03	**0.25**	**0.04**	**0.09**	-0.01	-0.02	**0.07**	**-0.13**	**0.21**	**0.40**	1.00	**-0.28**	0.00	**0.06**	**0.05**
15	*ReturnVolatility*	**0.17**	**0.17**	**0.17**	0.01	**-0.21**	**-0.07**	**0.11**	**-0.03**	**-0.06**	**-0.18**	**0.10**	**-0.17**	**-0.33**	**-0.37**	1.00	**-0.04**	**-0.16**	**-0.10**
16	*SameIndustry*	**-0.03**	**-0.04**	**-0.03**	**0.27**	**0.05**	**-0.03**	**0.06**	**-0.03**	**0.08**	0.01	**0.05**	**0.09**	0.00	0.01	**-0.04**	1.00	**0.07**	**-0.02**
17	*Size*	**-0.19**	**-0.19**	**-0.19**	**0.11**	**0.08**	**0.08**	-0.02	**-0.03**	**0.11**	**0.34**	**-0.16**	**0.10**	**0.19**	**0.25**	**-0.51**	**0.10**	1.00	**0.35**
18	*SwitchingCosts*	**-0.06**	**-0.05**	**-0.06**	**-0.02**	**0.02**	**0.10**	**-0.03**	**-0.04**	0.01	**0.24**	**-0.21**	**0.06**	**0.15**	**0.25**	**-0.25**	**-0.06**	**0.58**	1.00

This table presents correlations among the variables used in our analyses. Pearson (Spearman) correlations appear above (below) the diagonal. Panel A includes the variables and sample used for bid probability tests. Panel B includes the variables and sample used for payment method tests. See the appendix for all variable definitions. Bold indicates significance at the 10 percent level.

Table 3

Customer concentration and bid likelihood

Dependent variable = *BidIndicator*	(1)	(2)	(3)
Customer Concentration =	**Major Customer**	**Customer HHI**	**Total Major Customer Sales**
Intercept	-2.618 ***	-2.553 ***	-2.561 ***
	-(69.83)	-(53.83)	-(53.91)
CustomerConcentration	-0.104 ***	-0.022 ***	-0.020 ***
	-(3.27)	-(3.37)	-(3.11)
AbnormalReturn	-0.122 ***	-0.122 ***	-0.122 ***
	-(4.82)	-(4.82)	-(4.82)
ROE	-0.020	-0.020	-0.020
	-(1.12)	-(1.12)	-(1.11)
GrowthMismatch	0.008	0.008	0.008
	(0.27)	(0.27)	(0.27)
Growth	-0.007 *	-0.007 *	-0.007 *
	-(1.65)	-(1.65)	-(1.65)
Liquidity	0.077	0.080	0.080
	(1.12)	(1.17)	(1.16)
Leverage	0.060 ***	0.060 ***	0.060 ***
	(7.42)	(7.42)	(7.43)
Size	-0.013 ***	-0.013 ***	-0.013 ***
	-(4.35)	-(4.35)	-(4.34)
MTB	-0.033 ***	-0.033 ***	-0.033 ***
	-(7.60)	-(7.60)	-(7.60)
PERatio	-0.001 ***	-0.001 ***	-0.001 ***
	-(2.97)	-(2.98)	-(2.98)
InstitutionalOwnership	-0.047	-0.048	-0.047
	-(0.91)	-(0.93)	-(0.92)
Industry and Year Fixed Effects	Y	Y	Y
Pseudo R^2	0.043	0.043	0.043
Observations	108,430	108,430	108,430

This table reports results from Logit regressions relating the probability of receiving a bid to customer concentration measures and controls for Compustat firms from 1985-2016. The dependent variable is *BidIndicator*. See the appendix for all variable definitions. Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 4

Customer concentration and payment method

Panel A: The full payment method sample

Dependent variable = *Percent Stock*	(1)		(2)		(3)	
Customer Concentration =	**Major Customer**		**Customer HHI**		**Total Major Customer Sales**	
Intercept	25.998	***	24.061	***	24.006	***
	(7.70)		(7.17)		(7.16)	
CustomerConcentration	3.246	***	0.617	***	0.666	***
	(2.92)		(2.73)		(2.96)	
AbnormalReturn	2.922	***	2.904	***	2.913	***
	(2.85)		(2.83)		(2.84)	
ROE	-0.596		-0.602		-0.603	
	-(0.89)		-(0.90)		-(0.90)	
GrowthMismatch	-3.860	***	-3.861	***	-3.855	***
	-(3.88)		-(3.88)		-(3.88)	
Growth	0.350		0.346		0.346	
	(1.64)		(1.62)		(1.63)	
Liquidity	7.744	***	7.624	***	7.627	***
	(2.86)		(2.82)		(2.82)	
Leverage	-1.305	***	-1.308	***	-1.308	***
	-(4.71)		-(4.72)		-(4.72)	
Size	1.131	***	1.131	***	1.132	***
	(8.30)		(8.29)		(8.30)	
MTB	1.080	***	1.081	***	1.081	***
	(6.33)		(6.33)		(6.33)	
PERatio	0.012		0.012		0.012	
	(1.30)		(1.30)		(1.30)	
InstitutionalOwnership	-0.739		-0.733		-0.745	
	-(0.45)		-(0.44)		-(0.45)	
Same Industry	14.014	***	14.017	***	14.021	***
	(13.89)		(13.89)		(13.90)	
Return Volatility	21.675		21.676		21.409	
	(0.87)		(0.87)		(0.86)	
Competed Bid	-8.872	***	-8.843	***	-8.845	***
	-(7.23)		-(7.20)		-(7.20)	
Industry and Year Fixed Effects	Y		Y		Y	
Adjusted R^2	0.241		0.241		0.241	
Observations	6,215		6,215		6,215	

This table reports results from OLS regressions relating the payment method to customer concentration measures and controls for bid offers from 1985-2016. The dependent variable is *Percent Stock*. See the appendix for all variable definitions. Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 4, cont.
Customer concentration and payment method

Panel B: The public acquirer sample

Dependent variable = *Percent Stock*	(1)		(2)		(3)	
Customer Concentration =	**Major Customer**		**Customer HHI**		**Total Major Customer Sales**	
Customer concentration variables						
CustomerConcentration (β_1)	-3.249		-0.594		-0.538	
	-(1.02)		-(0.95)		-(0.86)	
*CustomerConcentration*RelativeSize* (β_2)	10.831	**	2.118	**	2.188	**
	(1.99)		(1.98)		(2.04)	
Acquirer controls						
AcquirerSales	-0.100	**	-0.099	**	-0.099	**
	-(2.34)		-(2.32)		-(2.32)	
AcquirerROA	-20.749	***	-20.639	***	-20.673	***
	-(2.96)		-(2.93)		-(2.95)	
AcquirerMTB	0.003		0.003		0.003	
	(0.36)		(0.35)		(0.36)	
RelativeSize	25.834	***	19.669	***	19.334	***
	(7.05)		(3.29)		(3.24)	
Target controls						
AbnormalReturn	2.229		2.231		2.251	
ROE	-0.769		-0.759		-0.768	
GrowthMismatch	-4.893	***	-4.890	***	-4.865	***
Growth	-0.195		-0.197		-0.197	
Liquidity	8.338	*	8.237	*	8.161	*
Leverage	-1.731	***	-1.727	***	-1.729	***
Size	0.968	***	0.969	***	0.970	***
MTB	1.164	***	1.159	***	1.161	***
PERatio	0.022		0.022		0.022	
InstitutionalOwnership	-3.439		-3.429		-3.430	
Same Industry	2.153		2.193		2.212	
Return Volatility	46.043		46.469		45.651	
Competed Bid	-13.746	***	-13.742	***	-13.731	***
Industry and Year Fixed Effects	Y		Y		Y	
Adjusted R^2	0.275		0.275		0.275	
Observations	2,310		2,310		2,310	
Total effect of cust. concentration ($\beta_1 + \beta_2$)	7.582	**	1.524	**	1.650	**
t-test of ($\beta_1 + \beta_2$) = 0:	(2.13)		(2.13)		(2.32)	

This table reports results from OLS regressions relating the payment method to customer concentration measures and controls for bid offers from 1985-2016. The dependent variable is *Percent Stock*. See the appendix for all variable definitions. Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively. For brevity, intercepts and t-stats for target controls have been repressed.

Table 5

Government and non-government customer concentration

Panel A: Bid likelihood

Dependent variable = *BidIndicator*	(1)		(2)		(3)	
	Major		**Customer**		**Total Major**	
Customer Concentration =	**Customer**		**HHI**		**Customer Sales**	
Intercept	-2.618	***	-2.537	***	-2.543	***
	-(69.88)		-(33.64)		-(33.67)	
NonGovt_Concentration ($_1$)	-0.122	***	-0.026	***	-0.025	***
	-(3.68)		-(3.91)		-(3.76)	
Govt_Concentration ($_2$)	-0.003		-0.001		0.000	
	-(0.05)		-(0.06)		-(0.03)	
AbnormalReturn	-0.122	***	-0.122	***	-0.122	***
	-(4.81)		-(4.81)		-(4.81)	
ROE	-0.021		-0.021		-0.021	
	-(1.15)		-(1.17)		-(1.16)	
GrowthMismatch	0.007		0.007		0.007	
	(0.25)		(0.24)		(0.24)	
Growth	-0.007	*	-0.007	*	-0.007	*
	-(1.66)		-(1.65)		-(1.65)	
Liquidity	0.084		0.088		0.088	
	(1.22)		(1.28)		(1.28)	
Leverage	0.059	***	0.059	***	0.059	***
	(7.40)		(7.38)		(7.39)	
Size	-0.013	***	-0.013	***	-0.013	***
	-(4.35)		-(4.35)		-(4.35)	
MTB	-0.033	***	-0.033	***	-0.033	***
	-(7.58)		-(7.57)		-(7.57)	
PERatio	-0.001	***	-0.001	***	-0.001	***
	-(2.99)		-(3.00)		-(3.00)	
InstitutionalOwnership	-0.049		-0.050		-0.050	
	-(0.95)		-(0.98)		-(0.97)	
Industry and Year Fixed Effects	Y		Y		Y	
Pseudo R^2	0.043		0.043		0.043	
Observations	108,430		108,430		108,430	
Comparison of cust. concentration coefficients ($_1$ - $_2$)	-0.119	*	-0.025	**	-0.025	*
t-test of ($_1$ - $_2$) = 0:	-(1.90)		-(1.99)		-(1.95)	

This table reports results from Logit regressions relating the probability of receiving a bid to customer concentration measures and controls for Compustat firms from 1985-2016. The dependent variable is *BidIndicator*. See the appendix for all variable definitions. Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 5, cont.

Government and non-government customer concentration

Panel B: Payment method (using full payment method sample)

Dependent variable = *PercentStock*	(1)		(2)		(3)	
	Major		**Customer**		**Total Major**	
Customer Concentration =	**Customer**		**HHI**		**Customer Sales**	
Intercept	26.085	***	23.898	***	23.835	***
	(7.73)		(6.22)		(6.20)	
NonGovt_Concentration (β_1)	3.816	***	0.753	***	0.772	***
	(3.26)		(3.31)		(3.40)	
Govt_Concentration (β_2)	-0.048		-0.012		-0.004	
	-(0.02)		-(0.03)		-(0.01)	
AbnormalReturn	2.889	***	2.879	***	2.872	***
	(2.81)		(2.80)		(2.80)	
ROE	-0.583		-0.584		-0.584	
	-(0.87)		-(0.87)		-(0.87)	
GrowthMismatch	-3.858	***	-3.855	***	-3.850	***
	-(3.88)		-(3.88)		-(3.87)	
Growth	0.352	*	0.349		0.349	
	(1.65)		(1.64)		(1.64)	
Liquidity	7.524	***	7.390	***	7.373	***
	(2.78)		(2.73)		(2.72)	
Leverage	-1.292	***	-1.295	***	-1.294	***
	-(4.68)		-(4.69)		-(4.68)	
Size	1.133	***	1.134	***	1.135	***
	(8.27)		(8.28)		(8.28)	
MTB	1.076	***	1.077	***	1.077	***
	(6.32)		(6.33)		(6.33)	
PERatio	0.012		0.012		0.012	
	(1.32)		(1.32)		(1.31)	
InstitutionalOwnership	-0.748		-0.770		-0.764	
	-(0.45)		-(0.47)		-(0.46)	
SameIndustry	13.990	***	13.994	***	14.001	***
	(13.87)		(13.87)		(13.88)	
ReturnVolatility	19.472		19.132		18.924	
	(0.78)		(0.77)		(0.76)	
CompetedBid	-8.872	***	-8.847	***	-8.853	***
	-(7.22)		-(7.20)		-(7.21)	
Industry and Year Fixed Effects	Y		Y		Y	
Adjusted R^2	0.241		0.241		0.241	
Observations	6,215		6,215		6,215	
Comparison of cust. concentration coefficients ($\beta_1 - \beta_2$)	3.863		0.765		0.776	
t-test of ($\beta_1 - \beta_2$) = 0:	(1.60)		(1.59)		(1.61)	

This table reports results from OLS regressions relating the payment method to customer concentration measures and controls for bid offers from 1985-2016. The dependent variable is *Percent Stock*. See the appendix for all variable definitions. Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 5, cont.

Government and non-government customer concentration

Panel C: Payment method (using public acquirer sample)

Dependent variable = *Percent Stock*	(1) Major Customer		(2) Customer HHI		(3) Total Major Customer Sales	
Customer Concentration =						
Customer concentration variables						
NonGovt_Concentration (β_1)	-3.845		-0.617		-0.565	
	-(1.15)		-(0.97)		-(0.90)	
NonGovt_Concentration*RelativeSize (β_2)	14.281	**	2.726	**	2.629	**
	(2.50)		(2.51)		(2.44)	
Govt_Concentration (β_3)	0.670		0.190		0.209	
	(0.09)		(0.13)		(0.14)	
Govt_Concentration*RelativeSize (β_4)	-9.028		-1.849		-1.885	
	-(0.75)		-(0.77)		-(0.78)	
Acquirer controls						
AcquirerSales	-0.097	**	-0.097	**	-0.097	**
	-(2.30)		-(2.28)		-(2.28)	
AcquirerROA	-19.923	***	-19.847	***	-19.817	***
	-(2.84)		-(2.81)		-(2.81)	
AcquirerMTB	0.003		0.003		0.003	
	(0.34)		(0.33)		(0.34)	
RelativeSize	25.879	***	25.207	**	25.799	**
	(7.06)		(2.02)		(2.06)	
Target controls						
AbnormalReturn	2.303		2.330		2.311	
ROE	-0.778		-0.784		-0.787	
GrowthMismatch	-4.866	***	-4.847	***	-4.840	***
Growth	-0.188		-0.190		-0.187	
Liquidity	8.105		7.929	*	7.880	*
Leverage	-1.647	***	-1.646	***	-1.647	***
Size	0.968	***	0.969	***	0.968	***
MTB	1.131	***	1.127	***	1.129	***
PERatio	0.021		0.021		0.021	
InstitutionalOwnership	-3.703		-3.721		-3.698	
Same Industry	2.227		2.274		2.288	
ReturnVolatility	41.308		40.404		40.259	
Competed Bid	-13.545	***	-13.497	***	-13.509	***
Industry and Year Fixed Effects	Y		Y		Y	
Adjusted R^2	0.277		0.277		0.277	
Observations	2,310		2,310		2,310	
Comparison of total effects of non-government and government concentration ($\beta_1 + \beta_2$) − ($\beta_3 + \beta_4$)	18.794	**	3.768	**	3.740	**
t-test of [($\beta_1 + \beta_2$) − ($\beta_3 + \beta_4$)] = 0:	(2.40)		(2.42)		(2.40)	

This table reports results from OLS regressions relating the payment method to customer concentration measures and controls for bid offers from 1985-2016. The dependent variable is *Percent Stock*. See the appendix for all variable definitions. Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively. For brevity, intercepts and t-stats for target controls have been repressed.

Table 6
Customer concentration and switching costs

Panel A: Bid likelihood

Dependent variable = *BidIndicator*	(1) Major Customer		(2) Customer HHI		(3) Total Major Customer Sales	
Customer Concentration =						
Intercept	-2.864	***	-2.672	***	-2.687	***
	-(50.72)		-(36.37)		-(36.46)	
CustomerConcentration (β_1)	-0.323	***	-0.067	***	-0.064	***
	-(6.35)		-(6.46)		-(6.16)	
SwitchingCosts (β_2)	0.351	***	-0.005		0.010	
	(4.31)		-(0.04)		(0.08)	
*CustomerConcentration * SwitchingCosts* (β_3)	0.547	***	0.119	***	0.116	***
	(5.94)		(6.24)		(6.08)	
AbnormalReturn	-0.129	***	-0.130	***	-0.130	***
	-(4.97)		-(4.98)		-(4.97)	
ROE	-0.045	**	-0.045	**	-0.045	**
	-(2.45)		-(2.44)		-(2.43)	
GrowthMismatch	0.015		0.015		0.015	
	(0.50)		(0.50)		(0.51)	
Growth	-0.006		-0.006		-0.006	
	-(1.59)		-(1.58)		-(1.58)	
Liquidity	0.205	***	0.212	***	0.211	***
	(2.86)		(2.96)		(2.96)	
Leverage	0.054	***	0.054	***	0.054	***
	(6.70)		(6.68)		(6.70)	
Size	-0.020	***	-0.019	***	-0.019	***
	-(4.20)		-(4.20)		-(4.20)	
MTB	-0.033	***	-0.033	***	-0.033	***
	-(7.48)		-(7.45)		-(7.46)	
PERatio	-0.001	***	-0.001	***	-0.001	***
	-(3.37)		-(3.40)		-(3.40)	
InstitutionalOwnership	-0.174	***	-0.176	***	-0.176	***
	-(3.25)		-(3.27)		-(3.27)	
Industry and Year Fixed Effects	Y		Y		Y	
Pseudo R^2	0.046		0.046		0.046	
Observations	108,430		108,430		108,430	
Total effect of customer concentration ($\beta_1 + \beta_3$)	0.224	***	0.053	***	0.053	***
t-test of ($\beta_1 + \beta_3$) = 0:	(3.68)		(4.08)		(4.08)	

This table reports results from Logit regressions relating the probability of receiving a bid to customer concentration measures and controls for Compustat firms from 1985-2016. The dependent variable is *BidIndicator*. See the appendix for all variable definitions. Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 6, cont.
Customer concentration and switching costs

Panel B: Payment method (using full payment method sample)

Dependent variable = PercentStock	(1) Major Customer		(2) Customer HHI		(3) Total Major Customer Sales	
Customer Concentration =						
Intercept	22.485	***	19.938	***	19.890	***
	(6.51)		(5.39)		(5.38)	
CustomerConcentration (β_1)	5.720	***	0.905	**	0.950	**
	(2.80)		(2.22)		(2.34)	
SwitchingCosts (β_2)	12.193	***	12.899	***	12.888	***
	(4.11)		(2.94)		(2.93)	
CustomerConcentration * SwitchingCosts (β_3)	-4.784		-0.508		-0.502	
	-(1.31)		-(0.68)		-(0.68)	
AbnormalReturn	3.062	***	3.056	***	3.067	***
	(2.97)		(2.97)		(2.98)	
ROE	-0.785		-0.806		-0.808	
	-(1.16)		-(1.19)		-(1.19)	
GrowthMismatch	-3.677	***	-3.674	***	-3.666	***
	-(3.70)		-(3.70)		-(3.69)	
Growth	0.324		0.321		0.321	
	(1.55)		(1.54)		(1.54)	
Liquidity	10.241	***	10.152	***	10.161	***
	(3.66)		(3.63)		(3.63)	
Leverage	-1.354	***	-1.363	***	-1.363	***
	-(4.89)		-(4.92)		-(4.92)	
Size	0.913	***	0.921	***	0.923	***
	(6.73)		(6.78)		(6.79)	
MTB	1.074	***	1.077	***	1.077	***
	(6.34)		(6.35)		(6.35)	
PERatio	0.011		0.011		0.011	
	(1.24)		(1.25)		(1.25)	
InstitutionalOwnership	-1.695		-1.675		-1.687	
	-(1.02)		-(1.01)		-(1.01)	
SameIndustry	13.962	***	13.963	***	13.968	***
	(13.83)		(13.83)		(13.84)	
ReturnVolatility	52.413	**	52.988	**	52.811	**
	(1.99)		(2.01)		(2.00)	
CompetedBid	-9.343	***	-9.323	***	-9.329	***
	-(7.63)		-(7.60)		-(7.61)	
Industry and Year Fixed Effects	Y		Y		Y	
Adjusted R^2	0.243		0.242		0.243	
Observations	6,215		6,215		6,215	
Total effect of customer concentration ($\beta_1 + \beta_3$)	0.936		0.398		0.448	
t-test of ($\beta_1 + \beta_3$) = 0:	(0.42)		(0.86)		(0.97)	

This table reports results from OLS regressions relating the payment method to customer concentration measures and controls for bid offers from 1985-2016. The dependent variable is *Percent Stock*. See the appendix for all variable definitions. Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 6, cont.
Customer concentration and switching costs

Panel C: Payment method (using public acquirer sample)

Dependent variable = *Percent Stock*	(1) Major Customer	(2) Customer HHI	(3) Total Major Customer Sales
Customer Concentration =			
Intercept	24.301 ***	26.447 ***	27.147 ***
	(4.31)	(3.77)	(3.89)
CustomerConcentration (β_1)	-4.444	-0.787	-0.862
	-(0.83)	-(0.76)	-(0.84)
RelativeSize (β_2)	27.454 ***	15.157	13.996
	(4.30)	(1.41)	(1.32)
SwitchingCosts (β_3)	9.114	7.573	5.793
	(1.11)	(0.60)	(0.46)
CustomerConcentration*RelativeSize (β_4)	22.286 **	4.255 **	4.483 **
	(2.25)	(2.23)	(2.38)
CustomerConcentration*SwitchingCosts (β_5)	3.142	0.536	0.904
	(0.28)	(0.25)	(0.42)
RelativeSize*SwitchingCosts (β_6)	-6.681	6.993	9.224
	-(0.55)	(0.34)	(0.45)
CustomerConcentration*SwitchingCosts*RelativeSize (β_7)	-24.285	-4.671	-5.119
	-(1.26)	-(1.25)	-(1.38)
Controls included	Y	Y	Y
Industry and Year Fixed Effects	Y	Y	Y
Adjusted R^2	0.276	0.276	0.276
Observations	2,310	2,310	2,310

Total effect of *CustomerConcentration* when:

	(1)	(2)	(3)
(1) *RelativeSize* = 1, *SwitchingCosts* = 0	17.842 ***	3.468 ***	3.622 ***
t-test of ($\beta_1 + \beta_4$) = 0:	(2.62)	(2.60)	(2.75)
(2) *RelativeSize* = 1, *SwitchingCosts* = 1	-3.301	-0.667	-0.594
t-test of ($\beta_1 + \beta_4 + \beta_5 + \beta_7$) = 0:	-(0.46)	-(0.47)	-(0.42)
Difference [(2) – (1)]	-21.143 *	-4.135 *	-4.215 *
t-test of [($\beta_5 + \beta_7$)] = 0:	-(1.78)	-(1.77)	-(1.81)

This table reports results from OLS regressions relating the payment method to customer concentration measures and controls for bid offers from 1985-2016. The dependent variable is *Percent Stock*. See the appendix for all variable definitions. Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively. For brevity, controls have been repressed.

Table 7

Customer concentration and relationship age

Panel A: Bid likelihood

Dependent variable = BidIndicator	(1)	(2)	(3)
	Major	**Customer**	**Total Major**
Customer Concentration =	**Customer**	**HHI**	**Customer Sales**
Intercept	-2.652 ***	-2.667 ***	-2.666 ***
	-(71.58)	-(40.43)	-(40.42)
CustomerConcentration_Long (β_1)	0.080 *	0.016 *	0.016 *
	(1.83)	(1.83)	(1.82)
CustomerConcentration_Short (β_2)	-0.087 **	-0.016 **	-0.017 **
	-(2.50)	-(2.51)	-(2.57)
AbnormalReturn	-0.121 ***	-0.121 ***	-0.121 ***
	-(4.80)	-(4.80)	-(4.80)
ROE	-0.019	-0.019	-0.020
	-(1.07)	-(1.07)	-(1.07)
GrowthMismatch	0.008	0.008	0.008
	(0.29)	(0.29)	(0.29)
Growth	-0.007	-0.007	-0.007
	-(1.63)	-(1.63)	-(1.63)
Liquidity	0.077	0.078	0.078
	(1.12)	(1.13)	(1.13)
Leverage	0.060 ***	0.060 ***	0.060 ***
	(7.45)	(7.45)	(7.45)
Size	-0.013 ***	-0.013 ***	-0.013 ***
	-(4.32)	-(4.32)	-(4.32)
MTB	-0.033 ***	-0.033 ***	-0.033 ***
	-(7.62)	-(7.62)	-(7.62)
PERatio	-0.001 ***	-0.001 ***	-0.001 ***
	-(2.96)	-(2.96)	-(2.96)
InstitutionalOwnership	-0.044	-0.045	-0.045
	-(0.86)	-(0.87)	-(0.87)
Industry and Year Fixed Effects	Y	Y	Y
Pseudo R^2	0.043	0.043	0.043
Observations	108,430	108,430	108,430
Comparison of cust. concentration coefficients ($\beta_1 - \beta_2$)	0.167 ***	0.033 ***	0.033 ***
t-test of ($\beta_1 - \beta_2) = 0$:	(3.52)	(3.46)	(3.49)

This table reports results from Logit regressions relating the probability of receiving a bid to customer concentration measures and controls for Compustat firms from 1985-2016. The dependent variable is *BidIndicator*. See the appendix for all variable definitions. Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 7, cont.
Customer concentration and relationship age

Panel B: Payment method (using the full payment method sample)

Dependent variable = *PercentStock*	(1)		(2)		(3)	
Customer Concentration =	**Major Customer**		**Customer HHI**		**Total Major Customer Sales**	
Intercept	24.648	***	21.440	***	21.439	***
	(7.34)		(5.64)		(5.64)	
CustomerConcentration_Long (μ_1)	1.332		0.284		0.283	
	(0.86)		(0.90)		(0.90)	
CustomerConcentration_Short (μ_2)	3.695	***	0.687	***	0.686	***
	(2.85)		(2.83)		(2.83)	
AbnormalReturn	2.874	***	2.872	***	2.871	***
	(2.80)		(2.80)		(2.80)	
ROE	-0.573		-0.574		-0.575	
	-(0.85)		-(0.85)		-(0.85)	
GrowthMismatch	-3.903	***	-3.894	***	-3.897	***
	-(3.93)		-(3.92)		-(3.92)	
Growth	0.351		0.349		0.349	
	(1.63)		(1.63)		(1.63)	
Liquidity	0.000	***	0.000	***	0.000	***
	(2.83)		(2.81)		(2.81)	
Leverage	-1.314	***	-1.316	***	-1.316	***
	-(4.73)		-(4.74)		-(4.74)	
Size	1.132	***	1.132	***	1.132	***
	(8.34)		(8.33)		(8.33)	
MTB	1.085	***	1.086	***	1.086	***
	(6.32)		(6.33)		(6.33)	
PERatio	0.012		0.011		0.011	
	(1.29)		(1.28)		(1.28)	
InstitutionalOwnership	-0.698		-0.686		-0.689	
	-(0.42)		-(0.42)		-(0.42)	
Same Industry	13.930	***	13.931	***	13.932	***
	(13.80)		(13.80)		(13.80)	
Return Volatility	22.916		22.816		22.816	
	(0.92)		(0.92)		(0.92)	
Competed Bid	-8.889	***	-8.874	***	-8.871	***
	-(7.23)		-(7.21)		-(7.21)	
Industry and Year Fixed Effects	Y		Y		Y	
Adjusted R^2	0.241		0.241		0.241	
Observations	6,215		6,215		6,215	
Comparison of cust. concentration coefficients ($\mu_1 - \mu_2$)	-2.364		-0.403		-0.403	
t-test of ($\mu_1 - \mu_2$) = 0:	-(1.36)		-(1.17)		-(1.17)	

This table reports results from OLS regressions relating the payment method to customer concentration measures and controls for bid offers from 1985-2016.The dependent variable is *Percent Stock*. See the appendix for all variable definitions. Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 8

Instrumental variable analysis - Bid likelihood

Panel A: First stage

Dependent variables = *Customer Concentration*	(1)		(2)		(3)	
Customer Concentration =	**Major Customer**		**Customer HHI**		**Total Major Customer Sales**	
Intercept	0.322	***	2.862	***	2.822	***
	(13.27)		(23.22)		(22.97)	
Industry Concentration t-2	0.395	***	0.465	***	0.476	***
	(27.05)		(29.14)		(29.92)	
Industry Concentration t-3	0.095	***	0.053	***	0.044	***
	(6.43)		(3.96)		(3.26)	
AbnormalReturn	0.001		0.005		0.007	
	(0.44)		(0.45)		(0.58)	
ROE	-0.018	***	-0.094	***	-0.093	***
	-(10.90)		-(11.84)		-(11.76)	
GrowthMismatch	-0.009	***	-0.045	***	-0.041	***
	-(3.09)		-(3.39)		-(3.08)	
Growth	-0.0001	*	-0.0003		-0.0003	
	-(1.65)		-(1.46)		-(1.44)	
Liquidity	0.047	***	0.390	***	0.396	***
	(6.98)		(11.97)		(12.18)	
Leverage	-0.004	***	-0.021	***	-0.021	***
	-(4.72)		-(5.37)		-(5.25)	
Size	-0.001	***	-0.006	***	-0.006	***
	-(18.68)		-(19.07)		-(19.20)	
MTB	-0.0004		-0.001		-0.001	
	-(1.14)		-(0.68)		-(0.82)	
PERatio	0.000	***	-0.001	***	-0.001	***
	-(3.42)		-(4.55)		-(4.57)	
InstitutionalOwnership	-0.038	***	-0.237	***	-0.226	***
	-(8.44)		-(11.09)		-(10.58)	
Industry and Year Fixed Effects	Y		Y		Y	
Observations	107,727		107,727		107,727	
Adjusted R^2	0.244		0.248		0.252	
Tests of endogeneity, weak instruments, and overidentification:						
Endogeneity Test (Pr > Chi-Sq)	0.013	**	0.004	***	0.005	***
F-Statistic	1883.720	***	2243.360	***	2267.282	***
Partial-R^2	0.027		0.031		0.032	
Sargan-Hansen Test (Pr > Chi-Sq)	0.231		0.563		0.441	

This table reports results from first-stage OLS regressions instrumenting for customer concentration variables using lagged industry customer concentration. The dependent variables are *MajorCustomer*, *CustomerHHI*, and *TotalMajorCustomerSales*. Industry concentration is measured in year t-2 and t-3 as the average customer concentration within the target SIC 3-digit industry level (excluding the target concentration from the calculation). Industry fixed effects are defined at the Fama-French 48 level. See the appendix for all variable definitions. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 8, cont.
Instrumental variable analysis - Bid likelihood

Panel B: Second stage

Dependent variable = *BidIndicator*	(1) Major Customer		(2) Customer HHI		(3) Total Major Customer Sales	
Customer Concentration =						
Intercept	-2.172	***	-1.830	***	-1.857	***
	-(8.90)		-(6.85)		-(5.71)	
Predicted CustomerConcentration	-0.523	***	-0.114	***	-0.110	***
	-(3.94)		-(4.46)		-(3.73)	
AbnormalReturn	-0.121	***	-0.121	***	-0.121	***
	-(4.95)		-(5.07)		-(5.32)	
ROE	-0.029	*	-0.030	*	-0.030	*
	-(1.91)		-(1.80)		-(1.74)	
GrowthMismatch	0.003		0.002		0.003	
	(0.11)		(0.09)		(0.11)	
Growth	-0.007		-0.007		-0.007	
	-(1.58)		-(1.47)		-(1.43)	
Liquidity	0.102	*	0.121	**	0.121	*
	(1.79)		(2.08)		(1.84)	
Leverage	0.057	***	0.057	***	0.057	***
	(7.45)		(7.15)		(8.64)	
Size	-0.013	***	-0.013	***	-0.013	***
	-(6.85)		-(7.54)		-(6.48)	
MTB	-0.033	***	-0.033	***	-0.033	***
	-(8.92)		-(7.70)		-(8.43)	
PERatio	-0.0008	***	-0.0008	***	-0.0008	***
	-(3.55)		-(3.84)		-(3.87)	
InstitutionalOwnership	-0.063		-0.071		-0.069	
	-(1.52)		-(1.63)		-(1.63)	
Industry and Year Fixed Effects	Y		Y		Y	
Pseudo R^2	0.033		0.033		0.033	
Observations	107,727		107,727		107,727	

This table reports results from second-stage Logit regressions relating the probability of receiving a bid to predicted customer concentration measures and controls for Compustat firms from 1985-2016. The dependent variable is *BidIndicator,* and *MajorCustomer, CustomerHHI*, and *TotalMajorCustomerSales* are the fitted values obtained in the first stage. See the appendix for all variable definitions.). Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on bootstrapped standard errors. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 9

Instrumental variable analysis – Payment method

Panel A: First stage

Dependent variables = *Customer Concentration*	(1)	(2)	(3)
	Major	**Customer**	**Total Major**
Customer Concentration =	**Customer**	**HHI**	**Customer Sales**
Intercept	-0.006	0.578	0.495
	-(0.05)	(0.86)	(0.76)
Industry Concentration t-2	0.644 ***	0.716 ***	0.715 ***
	(10.41)	(10.84)	(11.03)
Industry Concentration t-3	0.133 **	0.087	0.090
	(2.17)	(1.31)	(1.39)
AbnormalReturn	-0.029 **	-0.121 **	-0.124 **
	-(2.47)	-(2.05)	-(2.08)
ROE	0.007	0.045	0.043
	(0.88)	(1.19)	(1.13)
GrowthMismatch	-0.012	-0.065	-0.067
	-(1.00)	-(1.07)	-(1.11)
Growth	-0.004 *	-0.014	-0.013
	-(1.66)	-(1.08)	-(1.03)
Liquidity	-0.012	0.134	0.118
	-(0.34)	(0.76)	(0.68)
Leverage	-0.001	-0.001	-0.001
	-(0.27)	-(0.08)	-(0.08)
Size	-0.004 ***	-0.021 ***	-0.021 ***
	-(2.71)	-(3.03)	-(3.01)
MTB	0.000	-0.002	-0.001
	-(0.09)	-(0.16)	-(0.13)
PERatio	0.000	0.000	0.000
	(0.06)	(0.04)	(0.06)
InstitutionalOwnership	0.030	0.142	0.150
	(1.39)	(1.31)	(1.37)
Same Industry	-0.005	-0.031	-0.033
	-(0.43)	-(0.53)	-(0.56)
Return Volatility	0.915 ***	4.895 ***	4.900 ***
	(3.13)	(3.37)	(3.40)
Competed Bid	-0.025	-0.167 *	-0.152
	-(1.20)	-(1.70)	-(1.52)
Industry and Year Fixed Effects	Y	Y	Y
Observations	6,215	6,215	6,215
Adjusted R^2	0.271	0.287	0.289
Tests of endogeneity, weak instruments, and overidentification:			
Endogeneity Test (Pr > Chi-Sq)	0.166	0.200	0.216
F Statistic	246.151 ***	273.59 ***	274.849 ***
Partial-R^2	0.058	0.063	0.064
Sargan-Hansen Test (Pr > Chi-Sq)	0.705	0.560	0.404

This table reports results from first-stage OLS regressions instrumenting for customer concentration variables using lagged industry customer concentration. The dependent variables are *MajorCustomer, CustomerHHI*, and *TotalMajorCustomerSales*. Industry concentration is measured in year t-2 and t-3 as the average customer concentration within the target SIC 3-digit industry level (excluding the target concentration from the calculation). Industry fixed effects are defined at the Fama-French 48 level. See the appendix for all variable definitions. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Table 9, cont.
Instrumental variable analysis – Payment method

Panel B: Second stage

Dependent variable = *Percent Stock*	(1) Major Customer		(2) Customer HHI		(3) Total Major Customer Sales	
Customer Concentration =						
Intercept	-34.947	***	-34.812	***	-34.893	***
	-(3.76)		-(3.73)		-(3.77)	
Predicted Customer Concentration	1.541	**	1.513	**	1.555	**
	(2.04)		(2.00)		(2.06)	
AbnormalReturn	3.043	***	2.898	***	3.049	***
	(2.96)		(2.82)		(2.96)	
ROE	-0.642		-0.492		-0.640	
	-(0.95)		-(0.72)		-(0.95)	
GrowthMismatch	-3.782	***	-3.502	***	-3.777	***
	-(3.82)		-(3.53)		-(3.81)	
Growth	0.353	*	0.449	***	0.352	*
	(1.69)		(3.24)		(1.69)	
Liquidity	7.442	***	8.272	***	7.468	***
	(2.77)		(3.05)		(2.78)	
Leverage	-1.303	***	-1.266	***	-1.304	***
	-(4.72)		-(4.59)		-(4.72)	
Size	1.156	***	1.158	***	1.157	***
	(8.40)		(8.41)		(8.40)	
MTB	1.080	***	1.056	***	1.080	***
	(6.35)		(6.20)		(6.35)	
PERatio	0.012		0.012		0.012	
	(1.31)		(1.33)		(1.31)	
InstitutionalOwnership	-0.882		-0.986		-0.893	
	-(0.54)		-(0.60)		-(0.54)	
Same Industry	14.089	***	14.143	***	14.092	***
	(14.03)		(14.09)		(14.03)	
Return Volatility	15.440		17.999		15.489	
	(0.61)		(0.71)		(0.61)	
Competed Bid	-8.655	***	-8.743	***	-8.680	***
	-(7.05)		-(7.11)		-(7.08)	
Industry and Year Fixed Effects	Y		Y		Y	
Adjusted R^2	0.238		0.237		0.239	
Observations	6,215		6,215		6,215	

This table reports results from second-stage OLS regressions relating the payment method to predicted customer concentration measures and controls for bid offers from 1985-2016. The dependent variable is *Percent Stock,* and *MajorCustomer, CustomerHHI*, and *TotalMajorCustomerSales* are the fitted values obtained in the first stage. See the appendix for all variable definitions Industry fixed effects are defined at the Fama-French 48 level. Continuous variables are winsorized at 1 and 99. T-statistics (reported in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.