An investigation of the product market effects of horizontal divestitures via asset sales: Evidence from customer, supplier, and rival firms

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ABSTRACT

I investigate the wealth effects of horizontal asset sales on competitors, suppliers, and corporate customers of divesting firms. I find that restructuring firms must balance divestiture efficiency gains with potential unintended consequences, such as purchasing inefficiencies that arise from reduced bargaining power with suppliers. I observe that horizontal asset sales may generate efficiency gains for stakeholders, such as customers and suppliers. However, suppliers with high switching costs experience significant adverse valuation consequences at announcement. In addition, customers of deals that significantly increase competition (reduce industry concentration) in the divesting industry suffer negative wealth effects at announcement due to potentially higher input costs. Multivariate evidence of supplier and customer wealth effects also suggest that horizontal asset sales may reduce the probability of monopolistic collusion among divesting industry rivals.

JEL classification: G30; G34; G38; D40; D42; D43; L13; L22; L25; L41

Keywords: Asset sales, sell-offs, divestitures, horizontal asset sales, value creation, product market effects, supply chain, economic linkages, product market competition, purchasing inefficiencies, countervailing power, monopsonistic collusion, buying power, quiet life hypothesis

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1. Introduction

Prior research indicates that managers go to great lengths to expand the horizontal boundaries of the firm by undertaking horizontal acquisitions or takeovers to achieve gains related to efficiency, bargaining/buying power, or the ability to engage in collusive behavior (Stigler, 1964, Eckbo, 1983, Fee and Thomas, 2004; Shahrur, 2005; Bhattacharyya and Nain, 2011; Bernile and Lyandres, 2010). Fee and Thomas (2004) and Sharur (2005) document evidence that some of the gains from horizontal mergers can be attributed to the buying power motive (Galbraith, 1952), which conjectures that countervailing power enables merging firms to pressure suppliers into price concessions (Snyder, 1996, 1998; Stole and Zwiebel, 1996). Also, Shahrur (2005) finds evidence to suggest that some horizontal takeovers are motivated by efficiency considerations and have positive spillover effects on corporate customers, suppliers, and rivals in a subsample of bidders and targets that have a positive combined wealth effect. If horizontal expansions have important wealth implications for economically linked firms such as corporate customers, suppliers and rivals, then it raises the question of whether or not horizontal contractions (asset sales in this case) have implications for industry competitors, customers, and suppliers, as well.

This paper investigates the consequences of horizontal divestitures using a dataset of 81 horizontal divestitures on the product market.[1] Multivariate evidence of supplier and customer firm wealth effects, with respect to certain aspects of the product market structure (i.e., the level and degree of change in industry concentration), substantiate the monopolistic collusion and purchasing inefficiencies hypotheses. Specifically, I observe evidence consistent with the idea that horizontal divestitures reduce the probability of monopolistic collusion amongst competitors but also reduce the bargaining power of divesting firms relative to suppliers. Suppliers appear to take advantage of this notion by raising input costs, which lessens the magnitude of the gains associated with horizontal asset sales. Consequently, the results suggests that horizontal divestitures may produce unintended consequences, such as negative spillover effects for certain

[1] Asset sales, sell-offs, and divestitures are used interchangeably, hereafter.

corporate customers. Specifically, divestiture deals that significantly decrease divesting industry concentration have a significant and negative impact on customer firm abnormal returns. This evidence suggests that reduced divesting firm bargaining power with suppliers adversely affect divesting firm input costs may eventually be passed on to customers. Univariate evidence of all suppliers and concentrated suppliers corroborate this idea, which demonstrates that suppliers of downstream divesting firms experience significant short-lived increases in cash-flow performance in the immediate year subsequent to the divestiture of downstream firms. Evidence from concentrated supplier subsamples appear to drive this result and indicate that concentrated suppliers seem better positioned to take advantage of the reduced size of divesting downstream firms. The results substantiate the idea that horizontal divestitures may increase divesting firm exposure to purchasing inefficiencies from reduced bargaining power, which may adversely affect customer valuation.

I follow Fee and Thomas (2004) and examine the supplier termination retention decision to examine whether divesting firms face substantial product market pressures that increase managerial efficiency by terminating inefficient suppliers. I document that higher divesting firm abnormal returns are positively related to the supplier termination decision, suggesting divesting firms enhance value by terminating inefficient suppliers. I document that deals that result in large increases in industry competition in divesting industry increase the probability of terminating the supplier subsequent to the deal. Divesting firms seem to be more likely to terminate suppliers with higher switching costs, indicating that divesting firms increase efficiency and value by breaching implicit contracts with suppliers when faced with increased competitiveness within the industry.

To shed further light on the gains and losses related to suppliers, this study explores several supplier subsamples. I present evidence that downstream horizontal asset sales are detrimental to suppliers with high switching costs but are beneficial to the cash flows of supplier portfolios with lower switching costs. Suppliers who report a single large customer in their financial statements experience significantly negative stock price reactions at announcement and negative cash-flow performance subsequent to the divestiture. To examine this issue further, I follow Fee and Thomas (2004) and find that suppliers terminated subsequent

to the divestiture event experience significant negative wealth effects and negative cash-flow performance in the years subsequent to the divestiture of downstream firms. In contrast, suppliers retained subsequent to the divestiture event experience significant positive changes in median industry-adjusted cash-flows. This evidence suggests that divesting firms use horizontal asset sales as opportunity to enhance the efficiency of their product market relationships with suppliers, terminate contracts with less efficient suppliers and reduce order sizes from suppliers with high switching costs. Overall, I find that the overall impact of downstream horizontal asset sales on suppliers depends on supplier switching costs, and the ability of suppliers to preserve its product market relationship with divesting firms.

This study makes several contributions to the corporate finance literature. First, this study extends the line of research that examines the impact of corporate restructuring events on product market relationships. While the extant literature examines the impact of horizontal expansions (Fee and Thomas, 2004; Shahrur, 2005; Bhattacharyya and Nain, 2011), vertical expansions (Shenoy, 2012) and contractions (Jain, Kini, and, Shenoy, 2011), and firm contractions (Slovin, Sushka, and Ferraro, 1995) on product market relationships, this study addresses the gap in the literature by examining the impact of horizontal contractions on product market relationships. Slovin, Sushka, and Ferraro (1995) study the intra-industry valuation effects of divestitures (equity carve-outs, spinoffs, and asset sales) on corporate rivals, in comparison, this study includes the impact of asset sales on *suppliers and customers*, in addition to industry rivals.[2]

Second, this study adds to the nexus of the industrial organization and corporate finance literature that explores how changes in market structure influence firm value. Fee and Thomas (2004) and Shahrur (2005) document evidence of purchasing efficiencies arising from increased countervailing power from horizontal mergers. In contrast, I report evidence consistent with the idea that horizontal asset sales result in the divesting firm's decreased ability to counteract the market power of powerful suppliers as a

[2] Most of these studies typically investigate events in which the firm *increases in size* at the *same stage of the production process* (i.e. horizontal mergers, acquisitions, tender offers and takeovers), *successive stages of the production process* (i.e. vertical mergers and takeovers), or *unrelated stages of the production process* with intersecting sources of supply (i.e. conglomerate mergers).

consequence of reduced firm size. Moreover, multivariate analysis of supplier and customer abnormal returns provide evidence that horizontal assets decrease the likelihood of monopolistic collusion. Additionally, I present multivariate evidence that suggests customers of divestiture deals that compose a large percent of the industry suffer negative wealth effects at announcement as a potential consequence of reduced bargaining with suppliers over input costs. Also, the evidence also suggest that divestiture deals reduce the probability of managers being able to live the "quiet-life" (Bertrand and Mullainathan, 2003; Giroud and Mueller, 2001) subsequent to the divestiture event and improve cost efficiency for the divesting firm.

Lastly, I document the roles that customer (supplier) switching costs and market structure play in customer (supplier) wealth effects at announcement of upstream (downstream) asset sales. I provide evidence that high supplier switching costs have negative wealth implications for suppliers at announcement of downstream horizontal divestitures. This evidence complements that of Fee and Thomas (2004) who document high supplier switching costs negatively impact the wealth of suppliers at announcement of downstream horizontal mergers. I also report that customers (individual suppliers) with less market power (those in less concentrated industries) demonstrate a significant negative reaction at announcement to upstream (downstream) horizontal divestitures, whereas, Fee and Thomas (2004) report that concentrated suppliers respond negatively at announcement to horizontal mergers due to reduced bargaining power.

The remainder of this paper continues as follows. Section 2 develops the hypotheses that are empirically tested and discusses the relevant literature. Section 3 discusses the data sources, sample formation requirements, and empirical methodology. Section 4 presents the results. Section 5 provides a summary of the findings and concluding remarks.

2. Hypothesis development and related literature

Table 1 addresses the potential tradeoffs arising from horizontal divestitures and the ensuing consequences arising from product market effects that may reduce the potential gains from restructuring activities. Table 1 presents testable hypotheses that incorporate product market considerations. While the different reactions can occur in multiple outcomes, the respective source of gains/losses has a unique result with respect to the way in which individual firms are anticipated to be influenced by the divestiture. I exploit this point to discriminate among the distinct reactions resulting from monopolistic collusion, monopsonistic collusion, purchasing inefficiencies and product market competition.

2.1. Monopolistic collusion considerations

Stigler (1964) asserts that monopolistic collusion allows merging firms to collude with industry rivals and restrict production to customers earning the monopoly price. Eckbo and Wier (1985) theorize that events that decrease the probability of horizontal mergers would potentially result in lost monopoly rents to merging firms and industry rivals. Eckbo (1983) contends that under collusion engendered by merging firms, monopoly rents are detrimental to customers and suppliers. By implication, a horizontal divestiture may reduce the firm's size and hinder the divesting firm's potential to collude with industry rivals. Consequently, I expect that a horizontal divestiture will lead to increased output by the divesting firm and its former subsidiary or division by the acquiring firm. Therefore, customers will receive potentially lower input prices and higher quantities of goods and services. On the one hand, suppliers of the divesting firm may receive higher orders from the parent firm and the divested subsidiary under the control of the acquirer. On the other hand, suppliers may receive decreased quantities ordered from the divesting firm since the new acquirer may source its inputs from alternative suppliers. These effects are likely to be more detectable in concentrated industries in which the divesting firm operates and from divestitures that result in large changes in industry concentration. Divesting firms in less concentrated industries will likely have less monopoly power and customers in more concentrated industries will greater ability to reap the benefits from the divestiture.

The monopolistic collusion hypothesis proposes that horizontal integration (mergers, acquisitions, or expansions) facilitates collusion between industry rivals leading to limited output and elevated price to

the detriment of customers. The potential for advantages in a horizontally integrated framework calls into consideration of whether horizontal divestitures lead to the degradation of these advantages. Since the decreased probability of collusion amongst rival firms is greater in concentrated industries, the monopolistic collusion hypothesis predicts that divesting and rival firms would suffer and that customers would profit provided that the dominant outcome of an inadequate monopoly is increased production and decreased prices. The effects of a surge in downstream output and input utilization would positively affect suppliers; however, the significance of these effects remains ambiguous.

Considering that concentrated industries are more likely to exhibit pricing discretion, there may the two potential outcomes. The effect under the monopolistic collusion hypothesis may be more pronounced in less concentrated industries for product market counterparts. If divesting firms in less concentrated industries have less pricing discretion or ability to limit output, then the effects on product market customers would be increased production and even lower prices relative to concentrated industries, assuming less concentrated industries are more susceptible to market forces than concentrated firms. Whereas, divesting firms in more concentrated industries may have a greater ability to adjust to more efficient prices.

To capture the effects customer concentration, I proxy customer concentration by examining both concentrated industries and less concentrated industries as follows. *Non-concentrated customers* classifies corporate customers that have a 4-digit industry Herfindahl that is less than or equal to1800. *Concentrated customers* classifies corporate customers that have a 4-digit industry Herfindahl that is greater than 1800.

2.2. Monopsonistic collusion considerations

Blair and Harrison (1993) argue that, in an imperfectly competitive product market, a monopsonist will have the ability to restrict production in the output market, leading to higher prices and reduced output compared to the perfectly competition case. Chen (2007) argues that employing monopsony power results in decreased economic efficiency, indicating that the use of monopsonistic power is detrimental to consumer welfare. Given that horizontal mergers or acquisitions potentially increase the industry concentration of buyers and may lead to increased monopsony power as proposed by Eckbo (1983). Again, Eckbo and Wier (1985) conjecture that events that reduce the likely of horizontal mergers would potentially

result in lost rents to colluding firms, merging firms and industry rivals. By inference, this notion raises the concern of whether or not horizontal divestitures lead to reduced market power and, therefore, monopsony rents for divesting firms and industry rivals.

Drawing on these studies, I refer to the monopsonistic collusion hypothesis as the concept that horizontal divestitures potentially decrease the anticompetitive behavior of divesting firms and their product market rivals. This hypothesis asserts that rivals no longer are able to profit at the expense of suppliers due to decreased probability of coordination amongst competitors to obtain lower input prices. The monopsonistic collusion hypothesis proposes that industry rivals will react negatively to news of decreased potential for collusion. Eckbo (1983) argues that under collusion engendered by merging firms, monopoly rents are unfavorable to customers and suppliers. A reduction in monopsonistic collusion will result in an improvement in economic efficiency for customers and suppliers. Customers will receive increased production. Suppliers will likely receive increased production and higher prices due to reduced buyer power. These effects will most likely be revealed in industries in which there is greater competition amongst suppliers and divesting industries that experience a larger change in industry concentration.

To capture the effects supplier concentration, I proxy supplier concentration by examining both concentrated industries and less concentrated industries as follows. The variable, *Non-concentrated suppliers*, classifies corporate suppliers that have a 4-digit industry Herfindahl that is less than or equal to1800. The variable, *Concentrated suppliers*, classifies corporate suppliers that have a 4-digit industry Herfindahl that is greater than 1800.

2.3. Purchasing inefficiency/countervailing power considerations

The theory of countervailing power conjectures that economic power leads to economic power (Galbraith, 1952). More specifically, the group that is bound by the economic power of a dominant group offsets that position by augmenting its own economic power in relation to the power of the dominant group, thus revealing countervailing power. In this framework, a large customer uses its bargaining power relative to its suppliers' bargaining power; consequently, suppliers cut their selling prices to its buyers. If countervailing power serves as a channel to constrain buying power and selling power, then what is the

implication of relaxing this constraint, in this case buyer size, on buying power? Intrinsic in the theory of countervailing power is the concept that horizontal divestitures of downstream firms or buyers relax the channel that limits or keeps in check upstream firms' or suppliers' selling power. More specifically, horizontal divestitures may reduce bargaining power, to the point in which it diminishes the boundaries on suppliers' selling power, resulting in moderated buying power for a given divesting firm relative to its suppliers.

In a theory of dynamic countervailing power, Snyder (1996) finds that large buyers achieve lower prices from colluding sellers, and that the profitability of all buyers improves at the detriment of the supplier after a merger of another firm due to merger induced competition amongst suppliers (Snyder, 1998). Hence, in the context of reduced buying power, countervailing power theory suggests adverse consequences for not only the horizontally divesting firm, but for industry rivals as well. Thus, I expect industry rivals to respond negatively to news of a horizontal divestiture. I anticipate that a reduction in countervailing power will lead to a potential reduction in corporate customer welfare and an improvement in supplier bargaining power for concentrated suppliers. Consequently, concentrated suppliers may opportunistically raise input prices on less powerful divesting firms. Ultimately, this may lead to higher prices but a conceivably lower quantity; therefore, the effects may be ambiguous for suppliers. The divesting firms will no longer be able to pass lower input prices along to their customers. Therefore, customers may see an increase in their input costs. If divesting firms pass along these potentially higher costs, these firms pay decide to pass along these costs to customers to high or low switching costs. On the one hand, customers with high switching costs may have a strong customer-supplier relationship, and thus, divesting firms may pass these costs along to customers with lower switching costs (non-essential customers). On the other hand, divesting firms may act opportunistically and pass these costs along to those customers with lower switching costs. Ultimately, this is an empirical question. These effects may be more pronounced in less concentrated industries in which the divesting firm operates and divestitures that result in substantial changes in the industry Herfindahl index.

I proxy customer switching costs using a measure a measure of customer reliance in the spirit of Johnson, Kang, Masulis, and Yi (2011). *Reliant* classifies customers that have a ratio of customer sales (from the divesting firm) divided by the market value of the customer firm two days prior to the event that is greater than 2.5%. *Non-reliant* classifies customers that have a ratio of customer sales (from the divesting firm) divided by the market value of the customer firm two days prior to the event that is less than or equal to 2.5%.

2.4. Product market competition hypothesis

Extant literature discusses the role that product market competition plays in mitigating conflicts between shareholders and management (Alchian, 1950; Stigler, 1958). Several papers conjecture that increased product market competition may serve as an efficient tool to abate managerial slack or ineffectiveness (Hart, 1983; Shleifer and Vishny, 1997, Allen and Gale, 2000). Hart (1983) posits that product market competition unequivocally decreases managerial slack by assuming that managers attempt to obtain a profit target, consequently, managers face stiff competition and must work diligently to reach those targets. However, Scharfstein (1988) conjectures product market competition potentially makes the incentive problem worse and reduces managerial effort. Nickell (1996) uses a sample of U.K. manufacturing firms and shows that greater competition results in fewer monopoly rents. Monopoly rents provide opportunity for company stakeholders such as managers and employees to capture monopolistic rents with slack or lack of effort. Nickell (1996) finds evidence that an increase in product market competition is related to an increase in productivity. Nickell finds that increased competition leads to a decrease in costs and managerial slack and an increase in innovation. Bertrand and Mullainathan (2003) postulate that weak governance firms prefer to enjoy the quiet life by circumventing cognitively difficulty behaviors that may include bargaining with suppliers and unions over input prices and wages, respectively, and attempting to enhance labor productivity (Giroud and Mueller, 2010).

By implication, if horizontal divestiture activity increases product market competition, then I expect that divesting firms in concentrated industries or industries that experience large reductions in concentration will undergo improved performance from increased susceptibility to product market

competition. This hypothesis stipulates that horizontal divestitures potentially increase competition and reduce the probability that managers will be able to enjoy "the quiet life" (Bertrand and Mullainathan (2003), therefore increasing managerial incentives to negotiate lower prices from suppliers or lower wages from unions and improve productivity. Therefore, I anticipate that suppliers may experience an adverse stock price reaction and reduced cash-flow performance as a result of horizontal divestitures, in concentrated industries relative non-concentrated industries or industries that experience a large change in industry concentration.

With respect to customers, increased competition may pressure managers to maintain cash-flow performance despite a reduction in size or to reduce prices in the face of increased competition, therefore the outcome is ambiguous. Thus, customers may react positively or negatively to news of horizontal divestitures. Industry rivals may react positive as a result of increased competitive pressure that incentive managers to decrease managerial slack or competitors may react negatively in response to a more efficient rival. Therefore, if a rival is more concentrated than the divesting firm, I anticipate that positive reaction will indicate a contagion effect, whereas, a negative reaction would indicate a competitive effect.

To capture the impact of product market competition, I proxy supplier low and high switching costs using suppliers with suppliers a single large customer and more than one large customers. I also attempt to capture the economic effects of product market competition by examining supplier retention versus termination decisions by divesting firms. *Suppliers w/multiple large customers* is defined as suppliers that disclose more than one large public customer in the Compustat Customer Segment Database. *Suppliers w/single large customer* is defined as suppliers that disclose only one large public customer in the Compustat Customer Segment Database. *Retained suppliers* are those suppliers that were listed as suppliers before and after a divestiture deal. *Terminated suppliers* are those suppliers that were listed as suppliers before a divestiture deal but not after.

3. Data

In this section, I discuss the data sources and sample formation requirements employed to identify our sample of horizontal divestitures. I also offer the relevant features of our final sample of horizontal divestitures.

3.1. Sample construction

This paper depends on several data sources for our empirical investigation. I initially obtain our preliminary sample of horizontal divestitures from the universe of divestitures proposed from Securities Data Company. I employ the data on firm-level customer-supplier relationships established by Cohen and Frazzini (2008) using the Compustat Customer Segment database.[3] Similar to other studies, I acquire financial security data from the Center for Research in Securities Prices (CRSP) and accounting data from Compustat.

Our sample of divestitures excludes equity carve-outs and spin-offs over the period 1987-2005. Our initial sample of divestitures is acquired from the Securities Data Company (SDC) Mergers and Acquisitions database. This study eliminates divestitures that are described by the following (1) parent firms are private firms, limited partnerships, financial and regulated firms [Compustat historical Standard Industrial Classification (SIC) code 6000-6999, 4000-4099, 4500-4599, or 4800-4999], Real Estate Investment Trusts (REITs), foreign firms, or joint ventures, (2) information on the parent firm is not accessible on Center for Research in Security Prices (CRSP) directly following the divestiture, (3) concurrent announcements are made such as quarterly earnings; issues of equity, preferred stock or warrants; mergers and acquisitions; termination of technical agreements; share repurchases; private placements, dividends; and executive turnover, (4) parent firms simultaneously announce an intent to spin off or carve out a unit in addition to divesting assets (5) the announcement date of the proposed divestiture cannot be determined via a search of newswires and newspapers, Lexis-Nexis or Wall Street Journal searches, (6) the parent firm does not have data available in Compustat on both a consolidated and industry–segment basis (7) parent and acquirer are not U.S. based, (8) the parent and divestiture target do not have

[3] I am indebted to Lauren Cohen and Andrea Frazzini for generously sharing their data.

matching SIC codes in SDC Mergers and Acquisitions database, (9) the parent SIC code in SDC Mergers and acquisitions database does not match historical standard industry classification codes in Compustat (10) divestiture is considered equity carve-out or spin-off, (10) the parent has less than $20 million in sales (in constant 1987 dollars), and (11) the ratio of the deal value to total assets is less than 0.1%.[4] These last two restrictions facilitate the collection of transaction information from news stories and maintain the relative meaningfulness of these deals in the product market.

As a consequence of these limitations placed on the sample, there are 81 transactions that met the sample construction conditions from 1988 to 2005, and summary statistics for these divestiture deals are displayed in Table 2. The number of transactions does not vary substantially compared to other studies considering that horizontal divestitures represent a subcategory of divestitures, in general. Divestitures may also be conglomerate or vertical in nature. Lang, Poulsen, and Stulz (1995) report 151 asset sales. Slovin, Sushka, and Ferraro (1995) examine 179 sell-offs. Mulherin and Boone (2000) examine 139 asset sales, and Lang, Poulsen, and Stulz (1995) have a final sample of 93 asset sales. As shown in Panel A, there is some degree of variability in the incidence of deals, relative size of the transactions, and number of employees by year. Roughly sixty-five percent of the divestiture activity occurs from 1999-2005 in the sample. The average (median) ratio of subsidiary/unit net transaction value (transaction value less advisor fees) to parent total asset value one year prior to the divestiture is 17 (2.5) percent for this sample of deals, which suggests that this sample is relatively smaller and skewed upward compared to the average (median) ratio of subsidiary/unit net transaction value of 18 (11) percent reported by Mulherin and Boone (2000). Thus, horizontal divestiture deals appear to be about the same size as general divestiture deals, on average. The typical net transaction value (deal value less advisor fees) is $172.87 million. The average divesting firm in the sample has roughly $10.8 billion in market capitalization, $7.4 billion in total assets, and 37,400 employees. Market capitalization, total assets, and transaction values are reported in 2003 dollars.

[4] Berger and Ofek (1999) restrict their sample of asset sell-offs to sales at least $100 million in 1984 (the initial year in the sample).

Panel B of Table 2 reports the accumulated deals into broad industries established by Fama and French (1997).[5] Petroleum and natural gas, healthcare, electronic equipment, pharmaceutical products, and restaurants, hotels and motels industries generate the most divestiture activity in our sample. Divestitures in these industries comprise 72.87 percent of the divestitures in the sample. Additionally, the petroleum and natural gas industry dominates other industries in the sample accounting for 29.63 percent of the divestiture activity in the sample. The relative transaction value of deals reported in electronic equipment industries, 0.92, appear to be much greater than the relative transaction value of deals reported in the other industries.

Panel C of Table 2 reports the frequency of divestiture deals by deal characteristics. With respect to method of payment or deal consideration as reported by SDC's Mergers and Acquisitions database and news stories, 38.27 percent of the deals were paid via a cash transaction. Stock based and mixed (cash and stock based) methods of payment compose 3.70 percent and 3.70 percent, respectively. However, the method of payment was unknown for 54.32 percent of divestiture deals. Panel C also describes the deals based on whether the deal was an intra-industry transaction versus an inter-industry transaction between seller and buyer. A greater proportion of intra-industry deals, 53.09 percent, occur via sellers and buyers within the same four-digit SIC code than inter-industry deals that occur between sellers and buyers in different industries, compared to 46.91 percent.

3.2. Identifying corporate rivals, suppliers, and customers

This paper follows Fee and Thomas (2004), Cohen and Frazzini (2008), Hertzel, Li, Officer, and Rodgers (2008), and Bernile and Lyandres (2013) by employing the firm's reported information regarding material corporate customers from the Compustat Customer Segment Files to find firm suppliers and customers of the divesting firms, and their industry rivals. SFAS No. 131 mandates firms to disclose specific financial information the existence of customers whose purchases comprise at least 10 percent of the firm's consolidated annual sales. Obtaining the identifying characteristics of each firm's major customers from the Compustat Segment Files and linking these major customers to corresponding firms on CRSP and

[5] One hundred percent of the divesting firms in this sample are all focused reporting one business segment.

Compustat databases facilitates the creation of a sample of firms' primary customers. Once firm *i* is classified as a major customer of firm *j*, the database is inverted and firm j is classified as a supplier of firm *i*.[6] To identify suppliers of divesting firms, I match the parent (divesting) firm's name to a customer firm's name (from the Compustat Customer Segment Files) in the fiscal year-end prior to the divestiture announcement date within one year. I include customers of the divesting parent firm. For the typical deal in the sample, I identify 0.52 customer firms and 1.21 supplier firms with the required data to compute announcement period abnormal returns. This is similar to the average deal in the sample of Fee and Thomas (2004), who identify 0.40 customer firms and 1.09 supplier firms with required data.

Table 3 describes the sample distribution of 140 corporate customers and suppliers of firms proposing horizontal assets sales between 1988 and 2005 by industry The mean supplier market capitalization is $1.47 billion (in 2003 dollars), and the mean customer market capitalization is $41.15 billion (in 2003 dollars) Thus, the mean divesting firm market capitalization is more than 7.34 times greater than its suppliers' market capitalization, whereas, the typical customer firm in the sample has a market capitalization more than 3.81 times greater than the typical divesting firm the in the sample. The relative size of the event firm in question and the supplier firm is similar to that of Fee and Thomas (2004) (8.57 times), while the relative size of the event firm in question and the customer firm is somewhat smaller compared to that of Fee and Thomas (2004) (6.93 times). This indicates that the database may be more efficient in testing hypotheses linked to purchasing inefficiencies/countervailing power considerations rather than the reduced monopsonistic power considerations. The industries with the largest proportion of matches of customers and suppliers are the electronic equipment, petroleum and natural gas. Wholesale, computers, machinery, and communications industries, respectively. The greatest proportion of customer firms come from the petroleum and natural gas industry, while the greatest proportion of supplier firms come from electronic equipment industry. This industry distribution of customers and suppliers is somewhat similar to that of divesting firms, with the exception of the healthcare industry.

[6] See Cohen and Frazzini (2008) for a more comprehensive description of the matching algorithm employed.

The data employed to classify industry rivals for the divesting firms is also from the Compustat industry segment files. I consider rivals as any firm, other than the parent firm, customer or supplier, which reports the same historical four-digit SIC code as the parent firm with at least $5 million in market capitalization to reduce the impact of very small rivals. For the typical deal in the sample, I identify 67.63 (50.84) single and multiple-segment (single-segment only) rival firms with the required data to compute announcement period abnormal returns that is not substantially lower than comparable studies.[7]

3.3. Computing announcement period abnormal returns

Staying consistent with Fee and Thomas (2004), I use standard event study methodology to compute abnormal returns for the parent, in addition to any firm classified as an industry rival, supplier, or customer of the divesting parent firm. The market model parameters are calculated over the 200 trading day period beginning at day -240 in relation to the announcement date. I require a minimum of 100 trading over the trading days over the estimation period for a firm to be incorporated in the sample. Cumulate abnormal returns (CARs) are computed over the three-day window centered on the announcement date, and all significance tests are executed employing standardized prediction errors in accordance with similar studies.

With the purpose of investigating the cross-sectional differences, I consider each rival, customer, and supplier as one observation in the computation of abnormal returns. The returns of rivals, customers, and suppliers may be subject to event induced cross-sectional correlation (Eckbo, 1983; Fee and Thomas, 2004; Shahrur, 2005; Jain, Kini, and Shenoy, 2011). Consequently, I document results considering all rivals, customers, and suppliers, respectively, as equally weighted portfolios for each transaction. The equally weighted strategy is put forth to take into consideration the contemporaneous cross-sectional dependence in returns (Eckbo, 1983; Fee and Thomas, 2004; Shahrur, 2005; Jain, Kini, and Shenoy, 2011). I compute the abnormal returns to the parent rival, supplier, and customer portfolios for the same event windows as for the parent firm.

3.4. Measuring changes if operating performance

[7] Fee and Thomas report 75.55 industry competitors per average deal in their sample of merging firms.

Following Fee and Thomas (2004), I utilize a matching-firm methodology so as to compare industry-adjusted pre- and post-divestiture operating performance and to account for mean reversion in operating performance metric. I explore changes in operating performance for divesting firms that complete their transactions and the corresponding customers and suppliers of divesting firms. I select matching firms for each of the divesting firms and their customers and suppliers contingent on industry, asset size, and preceding operating performance consistent with Barber and Lyon (1996) and performed by Loughran and Ritter (1997) and Fee and Thomas (2004).

This study performs the following matching algorithm. I begin with all firms on Compustat that are not included in the sample (i.e., parent, supplier, or customer) and cash-flow (defined as operating income before depreciation (item 13) to sales (item 12) data available for the same years as the firms in the sample (i.e., matching firms are obligated to have accessible data for the same time window around the divestiture as the firms in the sample). I identify the firms with same two-digit SIC code as our the sample firm, asset size at the close of year-1 relative to the divestiture between 25 percent and 200 percent of the sample firm, and cash-flow to sales between 90 percent and 110 percent of the sample firm. I select the matching firm from these firms the company with the cash-flow to sales ratio nearest in magnitude to that of the sample firm. However, if no matching firm fulfills this requirement, I lessen the industry restrictions to necessitate only a match of the one-digit SIC code. Yet, if there continues to be no match, I remove the industry matching condition and match on size and performance. Ultimately, if I obtain no match after removing the industry matching condition, I eliminate the size restriction and match solely on performance. Considering the 221 firms in which an industry counterpart is pursued, 110 have matches at the two-digit level, 24 at the one digit level, 9 retaining size and performance, and 12 retaining only performance.

Staying consistent with Fee and Thomas (2004), I predominantly measure operating performance using the cash-flow to sales ratio. This ratio is computed for the sample firms and for the matching firms for one year preceding the divestiture and for each of the three years following the year in which the

divestiture is completed.[8] For a given year, I delineate the industry-adjusted performance measure as the sample firm's ratio less the benchmark ratio. Following Loughran and Ritter (1997) and Fee and Thomas (2004), I concentrate on median values as a result of skewness and the underlying effect of outliers when employing accounting ratios. Other measures of operating performance include the cost of goods sold to sales ratio, the employee to sales ratio, and selling, general and administrative expenses to sales ratio.

4. Empirical results

In this section, I investigate the announcement period wealth effects of horizontal divestitures and changes in operating performance around horizontal divestitures in both univariate and multivariate frameworks. I develop univariate and multivariate analyses in an approach that improves the ability to differentiate amongst non-mutually exclusive hypotheses.

4.1. Abnormal returns for all divestitures

Table 4 documents the mean (median) abnormal returns for the samples of divesting firms, rival firms, corporate customers and suppliers. In Panel A of Table 4, I present the announcement period abnormal returns for the divesting firms in our sample. Panels B and C of Table 4 documents the abnormal returns to parent rivals at the divestiture announcement on industry rival portfolios at divestiture announcement for single-segment portfolios and single and multiple segment industry rival portfolios, respectively. Panels D and E of Table 4 report the abnormal returns for individual customers firms (available for cross-sectional tests) and customer firm portfolios (constructed per divestiture transaction), correspondingly. Panels F and G in Table 4 report the abnormal returns for individual suppliers and supplier portfolios, respectively.

[8] I compute this ratio for each year following the divestiture completion date, as well to be consistent with similar studies. Currently, I assume that each divestiture deal is completed within the three years following the divestiture proposal date.

For the total sample of horizontal divestitures, I report a mean (median) positive abnormal return of 1.58% (0.79%) to parent firms over the three-day window, significant at the 5% level using a t-test (Wilcoxon signed-rank test) on standardized prediction errors, and significantly more positive than negative abnormal returns, using a sign test. This evidence of positive mean abnormal returns is in accordance with prior divestiture studies using asset sales (Hite, Owers, and Rogers, 1987; John and Ofek, 1995; Lang, Poulsen, and Stulz, 1995; Slovin, Sushka and Ferraro, 1995; Mulherin and Boone, 2000; Datta, Iskandar-Datta, and Raman, 2003). I present statistically significant (at the 10% level) mean abnormal returns of -1.09% for single segment rival portfolios for the entire sample, while the single- and multiple-segment rival portfolios earn a significant mean (median) abnormal return of -1.49% (0.52%) at the 5% level. The evidence from Panel B and C is inconsistent with that of Slovin, Sushka, and Ferraro (1995), who examine the impact of asset sell-offs of industry rivals and document a 0.04% mean excess return that is statistically insignificant. This inconsistency may be limited to the nature of horizontal asset sales, which produce a competitive effect amongst rivals.

For the full sample of corporate customers of divesting firms, individual customer firms experience a median abnormal return of -0.96% at the 10% level of significance at announcement, and the individual and portfolio of customer firms experience significantly more negative than positive abnormal returns at 10% level of significance, at least. For the entire sample of deals and subsamples of deals of downstream firms, individual suppliers and supplier portfolios have no detectable share price effects to the divestiture announcement.

To summarize the stock price reactions for the entire sample of divestitures, I find that divesting firms react positively; rivals and corporate customers respond negatively; while suppliers fail to generate share prices distinguishable from zero. The adverse reaction by only the single- and multiple-segment industry rival portfolios sample indicate that horizontal sell-offs produce a competitive effect for industry rivals. The results for the entire sample of divestitures appear to suggest that divesting firms become better off at their rivals' and customers' expense.

4.2. Abnormal returns for divestiture subsamples

In the spirit of Fee and Thomas (2004), I also present in Table 4 the abnormal returns for multiple subsamples of deals in which the product-market influence is anticipated to be discernible. Fee and Thomas (2004) capture large changes in industry Herfindahl and industry concentration, resulting from horizontal acquisitions, as an increase greater than 100 in industry Herfindahl and a Herfindahl of 2000, respectively, for their sample. I employ a subsample of deals in which the pre-divestiture industry Herfindahl Index is greater than 1800, (*Ind. Herf > 1800),* to evaluate the impact of divestitures in concentrated industries.[9] I also use a subsample of deals in which the pre-divestiture industry Herfindahl Index is less than or equal to 1800, (*Ind. Herf <= 1800),* to evaluate the impact of divestitures in less concentrated industries. Consistent with prior studies, I compute the Herfindahl Index as the sum of the squared market shares of the firms that operate in the industry (4-digit SIC code). To capture the deals that produce a substantial change in industry Herfindahl or concentration, I observe those deals that decrease the industry Herfindahl by more than 100 *(*Δ *Ind. Herf. < -100)*. I also capture the deals that do not produce a substantial change in industry Herfindahl or concentration by observing those deals that do not decrease the industry Herfindahl by more than 100 *(*Δ *Ind. Herf. >= -100).*

4.2.1. Abnormal returns for concentrated vs non-concentrated industries

For the subsample of deals in concentrated industries, Panel A of Table 4 documents that divesting firms experience a statistically significant average (median) abnormal return of 2.32% (1.04%) at announcement, in contrast, Panels B presents statistically significant mean (median) abnormal returns to single-segment rivals of -1.99% (-2.01%) at the 10% level of significance. In contrast for the subsample of deals in non-concentrated industries, Panel C of Table 4 presents mean (median) statistically significant single- and multiple-segment industry rivals of -1.51% (0.45%) at the 10% level of significance at announcement: indicating differential competitive effects for single segment and diversified rivals. Also for the subsample of deals in less concentrated industries, a sign test in Panel D of Table 4 indicates that

[99] An industry Herfindahl of 2000 is also used in untabulated results but reduces the number of observations in the subsample, decreasing the statistical power of the sample. The results are qualitatively similar but inferences are more difficult to substantiate.

corporate customers experience significantly more negative abnormal returns than positive, at the 10% level of significance: suggesting that divestitures occurring in less concentrated industries are considered worse news for corporate customers than those that occur in more concentrated industries. For the subsample of deals in more concentrated industries, Panels F and G in Table 4 indicate no significant share price effects for corporate suppliers at announcement.

Next, this paper summarizes the subsample of deals in concentrated industries. Divesting firms react positively at announcement. In contrast, single-segment rivals in concentrated industries respond negatively. However, diversified rivals react less negatively compared to diversified rivals in non-concentrated industries. Customers react less negatively (compared to deals in less concentrated industries) or not at all. Suppliers generate no significant reaction at announcement. For the subsample of deals in concentrated industries, the evidence partially supports the product market competition and purchasing inefficiencies/countervailing power hypotheses and, to a lesser extent, the monopolistic collusion hypothesis.

4.2.2. Abnormal returns for deals for deals with large declines in industry concentration vs. deals with no large decline in industry concentration

For the subsample of divestiture deals that result in a large drop in industry concentration, Panel A reports that divesting firms earn a marginally significant mean (median) abnormal return of 2.50% (1.19%), which appears to be more positive than the subsample of deals that do not experience a large change in concentration. Also for the subsample of deals in industries that do not experience a large decline in concentration, I find that divesting firms earn a slightly more positive than negative abnormal returns in response the event, at the 10% level of significance. For the subsample of deals that undergo a large reduction in industry Herfindahl, Panels B presents marginally significant mean abnormal returns to single-segment rivals of -1.87% at the 10% level of significance. In comparison for the subsample of deals in industries that do not experience a large decline in concentration, Panels C presents slightly significant mean (median) abnormal returns to single- and multiple segment rivals of -1.62% (-0.92%) at the 10% level of significance. These results reinforce the evidence of differential competitive reactions from single

segment and diversified industry rivals at announcement of horizontal asset sales. For deals in industries that experience a large decline in industry concentration, Panels D and E report that individual customers and customer portfolios experience unfavorable median abnormal returns of -1.07% at announcement and significantly more negative than positive abnormal returns at the 5% and 10% levels of significance, respectively. However, Panels F and G report no significant share price reactions for individual suppliers and supplier portfolios at announcement for this subsample of deals.

To summarize for the subsample of divestiture deals that result in a large decrease in industry concentration, divesting firms respond positively; single-segment rivals respond significantly; corporate customers react adversely, and suppliers do not react at all at announcement. These results provides mixed evidence to support the product market competition and purchasing inefficiencies/countervailing power hypotheses.

4.3.1. Abnormal operating performance for all divestitures

I report median industry-adjusted operating performance changes for divesting firms, customers, and suppliers in Table 5 using median industry-adjusted cash-flow to sales. Panel A of Table 5 reports changes in median industry-adjusted cash-flow to sales for divesting firms. Panels B and C of Table 5 report changes in median industry-adjusted cash-flow to sales for individual customer and customer portfolio, respectively. Changes are presented from the year preceding the divestiture to each of the three years subsequent to the divestiture, in addition to the median of the three year post-divestiture period.[10] I use the Wilcoxon signed-rank test to determine significance for changes in operating performance. I document evidence of significant operating performance deterioration for the entire sample of divesting firms.

For the entire sample, Panel A of Table 5 reports sign tests that indicate that divesting firms experience significantly more negative changes abnormal cash-flow margin during the post-divestiture period and for the first two years immediately following the divestiture 10% level of significance, at least. Panels B and C of Table 5 indicate no significant changes in median industry-adjusted cash flow margins

[10] See Fee and Thomas (2004) for a more detailed description.

for individual customers and customer portfolios, respectively. Panels D and E of Table 5 report, for the entire sample of deals, that individual suppliers and supplier portfolios experience a transitory increase in abnormal cash-flow margin in the immediately year subsequent to the divestiture of 3.75% and 4.01%, respectively, at the 10% level of significance.

In sum for the entire sample of deals, divesting firms' operating performance declines; customers' operating performance does not change; and suppliers' operating performance improves. This suggest that perhaps suppliers' cash flow performance improves at the expense divesting firms. F For the most part, these results are consistent with John and Ofek (1995) who note the underperformance (using operating margin performance) of a sample of 46 firms (56.8% the size of our sample) that divest non-focus increasing assets as a comparison sample to their sample of focus increasing firms. John and Ofek (1995) primarily focus their analysis on focus increasing asset sales, whereas, non-focus increasing asset sales is this paper's primary focus.

4.3.2. Abnormal operating performance for deals in concentrated vs. non-concentrated industries

For deals that occur in more concentrated industries, Panel A of Table 5 indicates that the median divesting firm experiences a statistically significant decrease in cash-flow margins of 1.39% during the post-divestiture period, which is most prominent in the year immediately following the divestiture, at the 10% level of significance. Moreover, sign tests indicate more negative than positive changes in abnormal operating cash-flow margin during each of the years subsequent to the divestiture and general post-divestiture performance of at least the 10% level of significance. For deals in concentrated industries, Panels B and C of Table 5 indicate no significant changes in operating performance for corporate customers. For deals in less concentrated industries, Panels D and E of Table 5 indicate that individual suppliers and supplier portfolios improve cash-flow margins in the year immediately following the divestiture and for the post-divestiture period, in general, by at least 5.06%, at the 10% level of significance. For deals in more concentrated industries, supplier post-divestiture performance is lower relative to that in less concentrated industries.

Overall for deals in concentrated industries, operating performance declines for divesting firms; there is no change in operating performance for customers; and supplier performance is more negative or does not change. Thus, the evidence for the changes in operating performance in concentrated industries relative to non-concentrated industries is more consistent with the purchasing inefficiencies/countervailing power hypothesis.

4.3.3. Abnormal operating performance for deals that result in large declines in industry concentration

For deals that occur in industries that do not experience a large change industry Herfindahl or concentration, sign tests in Panel A of Table 5 suggest that divesting firms display slightly more negative than positive changes in abnormal operating cash-flow margin during the first two years subsequent to the divestiture, which then disappears thereafter. For deals that occur in industries that do experience a large change industry Herfindahl or concentration, sign tests in Panel A of Table 5 suggest that divesting firms display significantly more negative than positive changes in abnormal operating cash-flow margin during the third year subsequent to the divestiture and during the post-divestiture period in general that are significant at the 5% level of significance. For deals that occur in industries that do experience a large change industry concentration, Panels B and C of Table 5 present no significant changes in abnormal cash-flows margin for corporate customers.

For deals that occur in industries that do experience a large change industry concentration, Panel D of Table 5 indicate that individual suppliers experience significantly more negative than positive changes in abnormal cash flow margin in the second year subsequent to the divestiture. The evidence indicates that suppliers react more negatively, with respect operating performance, for deals that result in a large decrease in industry concentration relative to those deals that do not result in a large change in concentration, as shown in Panels D and E of Table 5.

To summarize deals that occur in industries that do experience a large change industry concentration, divesting firms display a delayed negative reaction, in general; customer performance does not change, supplier performance deteriorates temporarily. Overall, the evidence, for deals that occur in

industries that experience a large change industry concentration, is consistent with the purchasing inefficiencies/countervailing power hypothesis.

4.4. Identifying sources of losses/gains

In the subsequent section, this study attempts to trace the sources of gains/losses or improvement/deterioration in abnormal returns and cash-flow performance to the divesting firms by investigating the variation in alternative measures of operating performance such as: cost of goods sold (item 30) to sales (item 12); selling, general, and administrative expense (SG&A) (item 189) to sales (item 12); employees (item 29) to sales (item 12), and the wage to sales ratio.[11] Table 6 documents the sources of gains/losses in abnormal returns and cash flow performance to the divesting firms.

4.4.1. Identifying sources of losses/gains for all divestiture deals

For the entire sample of divestitures, Panel A of Table 6 sign tests indicate that divesting firms experience slightly more positive (43) than negative (27) changes in median industry-adjusted operating cost of goods sold to sales during the post-divestiture period (year-1 to median post-divestiture), at the 10% level of significance. This suggests that more firms experience abnormal increases in input costs than those that experience abnormal decreases in input costs. Also for these deals, Panel B of Table 6 reports that the median divesting firm experiences a 1.15% transitory increase in median-industry adjusted SG&A expense to sales, at the 10% level of significance in the third year subsequent to the divestiture. This evidence indicates that there is slight and temporary increase in overhead costs. Panel C of Table 6 indicates that for the entire sample, the median divesting firm undergoes a marginal decline (10% level of significance) of median industry-adjusted employee to sales of 0.03 but experience no significant changes in divesting firm median industry-adjusted wage to sales in the year immediately following the asset sale. However, Panel D of Table 6 indicates no detectable changes in median industry-adjusted average wage to sales. Also, changes in customer median industry-adjusted cost of goods sold to sales subsequent to the upstream divestiture are not statistically significant (not reported in tables).

[11] I take the product of the number of firm employees (Compustat item 29) and the national average wage obtained from the Social Security Administration (Imrohoroglu and Tüzel, 2014)).

Panels E and F of Table 6 document the evidence from the changes in individual customer and customer portfolio median industry-adjusted cost of goods sold to sales in order to investigate the influence of upstream divestitures of customers' input costs subsequent to the divestiture. For the entire sample of divestitures, there are no statistically distinguishable changes in median industry-adjusted cost of goods sold to sales following the upstream divestiture.

Summarizing the analysis of the sources of gains/losses for the entire sample of deals, I document that abnormal input and overhead costs negatively impact operating performance of the median divestiture around the announcement of horizontal asset sales, which slightly offsets the reduction of median industry-adjusted employees to sales. These results indicate that financial distress may play a role in the operating performance of divesting firms around horizontal asset sales.

4.4.2. Identifying sources of losses/gains for deals in concentrated vs. non-concentrated industries

In the following section, I trace the sources of changes in operating performance by likening the subsample of deals that occur in concentrated industries to those that occur in less concentrated industries. For subsample of deals in concentrated industries, Panel B of Table 6 documents that divesting firms experience a statistically significant 0.39% decrease in SG&A expense margin during the post-divestiture period at the 10% level of significance and more abnormal reductions in SG&A expense to sales than abnormal increases during the second year following the divestiture and the general post-divestiture period (year-1 to median post-divestiture). For the subsample of deals that occur in less concentrated industries, the median divestiture results in an economically and statistically significant increase of 1.59% in SG&A expense to sales post-divestiture at the 10% level of significance. Also for the subsample of deals that occur in less concentrated industries, the median divesture experiences a statistically and economically significant increase of, at least, 2.00% in SG&A costs during the second and third years subsequent to the divestiture and significantly more increases in abnormal SG&A expense to sales than decreases in abnormal SG&A expense to sales in the third year subsequent to the divestiture. For the subsample of deals that occur in less concentrated industries, Panel C of Table 6 the median divesting firm experiences an economically and statistically significant decrease of 0.06 in industry median-adjusted employees to sales during the post-

divestiture at the 10% level of significance, which is most prominent during the first year subsequent to the divestiture.

For the subsample of deals in concentrated industries, individual customers and customer portfolios experience a significant increase in median abnormal input costs of 1.59% at the 5% level of significance, whereas for the subsample of deals in non-concentrated industries, individual customers experience significantly more negative than positive changes in costs of goods sold to sales in the third year subsequent to the divestiture. These results suggest that divesting firm market power or lack thereof influences post-divestiture customer input costs.

Post-divestiture overhead costs appear to be declining in concentrated industries while increasing in less concentrated industries, which may make it difficult to detect changes in abnormal overhead costs for the entire sample. Also, post-divestiture labor intensity (employee to sales) for deals in concentrated industries appear to decline more than deals in non-concentrated industries. For deals in concentrated industries, these changes in operating performance seem to enhance operating performance and serve as a source of gains for divesting firms compared to less concentrated industries. For deals in concentrated industries, post-divestiture customer input costs increase temporarily, while post-divestiture customer input costs decrease temporarily for deals in less concentrated industries. To summarize the comparison of deals in concentrated industries and less concentrated industries, the evidence tends to favor the product market competition and purchasing inefficiencies/countervailing power hypotheses.

4.4.3. Identifying sources of losses/gains for deals with large declines in industry concentration vs. deals with no large decline in industry concentration

Next, I attempt to identify the sources of gains/losses by comparing various measures of operating performance for divestiture deals that in large changes in industry Herfindahl to those that do not result in a large change in industry concentration. A sign test in Panel A of Table 6 suggests that divesting firms experience significantly more abnormal increases in input costs than abnormal decreases in input costs, at the 5% level of significance, during the post-divestiture period. For the subsample of deals in industries that do not experience a large change in industry Herfindahl, divesting firms undergo a 1.59% increase in

median industry-adjusted SG&A expenses to sales in third year following the divestiture and significantly more positive changes in median industry-adjusted SG&A expense to sales in the second year subsequent to the divestiture.

For the subsample of deals that experience a large change in industry Herfindahl, divesting firms realize a transitory 0.03 decrease in employee to sales at 5% level of significance, and a sign test indicates that divesting firms experience significantly more negative changes in median industry-adjusted employees to sales during the post-divestiture period (year-1 to median post-divestiture), at the 5% level of significance. Therefore, these results suggest that divestiture deals that result in a large reduction in industry concentration (potentially improving competition) reduce or maintain normal input costs, overhead costs, labor intensity, and wage expenses, in contrast, divestiture deals that do not result in a large reduction in industry concentration increase or maintain normal input costs, overhead costs, labor intensity, and wage expenses. Overall for the subsample of deals that experience a large change in industry Herfindahl, the evidence appears to substantiate the product market competition hypothesis.

4.5. Corporate customer abnormal returns and changes in operating performance: customer concentration and switching costs

The subsequent section investigates the influence of customer market structure and switching costs on corporate customer financial and operating performance. Table 7 presents the performance differences for several subsamples of corporate customers: non-concentrated customers versus concentrated customers; and reliant customers versus non-reliant customers. Panels A and B of Table 7 compares the performance differences of individual customers and customer portfolios between non-concentrated customer industries and concentrated customer industries, respectively, in order to evaluate the impact of customer market structure on customer gains/losses. Panels C and D of Table 7 compares the performance differences of individual customers and customer portfolios between reliant and non-reliant customers.

4.5.1. Customer concentration

First, the role of customer concentration of customer financial and operating performance is examined. Individual non-concentrated customers react adversely at announcement experiencing median

abnormal returns of -1.07%, at the 10% level of significance. Although non-concentrated individual customers and customer portfolios experience more negative than positive abnormal returns than concentrated customers, the difference in abnormal returns and operating performance around the divestiture announcement is negligible. The performance differences between the customer concentration subsamples fail to support the monopolistic collusion hypothesis but potentially substantiates the monopsonistic collusion, purchasing inefficiencies / countervailing power, and product market competition hypotheses.

4.5.2. Customer switching costs

Panels C and D of Table 7 compare the performance differences of individual customers and customer portfolios between non-reliant customers and reliant customers, respectively, in order to assess the impact of customer switching costs on customer gains/losses. Non-reliant individual customers and customer portfolios experience significantly (at the 10% level) more negative median abnormal returns and more negative than positive (at the 5% level) abnormal returns than reliant customers, the difference in abnormal returns at divestiture announcement is insignificant. None of the customer subsamples display significant changes in median industry-adjusted cash-flow to sales nor any significant differences in operating performance between reliant and non-reliant customers. The evidence from customer reliant and non-reliant subsamples suggest that, perhaps, horizontal asset sales less beneficial for non-essential customers than those with strong customer-supplier relationships. Overall, the evidence is slightly consistent with purchasing inefficiency/countervailing power hypothesis

4.6. Supplier abnormal returns and changes in operating performance: supplier concentration, supplier retention decisions, and supplier switching costs

The following section investigates the impact of supplier concentration, supplier retention, and supplier switching costs on supplier performance. By examining supplier concentration, I can extend our investigation of the monopsonistic collusion hypothesis, which posits that the benefits of reduced monopsony rents will most likely be revealed in less concentrated supplier industries. Supplier switching costs allow me to investigate the decision to retain a supplier subsequent to the divestiture rather than

terminating the relationship subsequent to the event to help us further explore the product market competition hypothesis, which suggests that managers subject to divestiture induced increased competition will likely terminate ineffective suppliers, reducing supplier profitability and value.

Table 8 presents the results of logit analysis of the supplier termination decision and the performance differences for several subsamples of suppliers. The logit analysis in Panel A of Table 8 will allow me to determine if the gains from the divestiture are linked to supplier termination decision. Specifically, the logit analysis of the supplier termination decision allows me to explore whether substantial changes in industry concentration or industry concentration influences the supplier termination decision by divesting firms to investigate the product market competition hypothesis. Panels B and C of Table 8 compares the performance differences of individual suppliers and supplier portfolios between non-concentrated supplier industries and concentrated supplier industries, respectively, to assess the impact of supplier market structure on supplier performance. Panels D and E of Table 8 compare the performance differences of individual suppliers and supplier portfolios between terminated and retained suppliers, respectively, to assess supplier retention decisions. Panels F and G of Table 8 presents the performance differences between suppliers that report a single large customer and those that report more than one large customer for individual suppliers and supplier portfolios, respectively, in order to evaluate supplier switching costs.

4.6.1. Logit analysis of supplier of termination decision: multivariate evidence

First, in Panel A of Table 8, I present the results of the logit regression in which the dependent variable is a binary variable that is equal to one if the supplier is terminated in the year following the divestiture and zero otherwise. I include only firms that have non-missing individual abnormal returns for divesting firms and suppliers. Explanatory variables of the logit regression include divesting firm abnormal returns, divesting firm deal characteristics, product market relationship characteristics, and environmental factors. Deal characteristics include relative size of the transaction and method of payment. Product market relationship characteristics examined are supplier switching costs and the length of the relationship between the customer and supplier. I also incorporate environmental factors that describe the competitive landscape

such as: supplier industry concentration; divesting firm industry concentration; and deals that result in large changes in industry concentration. *Divesting firm abnormal returns* are the three-day mean cumulative abnormal returns centered on the divestiture announcement using the market-model. *Suppliers with single large customer* is defined as suppliers that disclose only one large public customer in the Compustat Customer Segment Database. *Supplier industry concentration* is a binary variable which is equal to one if the supplier industry Herfindahl is greater than 1800 and zero otherwise. *Relative deal size* is the ratio of deal transaction value to the market value of common equity in the year prior to the divestiture. *Cash* is a binary variable that is equal to one if the method of payment was cash and is equal to zero otherwise. *Relationship duration* is the number of years in which there has been a consistent reported customer-supplier relationship in the Compustat Customer Segment Database. *Industry Herf > 1800* are those deals that occurred in industries (four-digit SIC code) in which the pre-divestiture Herfindahl Index was greater than 1800. Δ *Industry Herf. < -100* are those deals that resulted in a change in the industry Herfindahl Index that were below -100.

The primary variable of interest, Δ *Industry Herf <-100*, is significant and positive, suggesting that divestitures that result in a more competitive environment are more likely to lead to the termination of a supplier relationship post-divestiture. However, *Industry Herf >1800* is not significant, which suggest that the degree of change in the competitive environment and not the level of concentration is important to the supplier termination decision. This finding authenticates the product market competition hypothesis, indicating that divesting firms eliminate less efficient suppliers post-divestiture due to increased product market pressures. I also show that variable *Divesting firm abnormal returns* is positive and significant at the 5% level, which suggests that divesting firms' gains at announcement are positively associated with the supplier termination decision. This finding supports the notion that the value perceived by investors at divestiture announcement may be driven by not only asset sales assets but also by eliminating inefficient or less essential suppliers.

Relationship duration is positive and significant, at the 5% level of significance, which suggests that the greater the length of the supplier customer relationship the more likely the divesting firm is to sever

ties with the supplier. In addition, *Suppliers with single large customer* is positive and significant at the 10% level of significance suggesting that divesting firms are more likely to terminate suppliers with high switching costs or those that depend solely on the divesting firm. Collectively, the results with respect to *Relationship duration* and *Suppliers with single large customer* in the logit regression and univariate results for the industry-adjusted employee-to-sales ratio indicate that the divesting firm is increasing efficiency and value by breaking implicit contracts with various stakeholders, suppliers of labor and inputs.

Cash is negative and significant, which suggests that cash deals lessen the probability of terminating a supplier relationship. This result may suggest that the divesting firm has improved its liquidity and loosened its financial constraints, such that it is more likely to retain suppliers than terminate them. *Supplier industry concentration* and *Relative deal size* are insignificant and suggest that neither supplier market power nor the size of the divestiture deal influence the likelihood of the divesting firm terminating the supplier subsequent to the divestiture deal.

Overall, I make several findings from the logit multivariate analysis. I find that deals that result in large increases in the competitive environment in the divesting industry increase the probability of the supplier being terminated subsequent to the deal. In addition, higher divesting firm abnormal returns are positively associated with the supplier termination decision, suggesting divesting firms create value by eliminating less essential suppliers. Divesting firms also appear to be more likely to terminate long-term supplier relationships and those suppliers with greater switching costs, which suggests that divesting firm attempt to increase efficiency and value by breaking implicit contracts with suppliers of labor (refer to section *2.4.4.1. or* Panel C of Table 6) and inputs. Jointly, these results support the product market competition hypothesis.

4.6.2. Supplier concentration

Next, the role of supplier concentration on *supplier* stock price and operating performance is assessed. Sign tests in Panel B of Table 8 indicate that non-concentrated individual suppliers experience slightly (at the 10% level) more negative than positive abnormal returns than concentrated individual suppliers, but the difference in abnormal returns at divestiture announcement is insignificant. Sign tests in

Panel B of Table 8 indicate that, not only do, concentrated supplier portfolios experience slightly (at the 10% level) more positive than negative abnormal returns than non-concentrated supplier portfolios, but the difference in median abnormal returns of 2.09% at divestiture announcement is marginally significant as well. The evidence is inconsistent with the notion that non-concentrated suppliers are more likely to receive the benefits of reduced monopsony rents and, thus, fail to support the monopsonistic collusion hypothesis. However, the results indirectly support the idea that concentrated suppliers have a greater capability to exploit divesting firms and take advantage of reduced countervailing power by temporarily improving supplier profitability relative to non-concentrated suppliers. Hence, I identify indirect evidence in support of the purchasing inefficiency/reduced countervailing power hypothesis. Overall, evidence from Panels B and C of Table 8 indicates that concentrated suppliers compared to non-concentrated suppliers benefit from downstream divestitures, while non-concentrated suppliers appear to be disadvantaged by downstream horizontal asset sales.

4.6.2. Supplier retention versus termination

Subsequently, the financial effects of retention and termination decisions on suppliers are evaluated, similar to Fee and Thomas (2004). Panels C and D of Table 8 reports that though terminated individual suppliers experience substantial deterioration in post-divestiture median industry-adjusted cash-flow margins of -12.08%, the retained individual suppliers experience significant improvement in post-divestiture median industry-adjusted cash-flow margins of 5.46%. The difference in post-divestiture median industry-adjusted cash-flow to sales of 17.54% between terminated and retained individual suppliers is highly significant. Panel D of Table 8 indicates that terminated supplier portfolios experience significant adverse mean (median) abnormal returns of -3.36% (-1.83%) at divestiture announcement, whereas retained supplier portfolios insignificant abnormal returns at divestiture announcement. Although terminated supplier portfolios experience trivial changes in median abnormal operating performance, retained supplier portfolios experience a significant boost in cash-flows of 5.91%. Similar to the evidence in Panel C, Panel D of Table 8 indicates that the difference in cash-flows between terminated and retained supplier portfolios is 12.94% and is decidedly significant. In an untabulated logistic regression in which the

dependent variable is terminated supplier, I find that Δ *Ind. Herf <-100* is significant and positive, suggesting that divestitures that result in a large reduction in industry concentration are more likely to terminate a supplier relationship post-divestiture.[12] This finding validates the product market competition hypothesis, indicating that divesting firms eliminate less efficient suppliers post-divestiture due to increased product market pressures.

The results from the supplier retention and termination subsamples are similar to those of horizontal mergers (Fee and Thomas, 2004) but seem to be somewhat larger in magnitude (perhaps due to the difference in sample sizes). The results in Panels C and D of Table 8 substantiate support for the product market competition hypothesis.

4.6.3. Supplier retention versus termination: univariate results

Subsequently, the financial effects of retention and termination decisions on suppliers are evaluated, similar to Fee and Thomas (2004). Panels D and E of Table 8 reports that though terminated individual suppliers experience substantial deterioration in post-divestiture median industry-adjusted cash-flow margins of -12.08%, the retained individual suppliers experience significant improvement in post-divestiture median industry-adjusted cash-flow margins of 5.46%. The difference in post-divestiture median industry-adjusted cash-flow to sales of 17.54% between terminated and retained individual suppliers is highly significant. Panel E of Table 8 indicates that terminated supplier portfolios experience significant adverse mean (median) abnormal returns of -3.36% (-1.83%) at divestiture announcement, whereas retained supplier portfolios insignificant abnormal returns at divestiture announcement. Although terminated supplier portfolios experience trivial changes in median abnormal operating performance, retained supplier portfolios experience a significant boost in cash-flows of 5.91%. Similar to the evidence in Panel D, Panel E of Table 8 indicates that the difference in cash-flows between terminated and retained supplier portfolios is 12.94% and is decidedly significant. In conjunction with the results from the logit regression in Panel A of Table 8 in which Δ *Industry Herf <-100* is significant and positively associated

[12] Results available upon request.

with the supplier termination decision, the evidence suggests divestitures that result in a large reduction in industry concentration are more likely to terminate a supplier relationship post-divestiture. This finding validates the product market competition hypothesis, indicating that divesting firms eliminate less efficient suppliers post-divestiture due to increased product market pressures. The results from the supplier retention and termination subsamples are similar to those of horizontal mergers (Fee and Thomas, 2004) but seem to be somewhat larger in magnitude (perhaps due to the difference in sample sizes). The results in Panels D and E of Table 8 substantiate support for the product market competition hypothesis.

4.7. Divesting firms: multivariate results

For completeness, Table 9 reports the multivariate regressions that explain divesting parent firms' abnormal returns. The dependent variable for Columns (1) – (12) in Table 9 is the abnormal returns for divesting parent firms at announcement. In Column (1), the independent variable is the pre-divestiture *TOBINS_Q*. The estimated coefficient on *TOBINS_Q* is negative and significant, which suggest pre-divestiture underperformance promotes higher wealth effects. It suggests that low productivity firms/performing firms have higher abnormal returns at the announcement.

In Column (2), the independent variable is the pre-divestiture *NEED_FOR_FUNDS*. The estimated coefficient is positive and significant, which is consistent with prior research on the financing hypothesis from prior literature (Lang, Poulsen, and Stulz, 1995). It indicates that firms with high financial constraints have higher returns at announcement. In Column (3), the independent variable is the pre-divestiture *ALTMAN_Z_SCORE* (Altman, 1968). The coefficient on *ALTMAN_Z_SCORE* is negative and insignificant, which is inconsistent with prior evidence on financial distress (Brown, James, and Mooradian, 1964).

In Column (4), the independent variable is pre-divestiture *COGSSALE*. The coefficient is positive and insignificant and fails to support the monopsonistic collusion hypothesis. In Column (5), the independent variable is pre-divestiture *EMPSALE* and the coefficient is marginally significant and positive, suggesting that pre-divestiture labor intensity promotes greater wealth creation at announcement due to a potential reduction in labor force post-divestiture. In Column (6), the independent variable is pre-divestiture

WAGESALE. In Column (7), the independent variable is pre-divestiture *SGASALE*. The coefficient on *SGASALE* is positive and marginally significant, which provides suggests that higher wealth effects may be attained from firms with greater overhead and labor costs.

In Column (8), I include the indicator variable for significant concentration in addition to the indicator for divestitures that result in substantial decreases in industry concentration, *Ind. Herf.>1800* and Δ *Ind. Herf <-100*, respectively. The coefficients on *Ind. Herf.>1800* and Δ *Ind. Herf <-100* are positive insignificant. In Column (9), I include variables pertaining to deal characteristics *REL_SIZE*, *CASH*, and, *SAME_INDUSTRY*. *REL_SIZE* is the net transaction value of the asset sale scaled by the prior year's market value of equity. The coefficient on *REL_SIZE* is positive and significant, suggesting that larger transactions signal more positive news to shareholders. *CASH* is an indicator variable that is equal to one if the deal was all cash deal, and equal to zero otherwise. *CASH* is positive and significant suggesting that cash transactions are positive signals by sellers, which is consistent with Slovin, Sushka, and Poloncheck (2005). *SAME_INDUSTRY* is an indicator variable that is equal to one if the division/segment/business unit was sold to an acquirer with same four digit SIC code and equal to zero, otherwise. I anticipate the coefficient on SAME_INDUSTRY to be negative due to the fact that this type of deal would just redistribute market power amongst firms in the same industry and offset the gains via the divestiture. The coefficient on *SAME_INDUSTRY* is negative and insignificant. Therefore, this evidence suggests that market structure levels and changes appear to have a neutral impact on divesting firms. Perhaps, this supports the notion that some divestiture gains are offset by losses to customer and suppliers, generating a net wealth effect of zero. The impact of market structure and changes on suppliers and customers will be investigated further in section 4.8., below.

In Column (10), I omit the variables *NEED_FOR_FUNDS* and *COGSSALE* due to multicollinearity with *SGASALE* and *EMPSALE*, respectively. I omit *WAGESALE* because it is mechanically related to *EMPSALE*. The coefficients on *EMPSALE* and *SGASALE* are significant and positive, while t-statistics suggest that firms with higher labor intensity are more important to value creation for divesting firms than overhead costs.

In Column (11), I add the variables *NEED_FOR_FUNDS* and *COGSSALE* and omit the variable *SGASALE*. *NEED_FOR_FUNDS* is significant and positive, which provides strong support the financing hypothesis. *COGSSALE* is significant and negative, which suggest that divesting firms with high input costs leads to lower abnormal returns. This evidence suggests that horizontal divestitures may subject divesting firms to higher rents from suppliers, which may provide some evidence in favor of the monopolistic collusion, monopsonistic collusion, and purchasing inefficiencies hypotheses. To further understand the impact increased input costs on divesting firms' wealth effects, I examine the wealth effects of suppliers and customers in the section below.

In Column (12), I replace the variable *EMPSALE* with *WAGESALE*. *WAGESALE* and *NEED_FOR_FUNDS* are both positive and significant, while *COGSSALE* is negative and significant. However, *SGASALE* is no longer significant, which likely due to the multicollinearity. These results are consistent with those from Columns (10) and Column (11). Therefore, the multivariate results in Table 10 allow us to evaluate the relative importance between the hypotheses and identify the sources of value creation and destruction.

Multivariate analyses of divesting firm abnormal returns indicate that firms with high pre-divestiture input costs, will likely result negative abnormal returns. While, the industry concentration and change in concentration variables do not appear to be significant, this result does suggest further corroboration of purchasing inefficiencies/countervailing power hypothesis and provides support for the monopsonistic collusion hypothesis, as well. These results also indicate that cash deal consideration adds value for divesting firms.

4.8. Determinants of the wealth effects of supplier and customer firms.

In this section, I explore the determinants of the wealth effects to supplier (*Supplier abnormal returns*) and customer firms (*Customer abnormal returns*) at announcement of horizontal asset sales of downstream and upstream firms, respectively. I consider the product market competition hypothesis by employing proxies for supplier switching costs (*Duration of suppler relationship and Supplier with single large customer*) and customer switching costs (*Reliant customer*) as independent variables in the respective

regression models. I assess the monopolistic collusion hypothesis, monopsonistic collusion hypothesis, purchasing inefficiency hypothesis, and product market competition hypothesis by including an indicator variable for divesting industry concentration (*Ind. Herf > 1800*) and differentiate between the product market competition hypothesis and the other hypotheses by including an indicator variable that identifies the degree change in divesting industry concentration resulting from the divestiture (*⊿Ind. Herf. < -100*) as explanatory variables. I include measures of supplier industry concentration (*Supplier Ind. Herf > 1800*) and customer industry concentration *(Customer Ind. Herf. > 1800*) as control variables in the respective regressions to reflect degree of supplier and customer bargaining power and competitiveness, respectively.

I document evidence for the determinants of the wealth effects to supplier firms in column (1) and customer firms in column (2) of Table 10. I estimate the regression models using White's adjusted heteroscedastic standard errors. I report a positive and marginally significant association between divesting firm wealth effects and supplier wealth effects in column (1) and a positive and statistically significant association between divesting firm wealth effects and customer wealth effects in column (2). This evidence suggests that the greater the value generated by divesting firms the more likely suppliers and customers will benefit due to enhanced divesting firm efficiency from restructuring, leading to spillovers to suppliers and customers.

The monopsonistic collusion hypothesis postulates a positive relation between divesting firm pre-divestiture industry concentration and supplier firm wealth effects and a potentially positive (non-negative) relation between pre-divestiture industry concentration and customer firm wealth effects. The monopolistic collusion hypothesis postulates a positive relation between divesting firm pre-divestiture industry concentration and customer firm wealth effects but an indeterminate relation with supplier firm wealth effects. In contrast, the purchasing inefficiency hypothesis posits a potentially non-positive relation between pre-divestiture industry concentration and customer wealth effects but an indeterminate relation with supplier wealth effects. Last, the product market competition hypothesis posits a negative association between pre-divestiture industry concentration and supplier wealth but an indeterminate association with customer wealth effects. I report a positive but statistically insignificant association between pre-divestiture

industry concentration and supplier wealth effects in column (1), whereas, I report a strong positive and significant association between pre-divestiture industry concentration and customer wealth effects in column (2). These results suggest strong support for the monopolistic collusion hypothesis, which suggests that horizontal asset sales decrease the likelihood of industry competitors being able to coordinate a decrease in output, meaning potentially lower input prices and an increase quantity supplied to customer firms.

The purchasing inefficiency hypothesis postulates a non-positive effect of large changes in divesting firm industry concentration on customer wealth effects but an indeterminate impact on supplier wealth effects. In comparison, the product market competition hypothesis posits a negative association between large changes in divesting firm industry concentration on supplier firm wealth effects but an indeterminate association between large changes in divesting firm industry concentration on customer firm wealth effects. I document a positive but statistically insignificant association between large changes in divesting firm industry concentration and supplier wealth effects in column (1) and a strong negative and statistically significant relation between large changes in divesting firm industry concentration and customer wealth effects in column (2). These results are consistent with the purchasing inefficiency hypothesis, suggesting that corporate customers of divesting firms may experience adverse valuations effects resulting from a potential loss in the divesting firm's reduced bargaining power subsequent to divestiture deals that alter the divesting industry's competitive landscape.

5. Conclusion

This paper investigates the upstream and downstream product market impact of a sample of horizontal asset sales from 1988 through 2005. I construct a data set that identifies corporate customers, suppliers, and rival firms from a sample of firms proposing horizontal asset sales. I employ this data set to explore the announcement related stock price reactions and post-divestitures changes in abnormal operating performance. I present evidence that substantial divestiture activity promotes positive changes in the

competitive environment, which enhances managerial incentives to increase firm productivity and reduced factor costs. However, I note that managers undertaking horizontal asset sales must be aware of the risks associated with this event such as potential purchasing inefficiencies that may arise from reduced bargaining power relative to powerful suppliers. This paper complements prior studies on countervailing power (Fee and Thomas, 2004; Shahrur, 2005; Bhattacharyya and Nain, 2011), indicating that substantial horizontal deconsolidation activity may weaken divesting firm countervailing power relative to power suppliers.

Next, this study provides evidence that the competitive landscape matters when considering horizontal asset sales. Divestiture deals that compose a large percent of the industry enhance competition, are associated with lower abnormal labor intensity and employee related expenses, but are exposed to increased abnormal input costs relative to deals that do not compose a large percent of the industry. In contrast, divestiture deals in more concentrated industries result in positive abnormal returns from increased efficiency gains despite rising overhead costs and decreased cash flows for divesting firms. However, divestiture deals in less concentrated industries result in suppliers experience improved abnormal cash flows around the event, while less divesting firms suffer decreased abnormal cash flows. These results provide complementary evidence to prior studies that enhanced industry competition diminishes the prospect of managers being able to live the "quiet-life" (Bertrand and Mullainathan, 2003; Giroud and Mueller, 2001).

Next, I report the significant role that customer switching costs have on corporate customer wealth effects and performance at announcement of upstream divestitures. I find that customers less reliant on divesting firms experience significantly more negative median abnormal returns and more negative than positive abnormal returns than reliant customers. This evidence suggests horizontal asset sales are less beneficial for non-essential customers than those with strong customer-supplier relationships.

This paper also underscores the importance of how supplier retention and termination decisions and supplier switching costs affect supplier wealth effects (performance) at announcement (around the announcement) of downstream divestitures. Multivariate logit analysis of the supplier termination decision indicates that large changes in divesting firm industry competition, high supplier switching costs, and length

of the supplier divesting firm relationship are positively associated with the supplier termination decision. Decreases in divesting firm industry concentration appear to motivate managers to sever ties with suppliers, suggesting that these deals provoke managers cut ties with inefficient suppliers and, also, reduces the chance of managers being able to live the "quiet-life" (Bertrand and Mullainathan, 2003; Giroud and Mueller, 2001).

The multivariate investigation of the determinants of supplier and customer firm wealth effects corroborate the monopolistic collusion hypothesis and purchasing inefficiencies hypothesis. The evidence also corroborates the idea that horizontal asset sales reduce the ability of industry rivals to coordinate a reduction in output, leading to possibly higher output and reduced prices for customer firms. Last, the evidence suggests that horizontal divestitures may produce unintended consequences, such as negative spillover effects for customers. This results from large deals that increase competition in the divesting industry, leading reduced bargaining power and potentially higher customer input costs.

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Table 1
Predicted effects of events increasing/decreasing the probability of a divestiture on divesting firms, rivals, customers, and suppliers
These effects apply to anticipated changes in operating performance that follow divestitures as well stock market reactions to events that increase the probability of divestiture. Panel A presents the hypotheses for the entire sample of divestiture deals. Panel B presents hypotheses for subsamples of divestiture deals with product market considerations.

Hypotheses	Divesting firms	Rivals	Customers	Suppliers
Monopolistic collusion: Decreased ability of industry competitors to coordinate a reduction in output and higher prices	Negative (reduced monopoly rents) More/less pronounced amongst concentrated / Non concentrated firms	Negative (Decreased monopoly rents)	Positive (Lower Prices and quantity increased)	Zero, positive, or negative (Higher input prices or decreased size engenders fewer orders)
Monopsonistic collusion: Decreased ability of industry competitors to coordinate lower input prices	Negative (reduced monopsony rents) More/less pronounced among concentrated / Non concentrated firms	Negative (Decreased monopsony rents)	Zero to positive (customers unaffected or higher quantity and decreased prices)	Positive (higher prices) More pronounced among concentrated supplier industries and concentrated deals
Purchasing inefficiencies / countervailing power considerations: Inability to switch to more efficient suppliers	Negative (higher input costs) More/less pronounced among concentrated / Non concentrated firms	Positive or negative (higher input costs or competitive advantage)	Zero to negative (customers unaffected or cost increase passed along in higher prices) More pronounced for customers with higher switching costs or lower relationship-specific investments	Positive, negative, or zero (higher prices but conceivably lower quantity for retained suppliers) More pronounced for more concentrated suppliers or suppliers with lower switching costs
Product market competition: increased susceptibility to competition for less competitive industries	Positive (decreased probability of living quiet life) More pronounced in more concentrated industries	Positive or negative	Positive, Zero, or negative	Negative (More pronounced for suppliers with higher switching costs or less supplier concentration)

Table 2
Sample description of divesting firms
The sample includes all proposed divestitures initiated between 1988 and 2005 that are covered in the Securities Data Corporation (SDC) database and that also meet the following criteria: Parent was seeking to divest a majority interest through the transaction; announcement date of the deal can be determined via a search of Lexis Nexis and Wall Street Journal newswire. The sample includes all proposed divestitures initiated between 1988 and 2005 that are covered in the Securities Data Corporation (SDC) database and that also do not meet the following criteria: (1) parent firms are private firms, limited partnerships, financial and regulated firms [Compustat historical Standard Industrial Classification (SIC) code 6000-6999, 4000-4099, 4500-4599, or 4800-4999], Real Estate Investment Trusts (REITs), foreign firms, or joint ventures, (2) information on the parent firm is not accessible on Center for Research in Security Prices (CRSP) directly following the divestiture, (3) concurrent announcements are made such as quarterly earnings; issues of equity, preferred stock or warrants; mergers and acquisitions; termination of technical agreements; share repurchases; private placements, dividends; and executive turnover (4) parent firms simultaneously announce an intent to spin off or carve out a unit in addition to divesting assets, (5) the announcement date of the proposed divestiture cannot be determined via a search of newswires and newspapers archived in Lexis-Nexis and WSJ, (6) parent does not have data available in Compustat on both a consolidated and industry –segment basis (7) parent and proposed divestiture target (subsidiary or unit) are not U.S. based, (8) the parent and divestiture target do not have matching SIC codes in SDC Mergers and Acquisitions database. Parent TA is total value of assets in prior calendar year obtained from Compustat and is reported in 2003 dollars. MVE is market value of equity in the prior calendar year obtained from Compustat (calculated as the share price of common stock at fiscal year-end * number common shares outstanding) and is reported in 2003 dollars. Industries in Panel B are defined as in Fama and French (1997).

Year	Deals	Percentage	Average Parent MVE ($ millions)	Average Parent TA ($ millions)	Average NTV ($ millions)	Relative NTV / Parent TA
1988	1	1.23	331.57	50.07	54.45	0.03
1989	1	1.23	36.95	38.57	2.49	0.07
1991	5	6.17	6,041.11	5,922.24	238.93	0.04
1992	5	6.17	571.06	1,673.47	53.17	0.06
1993	2	2.47	3,126.04	6,780.67	154.05	0.02
1994	1	1.23	939.92	2,530.83	67.02	0.03
1996	2	2.47	465.63	865.64	46.78	0.15
1997	4	4.94	10,489.62	7,248.09	99.78	0.15
1998	1	1.23	329.09	857.67	31.52	0.04
1999	9	11.11	5,254.68	7,190.47	69.11	0.07
2000	3	3.70	460.60	467.17	30.19	0.21
2001	5	6.17	9,345.28	6,380.51	255.62	0.05
2002	6	7.41	8,639.27	4,447.30	134.66	0.02
2003	10	12.35	25,234.59	11,581.49	262.34	0.94
2004	6	7.41	3,225.37	5,512.67	89.57	0.03
2005	14	17.28	13,794.63	9,370.32	185.96	0.06
All deals	81	100.00	10,801.58	7,399.85	172.87	0.17

Petroleum and Natural Gas	24	29.63	4,668.98	6,619.70	236.25	0.08
Healthcare	10	12.35	2,742.99	5,821.20	87.27	0.07
Electronic Equipment	10	12.35	24,803.23	13,934.61	170.86	0.92
Pharmaceutical Products	8	9.88	42,087.53	13,247.41	112.29	0.03
Restaurants, Hotels, Motels	7	8.64	9,570.20	8,651.47	126.40	0.01
Business Services	6	7.41	586.49	443.28	57.70	0.10
Retail	5	6.14	10,621.74	8,229.74	474.07	0.10
Other	11	13.58	2,462.80	2,964.47	113.76	0.08
Cash	31	38.27	7,776.74	7,016.98	226.17	0.34
Stock	3	3.70	618.38	387.55	8.15	0.08
Mixed	3	3.70	1,937.59	1,661.90	238.04	0.26
Unknown	44	54.32	14,231.39	8,538.94	142.10	0.06
Intra-industry transaction	43	53.09	13,736.25	8,051.02	190.65	0.07
Inter-industry transaction	38	46.91	7,480.76	6,663.01	152.74	0.29

Table 3
Sample description of corporate customers and suppliers of divesting firms by industry
Customer and supplier market value of equity are calculated two trading days prior to the announcement date. MVE is the market value of equity obtained from CRSP and is reported in 2003 dollars. Industries are defined as in Fama and French (1997).

Industry	Number with customer or supplier as match	Percentage	Number with customer as match	Average Customer MVE ($ millions)	Number with supplier as match	Average Supplier MVE ($ millions)
Electronic Equipment	22	15.71%	3	23,295.29	19	315.45
Petroleum and Natural Gas	21	15.00%	10	56,244.00	11	872.31
Wholesale	11	7.86%	6	9,122.41	5	513.06
Computers	10	7.14%	4	41,921.97	6	122.59
Machinery	10	7.14%	-	-	10	223.73
Communication	10	7.14%	2	58,959.02	8	10,604.83
Business Services	6	4.29%	-	-	6	123.79
Pharmaceutical Products	6	4.29%	-	-	6	1,853.50
Measuring and Control Equipment	5	3.57%	1	13,548.67	4	428.72
Retail	5	3.57%	5	100,609.06	-	-
Automobiles and Trucks	4	2.86%	4	35,458.67	-	-
Trading	4	2.86%	-	-	4	3,158.05
Utilities	4	2.86%	4	14,711.55	-	-
Other	22	15.71%	3	2,288.49	19	549.09
Total	140	100.00%	42	41,148.41	98	1,472.00

Table 4
Average and median abnormal returns for divesting firms, industry rivals, corporate customers and suppliers
Abnormal return is the abnormal return for a three-day window centered on the divestiture announcement date and calculated from a market model estimated over the period from 240 to 41 days before the divestiture announcement. I require at least 100 trading days over the estimation window to calculate abnormal returns. Industry Herf > 1800 are those deals that occurred in industries (four-digit SIC code) in which the pre-divestiture Herfindahl Index was greater than 1800. Industry Herf <= 1800 are those deals that occurred in industries (four-digit SIC code) in which the pre-divestiture Herfindahl Index was less than or equal to 1800. Δ Industry Herf. < -100 are those deals that resulted in a change in the industry Herfindahl Index that were below -100. Δ Industry Herf. >= -100 are those deals that resulted in a change in the industry Herfindahl Index that were greater than or equal to -100. *t-statistics* for abnormal returns are based on tests that the standardized prediction errors are equal to zero. Significance of the number of positive versus number of negative is calculated using a sign test. Significance of the median abnormal return is assessed using a Wilcoxon signed-rank test.

Subsample of deals				
	Industry Herf. >1800	Industry Herf. <=1800	Δ Industry Herf. < -100	Δ Industry Herf. >= -100
Mean abnormal return	2.32%	1.15%	2.50%	1.04%
t-statistic	2.51**	1.31	2.04*	1.41
Median abnormal return	1.04%**	0.71%	1.19%*	0.75%
Positive, negative	19, 11	31, 20	18, 12	32, 19*
Mean abnormal return	-1.99%	-0.58%	-1.87%	-0.63%
t-statistic	-1.80*	-0.86	-1.93*	-0.84
Median abnormal return	-2.01%*	-0.17%	-0.89%	-0.32%
Positive, negative	11, 18	25, 26	13, 17	23, 27
Mean abnormal return	-1.45%	-1.51%	-1.28%	-1.62%
t-statistic	-1.27	-1.90*	1.28	-1.76*
Median abnormal return	-1.67%	-0.45%*	-0.52%	-0.89%*
Positive, negative	12, 17	21, 30	14, 16	19, 31
Mean abnormal return	0.09%	-0.81%	-0.92%	-0.29%
t-statistic	0.09	-1.13	-1.49	-0.32
Median abnormal return	-1.00%	-0.79%	-1.07%**	-0.75%
Positive, negative	4, 7	10, 21*	5, 14*	9, 14
Abnormal return	0.09%	-0.89%	-0.92%	-0.23%
t-statistic	0.09	-1.08	-1.49	-0.19
Median abnormal return	-1.00%	-1.06%	-1.07**	-0.77%
Positive, negative	4, 7	8, 17	5, 14*	7, 10
Mean abnormal return	1.95%	-0.56%	1.66%	-0.58%
t-statistic	1.24	-0.59	1.31	-0.53

Median abnormal return	-0.04%	-0.04%	0.22%	-0.60%
Positive, negative	16, 19	31, 32	21, 19	26, 32
Mean abnormal return	2.44%	-0.60%	1.46%	0.29%
t-statistic	1.21	-0.56	0.72	0.23
Median abnormal return	0.28%	-0.72%	0.41%	-0.60%
Positive, negative	10, 9	10, 16	8, 7	12, 18

***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.

Table 5
Changes in median industry-adjusted operating performance divesting firms, corporate customers and suppliers
Changes in median industry-adjusted operating performance are calculated as post-divestiture industry-adjusted operating performance minus year –1 industry-adjusted operating performance. Cash-flow to sales is defined as the ratio of operating income (item 13) to sales (item 12). Industry Herf > 1800 are those deals that occurred in industries (four-digit SIC code) in which the pre-divestiture Herfindahl Index was greater than 1800. Industry Herf <= 1800 are those deals that occurred in industries (four-digit SIC code) in which the pre-divestiture Herfindahl Index was less than or equal to 1800. Δ Industry Herf. < -100 are those deals that resulted in a change in the industry Herfindahl Index that were below -100. Δ Industry Herf. >= -100 are those deals that resulted in a change in the industry Herfindahl Index that were greater than or equal to -100. Significance of the number of positive versus number of negative is calculated using a sign test. Significance of changes in median industry-adjusted operating performance is assessed using a Wilcoxon signed-rank test.

	Subsample of deals				
	All	Industry Her. >1800	Industry Herf. <=1800	Δ Industry Herf. < -100	Δ Industry Herf. >= -100
Panel A: changes in divesting firm median industry-adjusted cash-flow to sales					
Year –1 to year +1	-2.51%	-2.53%*	-2.47%	-1.39%	-2.75%
Positive, negative	24, 45**	8, 21**	16, 24	8, 17	16, 28*
Year –1 to year +2	-2.08%	-1.58%	-2.92%	-0.56%	-3.45%
Positive, negative	20, 41**	7, 19**	13, 22	7, 15	13, 26*
Year –1 to year +3	-0.94%	-2.80%	0.25%	-6.62%	0.25%
Positive, negative	22, 30	6, 16*	16, 14	4, 14**	18, 16
Year –1 to median post-divestiture	-1.07%	-1.39%**	-0.43%	-0.96%	-1.42%
Positive, negative	27, 42*	7, 22***	20, 20	7, 18**	20, 24
Panel B: changes in individual customer median industry-adjusted cash-flow to sales					
Year –1 to year +1	-0.65%	2.11%	-0.93%	0.48%	-2.00%
Positive, negative	12, 16	4, 3	8, 13	8, 7	4, 9
Year –1 to year +2	0.78%	0.74%	0.78%	0.74%	0.78%
Positive, negative	17, 10	4, 2	13, 8	8, 6	9, 4
Year –1 to year +3	0.41%	-0.42%	1.31%	0.43%	0.40%
Positive, negative	15, 11	3, 3	12, 8	7, 6	8, 5
Year –1 to median post-divestiture	0.88%	1.06%	0.78%	1.06%	0.78%
Positive, negative	17, 11	4, 3	13, 8	8, 7	9, 4

***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.

	All	Industry Her. >1800	Industry Herf. <=1800	Δ Industry Herf. < -100	Δ Industry Herf. >= -100
Panel C: changes in customer portfolio median industry-adjusted cash-flow to sales					
Year –1 to year +1	-0.19%	2.11%	-0.37%	0.48%	-2.00%
Positive, negative	11, 13	4, 3	7, 10	8, 7	3, 6
Year –1 to year +2	0.78%	0.74%	0.78%	0.74%	0.78%
Positive, negative	14, 9	4, 2	10, 7	8, 6	6, 3
Year –1 to year +3	0.41%	-0.42%	1.31%	0.43%	0.39%
Positive, negative	12, 10	3, 3	9, 7	7, 6	5, 4
Year –1 to median post-divestiture	0.88%	1.06%	0.78%	1.06%	0.78%
Positive, negative	14, 10	4, 3	10, 7	8, 7	6, 3
Panel D: changes in individual supplier median industry-adjusted cash-flow to sales					
Year –1 to year +1	3.75%*	-2.66%	5.91%**	-2.66%	11.19%***
Positive, negative	35, 23	10, 11	25, 12**	12, 15	23, 8**
Year –1 to year +2	-4.32%	-3.33%	-5.71%	-11.03%	-0.64%
Positive, negative	15, 25	4, 10	11, 15	4, 14**	11, 11
Year –1 to year +3	-1.62%	-2.64%	-0.59%	-7.60%	2.14%
Positive, negative	18, 20	6, 7	12, 13	6, 10	12, 10
Year –1 to median post-divestiture	1.55%	-2.83%	9.07%*	-4.12%	5.91%
Positive, negative	31, 27	9, 12	22, 15	11, 16	20, 11
Panel E: changes in supplier portfolio median industry-adjusted cash-flow to sales					
Year –1 to year +1	4.01%*	0.11%	5.48%**	1.61%	8.55%**
Positive, negative	21, 8**	5, 4	16, 4**	5, 4	16, 4**
Year –1 to year +2	-4.53%	-4.53%	-4.35%	-6.84%	-4.10%
Positive, negative	9, 14	2, 5	7, 9	2, 6	7, 8
Year –1 to year +3	-1.02%	-1.02%	-1.73%	-6.67%	0.87%
Positive, negative	9, 13	2, 5	8, 8	2, 6	8, 7
Year –1 to median post-divestiture	4.01%	-2.64%	5.06%*	4.01%	4.47%
Positive, negative	19, 10	3, 6	16, 4**	6, 3	13, 7

***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.

Table 6
Sources of losses/gains in abnormal returns and changes in abnormal operating performance
Changes in median industry-adjusted operating performance are calculated as post-divestiture industry-adjusted operating performance minus year –1 industry-adjusted operating performance. Cost of goods sold to sales is defined as the ratio of cost of goods sold (item 30) to sales (item 12). SG&A to sales is defined as the ratio of selling, general, and administrative expense (item 189) to sales (item 12). Employee to sales is defined as the ratio of the number of firm employees (item 29) to sales (item 12). Wage to sales is defined as the product of the number of firm employees (item 29) and the national average wage in a given year obtained from the Social Security Administration (Imrohoroglu and Tüzel, 2014) divided by sales (item 12). Industry Herf > 1800 are those deals that occurred in industries (four-digit SIC code) in which the pre-divestiture Herfindahl Index was greater than 1800. Δ Industry Herf. < -100 are those deals that resulted in a change in the industry Herfindahl Index that were below -100. Δ Industry Herf. >= -100 are those deals that resulted in a change in the industry Herfindahl Index that were greater than or equal to -100. Significance of the number of positive versus number of negative is calculated using a sign test. Significance of changes in median industry-adjusted operating performance is assessed using a Wilcoxon signed-rank test.

	Subsample of deals				
	All	Industry Her. >1800	Industry Herf. <=1800	Δ Industry Herf. < -100	Δ Industry Herf. >= -100
Panel A: changes in divesting firm median industry-adjusted cost of goods sold to sales					
Year –1 to year +1	1.22%	1.33%	1.10%	2.98%*	1.00%
Positive, negative	43, 27*	18, 11	25, 16	18, 7**	25, 20
Year –1 to year +2	1.54%	1.84%	1.23%	2.45%	0.76%
Positive, negative	36, 25	16, 9	20, 16	15, 7	21, 18
Year –1 to year +3	2.40%	2.02%	2.92%	4.85%*	0.38%
Positive, negative	30, 21	14, 10	16, 11	15, 6*	15, 15
Year –1 to median post-divestiture	1.60%	1.33%	1.67%	3.71%*	1.10%
Positive, negative	43, 27*	18, 11	25, 16	19, 6**	24, 21
Panel B: changes in divesting firm median industry-adjusted SG&A expenses to sales for divesting firms					
Year –1 to year +1	0.30%	-0.24%	0.69%	-0.17%	0.56%
Positive, negative	30, 28	10, 15	20, 13	11, 13	19, 15
Year –1 to year +2	-0.15%	-2.17%	2.00%**	-2.14%	1.88%
Positive, negative	23, 26	5, 17**	18, 9	7, 14	16, 12*
Year –1 to year +3	1.15%*	-0.69%	6.97%***	-0.39%	1.59%**
Positive, negative	24. 19	7, 13	17, 6**	8, 10	16, 19
Year –1 to median post-divestiture	-0.25%	-0.39%*	1.59%*	-0.39%	0.45%
Positive, negative	27, 31	7, 18**	20, 13	10, 14	17, 17

***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.

	All	Industry Her. >1800	Industry Herf. <=1800	Δ Industry Herf. < -100	Δ Industry Herf. >= -100
*Panel C: changes in divesting firm median industry-adjusted employees to sales (thousands per million ($)) * 100*					
Year –1 to year +1	-0.03*	-0.04*	-0.01	-0.02*	-0.04
Positive, negative	29, 41	10, 19	19, 22	9, 16	20, 25
Year –1 to year +2	-0.02	-0.08	-0.00	-0.07	0.01
Positive, negative	27, 33	10, 17	17, 26	8, 15	19, 18
Year –1 to year +3	-0.01	-0.02	0.00	-0.04	0.00
Positive, negative	24, 28	9, 15	15, 13	6, 12	17, 16
Year –1 to median post-divestiture	-0.01	-0.06*	0.00	-0.04**	0.01
Positive, negative	30, 40	10, 19	20, 21	6, 19**	24, 21
Panel D: changes in divesting firm median industry-adjusted wage to sales					
Year –1 to year +1	-0.38%	-1.19%**	-0.03%	-0.37%	-0.38%
Positive, negative	30, 40	9, 20*	21, 20	10, 15	20, 25
Year –1 to year +2	-0.79%	-1.98%	0.06%	-1.58%	-0.60%
Positive, negative	27, 35	9, 18	18, 17	8, 15	19, 20
Year –1 to year +3	-0.53%	-0.72%	-0.01%	-0.82%	-0.24%
Positive, negative	23, 31	8, 16	15, 15	6, 13	17, 18
Year –1 to median post-divestiture	-0.28%	-1.35%*	-0.29%	-0.39%*	0.30%
Positive, negative	30, 40	9, 20*	21, 20	5, 19**	23, 22
Panel E: changes in individual customer cost of goods sold to sales					
Year –1 to year +1	-0.22%	-1.39%	-0.14%	-0.93%	0.99%
Positive, negative	13, 15	3, 4	10, 11	6, 9	7, 6
Year –1 to year +2	-1.05%	1.03%	-1.05%	-0.65%	-1.05%
Positive, negative	12, 16	4, 3	8, 13	7, 8	5, 8
Year –1 to year +3	-0.30%	1.59%**	-1.17%	0.74%	-1.14%
Positive, negative	11, 14	6, 1	5, 13*	8, 6	3, 8
Year –1 to median post-divestiture	-0.57%	1.03%	-1.00%	-1.00%	0.99%
Positive, negative	13, 15	4, 3	9, 12	6, 9	7, 6

	All	Industry Her. >1800	Industry Herf. <=1800	Δ Industry Herf. < -100	Δ Industry Herf. >= -100
Panel F: changes in customer portfolio cost of goods sold to sales					
Year –1 to year +1	-0.22%	-1.39%	-0.14%	-0.93%	0.99%
Positive, negative	11, 13	3, 4	8, 9	6, 9	5, 4
Year –1 to year +2	-0.85%	1.03%	-1.05%	-0.65%	-1.05%
Positive, negative	11, 13	4, 3	7, 10	7, 8	4, 5
Year –1 to year +3	-0.29%	1.59%**	-1.14%	0.74%	-1.04%
Positive, negative	10, 12	6, 1	4, 11	8, 6	2, 6
Year –1 to median post-divestiture	-0.57%	1.03%	-1.00%	-1.00%	0.99%
Positive, negative	11, 13	4, 3	7, 10	6, 9	5, 4

***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.

Table 7

Performance differences for customer subsamples: non-concentrated versus concentrated; and reliant versus non-reliant

Non-concentrated customers classifies corporate customers that have a 4-digit industry Herfindahl that is less than or equal to1800. Concentrated customers classifies corporate customers that have a 4-digit industry Herfindahl that is greater than 1800. Reliant classifies customers that have a ratio of customer sales (to the divesting firm) divided by the market value of the customer firm two days prior to the event that is greater than 2.5%. Non-reliant classifies customers that have a ratio of customer sales (to the divesting firm) divided by the market value of the customer firm two days prior to the event that is less than or equal to 2.5%. Abnormal return is the abnormal return for supplier firms over a three day window centered on the merger announcement date. Changes in median supplier industry-adjusted cash-flow to sales are calculated as median post-divestiture industry-adjusted cash-flow to sales minus year –1 industry-adjusted cash-flow to sales. Significance of differences in abnormal returns is assessed using a t-test. Significance of differences in median abnormal returns and changes in median industry-adjusted operating performance is assessed using a Wilcoxon signed-rank test.

Panel A: performance differences between non-concentrated and concentrated individual customers			
	Non-concentrated customers	Concentrated customers	Difference
Mean abnormal returns	-0.45%	-0.85%	-0.40%
t-statistic	-0.68	-0.74	0.32
Median abnormal returns	-1.07%*	0.40%	1.47%
Positive, negative	7, 22***	7, 6	
Change in median industry-adjusted cash-flow to sales	1.06%	0.18%	-0.88%
Positive, negative	13, 8	4, 3	
Panel B: performance differences between non-concentrated and concentrated for customer portfolios			
Mean abnormal returns	-0.32%	-1.18%	-0.87%
t-statistic	-0.43	-0.99	0.64
Median abnormal returns	-1.07%	0.12%	1.19%
Positive, negative	7, 19**	6, 6	
Change in median industry-adjusted cash-flow to sales	1.06%	-0.10%	-1.16%
Positive, negative	12, 7	3, 3	
Panel C: performance differences between reliant and non-reliant individual customers			
	Reliant	Non-reliant	Difference
Mean abnormal returns	-0.47%	-0.64%	-0.17%
t-statistic	-0.59	-0.80	0.14
Median abnormal returns	-0.47%	-1.08%*	-0.61%
Positive, negative	7, 9	7, 19**	
Change in median industry-adjusted cash-flow to sales	1.41%	0.48%	-0.93%
Positive, negative	5, 3	12, 8	
Panel D: performance differences between reliant and non-reliant customer portfolios			
Mean abnormal returns	-0.76%	-0.60%	0.16%
t-statistic	-0.97	-0.69	0.13
Median abnormal returns	-0.79%	-1.07%*	-0.28%
Positive, negative	6, 9	6, 17**	
Change in median industry-adjusted cash-flow to sales	1.41%	0.88%	-0.53%
Positive, negative	4, 3	11, 7	

***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.

Table 8

Supplier termination decision and performance differences for supplier subsamples

Panel A presents the results of a logit regression where the dependent variable is equal to one if a supplier is terminated in year after divestiture and zero otherwise. The sample for this analysis consists of suppliers with non-missing 3-day cumulative abnormal returns around completed divestitures. *Divesting firm abnormal returns* are the 3-day mean cumulative abnormal returns centered on the divestiture announcement for divesting firm using market-model. *Suppliers with single large customer* is defined as suppliers that disclose only one large public customer in the Compustat Customer Segment Database. *Supplier industry concentration* is a binary variable which is equal to one if the supplier industry Herfindahl is greater than 1800 and zero otherwise. *Relative deal size* is the ratio of deal transaction value to the market value of common equity in the year prior to the divestiture. *Relationship Duration* is the number of years in which there has been a consistent reported customer-supplier relationship in the Compustat Customer Segment Database. *Industry Herf > 1800* are those deals that occurred in industries (four-digit SIC code) in which the pre-divestiture Herfindahl Index was greater than 1800. Δ *Industry Herf. < -100* are those deals that resulted in a change in the industry Herfindahl Index that were below -100. *Cash* is a binary variable that is equal to one if the method of payment was cash and is equal to zero otherwise. *Non-concentrated suppliers* classifies suppliers that have a 4-digit industry Herfindahl that is less than or equal to 1800. *Concentrated suppliers* classifies suppliers that have a 4-digit industry Herfindahl that is greater than 1800. *Retained suppliers* are those suppliers that were listed as suppliers before and after a deal. *Terminated suppliers* are those suppliers that were listed as suppliers before a deal but not after. *Suppliers w/multiple large customers* is defined as suppliers that disclose more than one large public customer in the Compustat Customer Segment Database. *Suppliers w/single large customer* is defined as suppliers that disclose only one large public customer in the Compustat Customer Segment Database. Abnormal return is the abnormal return for supplier firms over a three day window centered on the merger announcement date. Changes in median supplier industry-adjusted cash-flow to sales are calculated as median post-divestiture industry-adjusted cash-flow to sales minus year –1 industry-adjusted cash-flow to sales. Chi-squared statistics are reported in parentheses to determine significance of logit regression coefficients. Significance of differences in abnormal returns is assessed using a t-test. Significance of differences in median abnormal returns and changes in median industry-adjusted operating performance is assessed using a Wilcoxon signed-rank test.

Panel A: logit regression analysis of supplier termination decision

	Dependent variable: Supplier Terminated
Intercept	-4.252***
	(11.27)
Divesting firm abnormal returns	0.260**
	(4.38)
Supplier with single large customer	1.975*
	(3.19)
Relative deal size	-6.237
	(0.17)
Supplier industry concentration	-0.477
	(0.18)
Relationship Duration	1.027**
	(5.84)
Industry Herf > 1800	-1.228
	(1.01)
Δ Industry Herf < -100	2.450**
	(4.87)
Cash	-3.667*
	(5.37)
Pseudo R^2	0.431
Observations	71

***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.

Panel B: performance differences between non-concentrated and concentrated for individual suppliers			
	Non-concentrated suppliers	Concentrated suppliers	Difference
Mean abnormal returns	-0.69%	1.55%	2.25%
t-statistic	-0.67	1.17	1.35
Median abnormal returns	-0.95%*	1.85%	2.80%
Positive, negative	21, 32	26, 19	
Change in median industry-adjusted cash-flow to sales	2.96%	1.54%	-1.42%
Positive, negative	14, 12	16, 15	
Panel C: performance differences between non-concentrated and concentrated for supplier portfolios			
Mean abnormal returns	-1.15%	2.20%	3.35%
t-statistic	-0.98	1.27	1.66
Median abnormal returns	-0.76%	1.33%	2.09%*
Positive, negative	12, 21	16, 7*	
Change in median industry-adjusted cash-flow to sales	4.47%	1.57%	-2.90%
Positive, negative	12, 6	9, 7	
Panel D: performance differences between terminated and retained individual suppliers			
	Terminated	Retained	Difference
Mean abnormal returns	-1.76%	1.13%	2.89%
t-statistic	-1.29	1.12	1.57
Median abnormal returns	-1.39%	0.04%	1.43%
Positive, negative	11, 16	36, 35	
Change in median industry-adjusted cash-flow to sales	-12.08%**	5.46%**	17.54%***
Positive, negative	4, 11	26, 16	
Panel E: performance differences between terminated and retained supplier portfolios			
	Terminated	Retained	Difference
Mean abnormal returns	-3.36%	1.44%	4.80%
t-statistic	-2.10*	1.16	2.26**
Median abnormal returns	-1.83%**	0.27%	1.59%**
Positive, negative	4, 13**	20, 17	
Change in median industry-adjusted cash-flow to sales	-7.03%	5.91%**	12.94%**
Positive, negative	4, 7	15, 6*	

***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.

	Suppliers w/single large customer	Suppliers w/multiple customers	Difference
Panel F: performance differences between individual suppliers with a single large customer and multiple large customers			
Mean abnormal returns	-2.16%	1.29%	3.44%
t-statistic	-1.90*	1.23	2.23**
Median abnormal returns	-1.77%*	0.19%	1.96%**
Positive, negative	10, 17	37, 34	
Change in median industry-adjusted cash-flow to sales	-0.59%	4.22%	4.81%
Positive, negative	8, 9	22, 18	
Panel G: performance differences between supplier portfolios with a single large customer and multiple large customers			
Mean abnormal returns	-1.90%	1.54%	3.44%
t-statistic	-1.93*	1.27	2.21**
Median abnormal returns	-2.27%*	0.20%	2.47%
Positive, negative	7, 10	20, 18	
Change in median industry-adjusted cash-flow to sales	-2.94%	5.91%*	8.85%
Positive, negative	5, 7	15, 8	

***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.

Table 9

Determinants of divesting firms' wealth effects at the announcement of horizontal asset sales

Independent variables are in the year prior to the divestiture. *Tobins_Q* is defined as the ratio of the firm's market value of assets (price at fiscal year-end close (item 199) * common shares outstanding (item 25) plus total assets (item 6) less book value of common equity (item 60) to the book value of total assets (item 6). *NEED_FOR_FUNDS* as the difference between capital expenditures and the sum of operating income before depreciation and change in net working capital in the year prior to the divestiture announcement. *ALTMAN_Z_SCORE* is the sum of 3.3* earnings before interest and taxes scaled total assets, 0.99* net sales scaled by total assets, 0.6*market capitalization at fiscal year-end scaled by total liabilities, 1.2* current assets scaled by total assets, and 1.4*retained earnings scaled by total assets. *COGSSALE* is defined as the ratio of cost of goods sold (item 30) to sales (item 12). *SGASALE* is defined as the ratio of selling, general, and administrative expense (item 189) to sales (item 12). Employee to sales is defined as the ratio of the number of firm employees (item 29) to sales (item 12). *WAGESALE* is defined as the product of the number of firm employees (item 29) and the national average wage in a given year obtained from the Social Security Administration (Imrohoroglu and Tüzel, (2014) divided by sales (item 12). *Ind. Herf.>1800* are those deals that occurred in industries (four-digit SIC code) in which the pre-divestiture Herfindahl Index was greater than 1800. Δ *Ind. Herf.<-100* are those deals that resulted in a change in the industry Herfindahl Index that were below -100. *CASH* is an indicator variable that is equal to one if the deal was all cash deal, and equal to zero otherwise. *REL_SIZE* is the net transaction value of the asset sale scaled by the prior year's market value of equity. CARs is the abnormal return for divesting parent firms over the three-day window centered on the divestiture announcement date. *t-statistics* are based on the White-adjusted standard errors in parentheses.

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variable	CARs	CARs	CARs	CARs	CARs	CARs	CARs	CARs	CARs	CARs	CARs	CARs
TOBINS_Q	-1.397**									-1.376	-1.867	-1.929
	(-2.21)									(-1.43)	(-1.61)	(-1.62)
NEED_FOR_FUNDS		5.649***									7.221***	7.654**
		(3.44)									(3.05)	(2.26)
ALTMAN_Z_SCORE			-0.230							0.119	0.308	0.345
			(-0.90)							(0.31)	(0.85)	(0.85)
COGSSALE				1.649							-7.193**	-7.904*
				(0.78)							(-2.25)	(-1.94)
EMPSALE					98.430*					140.381**	168.598***	
					(1.74)					(2.37)	(2.72)	
WAGESALE						3.906*						6.507**
						(1.75)						(2.58)
SGASALE							4.330*			5.447*		-1.030
							(1.75)			(1.97)		(-0.24)
Ind. Herf.>1800								0.476		0.451	1.165	1.157
								(0.31)		(0.27)	(0.71)	(0.69)
Δ *Ind. Herf <-100*								1.168		1.864	1.004	1.013
								(0.69)		(1.11)	(0.60)	(0.58)
CASH									6.440*	2.459*	2.844**	2.896**
									(2.54)	(1.74)	(2.05)	(2.01)
REL_SIZE									2.756**	3.551	4.152	4.270
									(1.97)	(1.28)	(1.57)	(1.66)
SAME_INDUSTRY									-0.250	0.444	-0.189	-0.186
									(-0.19)	(0.28)	(-0.12)	(-0.12)
Intercept	3.897	2.311	2.704	1.010	1.361	1.276	0.842	1.236	0.102	-1.218	4.554	5.013
	(3.27)	(2.95)	(2.33)	(0.76)	(1.72)	(1.58)	(1.03)	(1.26)	(0.09)	(-0.56)	(1.31)	(1.32)
R^2	0.054	0.056	0.013	0.005	0.014	0.018	0.023	0.013	0.118	0.196	0.2411	0.25

***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.

Table 10
Determinants of supplier and customer firms' wealth effects at the announcement of horizontal asset sales
The dependent variable in regression model (1) is *Supplier abnormal returns*. The dependent variable in regression model (2) *Supplier abnormal returns* is the abnormal return for supplier firms over the three-day window centered on the (downstream) divestiture announcement date. *Customer abnormal returns* is the abnormal return for customer firms over the three-day window centered on the (upstream) divestiture announcement date. *Divesting firm abnormal returns* is the abnormal return for divesting parent firms over the three-day window centered on the divestiture announcement date. S*upplier with single large customer* is defined as suppliers that disclose only one large public customer in the Compustat Customer Segment Database. *Reliant customer* is an indicator variable that is equal to one if customers that have a ratio of customer sales (to the divesting firm) divided by the market value of the customer firm two days prior to the event that is greater than 2.5% and is equal to zero, otherwise. *Supplier Ind. Herf.>1800* are divestiture deals that occurred in supplier industries (four-digit SIC code) in which the supplier's pre-divestiture Herfindahl Index was greater than 1800. *Customer Ind. Herf.>1800* are divestiture deals that occurred in customer industries (four-digit SIC code) in which the customer's pre-divestiture Herfindahl Index was greater than 1800. *Ind. Herf.>1800* are those deals that occurred in industries (four-digit SIC code) in which the pre-divestiture Herfindahl Index was greater than 1800. Δ *Ind. Herf.<-100* are those deals that resulted in a change in the industry Herfindahl Index that were below -100. *Cash* is an indicator variable that is equal to one if the deal was all cash deal, and equal to zero otherwise. *Duration of supplier relationship* is the number of years in which there has been a consistent reported customer-supplier relationship in the Compustat Customer Segment Database. *t-statistics* are based on the White-adjusted standard errors in parentheses.

	(1)	(2)
Dependent variable	*Supplier abnormal returns*	*Customer abnormal returns*
Divesting firm abnormal returns	0.353*	0.255***
	(1.79)	(4.17)
Supplier with single large customer	-5.226***	
	(-2.94)	
Duration of supplier relationship	-1.035**	
	(-2.01)	
Reliant customer		-0.060
		(-0.06)
Cash	-1.158	-3.177***
	(-0.61)	(-3.54)
Ind. Herf > 1800	1.431	3.209***
	(0.75)	(2.80)
Δ Ind. Herf < -100	2.269	-2.993***
	(1.13)	(-3.16)
Supplier Ind. Herf > 1800	-1.687	
	(-0.96)	
Customer Ind. Herf > 1800		-0.190
		(0.23)
Intercept	4.595**	1.085*
	(2.13)	(1.73)
Adjusted R^2	0.16	0.53
Number of observations	71	32

***, **, and * denote significance at the 0.01, 0.05, and 0.10 level, respectively.