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# Essays On Horizontal Divestitures And Product Market Relationships

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**ESSAYS ON HORIZONTAL DIVESTITURES AND PRODUCT MARKET RELATIONSHIPS**

by

**NORKEITH ERVIN SMITH**

**DISSERTATION**

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

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## CHAPTER 1: INTRODUCTION

### 1.1. Background

This dissertation is composed of two essays on horizontal divestitures and product market relationships. The first essay of my dissertation explores horizontal asset sale activity from 1988-2005, at the firm level, utilizing a database of customer, supplier, and rival firms in order to investigate the wealth effects of horizontal divestitures on divesting firms, industry rivals, corporate customers, and suppliers. Subsequently, I investigate the impact of horizontal asset sales on changes in operating performance around the divestitures for divesting firms, corporate customers, and suppliers.

The second essay of my dissertation investigates this topic by exploring quarterly horizontal divestiture activity at the industry level by aggregating firm level divestitures by industry using a sample of horizontal divestitures from 1979-2010. I explore whether customer (supplier) industry level horizontal divestiture activity has implications for the profitability and value of supplier (customer) industries. Additionally, I consider whether customer (supplier) industry level divestiture activity influences real producers' prices (input costs) charged (faced) by upstream (downstream) firms. Finally, I determine whether industry dependence and barriers to entry play a vital role in changes in supplier (customer) industry cash-flow margins and real producers' prices (input costs) around horizontal divestiture events.

What exactly are horizontal divestitures? Horizontal divestitures represent asset sales, spinoffs, or equity carve-outs of a subsidiary, division, business line, or asset that operates within the *same industry* or *same stage of the production process* (along the supply chain) as the firm's primary line of business. In other words, horizontal divestitures signify a reduction or contraction in divesting firm size in its primary line of operating activities.

Prior research focuses on corporate events that increase relative firm size and its impact along the supply chain. These studies investigate events in which the firm increases in size at the same stage of the production process (i.e. horizontal takeovers or acquisitions), 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). This line of research has explored, both, firm level and

aggregate industry level horizontal expansion activity on the product market. Another line of related research investigates the impact of, firm level, vertical divestitures—an event in which the firm decreases its relative size via successive stages of the production process—along the supply chain by exploring equity carve-outs and spinoffs. Consequently, the literature fails address the motivations behind horizontal contractions or divestitures and the implications on the divesting firms, rival firms, customer (downstream) firms, and supplier (upstream) firms. This dissertation attempts to fill this gap in the literature.

The first essay entitled “What are the motives and consequences behind horizontal asset sales? Evidence from customer, supplier, and rival firms.” explores the firm level motivations of horizontal asset sales and the implications for divesting firms, rivals, corporate customers, and suppliers. Using a sample of horizontal asset sales, I compare the wealth effects and operating performance of divesting firms, rival firms, customer firms, and supplier firms, to determine the relative significance of industry demand shocks, financial constraints, diseconomies of scale / efficiency, or financial distress related motivations behind horizontal asset sales. Using this approach, this is the first study, to my knowledge, to document the product market effects of horizontal divestitures, rather than considering these effects in isolation.

Prior research suggests that environmental factors such as the level of product market concentration and changes in concentration affect firm financial and operating performance. This essay considers how the level and the extent of changes in industry concentration enhance or lessen the wealth effects at the announcement of horizontal asset sales. I also consider how these environmental factors may affect changes in operating performance around horizontal asset sales. Specifically, I consider how the probability of reduced selling power, reduced buyer power, reduced purchasing efficiencies, or enhanced product market competition may influence the anticipated gains and losses associated with the primary motivations of horizontal asset sales.

The second essay entitled “Is your loss my gain? Horizontal divestitures and product market relationships.” explores industry level horizontal divestiture activity and the industry-wide repercussions for customer (downstream) firms, suppliers (upstream) firms, and rival (side-stream) firms. Using a



sample of 46 downstream (35 upstream) industry-level horizontal divestiture events, I conduct a cross-industry analysis of the product market effect of industry horizontal divestiture activity on supplier industries, leading to 274 (35) industry-supplier (industry-customer) pairs from 1979-2010. I empirically test whether downstream industry level horizontal divestiture activity diminishes buying power of customer (downstream) industries relative to supplier (upstream) industries, enhances the relative bargaining position of repositioning customer (downstream) industries, or produces offsetting input price increases and decreases by price discriminating suppliers. Additionally, I test whether upstream industry level divestiture activity diminishes selling power of supplier (downstream) industries and prompts customers to exploit suppliers to negotiate lower input costs, leading to increased profitability. Specifically, I test whether supplier opportunism, customer opportunism, or rival opportunism plays a role in potential changes in supplier (upstream) industry cash-flow margins, value, and real producers' prices following industry-level divestiture activity. In addition, I investigate whether customer opportunism plays a substantial role in the changes of customer (downstream) industry cash-flow margins, value, and input costs subsequent to upstream divestiture activity.

Prior research documents that customer (downstream) industry-level horizontal acquisition (or merger) activity produces buying power relative to supplier (upstream) industries due to downstream consolidation (increased market/bargaining power). The enhanced buying power for downstream industries adversely impacts the performance of economically dependent supplier industries, leading to substantial declines in supplier profitability and supplier prices subsequent to downstream consolidation. This evidence suggests that customer (downstream) deconsolidation (horizontal divestiture activity) may adversely impact the buying power of downstream firms relative to upstream firms. Therefore, downstream horizontal divestiture activity suggests that economic (industry dependence) may enhance the economic performance and pricing power of upstream firms favorably.

## **1.2. Organization of the Dissertation**

This dissertation is organized as follows. The first essay is presented in Chapter 2 and comprises an introduction, hypothesis development and literature review, a discussion of data sources, sample

formation, empirical methodology, results, and conclusions. The second essay is presented in Chapter 3 and comprises an introduction, discussion of empirical existing literature, motivation and development of testable hypotheses, sample construction, empirical methodology, results, and conclusions. Chapter 4 discusses overall conclusions. Tables are contained within appendices at the end of the dissertation.

## **CHAPTER 2: WHAT ARE THE MOTIVES AND CONSEQUENCES BEHIND HORIZONTAL ASSET SALES? EVIDENCE FROM CUSTOMER, SUPPLIER, AND RIVAL FIRMS.**

### **2.1. Introduction**

What are the motivations behind horizontal assets sales? One line of research contends that asset sales are driven by efficiency considerations (Mulherin and Boone, 2000; Maksimovic and Phillips, 2001; Warusawitharan, 2008; Yang, 2008) that may be an efficient firm response to changes in optimal firm size, a reallocation to higher valued uses, or changing economic conditions. Other lines of research suggest that asset sales are determined by financing considerations (Lang, Poulsen, and Stulz, 1995, Gadad and Thomas, 2005) or financial distress (Shleifer and Vishny, 1992; Brown, James, and Mooradian, 1994). A fourth line of thought proposes that asset sales are driven by gains related to corporate focus considerations (John and Ofek, 1995). With the exception of Slovin, Sushka, and Ferraro (1995), very little research considers the role that economic linkages play in these transactions by considering the impact on industry rivals, corporate customers, and corporate suppliers.

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, 1963, 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 rivals, corporate customers, and suppliers, as well.

This study investigates the motivations and consequences of horizontal divestitures using a dataset of 81 horizontal divestitures.<sup>1</sup> Multivariate analysis of divesting firm abnormal returns indicate the wealth effects of horizontal asset sales are driven primarily by reducing pre-divestiture financing frictions and scale diseconomies within the firm. I also find mixed evidence regarding divesting firm underperformance subsequent to divestiture, providing some support that some firms in financial distress engage in horizontal asset sales. This study documents that increased product market competition, resulting from substantial horizontal divestiture activity, enhances managerial performance and increase firm efficiency. However, I also note that horizontal asset sales reduce divesting firm bargaining power. Consequently, suppliers appear to take advantage of this notion by raising input costs, which lessens the magnitude of the gains associated with horizontal asset sales. I report that some of the gains from horizontal asset sales are more pronounced in concentrated industries and industries that experience a large change in industry concentration, leading to lower overhead costs, labor intensity, and wage related expenses. However, the gains from horizontal divestitures are less pronounced due to a decrease in purchasing efficiencies resulting from higher input costs in industries that have a large decrease in industry concentration.

I present evidence that corporate customers of upstream (supplier) divesting firms experience more negative than positive stock price reactions and a significant increase in input costs subsequent to upstream divestitures in more concentrated industries, suggesting that divesting suppliers face increasing competitive pressures to maintain cash-flow performance and increase input costs for their customers. The customer wealth effects are more pronounced in response to upstream divestitures that compose a large proportion of the industry. For deals in concentrated industries, the post-divestiture median industry-adjusted costs of goods sold-to-sales ratio increases temporarily, while it decreases temporarily for deals in less concentrated industries. Non-reliant individual customers and customer portfolios experience significantly more negative than positive abnormal returns relative to reliant customers. Univariate evidence from customer reliant and non-reliant subsamples indicate that horizontal asset sales are less

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<sup>1</sup> Asset sales, sell-offs, and divestitures are used interchangeably, hereafter.

beneficial for non-essential customers than those customers with greater relationship specific investments, providing evidence that divesting firms appear to pass along higher input costs from reduced bargaining power with suppliers along to customers that are less important to their business.

I report 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. These effects are more pronounced for deals in less concentrated industries and for divestiture deals that do not substantially change the competitive landscape. This evidence indicates that suppliers are better positioned to take advantage of the reduced size of divesting downstream firms, in more competitive industries, by instituting higher input prices post-divestiture: providing evidence in support of the purchasing inefficiencies hypothesis.

I follow Fee and Thomas (2004) and examine the supplier termination retention decision to examine whether divesting firms look to increase efficiency subsequent to the divestiture or 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 end long-term supplier relationships and those terminate suppliers with higher switching costs, indicating that divesting firms increase efficiency and value by breaching implicit contracts with suppliers.

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. Concentrated suppliers appear to benefit from downstream divestitures, while non-concentrated suppliers appear to be disadvantaged by divestitures. Overall, I find that the overall impact of downstream horizontal asset sales on suppliers depends on supplier concentration, 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, the extant literature on corporate restructuring tends to concentrate primarily on corporate events that increase relative firm size, which may change the dynamics between customer firms and suppliers (Fee and Thomas, 2004; Shahrur, 2005; Bhattacharyya and Nain; Shenoy, 2012; and Greene, Kini, and Shenoy, 2013). The exception to this statement is Jain, Kini, and Shenoy (2011), who investigate the product market implications of vertical divestitures. 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). In contrast, Jain, Kini, and, Shenoy (2011) investigate customer supplier relationships using vertical divestitures (equity carveouts and spinoffs)—an event in which the firm *decreases its relative size via successive stages of the production process*. While the motives and consequences of horizontal expansions have been well established, a scarcity of empirical evidence on horizontal contractions exists. Therefore, I endeavor to fill a void in this stream of literature by investigating a corporate event that *decreases relative firm size at the same stage of the production process*, horizontal asset sales. Horizontal divestitures represent an important area to study because, unlike a vertical or non-horizontal divestiture, it does not increase firm focus (in certain situations, a horizontal divestiture may decrease firm focus in a

diversified firm) and may have unintended consequences for the divesting in the product market such as reduced bargaining power or ability to collude.

This study extends the line of research that examines the impact of corporate events on product market relationships. This is the first paper, to my knowledge, that explores the impact of asset sales on customer-supplier 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.

Fee and Thomas (2004), Shahrur (2005), and Bhattacharyya and Nain (2011) explore the impact of horizontal mergers on product market relationships. Additionally, prior research examines the effect of vertical restructuring on product market relationships such as takeovers (Shenoy, 2012) and carveouts and spin-offs (Jain, Kini, and Shenoy, 2011), while this study focuses on horizontal asset sales product market relationships with respect to divestitures. The primary difference between this study and that of John and Ofek (1995) is that this study extends the analysis of sell-offs to include the valuation effects on corporate customers, suppliers, and rivals, whereas, John and Ofek (1995) do not. John and Ofek concentrate on focus increasing asset sales, whereas my primary event is horizontal asset sales (events that may potentially decrease firm focus in the case of a diversified or multiple segment firm). In contrast John and Ofek's (1995) study, this study also examines the wealth effects of horizontal divestitures and also entails substantially larger sample of asset sales (my sample is more than 1.7 times the size of John and Ofek's sample). To my understanding, there exists no prior studies that investigate the impact of horizontal asset sell-offs on corporate customers and suppliers.

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 the notion that horizontal asset sales result in the divesting firm's decreased ability to counteract the market power of powerful suppliers as a consequence of reduced firm size. Additionally, I present evidence consistent with the idea that some divesting firms become exposed to increased competitive pressures resulting from divestiture deals in concentrated industries and those deals that compose a large percent of the industry. These 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.

Third, 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. In addition, I report that customers with low switching costs (less reliant) or low relationship-specific investments experience negative wealth effects at announcement of upstream horizontal divestitures. 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.

Finally, this study also contributes to the literature on the source of gains of asset sales. Prior literature suggests that gains related to asset sales come from financing consideration (Lang, Poulsen, and Stulz, 1995), corporate focus considerations (John and Ofek, 1995), and efficiency considerations (Hite, Owers, and Rogers, 1987; Maksimovic and Phillips, 2001, 2002). Using multivariate regression analysis, I that pre-divestiture labor intensity, overhead costs, and financing constraints are positively related to



divesting firm abnormal returns suggesting that a reduction firm bureaucracy and financing frictions are the primary source of gains for horizontal asset sales. In addition, I note that managers use horizontal divestitures as an opportunity to increase the efficiency of the firm's contracts with corporate suppliers and customers, similar to the way in which horizontal mergers are used as an opportunity to terminate the merging firm's relationship with inefficient suppliers (Fee and Thomas, 2004). In particular, some of the gains from asset sales are achieved through the reduction of the firms' labor intensity, overhead costs, and wage related expenses in concentrated industries that may be suffering from corporate bureaucracy, suggesting that the gains come from the disposition of human capital rather than physical capital.

The remainder of this chapter continues as follows. Section 2.2 develops the hypotheses that are empirically tested and discusses the relevant literature. Section 2.3 discusses the data sources, sample formation requirements, and empirical methodology. Section 2.4 presents the results. Section 2.5 provides a summary of the findings and concluding remarks.

## **2.2. Hypothesis development and related literature**

This section of the paper develops the hypotheses for the entire sample of divestitures. In particular, I motivate the industry demand hypothesis, financing hypothesis, diseconomies of scale / efficiency hypothesis, and financial distress hypothesis.

### *2.2.1. Industry demand considerations*

Prior research indicates that asset sales are events that transfer assets to higher valued uses due to differential productivity among industry firms (Maksimovic and Phillips 2001, 2002). More specifically, firms divest less productive assets, divisions, or subsidiaries to more proficient firms in the industry, resulting from an industry demand shock. Consequently, I posit that industry demand shocks generate a positive reaction from the divesting firm. Industry competitors may respond positive or negatively in response to the event. For instance, less efficient rivals may react negatively in response to a more efficient firm post-divestiture or positively in response to information of positive demand shocks for their less productive divisions. Corporate customers are likely to respond positively in response to a more efficient divesting firm and a higher valued subsidiary or division in the hands of a more capable

producer. I conjecture that corporate suppliers may react positively or not at all in response to an industry demand shock. Suppliers may face a more valuable and productive customer post-divestiture due to a more efficient parent and subsidiary. Alternatively, suppliers may face a more efficient customer that is able to increase its value without increasing its demand for inputs.

It is well established that prior studies use Tobin's Q a proxy for firm growth prospects/managerial productivity, therefore, I employ the variable *Tobins\_Q* in the year prior to the divestiture as a proxy for the demand conditions for firm assets. I define *Tobins\_Q* as the ratio of the firm's market value of assets to the book value of firm assets: price at fiscal year-end close (Compustat item 199) \* common shares outstanding (Compustat item 25) plus total assets (Compustat item 6) less book value of common equity (Compustat item 60) scaled by total assets (Compustat item 6). Maksimovic and Phillips (2001) surmise that there is a greater likelihood that less productive firms will sell segments to more productive producers. Thus, if managerial productivity is low for the divesting firm, then there will be a greater demand for the firm division sold.

### 2.2.2. *Financing considerations*

The financing hypothesis contends that assets sales deliver funds when different sources of funding are too costly due to agency costs of debt or information asymmetries that make equity sales unappealing (Lang, Poulsen, and Stulz, 1995). Several studies argue that financing considerations are important in divestiture decisions (Lang, Poulsen, and Stulz, 1995; Colak and Whited, 2007; Jain, Kini, and Shenoy, 2011). Lang Poulsen and Stulz (1995) find that firms selling assets 1) are likely poor performers, 2) have considerable leverage likely driven by its financial condition rather than another firm having comparative advantage in operating assets, and 3) respond positively to asset sales planning to use proceeds to pay down debt.

Jain, Kini, and Shenoy (2011) document that industry financing conditions influence the choice to vertically divest rather than internal financing constraints. Given that the divesting firm and the asset, subsidiary or division are in the same industry, industry financing conditions can be ruled out since both

are equally affected. However, internal financing constraints of the parent firm could still explain horizontal divestitures.

Therefore, I postulate that financing constraints in the fiscal year prior to the divestiture produce a positive reaction from divesting firms. Industry rivals may face a more competitive firm that can take advantage of investment opportunities eliciting a negative reaction. However, industry competitors with similar or worse financing constraints will receive information on how to resolve financial constraints of their own, resulting in a positive contagion effect and, therefore, a positive stock price reaction. Eliminating financing constraints suggests that divesting firms can take advantage of investment opportunities leading to increased demand for inputs. Therefore, suppliers may react positively to the reduction of financial constraints. Customers, similarly, may respond positively to divesting firms who overcome financial constraints due to higher quality products or new offerings. I follow Jain, Kini, and Shenoy (2011) and proxy financing constraints with the variable *NEED\_FOR\_FUNDS* as the difference between capital expenditures (Compustat item 128) and the sum of operating income before depreciation (Compustat item 13) and change in net working capital (Compustat item 4 less Compustat item 5) in the year prior to the divestiture announcement.

### 2.2.3. *Diseconomies of scale/Efficiency*

Several papers suggest that managerial and coordination costs linked to diseconomies of scale influence firm size. Coase (1937) conjectures that firm size varies over time in response to: changes in marketing costs and diminishing returns to management. Rosen (1982) posits that firm management is subject to scale economies, but there exists diminishing returns to management because managers lose the ability to govern as firm size increases. Rosen indicates that there is a compromise between scale economies and the ability to manage effectively. Warusawitharana (2008) develops a model of asset purchases and sales and postulates that firm profitability and size play a role in a firm's decision to engage in asset sales. Warusawitharana posits that a decrease in profitability leads to a decrease in optimal, proposing that the least profitable firms downsize via asset sales. Mulherin and Boone (2000)

examine acquisitions and divestitures in the 1990s and document that firms reduce size (downsize) by efficiently reacting to economic changes by engaging in divestitures.

Consequently, I conjecture that the elimination of firm scale diseconomies is positively related to the gains from abnormal returns and operating performance resulting from new efficiencies. However, Industry rivals may react negatively or positively to news of horizontal divestitures depending on contagion or competitive effects. For instance, industry rivals with greater scale diseconomies may respond negatively (positively) in response to facing a more efficient rival (to information on how to eliminate scale diseconomies of its own). Yet, the effect of divestitures on corporate suppliers is not as clear. Corporate suppliers may respond negatively or not at all to the elimination of scale diseconomies (downsizing) due to lower input demand bringing about fewer orders. Customers may react negatively or not at all to scale diseconomies. For example, the divesting firm may use the divestiture as an opportunity to renegotiate contracts with their customers to become even more efficient. Alternatively, customers may respond positively to improved coordination from decreased divesting firm size. Therefore, the net effect on customers is ambiguous.

I explore two specific proxies related to scale diseconomies: input costs and labor intensity to pinpoint the potential gains associated with horizontal divestitures. Fee and Thomas (2004) proxy input costs with the ratio of cost of goods sold-to-sales for input related scale economies and labor related factors with the employee to sales and selling, general, and administrative expense-to-sales ratios. Several measures of firm size include value added, employees, revenues, or assets (Canback, Samouel, and Price, 2006). Canback, Samouel, and Price surmise that the number of employees is a good proxy for firm size and diseconomies of scale should be linked to human frailty. As such, they identify bureaucratic failure as a cause of increased coordination costs. Therefore, I use the employee to sales ratio, selling, general, and administrative expense (also linked employee and salary related cost), and the number of parent firm employees as to proxy for the coordination costs associated with diseconomies of scale.

To determine whether divesting firms extend their efforts to increase efficiencies from not only inside the firm but also outside of the firm, I examine the divesting firm's contracting relationships

between customers and suppliers. To explicitly test these contracting relationships, I consider both supplier and customer switching costs. With respect to suppliers, I hypothesize that divesting firms will opportunistically seek to improve contracting efficiencies with suppliers with high switching costs. Hence, I predict that suppliers with high switching costs will react negatively to horizontal asset sales. With respect to corporate customers, the outcome is not so straightforward. On the one hand, divesting firms may see the divestiture as an opportunity to adjust prices upward on customers with high switching costs, and customers may react negatively. On the other hand, divesting firms may want to appease and assure customers essential to their business (those with high switching costs) that quality and service subsequent to the divestiture will not decline but choose to exploit customers less essential to their survival (those with low switching costs). Therefore, customers with high switching costs may react positively or negative to horizontal asset sales. In the end, this is an empirical matter. I proxy supplier low and high switching costs using suppliers with suppliers a single large customer and more than one large customers. *Suppliers with multiple large customers* is defined as suppliers that disclose more than one large public customer in the Compustat Customer Segment Database. *Suppliers with a single large customer* is defined as suppliers that disclose only one large public customer in the Compustat Customer Segment Database. 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 (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%.

#### 2.2.4. *Financial distress considerations*

Other researchers postulate that asset sales are motivated by financial distress or financial constraint considerations. Shleifer and Vishny (1992) posit that asset sales by financially distressed firms may be sold at a discount relative to financially healthy firms. Brown, James, and Mooradian (1994) empirically investigate asset sales conducted by financially distressed firms and document significantly

lower returns to shareholders when asset sales proceeds are used to repay debt compared to when the proceeds are retained by the firm. The financial distress hypothesis postulates that distressed firms will likely sell assets at a significant discount relative to healthy firms. Thus, I anticipate divesting firms to react negatively to financial distress. Industry rivals may react positively or negatively at announcement. For instance, rivals may face a more financially healthy rival and elicit a negative competitive effect. Alternatively, rivals in financial distress may elicit a contagion, indicating information on how other distressed firms can sell assets to resolve issues of financial distress. Corporate customers and suppliers may react negatively in reaction to the asset sale as a result of the firm's financially distressed state. Prior literature indicates that on average industry rivals and suppliers react negatively to firms in financial distress and that customers may be the source of financial distress (Lang and Stulz, 1992; Hertz, Li, Officer, and Rodgers, 2008).

I eliminate firms with negative book values of equity from consideration in the year prior to the divestiture announcement; therefore, I do not specifically consider distressed firms. However, I use the variable, Altman Z-score (Altman, 1968) as a proxy for firm financial distress or financial health. Following Altman (1968), I define *ALTMAN\_Z\_SCORE* as the sum of  $3.3 * \text{earnings before interest and taxes scaled by total assets}$ ,  $0.99 * \text{net sales scaled by total assets}$ ,  $0.6 * \text{market capitalization at fiscal year-end scaled by total liabilities}$ ,  $1.2 * \text{current assets scaled by total assets}$ , and  $1.4 * \text{retained earnings scaled by total assets}$ . I expect a negative relation between the *ALTMAN\_Z\_SCORE* and wealth effects and operating performance.

Table 1 summarizes the possible underlying motivations driving horizontal asset sales and specifies the conjectured reactions of a horizontal sell-off on the divesting firms, in addition to their customers, suppliers, and rivals. Panel A presents the general hypotheses for the entire sample. 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 take advantage of this point to differentiate the reactions derived from industry demand, diseconomies of scale/efficiency, and financial distress hypotheses.

### 2.2.5. *Product market considerations*

This section addresses the potential tradeoffs arising from firms conducting horizontal divestitures and the consequences arising from product market effects from these deals that may reduce or enhance the potential gains from restructuring activities.

#### 2.2.5.1. *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 be more able 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 monopolistic collusion is more likely to be observed in concentrated industries than non-concentrated, I

anticipate a decreased probability of collusion amongst rival firms in concentrated industries. Thus, 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 be an alternative outcomes. The effect under the monopolistic collusion hypothesis may be less 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 less of change in production and prices relative to concentrated industries, assuming less concentrated industries are not as susceptible changes in market forces than concentrated firms. Whereas, divesting firms in more concentrated industries may have a greater ability to adjust to more efficient prices as they move prices closer to marginal costs.

To capture the effects customer concentration, I explore 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 to 1800. *Concentrated customers* identifies corporate customers that have a 4-digit industry Herfindahl that is greater than 1800.

#### 2.2.5.2. 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 quantities. 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 large change in industry concentration.

To capture the effects supplier concentration, I, similarly, investigate supplier concentration by examining both concentrated industries and less concentrated industries as follows. *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.

### 2.2.5.3. 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, especially, 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 may decide to pass these costs along customers with 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 high 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 the approach defined in section 2.2.3.

#### *2.2.5.4. 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 difficult 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 to 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 positively, as a result of increased competitive pressure that incentivizes managers to decrease managerial slack, or 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.

Additionally, I consider the effect of increased product market competition on the supplier retention termination decision. I conjecture that managers subject to increased competition will likely terminate ineffective suppliers, reducing supplier profitability and value. To capture the impact of product market competition, I proxy suppliers with high and low switching costs in a similar manner to the one outlined in Section 2.2.3. I also attempt to capture the economic effects of product market competition by examining supplier retention versus termination decisions by divesting firms. *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.

Panel B of Table 1 presents the testable hypotheses that incorporate product market considerations. In particular, Panel B presents the predicted effects of the monopolistic collusion, monopsonistic collusion, purchasing inefficiencies / countervailing power, and product market competition hypotheses on divesting firms, rivals, customers, and suppliers.

### **2.3. Data**

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

### 2.3.1. *Sample construction*

This study depends on several data sources for my empirical investigation. I initially obtain my preliminary sample of horizontal divestitures from the universe of divestitures proposed from the Securities Data Company (SDC). I employ the data on firm-level customer-supplier relationships established by Cohen and Frazzini (2008) using the Compustat Customer Segment database.<sup>2</sup> Similar to other studies, I acquire financial security data from the Center for Research in Securities Prices (CRSP) and accounting data from Compustat.

To simplify the analysis and limit the scope of this study and number of predictions, I focus primarily on asset sales. Thus, my sample of divestitures excludes equity carve-outs and spin-offs over the period 1987-2005. My 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 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 an equity carve-out or spin-off, (10) the parent has less than \$20

<sup>2</sup> I am indebted to Lauren Cohen and Andrea Frazzini for generously sharing their data.

million in sales (in constant 1987 dollars), and (11) the ratio of the deal value to total assets is less than 0.1%.<sup>3</sup> 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 a final sample of 93 asset sales. Slovin, Sushka, and Ferraro (1995) examine 179 sell-offs. Mulherin and Boone (2000) examine 139 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.

Panel B of Table 2 reports the accumulated deals into broad industries established by Fama and French (1997).<sup>4</sup> Petroleum and natural gas, healthcare, electronic equipment, pharmaceutical products, and restaurants, hotels and motels industries generate the most divestiture activity in my sample. Divestitures in these industries comprise 72.87 percent of the divestitures in the sample. Additionally, the

<sup>3</sup> 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).

<sup>4</sup> One hundred percent of the divesting firms in this sample are all focused reporting one business segment.

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. I document a greater proportion of intra-industry deals, 53.09 percent, between sellers and buyers, than inter-industry deals, 46.91 percent.

### 2.3.2. *Identifying corporate rivals, suppliers, and customers*

This study follows Fee and Thomas (2004), Cohen and Frazzini (2008), Hertz, Li, Officer, and Rodgers (2008), and Bernile and Lyandres (2013) by employing the firm's reported information regarding material corporate customers obtained from the Compustat Customer Segment Files to identify 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 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  $i$ .<sup>5</sup> To identify suppliers of divesting firms, I match the parent (divesting) firm's name to a customer firm's name (from or on the Compustat Customer Segment Files) in the fiscal year-end prior to the divestiture announcement date. I include customers of the divesting parent firm. For the typical deal in

<sup>5</sup> See Cohen and Frazzini (2008) for a more comprehensive description of the matching algorithm employed.

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 the 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's 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 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 rather than the reduced monopsonistic power, since I am more likely to capture less powerful customers and more powerful suppliers. 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.

The data employed to identify industry rivals for the divesting firms is also from the Compustat industry segment files. I identify rivals as any firm (excluding the parent, customer, or supplier firm) 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, since I am examining asset sales of parent firms with at least \$20 million in sales (in 1987 dollars). 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.<sup>6</sup> Fee and Thomas (2004) consider the impact of horizontal mergers on single-segment and single and multiple segment rivals, whereas, Shahrur (2005) excludes them from his sample and considers only single-segment rivals because they increase the power of the sample. I include single and multiple segment rivals to determine if horizontal asset sales have a differential impact on pure play firms versus diversified firms in the same industry, however, I consider that the results from the single-segment rival sample result in more power.

### 2.3.3. *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. I compute the abnormal returns to the parent rival, supplier, and customer portfolios for the same event windows as for the parent firm.

### 2.3.4. *Measuring changes if operating performance*

<sup>6</sup> 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. For completed divestiture deals, I explore the changes in operating performance for divesting firms and their customers and suppliers. 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) that have cash-flow (defined as operating income before depreciation (Compustat item 13) to sales (Compustat 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 a 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 in the same year. I select the matching firm from these firms 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.<sup>7</sup> 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.

## 2.4. 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.

### 2.4.1. *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 my sample. Panels B and C of Table 4 documents the abnormal returns to industry rivals at the divestiture announcement for single-segment portfolios and single- and multiple-segment industry rival portfolios, respectively, to capture any potential differential effects between pure-play versus diversified rivals. 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.

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

<sup>7</sup> 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.

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. However, the parametric t-tests for customers report no significance for mean abnormal returns. For the entire sample of deals and subsamples of deals of downstream firms, individual suppliers and supplier portfolios have no significant 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 price reactions 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 are consistent with the diseconomies of scale/efficiency hypothesis, which suggests that horizontal asset sales result in the divesting firm improving its efficiency by eliminating firm scale diseconomies and utilizing the divestiture as an opportunity to renegotiate contracts with their customers to become even more efficient. In addition, the divestiture results in the divesting firm improving its competitive position relative to its rivals.

#### 2.4.2. *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 noticeable. To distinguish Fee and Thomas (2004) capture large *merger induced* changes in 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.<sup>8</sup> 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 *divestiture induced* deals that produce a substantial change in industry Herfindahl or concentration (increased competition), I observe those deals that decrease the industry Herfindahl by more than 100 ( $\Delta$  *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 ( $\Delta$  *Ind. Herf.* ≥ -100).

#### 2.4.2.1. 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

<sup>8</sup> 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.

Table 4 indicates that 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. To summarize the subsample of deals in concentrated industries, I find that divesting firms react positively at announcement, in contrast, single-segment rivals in concentrated industries respond negatively at announcement. 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. 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, which suggests that divesting firms may potentially subject themselves to improvements in efficiency in concentrated industries, but customers in less concentrated.

#### *2.4.2.2. Abnormal returns for deals for deals with large declines in industry concentration vs. deals with no large decline in industry concentration*

To shed light on *divestiture induced* changes in industry concentration and, thus, its impact on the competitive landscape that divesting firms, rivals, customers, and suppliers face in response to this event, I compare deals that result in a large decrease in industry concentration (increasing degree of competition in the divesting industry) to those deals that do not result in a large decrease in industry concentration. In addition, by examining deals resulting in a large change in industry concentration, I can separate the effects for the product market competition, purchasing efficiency, monopolistic collusion and monopsonistic collusion hypotheses. For the subsample of divestiture deals that result in a large drop in industry concentration, Panel A of Table 4 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, Panel B of Table 4 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 of Table 4 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 of Table 4 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 of Table 4 report no significant share price reactions for individual suppliers and supplier portfolios at announcement for this subsample of deals. The results for this subsample of deals indicates that horizontal divestitures potentially increase competition in the divesting industry, thus, reducing the likelihood that managers will be able to enjoy “the quiet life” (Bertrand and Mullainathan (2003). Accordingly, this increase in competition incentivizes managers to negotiate lower prices from suppliers or lower wages from unions and improve productivity. However, these improvements may be offset by a decline in buying power, suggesting that divesting firms experience waning bargaining power with suppliers.

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 provide mixed evidence to support the product market competition and purchasing inefficiencies / countervailing power hypotheses.

#### *2.4.3.1. Abnormal operating performance for all divestitures*

In this subsection, I provide additional tests for the hypotheses linked to the entire sample such as the industry demand hypothesis, financing hypothesis, diseconomies of scale hypothesis, and financial distress hypothesis using operating performance of the divesting firms, customers, and suppliers. 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.<sup>9</sup> 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 of deals, 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 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. With respect to the results for the entire sample, one reason for the inconsistency between the positive abnormal returns and negative cash-flow performance is that *some* of the divesting firms may be motivated to conduct horizontal divestitures due to financial distress (but not all), but this effect may only be significant in the initial years subsequent to the divestiture and not beyond that. Investors of the divesting may perceive these negative cash flows to be short-term but place the firm in an overall better financial position. However, financial distress would not necessarily explain why suppliers experience a temporary increase in operating

<sup>9</sup> See Fee and Thomas (2004) for a more detailed description.



performance. The increase in supplier operating performance may be attributed to a reduction in financing constraints for divesting firms or to suppliers taking advantage of the reduced bargaining power of divesting firms subsequent to the divestiture, which may also explain why divesting firms have negative cash flow performance subsequent to the divestiture. Finally, another explanation for the divergence in the results may be that the efficiency gains may offset adverse cash flow performance in the long term. In Section 2.4.4.1. below, I attempt to trace the sources of the gains of the divesting by examining other measures of operating performance to explain the positive abnormal returns for the entire sample.

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 evidence provides mixed evidence in support of the financial distress hypothesis, diseconomies of scale hypothesis, and industry demand and financing hypothesis for divesting firms, customers, and suppliers, respectively. 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 my 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 study's primary focus.

#### *2.4.3.2. 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, significant at the 10% level, which is most prominent in the year immediately following the divestiture. 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. So far the results indicate that the reduced operating performance for divesting firms cannot be attributed to a decrease in monopoly rents, since customers fail to experience any favorable increases in

operating performance due to increase quantities or reduced prices. Additionally, the results for the operating performance of the divesting firm rules out the notion that divestitures in concentrated industries enhance competition and thus managerial productivity. 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. Since supplier operating performance appears to increase subsequent to deals in less concentrated industries relative to deals in more concentrated industries, the evidence rules out the monopsonistic collusion hypothesis, which suggests that suppliers benefit from higher prices subsequent to divestiture deals in more concentrated industries. The evidence from this subsample appears to support the purchasing inefficiencies / countervailing power hypothesis, which suggests that divesting firms are unable to switch to more efficient suppliers. As a result, horizontal divestitures in concentrated industries erode the bargaining power of divesting firms resulting lower operating performance because suppliers experience an improvement in bargaining power. The improvement in cash flow performance for suppliers is more pronounced for deals in less concentrated industries because suppliers can more readily exert their increased market power over less powerful divesting firms.

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. However, suppliers experience improvements in operating performance subsequent to deals in less concentrated industries due to a deterioration in divesting firm buying power. Thus, the evidence for the changes in operating performance in concentrated industries relative to non-concentrated industries seems to be most consistent with the purchasing inefficiencies / countervailing power hypothesis.

#### *2.4.3.3. Abnormal operating performance for deals that result in large declines in industry concentration*

Similar to section 2.4.2.2. above, this section of the paper further investigates the impact of *divestiture induced* changes in industry concentration and its effect on the competitive environment with respect to the operating performance of divesting firms, customers, and suppliers. I compare the change in operating performance of these stakeholders by examining divestiture deals that result in a large decrease in industry concentration (increasing degree of competition in the divesting industry) to those deals that do not result in a large decrease 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 disappears thereafter. For deals that occur in industries that do experience a large change in 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 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. The results fail to support the monopolistic and monopsonistic collusion hypotheses, which posit that divesting firms are no longer able to earn monopsony or monopoly rents as a result of reduced market power since suppliers experience adverse rather than favorable operating performance and customers fail to experience significant positive performance subsequent to divestitures in industries that experience a large change in concentration. However, the evidence is mixed in favor of the product market competition hypothesis. On the one hand,

operating performance is negative for divesting firms in industries that experience a large change in the competitive environment. On the other hand, suppliers experience adverse operating performance subsequent to deals in industries that experience a large change in the competitive landscape, which suggests that divesting firms appear to negotiate with these suppliers more aggressively due to enhanced competitive pressures. Alternatively, these could also indicate that divesting firms in industries that experience a large change in concentration suffer greater purchasing inefficiencies with respect to suppliers, leading to negative performance due to a greater incapability to shift to more efficient suppliers. In turn, suppliers may achieve higher prices from divesting firms at the expense of selling lower quantities to divesting firm post-divestiture—leading adverse supplier performance.

To summarize deals that compose a large percentage of the industry, divesting firms display a delayed negative reaction, in general; customer performance does not change; and supplier performance deteriorates temporarily. Overall, the evidence, for these deals, is consistent with the purchasing inefficiencies / countervailing power hypothesis and, to a much lesser extent, product market competition hypothesis.

#### 2.4.3. *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 (Compustat item 30) to sales (Compustat item 12); selling, general, and administrative expense (SG&A) (Compustat item 189) to sales (Compustat item 12); employees (Compustat item 29) to sales (Compustat item 12), and the wage-to-sales ratio.<sup>10</sup> Table 6 documents the sources of gains/losses in abnormal returns and cash flow performance to the divesting firms and measures significance of performance using Wilcoxon sign-ranked tests and sign tests.

##### 2.4.4.1. *Identifying sources of losses/gains for all divestiture deals*

<sup>10</sup> 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).

For the entire sample of divestitures, Panel A of Table 6 presents sign tests that indicate 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 experiences 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).

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. One interpretation for these results is that divesting firms attempt to reduce financial distress via horizontal asset sales, but this interpretation does not explain the temporary increases in supplier cash flow performance. Another explanation for these results is that divesting firms attempt reduce scale diseconomies and financing constraints by reducing the firm's labor

intensity, but horizontal divestitures also subjects the firm to temporary side effects such as increases in input and administrative costs in the near term. In conjunction with the results from divesting firm abnormal returns, the results indicate that the positive abnormal returns can be attributed primarily to gains from labor related efficiencies and that the market perceives these gains to be greater than the reduced abnormal cash flows (resulting from input and overhead costs) in the long-run.

#### 2.4.4.2. *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 divestiture 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 period at the 10% level of significance, which is most noticeable during the first year subsequent to the divestiture. The results indicate that divesting firms in concentrated industries are able to improve their efficiency with respect to overhead costs and labor intensity, suggesting that efficiency gains come primarily from labor related factors despite the overall adverse cash flow performance. These efficiency gains in operating performance help to support the

positive abnormal returns exhibited by the divesting firms in concentrated industries and, perhaps, offset the decline in operating performance stemming from the increase in input costs attributed to a loss in bargaining power with suppliers.

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. Taken in conjunction with the increase supplier cash flow performance subsequent to deals in less concentrated industries and the decrease in divesting firm cash flow performance subsequent to deals in concentrated industries, this evidence suggests that divesting firms in concentrated industries appear to share increased input costs with their customers in response to increasing purchasing inefficiencies stemming from reduced bargaining power with suppliers. Overall the evidence from this customer subsample fails to support the monopolistic and monopolistic collusion hypotheses but also provides direct evidence for the purchasing inefficiency hypothesis and indirect evidence in support the product market competition hypothesis.

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. In other words, the evidence may support two competing effects. For instance, horizontal divestitures may increase the firm's susceptibility to competitive pressures with enhance managerial incentives to increase firm value but also come at a cost in the form of reduced bargaining power with suppliers. Furthermore, post-divestiture labor intensity (employee to sales) for deals in concentrated industries appears 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.

*2.4.4.3. 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. The evidence in this subsample suggest that the source of the positive abnormal returns may be likely attributed to the reduction of financing constraints and labor-related factors and/or scale diseconomies. The observable gains appear to be enhanced by substantial changes in the competitive environment, which seem to enhance managerial efficiency and effort to bring down labor-related and overhead costs. The market appears to perceive that the efficiency changes may



outweigh the increases in abnormal input costs in the long-run, suggesting that fixed costs and labor intensity may be more important factors when downsizing firms to alleviate financing constraints and diseconomies of scale. Overall for this subsample of deals, the evidence appears to substantiate the product market competition hypothesis and suggest that these deals may be motivated by financing constraints and firm scale concerns.

#### *2.4.4. 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. By examining customer concentration, I can further explore the monopolistic collusion hypothesis, which suggests that customers in more concentrated industries are likely to respond more positively to horizontal divestitures compared to those in less concentrated industries due to the decreased capacity of industry rivals and divesting firms to coordinate a reduction in output and higher prices. In contrast, investigating customer switching costs allows me to further test the diseconomies of scale/efficiency and purchasing inefficiency/countervailing power hypotheses. The diseconomies of scale/efficiency hypothesis suggests that divesting firms will utilize horizontal divestitures, also, as an opportunity to improve the efficiency of contracting relationships by adjusting prices upward on customers with high switching costs. Alternatively, divesting firms may prefer to satisfy and assure customers vital to their business (customers with high switching costs) that quality and service subsequent to the divestiture will not decline but choose to take advantage of customers less vital to the divesting firm's survival (customers with low switching costs). With respect to the purchasing inefficiency hypothesis, divesting firms may pass along potentially higher input costs to their customers. 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. Then again, divesting firms may act opportunistically and pass these costs along to those customers with higher switching costs.

Table 7 presents the performance differences for several subsamples of corporate customers: non-concentrated customers versus concentrated customers; and reliant customers (high switching costs) versus non-reliant (low switching costs) 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.

#### *2.4.5.1. 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 concentrated and non-concentrated customer subsamples are not significant and fail to support the monopolistic collusion hypothesis, which indicates that customers in more concentrated industries are likely to react more positively to horizontal divestitures from upstream firms compared to those in less concentrated industries due to the decreased capacity of industry rivals and divesting firms to coordinate a reduction in output and higher prices.

#### *2.4.5.2. 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 for these subsamples 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 the reliant and non-reliant customer subsamples suggests that, perhaps, horizontal asset sales are less beneficial for non-essential customers than those with strong customer-supplier relationships. With respect to the diseconomies of scale / efficiency hypothesis, the results suggest that divesting firms choose to satisfy and reassure customers vital to their business that quality and service subsequent to the divestiture will not decline but, instead, opt to take advantage of customers less important to the divesting firm's survival. Additionally, the evidence indicates some support for the purchasing inefficiency / countervailing power hypothesis, which indicates that divesting firms choose to maintain strong customer-supplier relationships with customers with higher switching costs (relationship specific investments) and pass along potentially higher costs to customers that are not as invested in divesting firm's business. Overall, the evidence is slightly consistent with the diseconomies of scale/efficiency and the purchasing inefficiency/countervailing power hypotheses.

*2.4.6. 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 continue examining the diseconomies of scale/efficiency hypothesis, which indicates that divesting firms will opportunistically seek to improve contracting efficiencies with suppliers with high switching costs. I also 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 further investigate the diseconomies of scale / efficiency hypothesis to determine if the gains from the divestiture are linked to supplier termination decision. In addition, 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. Lastly, the logit analysis can provide additional insight on whether cash deals mitigate financing frictions and, thus, the decision to terminate suppliers. 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 and efficiency motivations. 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.

#### *2.4.6.1. 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.  $\Delta$  *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,  $\Delta$  *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. These results also help to substantiate the diseconomies of scale / efficiency hypothesis.

*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 and, indirectly, the diseconomies of scale / efficiency hypothesis.

#### 2.4.6.2. *Supplier concentration: univariate results*

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 are more able 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.

#### *2.4.6.3. 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  $\Delta \text{Industry Herf} < -100$  is significant and positively associated 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.

#### 2.4.6.4. *Supplier switching costs: univariate results*

Next, the role of switching costs on supplier performance is assessed. Panels F and G of Table 8 indicate that individual suppliers and supplier portfolios with a single large reported customer experience adverse median abnormal returns of -1.77% and -2.27%, respectively, at the 10% level of significance, while suppliers with multiple large customers do not experience a significant reaction at announcement. Also, the difference in mean abnormal returns between suppliers with a single large customer and suppliers that report more than one large customer for individual suppliers and supplier portfolio is at least 2.21% at the 5% level of significance. In addition, a Wilcoxon signed-rank test indicates that the difference in median abnormal returns between suppliers with a single large customer and suppliers that report more than one large customer for individual suppliers is 1.96%. Panel G of Table 8 documents that supplier portfolios with multiple large customers experience more improvements in median industry-adjusted cash flows than supplier portfolios with a single large customer, however, the difference in cash flows around the divestiture announcement is negligible. The evidence from the proxies for supplier high and low switching cost subsamples suggest 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. In sum, these results tend to support the diseconomies of scale/efficiency hypothesis,



which designates that divesting firms resourcefully seek to improve contracting efficiencies with suppliers by taking exploiting those with high switching costs.

#### 2.4.7. *Divesting firms: multivariate results*

For completeness, Table 9 reports the multivariate regressions that explain divesting parent firms abnormal returns and changes in median industry adjusted changes in operating performance. 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 is the anticipated sign under the industry demand hypothesis. 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 the anticipated sign under the financing hypothesis. 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*. The coefficient on *ALTMAN\_Z\_SCORE* is negative and insignificant. Therefore, I fail to document evidence in support of the financial distress hypothesis.

In Column (4), the independent variable is pre-divestiture *COGSSALE*. The coefficient is positive and insignificant and fails to support the diseconomies of scale hypothesis. In Column (5), the independent variable is pre-divestiture *EMPSALE* and the coefficient is marginally significant and positive, suggesting evidence in favor of the diseconomies of scale hypothesis. 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 additional support for the diseconomies of scale/efficiency hypothesis.

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  $\Delta$  *Ind. Herf <-100*, respectively. The coefficients on *Ind. Herf.>1800* and  $\Delta$  *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). This may also indicate that cash deals help to reduce firm financing constraints. *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.

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. However, both coefficients support the diseconomies of scale/efficiency hypothesis and to a lesser extent the financing hypothesis due to the influence of *SGASALE* on financial constraints.

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.

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 8 allow us to evaluate the relative importance between the hypotheses and identify the sources of value creation and destruction.

Multivariate analysis of divesting firm abnormal returns present strong support for the financing hypothesis and diseconomies of scale/efficiency conjectures. These results also indicate that firms with higher pre-divestiture input costs will likely result negative abnormal returns. This result suggests further corroboration of purchasing inefficiencies / countervailing power hypothesis as well. These results also indicate that cash deal consideration adds value for divesting firms by potentially mitigating divesting firm financing constraints.

## 2.5. Conclusion

This study 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. Multivariate analysis of divesting firm abnormal returns at announcement suggest that the gains from horizontal asset sales arise from the elimination of divesting firm bureaucracy and relaxation of financing constraints. In addition, I document that environmental factors matter when considering horizontal divestitures. 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 urge managers, who ponder undertaking horizontal asset sales, to consider the risks associated with this event such as potential erosion of purchasing efficiencies that may arise from reduced bargaining power relative to powerful suppliers. The evidence indicates that horizontal asset sales tend to be wealth generating events for divesting firms, but the analysis of stakeholder wealth effects suggest that these events are perceived as bad news for less competitive rivals,

customers less essential to the divesting firm's production process, and suppliers with high switching costs.

Multivariate analyses of divesting firm abnormal returns present strong support for the financing and diseconomies of scale/efficiency hypotheses. The evidence indicates that firms with high pre-divestiture labor intensity and financing constraints are associated higher abnormal returns at announcement. However, firms with higher pre-divestiture input costs are inversely related to abnormal returns at announcement. This evidence suggests that horizontal divestitures may reduce firm countervailing power, leading to bargaining disadvantages with suppliers and, thus, increased input costs. This study 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 powerful 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 reduced 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 experiencing improved abnormal cash flows around the event, while less divesting firms suffer decreased abnormal cash flows. These results supplement prior studies that suggest enhanced industry competition diminishes the prospect of managers being able to live the "quiet-life" (Bertrand and Mullainathan, 2003; Giroud and Mueller, 2001).

For the entire sample of horizontal asset sales, this study documents a positive stock price reaction by divesting firms at announcement, a competitive effect (negative abnormal returns) for industry rivals at announcement, a negative stock price reaction corporate customers respond negatively, and a statistically insignificant stock price reaction by suppliers at announcement of the divestiture deal. Thus,

the investigation of the wealth effects of horizontal sell-offs indicates that parent firms experience positive wealth effects, but these gains do not extend to corporate customers and suppliers as they do with vertical divestitures (Jain, Kini, and Shenoy, 2011).

Next, I report the significant role that customer switching costs have on corporate customer wealth effects (performance) at announcement (around the 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.

Finally, this study 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 divesting firm abnormal returns, 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. Divesting firm wealth effects are positively linked to the decision to end a supplier relationship, which support the efficiency view of divestitures. 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). Particularly, divesting firms are more likely to sever long-standing supplier relationships and relationships with suppliers that are uniquely dependent on the divesting firm subsequent to the horizontal divestiture deal. However, cash deals appear to mitigate divesting firm financing constraints and are negatively associated with supplier termination decision. Divesting firms appear to create value by breaching long-term implicit contracts within the firm (employees) and outside of the firm (with suppliers). My evidence from the supplier retention and termination subsamples complement those of horizontal mergers (Fee and Thomas, 2004) but the magnitude of the performance

differences seem to be somewhat larger (perhaps due to the difference in sample sizes). Terminated suppliers experience substantial deterioration in post-divestiture median industry-adjusted cash-flow margins, while retained suppliers experience significant improvement in post-divestiture median industry-adjusted cash-flow margins. This study also presents 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. These suppliers appear ex-ante more reliant on divesting upstream firms and are expected to face larger switcher costs than suppliers that report more than one important customer in their financial statements.

## CHAPTER 3: IS YOUR LOSS MY GAIN? HORIZONTAL DIVESTITURES AND PRODUCT MARKET RELATIONSHIPS.

### 3.1. Introduction

An increasing body of literature in financial economics explores the sources of value creation of certain corporate events by exploring product market relationships along the supply chain, rather than exploring these events in isolation. For instance, one stream of literature examines the sources of value creation resulting from horizontal takeovers and mergers (Fee and Thomas, 2004; Shahrur, 2005; Bhattacharyya and Nain, 2011). Another stream explores the sources of value creation resulting from vertical takeovers (Shenoy, 2012). More recently, Greene, Kini, and Shenoy (2013) examine sources of value creation resulting from conglomerate acquisitions. This research often debates whether or not the value derived from the aforementioned corporate events is from efficiency considerations or from market/buying power considerations. Generally, this line of research indicates that increased buying power resulting from acquisitions may serve as one particular source of value creation in the product market. In a related paper, Jain, Kini, and Shenoy (2011) document that market power motivations (i.e. collusion, foreclosure) are not primary driving forces behind vertical divestitures and that customer/suppliers/rivals experience positive information transfer effects.

The extant literature focuses mostly on corporate events that increase relative firm size that alters the dynamics between customers and suppliers (Fee and Thomas, 2004; Shahrur, 2005; Bhattacharyya and Nain, 2011; Greene, Kini, and Shenoy, 2013), with exception of Jain, Kini, and Shenoy (2011). These papers largely study events that potentially improve buyer/bargaining power relative to customers/suppliers. In effect, the prior research only explores events in which the firm grows in size *at the same stage of production* (i.e. horizontal mergers/takeovers, tender offers), *successive stages of stages of production* (i.e. vertical mergers or takeovers), or *unrelated stages of production* with overlapping sources of supply (i.e. conglomerate mergers). In contrast, Jain, Kini, and Shenoy (2011) examine customer supplier relationships using vertical divestitures—an event in which the firm reduces its size via *successive stages of the production process*. Therefore, I attempt to fill a void in the literature by

examining product market relationships through an event that *reduces* firm size at the *same stage of production process*, horizontal divestitures.<sup>11</sup> This study examines the impact of upstream and downstream horizontal divestiture activity on product market relationships.

To date, little to no research, theoretical or empirical, discusses the consequences of a decrease in relative firm size at a specific stage of the production process. What happens to buying power as firm size decreases at the same stage of the production process? Therefore, this study explores four hypotheses related to horizontal divestitures: the customer expropriation hypothesis, the pivotal buyer repositioning hypothesis, the waterbed effect hypothesis, and the supplier expropriation hypothesis. The customer expropriation hypothesis posits that suppliers, in the presence of incomplete contracts (Williamson, 1985), behave opportunistically following large downstream divestiture activity and increase input prices as a result of reduced customer bargaining power, given relaxed countervailing power considerations (Galbraith, 1952). Expanding the extant literature on buyer power and the literature on pivotal buyer theory (Chipty and Snyder, 1999; Raskovich, 2003; and Adilov and Alexander, 2006), I investigate the pivotal buyer repositioning hypothesis. The pivotal buyer repositioning hypothesis conjectures that pivotal buyers have an incentive to reverse their pivotal position, by reducing their size and thus eliminating potential cross-subsidization of suppliers and non-pivotal buyers (Raskovich, 2003) subsequent to downstream divestiture activity. Next, I extend the literature on waterbed effects (Majumdar, 2005; Inderst and Valletti, 2011) by exploring the waterbed effect hypothesis, which postulates that downstream divestiture activity promotes asymmetric buyer power among customers and engender lower prices for more powerful customers while increasing input prices to competing customers in the years following downstream divestiture activity. Lastly, I complement the work of Bhattacharyya and Nain (2011) by investigating the supplier expropriation hypothesis, which postulates whether

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<sup>11</sup>There are several respects in which a horizontal divestiture differs from that of a vertical one; some of these differences include: stage of production, competitive effects, contracting environment, scale of production, and motivations. The first and foremost distinction that I emphasize is that a horizontal divestiture, typically, represents a separation of a subsidiary, division, or business unit *at the same stage of production* as that of the parent firm. In contrast, a vertical divestiture represents a separation of a subsidiary, division, or business unit *at a successive or preceding stage of production* relative to the parent firm.



customers take advantage of economically dependent suppliers following significant *upstream* horizontal divestiture activity.

I employ an empirical strategy, which strongly resembles that of Bhattacharyya and Nain (2011). I conduct a cross-industry analysis of the product market impact of 46 (35) downstream (upstream) industry-level horizontal divestiture events on supplier (customer) industries, resulting in 274 (35) industry-supplier (industry-customer) pairs on profits, value, and producers' prices (profits, value, and input costs) over a sample period from 1979-2010. In contrast to Bhattacharyya and Nain (2011), I concentrate on cases in which firms reduce their size vis-à-vis suppliers, whereas, their focus is on cases in which firm size increases via horizontal acquisition activity. In contrast, Bhattacharyya and Nain (2011) investigate the product market effects of a 141 downstream horizontal merger events on supplier industries that result in 1,155 merger industry-supplier industry pairs.

I document considerable evidence in support of the supplier expropriation hypothesis, suggesting that upstream horizontal divestiture activity has an adverse effect on supplier industry selling power (positive impact on customer industry buying power). I report evidence that opportunistic customers of dependent supplier industries experience favorable changes in abnormal cash flow margins (4.9%), abnormal cash flow-to-market value of assets (2.3%), and declines in abnormal costs-of-goods sold margin (2.3%) relative to customers of non-dependent suppliers. Supplier dependence captures the highest quintile in which a supplier industry's output sold to a customer industry as a percentage of its total output sold. I also present some evidence that certain supplier industry barriers to entry (capital expenditures) contribute to increase customer industry profitability, value and decreased input costs. I also find moderate evidence in support of the pivotal buyer repositioning hypothesis, indicating that pivotal buyers reduce their size via downstream divestiture activity and, therefore, exploit suppliers that are dependent on their pivotal position and eliminate cross-subsidization of suppliers and non-pivotal buyers. I find that suppliers with a pivotal buyer suffer a decrease in abnormal cash flow margin (10.1%) and abnormal cash flow-to-market value of assets (3.1%) relative to suppliers with a non-pivotal buyer. I also present minor evidence that suppliers with pivotal buyers endure an unfavorable price decrease

(0.2% per month) in the years subsequent to a downstream divestiture. These results suggest that pivotal buyers exhibit opportunistic behavior and take advantage of suppliers subsequent to substantial downstream divestitures. However, I find little to moderate evidence in support of the waterbed effect, while I present little to no evidence to corroborate the customer expropriation hypothesis with respect to downstream divestiture activity.

This study makes several contributions to the recent stream of financial economics literature that explores the impact of corporate events on buying power. This is the first study to explore, to my knowledge, the implications of reducing firm size on customer-supplier relations at a specific stage of the production process by examining producers' prices, profitability, and value. In particular, I employ the methodology by Bhattacharya and Nain (2011), who take the "direct approach" in examining the effect of horizontal mergers on product prices. I contribute to the industrial organization literature that examines the motives and consequences of buying power and waterbed effects. This study is similar to another closely related study by Jain, Kini, and Shenoy (2011), who examine the product market effects of vertical divestitures. The primary distinction between this study and that of Jain, Kini, and Shenoy is that I focus on same (within) industry divestitures that occur at the same stage of production conducting industry level analysis, whereas, Jain, Kini, and Shenoy focus on divestitures that occur in successive stages of the production process conducting firm-level analysis. In addition, this study examines the industry level impact of horizontal divestiture activity, which allow for cleaner tests of the industry level impact on upstream/downstream firms compared to a similar approach studying vertical divestitures at the industry level. For instance, the analysis vertical and horizontal divestitures allow one to examine different hypotheses. Horizontal divestitures allow one to investigate the impact of potential changes in buying power or market concentration on the ability to collude amongst rivals, using specific collusion hypotheses (i.e., monopolistic or monopsonistic). In contrast, vertical divestitures facilitate the ability to examine the ability to collude by exploring the impact on the coordination mechanism (Jain, Kini, Shenoy, 2011).

Next, I add to the line of research that explores the linkages along the supply chain and corporate finance. In particular, I look to extend the literature that investigates the influence of major corporate restructuring events and product market interactions. Finally, I contribute to the industrial-organization literature that examines the relationship between buying power, buyer size, and industry structure by distinguishing the relative impact of horizontal divestitures on countervailing power and pivotal buyer positions within the customer and supplier industry context. This is the first study that explores the effect of *horizontal* divestitures on countervailing power. In addition, this is the first to study how a type of divestiture (horizontal in my case) may influence the pivotal buyer relationship, if any exists. In the industrial organization literature, few studies consider the impact of a reduction in buyer size on the customer-supplier relationship. Hence, this study takes one of the first steps towards shedding light on that relationship. I introduce and examine the buyer repositioning hypothesis, which to my knowledge is the first paper to do so. This is also the first paper to empirically examine waterbed effects in the corporate finance literature and in the context of horizontal divestitures. In comparison, the prior literature on waterbed effects focuses predominantly on merger events.

The remainder of this essay is organized as follows. In Section 3.2, I illustrate the relevant existing empirical literature. In Section 3.3, I motivate and develop my testable hypotheses. In Section 3.4, I discuss my sample construction, empirical strategy and results. In Section 3.5, I conclude my discussion.

### **3.2. Existing Literature**

In this section, I discuss related empirical literature that examines the impact of certain corporate restructuring events along the supply chain with an emphasis on buyer power or market power theories. The empirical literature appears to be largely biased in examining the influence of corporate restructuring events on non-financial stakeholder relationships such as customers, suppliers, and rivals within the corporate finance and industrial organization literature. Most studies related to corporate restructuring and product markets are biased towards examining the effects of horizontal mergers and acquisitions on market power or economic efficiencies along the supply chain (Fee and Thomas, 2004; Shahrur, 2005;

Bhattacharyya and Nain, 2011). Other related papers examine buyer/market power (i.e. collusion, market foreclosure, etc.) and efficiency motives along the supply chain along the supply chain in vertical mergers and takeovers (Kedia, Ravid, and Pons, 2011; Shenoy, 2012), conglomerate acquisitions (Greene, Kini, and Shenoy, 2013), and vertical divestitures (Jain, Kini, and Shenoy, 2011).

Bhattacharya and Nain (2011) execute cross-industry analyses of the product market impact of horizontal acquisitions on supplier industries via effects on profits and prices and document evidence in line with the generation of buying power via consolidation downstream.<sup>12</sup> They document strong evidence that horizontal acquisitions generate buying power and impact the performance of economically dependent supplier industries, resulting in large drops in both supplier profits and supplier prices (real producers' prices in the three years subsequent to downstream consolidation activity. Bhattacharya and Nain's (2011) findings suggest that horizontal mergers countervail upstream market power, indicating that these mergers create bargaining power for merging firms to counteract bargaining power held by suppliers. They propose consolidation in one industry prompts countervailing consolidations in industries that share product market linkages as a potential transmission mechanism for mergers waves. In a recent study, Ahern (2012) finds that industry economic dependence is an important consideration for the division of gains between the target and acquiring firm in mergers. Fee and Thomas (2004) find evidence consistent with the notion that buying power of customer firms relative to suppliers serves as key source of gains in horizontal mergers. Shahrur (2005) shows that horizontal mergers and tender offers tend to generate significant positive abnormal returns for rivals, suppliers and corporate customers suggesting evidence in support of the efficiency hypothesis, however, they find that buyer power is a source of gains in imperfectly competitive industries.

Kedia, Ravid, and Pons (2011) compare market reactions of horizontal, vertical, and conglomerate mergers to investigate motives for vertical integration. Kedia, Ravid, and Pons (2011) document evidence that vertical mergers create value in noncompetitive market environments and

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<sup>12</sup> Downstream industries refers to customer industries along the supply chain, while, upstream industries refer to supplier industries along the supply chain.

evidence in support of market foreclosure theories, suggesting that vertical mergers of dominant firms shut out rival firms. In contrast, Shenoy (2012) explores efficiency (i.e. underinvestment in relationship-specific investments and hold-up concerns) and market power theories (i.e. collusion or market foreclosure) as sources of value and creation behind vertical takeovers by examining the impact announcements of vertical takeovers along the supply chain. Shenoy documents strong evidence in support of the efficiency hypothesis and weaker evidence in support of the collusion hypothesis, suggesting that firms undertake vertical mergers in order mitigate hold-up problems and underinvestment in relationship-specific assets and to a lesser extent collude with rivals. Greene, Kini, and Shenoy (2013) document evidence that conglomerate acquisitions create value from acquirers with segments that have overlapping suppliers with those of target, leading to reduced suppliers prices and positive wealth effects. Overall, the evidence is mixed evidence in support of both efficiency and market power theories (i.e. market foreclosure, collusion, etc.) as sources of value creation behind vertical mergers and takeovers.

Jain, Kini, and Shenoy (2011) investigate how product market considerations and financing considerations influence the vertical divestiture decision and choice of divestiture (equity carve-outs or spin-offs). Jain, Kini, and Shenoy (2011) find evidence that parent firms experience positive wealth effects on announcement. These wealth effects are linked to efficiency motives derived from corporate focus and holdup consideration, while, anti-competitive motives such as collusion or foreclosure do not appear to be a factor in the decision of the method to vertically disintegrate. In addition, Jain, Kini, and Shenoy (2011) find that the wealth effects are also passed along to rival firms, supplier firms, and customer firms, largely support efficiency explanations in vertical divestitures. Overall, they infer that vertical divestitures appear to be good news for non-financial stakeholders along the supply chain.

Another stream of literature considers the impact of leveraged buyouts (LBOs) on product markets. Chevalier (1995) examines the influence of leveraged buyouts on product market competition in the local supermarket industry, encouraging entry and expansion by supermarket chains. She finds that LBOs in the local supermarket industry increase the industry rivals' returns and thus stimulates softer product market competition in that industry.

The emerging stream of literature that explores the effect of certain types (i.e. vertical, horizontal, conglomerate) restructuring activities such as mergers, acquisitions, and takeovers generally associate buyer/market power themes with horizontal and vertical mergers or takeovers along the supply chain, while some of the evidence appears mixed between efficiency and market power explanations. Prior literature fails to address horizontal divestitures in the corporate finance literature, to my knowledge. In addition, extant research overlooks the influence of horizontal divestitures on product markets relationships. Hence, the effects of horizontal deconsolidation remain largely unexplored, and I attempt to fill this gap in the literature by investigating the impact of customer industry horizontal divestitures on its supplier industry operating performance and producers' prices.<sup>13</sup>

### **3.3. Hypothesis development**

In this section, I develop and discuss the implications of the supplier opportunism/expropriation, pivotal buyer repositioning, and rival opportunism/waterbed effect hypotheses on supplier industry cash flow margins and producers' prices. Lastly, I investigate the implications of customer opportunism/expropriation on customer industry cash flow margins. There are other potential explanations of supplier profitability and pricing and customer profitability such as collusion, agency, and market foreclosure theories, among others. In this study, I test implications that are specific to customer (supplier) industry horizontal divestitures and have direct repercussions for firms in supplier (customer) industries. I summarize hypotheses and empirical predictions in Table 10. Panel A of Table 10 contains the hypotheses and predictions for my sample of downstream divestitures. Panel B of Table 10 contains the hypotheses and predictions for my sample of upstream divestitures.

#### *3.3.1. Supplier opportunism/expropriation hypothesis*

There are several means in which divesting firms may diminish their buying power. A divesting firm may lose its ability to pool its purchases across divisions or business units, thus impeding its ability

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<sup>13</sup> I use "horizontal divestiture event," "horizontal deconsolidation," "industry divestiture event," and "industry deconsolidation interchangeably throughout the remainder of this study to describe my event of interest. Similarly, downstream deconsolidation is used interchangeably with customer deconsolidation, downstream divestitures, or customer divestiture event. In contrast, upstream deconsolidation is used interchangeably with supplier deconsolidation, supplier divestiture event, or upstream divestitures.

to demand price concessions or quantity discounts from its suppliers. Whereas in the case of horizontal acquisitions, Fee and Thomas (2004) and Bhattacharya and Nain (2011) find evidence of efficiency increasing buying power. Alternatively, a divesting firm may demonstrate a moderated capacity to use buying power to limit purchases to monopsony levels, leading to elevated input prices that may rise to or above marginal cost. Williamson (1985) argues that an incomplete contracting environment can promote opportunistic behavior. As a result of a divesting firm's reduced ability to negotiate lower input prices from suppliers, suppliers in industries that have a relative bargaining advantage vis-à-vis customer industries are poised to exploit their customers' diminished ability to negotiate lower input prices and potentially raised input prices.

If horizontal divestitures do diminish buying power, I anticipate this outcome to be revealed in the operating performance of supplier industries. If a customer industry is heavily dependent on a particular supplier industry for a key input in its production process, a significant horizontal divestiture will likely lessen the divesting customer industry's bargaining power relative to its supplier due to the customer's reduced size and ability to negotiate price concessions for volume purchases. Therefore, I postulate that suppliers of dependent customer industries will enjoy a greater increase in operating performance after downstream deconsolidation (horizontal divestiture event in a customer industry) relative to suppliers of non-dependent customer industries. Therefore, my first hypothesis is:

**Hypothesis 1.** *Suppliers of dependent customer industries experience greater favorable changes in abnormal cash flow margins in the two years following an announcement of downstream deconsolidation.*

Improvement in operating performance, while in line with selling power enhancement, is not a conclusive substantiation of reduced buying power. On the one hand, alternative isolated aspects such as decreases in production costs or wages may constitute an increase in profitability of supplier industries. If, on the other hand, the increase in operating performance is linked to diminished buying power, I assume that this effect will be highlighted in the form of improved selling prices in the supplier industry. Therefore, my second hypothesis is:

**Hypothesis 2.** *Suppliers of dependent customer industries experience larger increases in selling prices (real producers' prices) subsequent to downstream deconsolidation.*

Efficiency-improving divestitures bias the results against supporting my hypothesis for a reduction in buying power. However, production efficiencies can decrease marginal costs of production, resulting in lower selling prices and increased production. Similar to the case of horizontal mergers (Bhattacharya and Nain (2011), efficiency-improving horizontal divestitures can raise the productive efficiency downstream and can bring about a decrease in marginal costs of production, thus lowering selling prices and increasing output levels. Alternatively, if deconsolidation permits divesting firms to produce the same output with fewer inputs than the demand for inputs, and thus, prices should decline. Efficiency-enhancing divestitures can end in perceived decreases in selling prices. The reduction in supplier selling prices would not be explainable by diminished selling power, thus any increase in producers' prices would support the supplier opportunism hypothesis.

Next, I consider countervailing power in the context of horizontal divestitures. The theory of countervailing power posits that economic power results in economic power (Galbraith, 1952). In particular, the group that is subject to the economic power of a dominant group counteracts that position by enhancing its own economic power relative to the power of the dominant group, thus exhibiting countervailing power. In this context, a large customer employs its bargaining power relative to its suppliers' bargaining power; as a result, suppliers decrease their selling prices to its buyers. If countervailing power serves as a mechanism to constrain buying power and selling power, then what is the consequence of relaxing this constraint, in this case buyer size, on buying power? Inherent in the theory of countervailing power is the notion that horizontal divestitures of downstream firms or buyers relax the mechanism that constrains or keeps in check upstream firms' or suppliers' selling power. More specifically, horizontal divestitures may reduce bargaining power, to the extent in which it eases the restrictions on suppliers' selling power, resulting in diminished buying power for a given customer industry relative to supplier industries.



In a model of dynamic countervailing power, Snyder (1996) shows that large buyers (customers) achieve lower prices from colluding sellers, and that the profitability of all buyers improves at the expense of the supplier after a merger of another firm due to merger induced competition amongst suppliers (Snyder, 1998). Hence, in the absence of buying power or erosion thereof, countervailing power theory suggests adverse consequences for not only a horizontally divesting customer firm, but for all other customer firms in their industry, as well. If downstream deconsolidation diminishes countervailing power as these theories designate, then customer industries that enjoy some degree of noncompetitive pricing (resulting from industry concentration and firm size) prior to deconsolidation should experience greater increases in price from opportunistic supplier industries, ex post. Therefore, the observable effect of reduced countervailing power should be more pronounced (or easy to detect) in customer industries with higher levels of concentration prior to downstream deconsolidation, since this type of customer industry will be less likely to counteract supplier market power. Hence, my third hypothesis is:

**Hypothesis 3.** *If downstream deconsolidation diminishes buying power then customer industries with higher levels of concentration prior to downstream deconsolidation will undergo larger price increases in selling prices following downstream deconsolidation.*

Next, I consider how barriers to entry may play a role on the impact of horizontal divestitures. Industry demand characteristics that may influence barriers to entry are often highlighted as impediments to competitive practices in the theory of industrial organization. Oligopoly theory conjectures that barriers to entry serve as a mechanism to preserve a collusive environment reducing the risk of entry. There exists empirical evidence that the concentration of buyers negatively influence supplier profitability, in support of the theory of countervailing power (Galbraith, 1952; Lustgarten, 1975; Schumacher, 1991; Patatoukas, 2011).<sup>14</sup> Traditional textbooks in economic theory suggest that barriers to entry afford the ability to

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<sup>14</sup> Lustgarten (1975) finds evidence between the relationship of supplier concentration and buyer concentration, confirming that structural factors such as the number of firms and barriers to entry are a factor in determining oligopolistic relationships. Schumacher (1991) finds evidence that buyer power concentration reduces the profitability of concentrated suppliers. Patatoukas (2011) finds evidence to suggest that research on the underlying factors of customer-base concentration should be examined simultaneously with the features and dynamics of upstream and downstream firms and industries.

influence market prices (Pindyck and Rubinfeld, 2005). In order to distinguish between industry demand considerations and the conjectured deterioration of buying power, I must demonstrate that downstream divestitures that improve demand effects upstream simply owing to enhanced efficiencies ought to have no impact on prices of supplier industries with lower impediments to entry. Similarly, downstream divestitures that diminish buying reduce demand effects upstream owing to enhanced efficiencies ought to have little, if any, impact on prices of supplier industries with lower impediments to entry. Since these more competitive environments are subject to price-taking behavior. This leads us to my fourth hypothesis:

**Hypothesis 4.** *If downstream deconsolidation diminishes buying power, concentrated supplier industries with greater barriers to entry prior to deconsolidation will enjoy larger increases in selling prices following downstream deconsolidation of concentrated customer industries.*

### 3.3.2. Pivotal buyer repositioning hypothesis

Chifty and Snyder (1999) contend that larger buyers negotiate lower prices in the model of one seller and multiple buyers. More recently, Adilov and Alexander (2006) extend Chifty and Snyder 's (1999) model and define a buyer as crucial, if the supplier is unable to cover its costs in the absence of trading with the customer. Adilov and Alexander argue that firm size can still increase bargaining power in the event of a horizontal merger, suggesting that there is a substitution effect between the bargaining power effect and pivotal buyer effect, under the assumption of a concentrated supplier. In contrast, Raskovich (2003) postulates that, in cases in which a supplier industry is characterized by high fixed costs, low marginal costs and high concentration, a buyer may grow to the extent in which it assumes a crucial role to a supplier's choice to produce due to the supplier need to meet its high fixed costs. Consequently, the buyer can no longer, convincingly, relinquish accountability for financing the supplier's costs due to the extent the supplier is dependent on its customer. Therefore, a pivotal buyer is less able to credibly negotiate with its supplier. Consequently, Raskovich (2003) contends that this circumstance leads the pivotal buyer to commit unfairly toward shared costs of production, resulting in cross-

subsidization of smaller, non-pivotal buyers (given that these non-pivotal buyers can resign responsibility for financing the supplier's costs since they are not as crucial to the supplier production choice).

Overall, these buyer power and pivotal buyer theories imply that a pivotal buyer or customer firm will have an incentive to divest (in order to reduce its size and thus its pivotal buyer status) if it is “on the hook” for its supplier’s costs and cross-subsidization of non-pivotal buyers, thus reversing the buyer’s pivotal position, increasing the firm’s ability to negotiate forcefully with their supplier. The reversal of the buyer’s pivotal position may allow the supplier to fairly reassume responsibility for its shared costs, improving the customer bargaining position and relieving the customer of cross-subsidization of non-pivotal buyers, as well. Assuming that the divesting firm’s buying power is inconsequentially reduced, this improvement in bargaining position would allow the buyer to negotiate more aggressively and credibly post-divestiture, and thus reducing the selling price for its inputs. The notion of a pivotal buyer strongly suggests a role for supplier economic dependence. As a result, a dependent supplier may become less profitable or experience a drop cash flow margin since the supplier reassumes full responsibility of its own financing costs given that the *once* pivotal buyer is no longer considered as crucial to the supplier’s production decision. Thus, my fifth hypothesis is:

**Hypothesis 5.** *More dependent and concentrated supplier industries experience greater adverse changes in abnormal cash flow margins in the two years following an announcement of downstream deconsolidation.*

However, if the decline in supplier operating performance is linked to increased customer bargaining power, I can anticipate that this effect will be highlighted in the form of reduced selling prices by dependent supplier industries relative to non-dependent supplier industries. This leads us to my sixth hypothesis:

**Hypothesis 6.** *Dependent supplier industries experience larger declines in selling prices (real producers’ prices) subsequent to downstream deconsolidation.*

Efficiency-improving divestitures may reduce the ability to distinguish between the pivotal buyer repositioning hypothesis and one of efficiency, since production efficiencies arising from the

deconsolidated firm can decrease marginal costs of production, resulting in lower selling prices and increased production. Increased production levels can stimulate demand for inputs and thus prices by suppliers (in contrast to my proposition of pivotal buyer repositioning). Alternatively, if deconsolidation permits divesting firms to produce the same output with fewer inputs then the demand for inputs, and thus, prices should decline. Efficiency-enhancing divestitures can end in perceived decreases in selling prices. The reduction in supplier selling prices would not be explainable by diminished selling power of the deconsolidating industry but could be explaining by pivotal buyer repositioning, at least to some degree.

Underlying this argument is the assumption that if the pivotal buyer can relinquish its pivotal position, and therefore size, the buyer substitutes more bargaining power at the expense of its pivotal position (Adilov and Alexander, 2006). Hence, once the pivotal buyer has reversed its pivotal position, it will be more likely to obtain lower selling prices from its suppliers due to its increase bargaining power. This reduction of firm size of a pivotal buyer should be more pronounced with respect to a concentrated supplier industry. Thus a horizontal divestiture may serve as a mechanism to reverse a customer's pivotal position; as a consequence, I could interpret decreased input prices for the customer as evidence of reversing the customer's pivotal position: restoring the customer's ability to bargain more aggressively. Hence, more concentrated supplier industries prior to deconsolidation should experience a larger decrease in selling prices after deconsolidation reflecting the reversal of the pivotal buyer's position. Consequently, my seventh hypothesis is:

**Hypothesis 7.** *If downstream deconsolidation reverses a pivotal buyer's pivotal position then supplier industries with higher concentration prior to downstream deconsolidation will undergo a greater reduction in selling prices following downstream deconsolidation.*

Given that supplier industries could reduce selling prices as a result of increased efficiencies or decreasing industry demand, I must distinguish potential increases in customer industry bargaining position from those arising from efficiencies or demand. If downstream deconsolidation allows pivotal buyers to reposition themselves, supplier industries with greater barriers to entry prior to deconsolidation

will suffer larger declines in selling prices following downstream deconsolidation of customer industries.

Hence, I present my eighth hypothesis:

**Hypothesis 8.** *If downstream deconsolidation allows pivotal buyers to reposition themselves, supplier industries with greater barriers to entry prior to deconsolidation will suffer larger declines in selling prices following downstream deconsolidation of customer industries.*

### 3.3.3. Waterbed effect hypothesis

Majumdar (2005) demonstrates how downstream mergers can lead to reduced input prices for the newly merged firm, while at the same time increasing input prices of the newly merged firm's rivals, "the waterbed effect." In addition, Majumdar finds that pre-existing buying power plays a role in enhancing the merging firm's buying power in addition to making rivals worse off, citing reduced demand from independent competitors and increased access to markets that the acquiring firm did not initially have. In a related paper, Inderst and Valletti (2011) consider how a given buyer's power (arising from size) vis-à-vis suppliers compares with competing buyers and find that differential/asymmetric buyer power among customers may lead to lower prices for more powerful customer while increasing wholesale prices to competing customers. The asymmetry in buyer power provides the dominant firm with advantageous terms of trade, and an increased competitive position in the retail market. Inderst and Valletti (2011) show that if a supplier has the ability to price discriminate in which competing sources of supply are uncontested and disparity in downstream firm size differential (buyer market power), the potential waterbed effect should be more pronounced.

A horizontal divestiture potentially induces asymmetry or differential buying power of firms in the divesting customer industry by redistributing buying power among the competing firms in that industry. For instance, the resultant divesting firm is substantially smaller in size than prior to the divestiture event, suggesting a reduced ability to exert the same degree of bargaining power or buying power relative to its suppliers. Consequently, this event induces a potential redistribution of bargaining or buying power of rivals or competing firms in the same industry vis-à-vis suppliers of crucial inputs. This

suggests that more dominant competing rival firms may have improved bargaining position post-divestiture and possibly negotiate lower input prices with suppliers.

The waterbed effect suggests that horizontal divestitures may induce redistribution of buying power and asymmetric gains in buying power among now dominant industry rivals post-divestiture. These now dominant industry rivals potentially seek price concessions from suppliers, who have the ability to price discriminate, at the expense of less dominant industry firms that may endure ensuing price increase. As a result of these offsetting price increases and decreases, the net change in the supplier operating performance is anticipated to be zero. Therefore, my ninth hypothesis is as follows:

**Hypothesis 9.** *Supplier or customer industry dependence has no effect on abnormal cash flow margins in the two years following an announcement of downstream deconsolidation.*

Given that supplier dependence and customer dependence should play no role in inducing waterbed effects or rival opportunism, supplier dependence and customer dependence should have any impact average supplier industry selling price. Accordingly, my tenth hypothesis is:

**Hypothesis 10.** *Supplier or customer industry dependence has no impact on supplier selling prices (real producers' prices) subsequent to downstream deconsolidation.*

A large horizontal divestiture event can lead to a redistribution of buying power in a customer industry. This redistribution may trigger a differential in buying power among the competing industry rivals and divesting firm, resulting in a shift of dominant buyers within an industry. In supplier industries in which there exists the ability to price discriminate, suppliers would be able to offer newly dominant firms price discounts, while raising prices on newly non-dominant firms in the customer industry subject to differential buying power. Therefore, I present my eleventh hypothesis:

**Hypothesis 11.** *If downstream deconsolidation induces asymmetric customer buying power, supplier industries with higher levels of concentration prior to downstream deconsolidation will lead to offsetting selling price increases of less powerful customer and decreases in selling prices for more powerful customers following downstream deconsolidation.*

To distinguish from Hypotheses 4 and 8, I must demonstrate that barriers to entry in the supplier's industry exacerbate waterbed effects due to these barriers allowing the supplier to continue price discriminating behavior to customer industries. If downstream deconsolidation leads to asymmetric customer industry buying power, supplier industries with greater barriers to entry prior to deconsolidation will be able to better discriminate selling prices following downstream deconsolidation of concentrated customer industries, enhancing the waterbed effect of offsetting changes in input price. Next, I present my twelfth and final hypothesis with respect to downstream deconsolidation.

**Hypothesis 12.** *If downstream deconsolidation leads to asymmetric buying power, concentrated supplier industries with greater barriers to entry prior to deconsolidation will be able to better discriminate selling prices following downstream deconsolidation of concentrated customer industries.*

#### 3.3.4. *Customer opportunism/expropriation hypothesis*

For completeness, this section of the paper explores the implications of an upstream divestiture event (upstream deconsolidation or supplier deconsolidation) on downstream firms. Stigler (1964) contends that monopolistic collusion permits merging firms to collude with industry rivals and restrict production to customers earning monopoly rents. Eckbo and Wier (1985) postulate that events that reduce the chance of horizontal mergers would potentially result in lost monopoly rents to merging firms and industry rivals. Eckbo (1983) asserts that under collusion brought about by merging firms, monopoly rents are harmful to customers. By implication, a large horizontal divestiture may reduce supplier industry concentration and diminish potential to collude amongst industry rivals. Assuming decreased industry concentration from large horizontal divestiture activity, the divesting supplier industry may lose potential bargaining power relative to customer industries. Alternatively, divesting suppliers may no longer be able to restrict output to monopoly levels, leading to lower input prices that may decline to marginal cost. Thus, horizontal divestitures may harm ability of suppliers to bargain for higher input prices vis-à-vis customers. Customers industries that have a bargaining advantage relative to supplier industries are in a prime position to take advantage of their suppliers reduced ability to demand higher input prices, and consequently reduce their (customers') input prices.

If horizontal divestitures mitigate supplier selling power, I expect that this outcome will be discovered in the operating performance of customer industries. If a supplier industry is very reliant on a given customer industry for its sales, a substantial divestiture will likely reduce the supplier industry's negotiation power relative to its downstream customer industry. Thus, I posit that customer industries of divesting upstream dependent supplier industries will enjoy a greater increase in operating performance subsequent to upstream deconsolidation (horizontal divestiture event in a customer industry) relative to customers of less dependent supplier industries. Hence, my next hypothesis is:

**Hypothesis 13.** *Customers of dependent supplier industries experience greater favorable changes in abnormal cash flow margins (abnormal cash flow-to-market value of assets) in the two years subsequent to an upstream deconsolidation relative to customers of non-dependent supplier industries.*

Consequently, if an upstream divestiture event weakens the bargaining position of upstream firms, dependent supplier industries will be more vulnerable to granting price concessions as a result of increased post-divestiture competition relative to less dependent supplier industries. Hence, I postulate that customers of divesting upstream dependent supplier industries will experience reduced input costs subsequent to the upstream divestiture event relative to less dependent supplier industries. Therefore, I test the following conjecture:

**Hypothesis 14.** *Customers of dependent supplier industries experience greater declines in abnormal costs-of-goods sold margins in the two years subsequent to an upstream deconsolidation relative to customers of less dependent supplier industries*

Countervailing power theories posit that economic power brings about economic power (Galbraith, 1952). For instance, the group that is constrained by the economic power of a dominant group counters that position by boosting its own economic power in relation to the power of the dominant group, thus engendering countervailing power. In this model, a large customer employs its bargaining power relative to its suppliers' bargaining power; consequently, suppliers cut their selling prices to its buyers. If countervailing power serves as a medium to keep in check both buying power and selling power, then I anticipate that relaxing this restriction will have adverse consequences for upstream



suppliers' selling power. Inherent in this model is the concept that horizontal divestitures of upstream firms relax the channel that limits or keeps in check downstream firms' or customers' buying power. More specifically, upstream horizontal divestitures may reduce bargaining power of supplier industries. Potentially, upstream horizontal divestitures may strengthen the rivalry between colluding suppliers and encourage these suppliers to offer lower prices to large buyers in a manner similar in which horizontal mergers between buyers increase supplier competition (resulting in lower prices) in Snyder's (1996, 1998) theory of dynamic countervailing power.

If upstream deconsolidation weakens countervailing power for supplier industries, then concentrated suppliers, whose market power would be constrained by customer market power prior to upstream deconsolidation, should no longer be able to effectively offset customer market power. Therefore these customer industries should experience greater input price declines and hence higher cash flow margins subsequent to the upstream divestiture. Employing supplier industry concentration as a measure of market power, I state my next hypothesis:

**Hypothesis 15.** *If upstream deconsolidation reduces selling power, customers whose suppliers have higher concentration prior to upstream deconsolidation will experience greater favorable changes in cash flow margins (abnormal operating income to market value of assets) in the two years subsequent to an announcement of upstream deconsolidation.*

As noted earlier, oligopoly theory posits that barriers to entry act as a channel to maintain a collusive environment, in order to mitigate the risk of entry by new competitors, and is substantiated by empirical evidence (Galbraith, 1952; Lustgarten, 1975; Schuacher, 1991; Patatoukas, 2011; Bhattacharyya and Nain, 2011). Upstream divestitures may lead to the increased probability of entry by new competitors, and, thus, the threat of competition. Therefore, supplier industries will likely have to compete on price and quality post-divestiture to the benefit of their customers. This competition may also affect weaken structural barriers to entry within the industry.

Additionally, Bhattacharyya and Nain (2011) document evidence to support countervailing power theory, finding that suppliers with pricing power (market and structural) would be "natural targets" of

buying power generated by “downstream consolidation” via horizontal acquisitions. Inversely, countervailing power theory infers that upstream deconsolidation via horizontal divestitures make suppliers with structural sources pricing power, again, “natural targets” due to reduced selling power (alternatively, indirectly enhanced buying power) brought about by “deconsolidation upstream.” This leads to my final hypothesis:

**Hypothesis 16.** *If upstream deconsolidation reduces selling power, customers whose suppliers have higher barriers to entry prior to upstream deconsolidation will experience greater favorable changes in cash flow margins (abnormal cash flow-to-market value of assets) in the two years subsequent to an announcement of upstream deconsolidation.*

### **3.4. Data sources, sample selection, and relevant characteristics of the sample**

In this section, I describe the data sources and sample construction requirements employed to identify my final sample of horizontal divestitures. I also present the relevant aspects of my final sample of horizontal divestitures.

#### *3.4.1. Sample Formation*

I commence by assembling a sample of industries that experienced an identifiable rise in deconsolidation activity in order to obtain pre- and post-divestiture periods. I follow Villalonga and McGahan (2005) in my initial stage of identifying horizontal divestitures in the Securities Data Company (SDC) Platinum database. I obtain my sample of divestitures from SDC’s *Mergers and Acquisitions* database that meet the following criteria: (i) all divestitures announced and completed between January 1, 1979 and December 31, 2010. My next requirement is that the “divestitures” classification incorporates: (ii) deals categorized by SDC as divestitures, spin-offs, and carve-outs.<sup>15</sup> Following Bhattacharyya and

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<sup>15</sup> As defined by Villalonga and McGahan (2005), SDC tracks divestitures in the event of a loss of majority control, the parent firm loses majority ownership in the target, or the target firm disposes of assets. A spin-off represents the tax-free distribution of stock by a firm off a unit, subsidiary, division, or another firm’s stock, or any fraction thereof, to its stockholders. SDC follow spin-offs of any proportion. In comparison, a carve-out consists of a new firm’s stock being distributed or being put up for sale to the public by way of an initial public offering (IPO). SDC follows carve-outs under the condition that the carve-out corresponds to 100 percent of the unit, subsidiary, or division or other firm. Following Villalonga and McGahan (2005) I exclude modifications in a firm’s ownership structure created by a firm’s Employee Stock Ownership Plan (ESOP), or more generally by the acquisition of partial or remaining in one of the sample firms (or in a subsidiary) that does correspond to a divestiture.

Nain (2011), I also require that the: (iii) parent firm and the target firm (divested unit) to be U.S.-based. I identify the parent and target firms' divesting industries using the following SDC variables "Target Ultimate Parent Primary SIC Code" and "Target Primary SIC Code," respectively. Next, I restrict my sample to include cases in which: (iv) the parent and target share the same primary four-digit Standard Industrial Classification (SIC) code. In addition, I require that: (v) the transaction value associated with each divestiture is available.

For each four-digit SIC code in the divestiture sample, I measure quarterly divestiture activity as the total transaction value of all horizontal divestitures announced in a quarter as a proportion of industry total market value of common equity. Consistent with Bhattacharyya and Nain (2011), I categorize an industry as having undergone a *divestiture event* in a given quarter when the following restrictions are met: (i) quarterly divestiture activity in the current quarter exceeds 5% of industry total market capitalization and (ii) quarterly divestiture activity in any of the previous 8 quarters did not exceed 1.5% industry total market value of common equity.<sup>16</sup> My initial restriction, (i), guarantees that the selected industries undergo considerable horizontal deconsolidation in a given quarter, while the second restriction, (ii), guarantees that I have clean pre-event period in which there was modest horizontal divestiture activity. This designation of the divestiture event allows us to identify 137 four-digit SIC codes that underwent at least one divestiture event between 1979 and 2010.

In order to establish customer or supplier relationships, I employ the *make* and *use* tables from the 1992 and 1997 Benchmark I-O accounts of the Bureau of Economic Analysis (BEA). The *make* table is matrix displaying the industry *production, or output*, of each commodity in the economy at producer prices, whereas, the *use* table is a matrix displaying the commodities *consumed or used*, by each industry and final consumers at producer prices. Following Allayannis and Ihrig (2001) and Bhattacharyya and Nain (2011), I generate an input-output matrix from the *make* and *use* tables. I use Bhattacharyya and Nain's (2011) matching procedure for the 1992 and 1997 input output matrix, since the BEA provides

<sup>16</sup> I alter Bhattacharyya and Nain's (2011) requirement of 12 quarters prior to and after divestiture event to 8 quarters prior to and after divestiture event in order to maximize the size of my sample.

input-output tables every five years. In addition, 1992 is the final year in which the BEA uses the SIC codes that can be matched to Compustat data, while 1997 input output matrix uses NAICS codes. Therefore, staying consistent with Bhattacharyya and Nain, I must use the Census Bureau's SIC-NAICS correspondence tables for 1997 to match SIC and NAICS codes. I follow Bhattacharyya and Nain (2011) and assume that this relationship exists for the latter half of my sample. Following Bhattacharyya and Nain's (2011) approach, I use the 1992 input-output matrix to link suppliers to industries deconsolidating in or prior to 1994 (the first half of my sample) and the 1997 input-output matrix to match suppliers to industries deconsolidating in or following 1995 (the second half of my sample).

I find 46 downstream industries that I am able to match suppliers to in my sample, whereas, Bhattacharyya and Nain (2011) are able to match suppliers to 141 industries. This disparity is likely due to the frequency of divestiture activity that produces more contaminated matches that we are unable to cleanly test. In addition, divestitures in general tend to be approximately one-third to one-half the size of acquisitions, on average (Mulherin and Boone, 2000). Panel A of Table 11 identifies these divesting industries accompanied by the number of divestitures that contribute to each divestiture event and the proportion of the divestiture transaction value to industry total market value of common equity. I invert the methodology outlined in Bhattacharyya and Nain (2011) to identify upstream divestitures and match up to ten customers industries to the sample of upstream divestiture events. I am able to link 35 upstream divesting industries to customer industries in my sample. In contrast, Bhattacharyya and Nain (2011) do not examine upstream horizontal merger activity, since these actions are likely to be blocked by antitrust authorities given the bias that selling power would likely increase. Panel A of Table 11 identifies downstream divesting industries accompanied by the number of divestitures that contribute to each divestiture event and the proportion of the divestiture transaction value to industry total market value of common equity, while Panel B of Table 11 provides similar information for upstream divesting industries.

I extend Bhattacharyya and Nain (2011) in my approach to investigating the role of industry dependence, by examining not only supplier dependence for the upstream divestiture sample, but also to

investigate the pivotal buyer repositioning hypothesis by investigating the interaction of supplier industry dependence, supplier high fixed costs, and customer industry concentration. Additionally, I examine the role of customer dependence with respect to the supplier opportunism hypothesis. I use the input-output matrix in order to compute the fraction,  $f_{jm}$  of the deconsolidating customer industry  $m$ 's input purchased from supplier industry  $j$ . Higher values of  $f_{jm}$  suggest that the deconsolidating customer industry  $m$  is more dependent on supplier industry. For every deconsolidating industry, I recognize up to ten supplier industries with the largest values of  $f_{jm}$ . Working with up to ten suppliers per deconsolidating industry, I am able to incorporate industries selling a very small proportion of their output to the divesting industry and less likely to be influenced substantially by downstream divestiture activity. This approach increases the power of my cross-sectional tests in identifying any linkage between customer dependence and profit or price fluctuations undergone by the supplier industry. Since there are only 46 clean downstream and 35 upstream divestiture events, respectively, I can acquire at most 460 divesting industry-supplier pairs and 350 divesting industry-customer pairs. Panel A in Table 12 shows the 274 divesting industry-supplier industry pairs I obtain during my matching process, which is smaller than the number of merging industry-supplier industry pairs (1,155) obtained by Bhattacharyya and Nain (2011) due to the lower number events (47 compared to 141) we examine.

For the downstream divestiture sample, I characterize suppliers on which customers are dependent, *customer dependent*, as suppliers with value of  $f_{jm}$  in the top quintile of the distribution. I classify lingering suppliers as *non-customer dependent*. Also for the downstream divestiture sample, I characterize dependent suppliers as those suppliers with  $f_{mj}$  in the top tercile ( $1/3^{\text{rd}}$ ) of the distribution. I employ terciles rather than quintiles due to the fact that I using an interaction to capture pivotal buyers, which reduces the number of observations that meet the criteria without losing substantial variation in the sample. I use this delineation of supplier dependence to formulate my pivotal buyer classification. As indicated earlier, Raskovich (2003) describes the conditions in which a supplier has a pivotal buyer relationship. These conditions include a supplier having high fixed and marginal costs, high supplier concentration, and the buyer is crucial to supplier's production process. Using this depiction of a pivotal

buyer relationship, I operationalize the variable, *pivotal buyer*, concept by meeting the following conditions: suppliers with  $f_{mj}$  in the top tercile (high supplier dependence), suppliers with pre-divestiture abnormal high fixed costs top half of distribution (high fixed costs), and suppliers with average pre-divestiture industry concentration above 1800 (high concentration). All remaining suppliers that do not meet these conditions are classified as having a *non-pivotal buyer* relationship.

However in my upstream divestiture sample, I define supplier dependence in a manner similar to Bhattacharyya and Nain (2011). I characterize as the variable *supplier dependent* based on values  $f_{mj}$  in the top quintile. I also classify lingering suppliers as *non-supplier dependent* for those that are not characterized as *supplier dependent*.

Panel A of Table 12 reports the distribution of  $f_{jm}$  for dependent and non-dependent customers for the downstream divestiture sample.  $f_{jm}$  is calculated as the ratio of customer industry inputs purchased from a given supplier industry to that customer industry's total purchases in order to capture customer (industry) dependence. Dependent customers in the divesting industry procure, on average, 4.56% of their inputs from their suppliers, while non-dependent customers purchase 0.28%. Panel B of Table 12 represents the distribution of  $f_{mj}$  for pivotal and non-pivotal suppliers for the downstream divestiture sample. In contrast,  $f_{mj}$  is calculated as the ratio of supplier industry output sold to a given customer industry to that supplier industry's total output produced in order to capture supplier (industry) dependence. Dependent suppliers deliver, on average, 10.7% of their production to the divesting industry, while non-dependent suppliers provide 0.4%. Panel C of Table 12 shows the distribution of  $f_{mj}$  for dependent and non-dependent suppliers for the upstream divestiture sample. Dependent suppliers supply, on average, 10.7% of their production to the divesting industry, while non-dependent suppliers provide 0.4%.

### 3.4.2. *Supplier industry operating performance*

I follow Bhattacharyya and Nain (2011) with respect to my analysis of pre-divestiture and post-divestiture industry operating performance and choice of explanatory variables, but I include a variables for customer dependence, pivotal buyers, and both customer and supplier barriers to entry, whereas, they

include only on supplier dependence and supplier barriers to entry. I begin my multivariate analysis using the subsequent two regression models estimated using a pooled times series panel with clustered standard errors by supplier two-digit SIC codes in equations (1) and (2).

$$PreDivSuppOperPerf_j = \alpha_1 + \alpha_2 CD_j + \alpha_3 PB_j + \alpha_4 Supp\_HConc\_HFC_{jt} + \alpha_5 SD_j + \alpha_6 cust\_herf_{jt} + \alpha_7 cust\_ks_{jt} + \alpha_8 cust\_capex_{jt} + \alpha_9 cust\_advert_{jt} + \alpha_{10} supp\_herf_{jt} + \alpha_{11} supp\_ks_{jt} + \alpha_{12} supp\_capex_{jt} + \alpha_{13} Supp\_advert_{jt} + \varepsilon_{jt} \quad (1)$$

$$PostDivSuppOperPerf_j = \gamma_1 + \gamma_2 CD_j + \gamma_3 PB_j + \gamma_4 Supp\_HConc\_HFC_{jt} + \gamma_5 SD_j + \gamma_6 Cust\_herf_{jt} + \gamma_7 Cust\_ks_{jt} + \gamma_8 cust\_capex_{jt} + \gamma_9 cust\_advert_{jt} + \gamma_{10} supp\_herf_{jt} + \gamma_{11} supp\_ks_{jt} + \gamma_{12} Supp\_capex_{jt} + \gamma_{13} Supp\_advert_{jt} + \varepsilon_{jt} \quad (2)$$

Using these two models, I investigate the effect of downstream deconsolidation on supplier industry operating performance to empirically test my first, fifth, and ninth hypotheses. *PreDivSuppOperPerf* and *PostDivSuppOperPerf<sub>j</sub>* are pre-divestiture and post-divestiture operating performances of supplier *j*, respectively. I employ several measures of supplier operating performance as described below. I use two accounting based measures of operating performance, the cash flow-to-sales ratio and cash flow-to-total assets, and two value based measures of operating performance, the cash-flow-to-market value of assets ratio and cash flow-to-enterprise value ratio. For my first proxy of supplier operating performance, I define the cash flow-to-sales ratio of the median firm in the industry. Staying consistent with Fee and Thomas (2004) and Bhattacharyya and Nain (2011), I define the cash flow-to-sales ratio as the ratio of operating income before depreciation (Compustat item 13) to sales (Compustat item 12). I then measure the industry's abnormal operating performance from that of the median industry in the economy, which I define as ACFM. I measure ACFM two years prior to divestiture, *Pre\_ACFM*, and two years after divestiture, *Post\_ACFM*.

I define ROA as the ratio operating income before depreciation (Compustat item 13) to total assets (Compustat item 6) for the median firm in the industry. I define cash flow-to-total assets as the ratio of operating income before depreciation (Compustat item 13) to total assets (Compustat item 6) for the median firm in the industry. The cash flow-to-market value of assets is defined as the ratio of operating income (Compustat item 13) to the sum of the book value of total assets (Compustat item 6),

market value of equity (Compustat item 199) \* (Compustat item 61), less the book value of common equity (Compustat item 60) for the median firm in the industry. The cash flow-to-enterprise value ratio is defined as the ratio of earnings before interest, taxes, depreciation, and amortization (Compustat item 13) to the sum of the book value of total assets (Compustat item 6), market value of equity (Compustat item 199) \* (Compustat item 61), less the sum of book value of common equity (Compustat item 60) and cash and short term investments (Compustat item 1) for the median firm in the industry. I define abnormal operating performance for the cash flow-to-total assets, cash flow-to-market value assets, and cash flow-to-enterprise value ratios (*AROA*, *ACFMVA*, and *ACFEV*, respectively) similar to *ACFM* for the other variables. In addition, I define *PreDivSuppOperPerf* and *PostDivSuppOperPerf<sub>j</sub>* for the other variables for supplier industries similar to *Pre\_ACFM* and *Post\_ACFM*.

I regress abnormal operating performance prior to downstream deconsolidation on customer the dependence dummy and pivotal buyer dummy. The dummy variable, *CD*, represents suppliers on which customer industries are dependent. The dummy variable, *PB*, represents suppliers that have a pivotal buyer relationship with their customers. I regress, equation (2), abnormal operating performance after downstream deconsolidation on customer dependence and pivotal buyer, as well. I proxy for customer dependence using an indicator variable, *CD*, that equals one for suppliers in which the customer is dependent and is zero, otherwise. Similarly, I proxy for pivotal buyer using an indicator variable, *PB*, that equals one for suppliers that are dependent on customers, have high fixed costs, and have high industry concentration dependent and is zero, otherwise. I also control for supplier dependence using an indicator variable, *SD*, which equals one for suppliers that are dependent and is zero, otherwise, to capture the influence of pivotal buyers.<sup>17</sup> I employ the same control variables as Bhattacharyya and Nain (2011) and Shumacher (1991) with respect to both customers and suppliers to be consistent with their methodology.<sup>18</sup> In addition, I control for industries that have high fixed costs and high supplier concentration but lack

<sup>17</sup>Suppliers are dependent by definition of a pivotal buyer such that the buyer is essential to their business decisions.

<sup>18</sup>Bhattacharyya and Nain obtain measures of the determinants of industry profitability such as competition, barriers to entry, and product differentiation from the work of Shumacher (1991).



supplier dependence to unofficially proxy for suppliers that do not have a pivotal buyer relationship but have similar fixed costs and industry structure.

Supplier profitability is positively associated with more concentrated industry conditions, increased barriers to entry, and increased product differentiation. Hence, I anticipate that the coefficients on these barriers to be positive. As stated earlier, I follow Bhattacharyya and Nain (2011) with respect to my choice of explanatory variables and dependent variable. I use the Herfindahl index, a traditional measure of industry concentration. The Herfindahl index is sum of the squared market shares of the firms within an industry; it is often used to capture industry competitiveness. High barriers to entry make it difficult for firms to enter and compete with existing firms in a given industry. I measure barriers to entry using capital intensity and capital expenditures to capture the effect of high capital requirements in a given industry. I calculate capital intensity as industry total assets (Compustat item 6) divided by industry total sales (Compustat item 12), for every four-digit SIC in a given year. I calculate capital expenditures as industry total capital expenditures (Compustat item 128) divided by industry total assets (Compustat item 6). Capital intensity gives a scaled measure of the annual total capital stock relative at given point in time. In comparison, capital expenditures give a scaled measure of essential annual capital investment in an industry. Advertising intensity is used as a substitute measure for product differentiation in an industry. I calculate advertising intensity as industry total advertising expense (Compustat item 45) divided by industry total sales. Tables 13 and 14 provide us estimates of equations (1) and (2) using OLS with robust standard errors clustered at the supplier two-digit SIC level. To mitigate the impact of outliers, all the continuous variables are winsorized at the 99th percentile.

To examine these results, I utilize a similar interpretation as Bhattacharyya and Nain (2011) in the analysis of the pre-divestiture and post-divestiture operating performance, predominantly by comparing the change in the coefficient/significance of the dependence (or pivotal buyer) variable. In Columns 1 and 3 Table 13, the dependent variables are the two-year average of supplier industry abnormal cash flow margin and supplier abnormal return on assets prior to the downstream divestiture. The coefficient on the customer dependence dummy,  $\alpha_1$ , is statistically insignificant in Columns 1 and 3, suggesting that the

profitability of suppliers that have dependent customers is unnoticeably different than those which have non-dependent customers prior to a horizontal divestiture event. The coefficient on the pivotal buyer dummy,  $\alpha_2$ , is statistically significant, at the 1% level, and positive in Columns 1 and 3, suggesting that the profitability of suppliers in a pivotal buyer relationship is significantly higher from non-pivotal buyers prior to a horizontal divestiture event.

In Columns 2 and 4 of Table 13, the dependent variables are the two-year average of supplier industry abnormal cash flow margin and supplier abnormal return on assets subsequent to the downstream divestiture. The coefficient on the customer dependence dummy,  $\gamma_1$ , is statistically insignificant in Columns 2 and 4 of Panel A of Table 13, suggesting that the profitability of suppliers that have dependent customers is still indistinguishable from those which have non-dependent customers subsequent to a horizontal divestiture event. Thus, abnormal accounting performance for suppliers that have dependent customers does not appear to change significantly following a downstream divestiture event, which does not support the notion that suppliers act opportunistically and expropriate customers following horizontal divestitures. The coefficient on the pivotal buyer dummy,  $\gamma_2$ , is now insignificant in Columns 2 and 4, suggesting that the profitability of suppliers in a pivotal buyer relationship is not significant and indistinguishable from non-pivotal buyers subsequent to a horizontal divestiture event. Therefore the difference in the coefficients for  $\alpha_2$  and  $\gamma_2$  indicates that abnormal accounting performance for suppliers that have a pivotal buyer relationship is at least 10% higher than those that do not have a pivotal buyer relationship prior to the divestiture, which disappears subsequent to the horizontal divestiture event. Thus, it appears that pivotal buyers seem to be able to use horizontal divestitures as an opportunity to reposition themselves, reducing cross-subsidization by suppliers and non-pivotal buyers within their industry. Supplier profitability does not appear to be significantly influenced by customer barriers to entry. I document that supplier annual capital investment required in an industry appears to be associated with higher cash flow margins. Hence, the results indicate that concentrated supplier industries with greater barriers to entry prior to deconsolidation do not enjoy larger increases in supplier profitability following downstream deconsolidation of concentrated customer industries, failing to support the supplier

opportunism hypothesis. Also, the evidence fails to support the rival opportunism hypothesis, which states that horizontal divestitures will generate an offsetting effect as rivals capture lost market power at the expense of divesting firms.

In Columns 1 and 3 of Table 14, the dependent variables are the two-year average of supplier industry abnormal cash flow-to-market value of assets and supplier abnormal cash flow-to-enterprise value prior to the downstream divestiture. Similar to the results from Table 13, the coefficient on the customer dependence dummy,  $\alpha_1$ , is statistically insignificant in Columns 1 and 3, suggesting that the value of suppliers that have dependent customers is unremarkably different than those which have non-dependent customers prior to a horizontal divestiture event. The coefficient on the pivotal buyer dummy,  $\alpha_2$ , is statistically significant, at the 5% level at least, and positive in Columns 1 and 3, suggesting that the value of suppliers in a pivotal buyer relationship is significantly higher from non-pivotal buyers prior to a horizontal divestiture event.

In Columns 2 and 4 of Table 14, the dependent variables are the two-year average of supplier industry abnormal cash flow-to-market value of assets and supplier abnormal cash flow-to-enterprise value subsequent to the downstream divestiture. The coefficient on the customer dependence dummy,  $\gamma_1$ , is statistically insignificant in Columns 2 and 4, suggesting that the value of suppliers that have dependent customers continues to be indistinguishable from those which have non-dependent customers subsequent to a horizontal divestiture event. Thus, abnormal value based measures of operating performance for suppliers that have dependent customers does not appear to change significantly following a downstream divestiture event. The coefficient on the pivotal buyer dummy,  $\gamma_2$ , is now insignificant in Columns 2 and 4, suggesting that the value of suppliers in a pivotal buyer relationship is not significant and indistinguishable from non-pivotal buyers subsequent to a horizontal divestiture event. Therefore, the difference in the coefficients for  $\alpha_2$  and  $\gamma_2$  specifies that abnormal value based operating performance for suppliers that have a pivotal buyer relationship is at least 3.5% higher than those that do not have a pivotal buyer relationship prior to the divestiture but dissipates subsequent to the divestiture.

Supplier profitability does not appear to be significantly influenced by customer barriers to entry in general. I document that supplier annual capital investment required in an industry appears to be associated with higher cash flow margins. I report that supplier value is higher in industries in which their customer industries have higher capital stock. Since customer concentration tends to be associated with customer barriers to entry, this suggest that customers with high capital stock prior to horizontal divestitures may face a reduction in buying power for subsequent to horizontal divestitures and mildly supports the notion of supplier opportunism. I also report that value is higher in supplier industries with greater concentration and high annual capital investment requirements. The evidence supports most of the findings from the previous paragraphs but also suggest that pivotal buyer repositioning of customers subsequent to horizontal divestitures is value relevant for suppliers that cross-subsidize pivotal buyers prior to horizontal divestitures. It appears that certain barriers to entry (annual capital investment and supplier concentration) are important prior to and subsequent to horizontal divestitures but do not decrease significantly subsequent to horizontal divestitures. Therefore, the results fail to support the idea that concentrated supplier industries with greater barriers to entry prior to deconsolidation will enjoy larger increases in selling prices following downstream deconsolidation of concentrated customer industries.

Qualitatively speaking, the results from Table 14 are suggestive of the pivotal buyer repositioning notion that if downstream horizontal divestiture events allow pivotal buyers to reposition themselves, then supplier industries with greater barriers to entry prior to the event will suffer greater declines in profitability following downstream deconsolidation of customer industries. Yet, these results, with respect to supplier barriers to entry, are somewhat supportive of the waterbed effects hypothesis, which indicates that if downstream divestiture events lead to asymmetric buying power, concentrated supplier industries with greater barriers to entry be better positioned to price discriminate subsequent to downstream divestiture events.

With respect to the supplier opportunism hypothesis that indicates that suppliers will opportunistically take advantage of downstream divesting firms subsequent to horizontal divestitures, I

expect that the coefficient,  $\alpha_1$ , will be positive in equation (1) but to be significantly smaller in magnitude relative to  $\gamma_1$  in equation (2). With respect to the customer opportunism hypothesis that suggests that pivotal buyers use horizontal divestitures to reposition themselves with respect to suppliers, I expect that the coefficient,  $\alpha_2$ , will be significantly smaller in magnitude relative to  $\gamma_2$  in equation (2) to highlight the reversal of the buyers' pivotal position. The waterbed effect hypothesis posits that horizontal divestitures generate offsetting changes in input prices in favor of industry rivals (at the expense of divesting firms), which suggests that the coefficients,  $\alpha_1$  and  $\alpha_2$ , in equation (1) will not be statistically distinguishable from  $\gamma_1$  and  $\gamma_2$ , in equation (2), respectively. I fail to reject the null for hypotheses 1 and 9 but reject the null for hypothesis 5. Thus, the evidence from Table 14 appears to primarily provide evidence in support of the pivotal repositioning hypothesis.

### 3.4.3. Supplier industry selling prices

For every supplier of a deconsolidating industry, I acquire the Producer Price Index (PPI) from the Bureau of Labor Statistics (BLS).<sup>19</sup> The PPI series permit us to capture the fluctuations in prices obtained by domestic producers for their goods and services. I account for inflation the PPI series by using the Gross Domestic Product (GDP) price deflator. I delineate the deflated PPI series as the *Real Producer Price Index (RPPI)*.

### 3.4.4. Univariate analysis

I conduct independent sample t-tests on the RPPI series for the two years prior to divestiture and the two years after divestiture. I test difference in means of the real producer price index series (RPPI) prior to and subsequent to downstream deconsolidation; these tests will be conducted for all supplier industries, between suppliers on which customers are dependent and not dependent. I test the difference in

<sup>19</sup> The Producer Price Index series follows the prices of goods sold by wholesalers. The index represents typical changes in prices obtained by domestic producers for their production. Methodical sampling techniques of practically every mining through manufacturing industry in the economy are used to calculate producer price indexes. In concept, the Producer Price Index is calculated according to the modified Laspeyres formula:  $I_t = \frac{\sum Q_a P_t}{\sum Q_a P_0} \times 100$ , where  $I_t$  is the price index in the current period;  $P_0$  is the price of a commodity;  $P_t$  is the current price of the commodity; and  $Q_a$  represents the quantity shipped during the weight-base period. Additional information can be found in Chapter 14, Producers Prices, BLS Handbook of Methods <http://www.bls.gov/opub/hom/pdf/homch14.pdf>.

the means of the real producer price index between suppliers on which customers are dependent and suppliers on which customers are not dependent, prior to and after downstream deconsolidation. I use the univariate analysis to perform initial tests of my second set of hypotheses (hypotheses 2, 6, and 10) regarding the impact downstream deconsolidation of supplier's prices. Table 15 reports descriptive statistics of the entire supplier industry RPPI over the two years preceding the downstream divestiture, the two years subsequent to the downstream divestiture, and the difference between the two prices. The difference is negative and insignificant. Then I split the sample into distinct groups: dependent customers and non-dependent customers, and pivotal buyers and non-pivotal buyers. Panel A of Table 15 illustrates that suppliers with dependent customers pay significantly lower prices than those with non-dependent customers before and after downstream deconsolidation of at least the 5% level of significance. While both groups, dependent and non-dependent customers, experience negative and insignificantly lower prices after the downstream divestiture, the difference-in-differences test in the last row of Panel A of Table 15 indicates that this decline in prices is not significantly larger for non-dependent customers.

Panel B of Table 15 illustrates that suppliers with pivotal buyers do not pay significantly lower prices than those with non-pivotal buyers before and after downstream deconsolidation at traditional level of significance. Both suppliers with pivotal and non-pivotal buyers, fail to experience significantly different RPPI after the downstream divestiture and the difference-in-differences test in the last row of Panel A of Table 15 indicates that this difference in prices is not significantly larger for pivotal buyer relative to non-pivotal buyers before and after the downstream divestiture event. My univariate tests fail to reject both the supplier opportunism and pivotal buyer repositioning hypotheses, hence, my univariate results support the waterbed effect relative to the supplier opportunism and pivotal buyer repositioning hypotheses.

#### *3.4.5. Multivariate analysis*

Following Bhattacharyya and Nain's (2011) multivariate approach with only slight modifications, I estimate a pooled OLS model with Newey-West standard errors to continue examining the impact of deconsolidation of real producers' prices in Equation (3).

$$\Delta rppi_{jt} = \alpha_0 + \alpha_1 CD_j + \alpha_2 PB_j + \alpha_3 \Delta rppi\_inp^1_{jt} + \alpha_4 \Delta rppi\_inp^2_{jt} + \alpha_5 \Delta wage_{jt} + \alpha_6 \Delta tp_t + \varepsilon_{jt} \quad (3)$$

I take the natural logarithm of the RPPI of supplier industry  $j$ . The dummy variable,  $CD_j$ , represents the customer industries that are dependent on suppliers. The dummy variable,  $PB_j$ , represents the supplier industries that are characterized by a pivotal buyer relationship. The other explanatory variables in the regression control for industry demand conditions, and other factors of production that may influence producers' prices. The control variables  $rppi\_inp^1_{jt}$  and  $rppi\_inp^2_{jt}$  represent the natural logarithm of RPPI of supplier industry  $j$ 's two primary input factors. I use the I-O tables in order to determine supplier industry  $j$ 's two primary inputs by calculating weights,  $w_{ji}$ , that correspond to the share that supplier industry  $i$  provides for supplier industry  $j$ . I rank these weights and take the top two-ranked industries  $i$  that supply industry  $j$ .<sup>20</sup> I obtain price data for these inputs from BLS. I also take the natural logarithm of the control variable  $wage$ , which represents the average hourly earnings of production workers in the mining and manufacturing industries. However, these figures on hourly earnings are given only at the three-digit SIC level. I apply the correspond three-digit SIC code that matches the four-digit SIC code industries. I also control for industry demand conditions using the natural log of the industrial production index,  $tp$ . Industrial production data are obtained from Federal Reserve Board. The industrial production index measures the amount of productivity from the manufacturing, mining, electric and gas industries. I incorporate a time trend dummy, industry dummies at the two-digit SIC level, and year dummies to control for industry and time-specific factors.

I estimate equation (3) for all supplier industries over the 24 months prior to downstream deconsolidation in column (1) and then independently over the 24 months subsequent to downstream deconsolidation in column (2), disregarding the divestiture-event quarter. Using the input prices and industrial production allow us to control for price fluctuations in supplier industries in order to better assess the impact of my variables of interest. Table 16 shows results from the multivariate analysis of

<sup>20</sup> As in Bhattacharyya and Nain (2011), I too mitigate the potential issue of endogeneity amongst control variable input prices and the dependent variable in my regression by confirming that the industries that contribute the primary inputs of the supplier maintain no product market association with that of the downstream divesting industry.

suppliers selling prices. Column 1 in Table 16 shows that the coefficients of customer dependence dummy,  $CD$ , and pivotal buyer dummy,  $PBI$ , are positive and statistically insignificant in the period before the downstream divestiture event. Hence, after I take into account factor prices and demand conditions, price changes in supplier industries with dependent customers is no longer significantly different from those with non-dependent customers prior to the downstream divestiture event. The insignificance of the pivotal buyer dummy reiterates the evidence from the univariate test, suggesting that there is no significant difference in prices prior to the downstream divestiture event after controlling for factor prices.

Yet, Column 2 in Table 16 shows that the coefficient of customer dependence dummy,  $CD$ , is positive and significant at the 5% level, whereas the coefficient of pivotal buyer dummy,  $PB$ , is negative and significant at the 10% level. Thus after the downstream divestiture event, dependent customers do experience significantly adverse increases in input prices relative to non-dependent customers. This evidence suggests that supplier industries charge dependent customer industries roughly 0.2% higher prices per month relative to non-dependent customer industries subsequent to the downstream deconsolidation. In contrast, after the downstream divestiture event, suppliers with pivotal buyers experience significantly adverse decline in prices relative to those with non-pivotal buyers. The size of the pivotal buyer coefficient suggests that the drop in prices for suppliers with pivotal buyers is about 0.2% greater than suppliers with non-pivotal buyers.

Again, I follow Bhattacharyya and Nain (2011) to control for industry demand related factors to isolate the impact of our variables of interest on producers' prices. Once I have controlled for industry demand conditions and factor price fluctuations, I must still distinguish whether or not customer dependence on a supplier industry and suppliers with pivotal buyers impact sellers' prices prior to and subsequent to divestiture. I estimate equation (4) to make this distinction.

$$\Delta rppi_{jt} = \alpha_0 + \alpha_1 CD_j + \alpha_2 PB_j + \alpha_3 \Delta rppi\_inp^1_{jt} + \alpha_4 \Delta rppi\_inp^2_{jt} + \alpha_5 \Delta wage_{jt} + \alpha_6 \Delta tp_{jt} + \alpha_7 PD_{jt} + \alpha_8 CD_j PD_{jt} + \alpha_9 PB_j PD_{jt} + \varepsilon_{jt}$$

(4)



I include in equation (4), three additional explanatory variables. I use the original indicator variables,  $CD$  and  $PB$ , in this regression to measure customer dependence on a supplier industry and suppliers with a pivotal buyer in equation (4).  $PD$  represents the indicator variable for post-divestiture, which is equal to one for the period subsequent to the downstream *divestiture event*, and zero otherwise. The coefficient for  $PD$ ,  $\alpha_7$  accounts for the variation in average price levels after downstream deconsolidation for all suppliers. The coefficient for  $PD$ ,  $\alpha_7$  also accounts for any potential exogenous shocks that may influence price levels in the post-deconsolidation period in supplier industries, in addition to prompt divestitures in downstream industries. I also include an interaction term, my variables of interest,  $CD_jPD_{jt}$  and  $PB_jPD_{jt}$ , determines if there is a differential in average producer prices post downstream divestiture for dependent customers and pivotal buyers, respectively. If the coefficient for  $CD_jPD_{jt}$  ( $D_jPD_{jt}$ ),  $\alpha_8$  ( $\alpha_9$ ), is positive (negative) and significant, then it would suggest further evidence in line with the customer expropriation (supplier expropriation) hypothesis. I anticipate that the coefficients on my control input prices and proxy for industry demand conditions will be positive and significant, suggesting that these underlying factors influence suppliers' prices. Column 3 of Table 16 displays the results from the empirical test of equation (4) using the difference-in-differences approach. In Column 3, the interaction coefficient, denoting the post-divestiture effect of customer dependence,  $CD_jPD_{jt}$ , has the appropriate sign, positive, but is indistinguishable from zero. Similarly, in Column 3 the interaction coefficient identifying the post-divestiture effect on pivotal buyers,  $PB_jPD_{jt}$ , has the appropriate sign, negative, but is also statistically insignificant. The evidence from Column 3 of Table 16 does not further corroborate the findings from Columns 1 and 2.

As in Bhattacharyya and Nain (2011), I attempt to use a differences-in-differences regression model to illustrate that the potential difference in effect of downstream deconsolidation on suppliers' prices does not rely upon the regression technique employed. The difference-in-differences approach represents the interaction term between the variables of interest (i.e.,  $CD_j$ ,  $PB_j$ ) and the post-divestiture variable,  $PD$ , to isolate the effect of  $CD_j$  or  $PB_j$  subsequent to the divestiture event on producers' prices. I

execute the cross-sectional regression using OLS with robust standard errors clustered at the two-digit SIC industry level as shown in equation (5).

$$\Delta \ln RPPI_j = \alpha_0 + \alpha_1 CD_j + \alpha_2 PB_j + \alpha_3 \Delta \ln RPPI\_INP_j + \alpha_4 \Delta \ln RPPI\_INP_j^2 + \alpha_5 \Delta \ln WAGE_t + \alpha_6 \Delta \ln TP + \varepsilon_j \quad (5)$$

I drop the time subscript in equation (5). The dependent variable,  $\Delta \ln RPPI_j$ , represents supplier  $j$ 's average natural log of RPPI over the two years after the downstream divestiture less the average natural log of RPPI over the two years prior to the downstream divestiture. My control variables take on similar meaning. I take the changes in the average factor prices, wages, and total productivity. My variables of interest are  $CD_j$  and  $PB_j$ , the indicator variables for customer dependence on the supplier industry and suppliers with a pivotal buyer, respectively. Column 4 of Table 16 presents the empirical estimates of equation (5). The number of observations in Column 4 is fewer than 30 and the results are interpreted with caution. The coefficient on the customer dependence variable,  $CD$ , has the correct sign (positive) and is statistically insignificant. Likewise, the coefficient on pivotal buyer variable,  $PB$ , also has the appropriate sign (negative) but is statistically insignificant. The evidence from Columns 3 and 4 of Table 16 does not validate the evidence from Columns 1 and 2, with respect to the variable,  $CD$ , results fail to demonstrate that suppliers of dependent customer industries undergo greater increases in selling prices (real producers' prices) subsequent to downstream deconsolidation and are, thus, weakly consistent with the customer expropriation hypothesis. Similarly, the evidence from Columns 3 and 4 of Table 16 does not substantiate the evidence from Columns 1 and 2, with respect to the variable,  $CD$ , and thus narrowly supports the idea that dependent supplier industries experience larger declines in selling prices (real producers' prices) subsequent to downstream divestiture events, which is not supportive of the customer opportunism hypothesis. In contrast, the waterbed effect hypothesis posits that neither supplier nor customer industry dependence will have an impact on selling prices (real producers' prices) subsequent to downstream deconsolidation. Overall, evidence from real producers' prices provide mixed evidence at best. I document weak evidence in support of the customer expropriation and supplier expropriation hypotheses and moderate evidence in support of the waterbed effects hypothesis.

### 3.4.6. *Distinguishing amongst diminishing buying power, efficiency, and pivotal buyer reposition hypotheses*

The multivariate analyses, so far, should establish whether a (an) decrease (increase) in selling prices demonstrates pivotal buyer repositioning (diminishing buying power) amongst horizontally divesting downstream industries. Yet, it is not quite clear whether these price effects are explained solely by pivotal buyer repositioning or (diminishing buyer power). Highly concentrated industries are likely environments for the demonstration of market power in the form collusion, market foreclosure effects, or monopsonistic practices, hence, I must distinguish between the impact of efficiency produced by deconsolidation and price decreases and any price increases associate with concentrated industries.

Customers with pricing power would be the likely subject of diminished buying power (enhanced selling power from the perspective of the supplier) as submitted by countervailing power theory. The pivotal buyer model conjectures that there are one or few suppliers; hence, I would expect that concentrated suppliers would be a likely target for pivotal buyers looking to reposition themselves. Prior research indicates that Compustat measures of industry concentration are deficient substitutes of actual industry concentration, thus, we employ Becker and Thomas's (2011) estimates of the Herfindahl index using the Compustat Segment Database, which I designate as *sup\_herf* for supplier industries and *cust\_herf* for customer industries. Ali, Klasa, and Yeung (2008) indicate that the use of Compustat data to measure industry concentration may capture some other effect, which may lead to improper inferences. To examine my third set of hypotheses, I employ multiple measures of pricing power of both supplier and customer industries. I employ estimates of the four-firm concentration ratio following Cremers, Nair, and Peyer (2007), which I designate for supplier industries as *sup\_con* and customer industries as *cust\_con*, for supplier industries and customer industries respectively. I calculate the four-firm concentration ratio by taking the proportion of entire industry sales that is accounted for by the collective sales of the four largest firms in the industry. I use only the year prior to the horizontal divestiture to preserve the size of my sample to measure capital intensity, capital expenditures, and advertising expenses. I use following regression model to measure these relationships in the following equation.

$$\Delta \ln RPPI_j = \alpha_0 + \alpha_1 \text{Concentration/Barrier}_j + \alpha_2 \Delta \ln RPPI\_INP^1_j + \alpha_3 \Delta \ln RPPI\_INP^2_t + \alpha_4 \Delta \ln WAGE_t + \alpha_5 \Delta \ln TP + \varepsilon_j \quad (6)$$

The measures of customer industry structure should allow us to empirically test the supplier opportunism hypothesis that suggests if downstream deconsolidation moderates buying power, customer industries with greater levels of concentration prior to the downstream divestiture event will experience greater increases in selling prices following the downstream divestiture event. Table 17 presents relationship between changes in supplier selling prices and customer market power prior to downstream deconsolidation in a cross-sectional regression framework. I note that the number of observations for each column in my cross-sectional framework in Table 17 is below 30, therefore the results must be interpreted with caution and are considered qualitative in nature. Columns 1 and 2 of Table 17 present the regression estimates of equation (6) with my measures of customer industry concentration. Both coefficients on *cust\_con* and *cust\_herf* are positive and insignificant. Also, Panels A and B of Table 14 document that customer industry concentration has no significant of supplier industry abnormal operating performance. Collectively, these results indicate that customer concentration has no effect on supplier pricing and supplier operating performance.

The proxies for customer barriers to entry allow me to test hypothesis 4 related to barriers to entry. Similarly, I anticipate that the coefficients for the proxies for barriers to entry in the year prior to horizontal deconsolidation should result in positive coefficients. Columns 3-5 of Table 17 reports that only one of three customer barriers to entry, customer capital intensity, is statistically significant and negative. These results provide weak evidence customer structural barriers play a significant role in supplier pricing. Moreover, the results from Table 17 fail to substantiate the supplier opportunism hypothesis and provide indirect support for the waterbed effects hypothesis, which suggests that significant horizontal divestiture activity induces asymmetric input price changes in favor of industry rivals.

The measures of supplier industry structure permit us to empirically assess the customer pivotal buyer repositioning hypothesis that suggests if downstream deconsolidation reverses a pivotal buyer's

pivotal position, supplier industries with higher concentration prior to downstream deconsolidation will undergo a greater reduction in selling prices following downstream deconsolidation. Table 18 reports the relationship between changes in supplier selling prices and supplier pricing power prior to downstream deconsolidation in a cross-sectional regression framework. Similar to Table 17, I note that the number of observations for each column in my cross-sectional framework in Table 18 is below 30 and that the results must be interpreted with caution and are considered qualitative in nature. Columns 1 and 2 of Table 18 indicate that one of two supplier industry concentration measures are significant, *sup\_con*, at the 1% level. Overall, the evidence is mixed and suggest that downstream horizontal divestitures contribute to the reversal of a pivotal buyer's pivotal position, indicating that supplier industries with higher concentration prior to the downstream divestiture event will experience a greater drop in selling prices subsequent to the divestiture.

By the same token, the coefficients for the proxies of barriers to entry allow us to test the pivotal buyer hypothesis that postulates if downstream horizontal divestitures allow pivotal buyers to reposition themselves, supplier industries with greater barriers to entry prior to deconsolidation will undergo greater declines in selling prices subsequent to downstream deconsolidation of customer industries. Similarly, I anticipate that the proxies for the barriers to entry in the year prior to horizontal deconsolidation should result in negative coefficients. In contrast, the rival opportunism/waterbed effect hypothesis predicts that the measures for coefficients of supplier concentration and barriers to entry will only enhance the waterbed effect, leading to offsetting price changes, and therefore coefficients indistinguishable from zero. Columns 3-5 of Table 18 indicate that one of the three supplier industry barriers to entry are significant, *sup\_ks*, at the 10% level, and negative. This provides weak evidence in support of the pivotal buyer hypothesis. Overall, Table 18 provides weak to moderate evidence in support of the pivotal buyer repositioning hypothesis.

#### 3.4.7. Customer industry operating performance

Similar to prior analysis of operating performance, I follow Bhattacharyya and Nain with respect to my analysis of pre-divestiture and post-divestiture operating performance of customer industry

operating performance. I begin my multivariate analysis of upstream divestitures on customer industry operating performance using the following two regression models estimated using a pooled times series panel with clustered standard errors by customer two-digit SIC codes.

$$PreDivCustOperPerf_m = \alpha_0 + \alpha_1 SD_j + \alpha_2 sup\_herf_{jt} + \alpha_3 sup\_ks_{jt} + \alpha_4 sup\_capex_{jt} + \alpha_5 sup\_advert_{jt} + \varepsilon_{jt} \quad (7)$$

$$PostDivCustOperPerf_m = \alpha_0 + \alpha_1 SD_j + \alpha_2 sup\_herf_{jt} + \alpha_3 sup\_ks_{jt} + \alpha_4 sup\_capex_{mt} + \alpha_5 sup\_advert_{jt} + \varepsilon_{jt} \quad (8)$$

Using these two models, I investigate the effect of upstream deconsolidation on customer industry operating performance to empirically test the supplier opportunism hypothesis, customer opportunism hypothesis, and the waterbed effect hypothesis, with respect to operating performance, industry structure concentration, and ruling out industry demand considerations, correspondingly. *PreDivCustOperPerf* and *PostDivCustOperPerf* are the pre-divestiture and post-divestiture operating performances of customer *m*, respectively. I employ measures of customer operating performance similar to those described above in section 3.4.3.2. I use the accounting based measure of operating performance, the cash flow-to-sales ratio and the value based measure of operating performance, the cash-flow-to-market value of assets ratio.

I focus on the supplier dependence dummy, *SD*, and the continuous variable  $f_{mj}$ , to represent supplier dependence.  $f_{mj}$  is the percentage of divesting supplier industry *j*'s output sold to the customer industry *m*. Higher values of  $f_{mj}$  indicate that the divesting supplier industry *j* is more dependent on the downstream (customer) industry for buying its output. The supplier dependence dummy, *SD*, equals one if  $f_{mj}$  is in the top quintile, and is equal to zero otherwise. The control variables *sup\_herf*, *sup\_ks*, *sup\_capex*, and *sup\_advert* take on similar meanings as defined earlier. Table 19 provides us estimates of equations (8) and (9) using OLS with robust standard errors clustered at the supplier two-digit SIC level and year dummies.

Once again, I employ a consistent interpretation as Bhattacharyya and Nain (2011) in the analysis of the pre-divestiture and post-divestiture operating performance, primarily by comparing the change in value/significance of the dependence variable. In Columns 1 and 3 of Table 19, the dependent variables is the two-year average of customer industry abnormal cash-flow margin prior to the upstream divestiture.

The coefficients for the proxies for supplier dependence,  $SD$  and  $f_{mj}$ , are statistically insignificant in Columns 1 and 3, suggesting that supplier dependence (or the extent of supplier dependence) on customer industries has no effect on customer industry profitability prior to upstream divestitures. In Columns 2 and 4 of Table 19, the dependent variable is the two-year average of customer industry abnormal cash flow margin subsequent to the upstream divestiture. However, the coefficients for the proxies for supplier dependence,  $SD$  and  $f_{mj}$ , are, now, both positive and statistically significant (at the 10% level), indicating that there is a significant positive association between supplier dependence subsequent to the upstream divestiture event. The size of the coefficient for  $SD$  in Column 2 suggests that the abnormal cash-flow margins of customer industries on which supplier industries are dependent are roughly 4.9% higher than those customer industries on which suppliers industries are not dependent. This evidence supports the supplier expropriation hypothesis that suggests customers of dependent supplier industries experience greater favorable changes in abnormal cash flow margins in the two years subsequent to an upstream divestiture event relative to customers of non-dependent supplier industries.

In Columns 1 and 3 of Table 20, the dependent variables is the two-year average of customer industry abnormal cash flow-to-market value of assets prior to the upstream divestiture event. The coefficients for the proxies for supplier dependence,  $SD$  and  $f_{mj}$ , reiterate are statistically insignificant in Columns 1 and 3, and reiterate the evidence found in Table 19, suggesting that supplier dependence has no effect on customer value prior to the upstream divestiture event. In Columns 2 and 4 of 20, the dependent variable is the two-year average of customer industry abnormal cash flow-to-market value of assets following the upstream divestiture event. The proxies for supplier dependence,  $SD$  and  $f_{mj}$ , are, again, both positive and statistically significant (at the 10% level), indicating that there is a significant positive association between supplier dependence subsequent to the upstream divestiture event. The magnitude of the coefficient for  $SD$  in Column 2 suggests that the abnormal cash flow-to-market value of assets in customer industries on which supplier industries are dependent are roughly 2.3% higher than those customer industries on which suppliers industries are not dependent. Therefore, the results from Table 20 corroborate those from Table 19, which indicates that customers of dependent supplier

industries experience improved changes in accounting performance *and* value in the two years subsequent to an upstream deconsolidation relative to customers of non-dependent supplier industries. Again, this evidence suggests that customer industries exploit upstream divesting firms in the years subsequent to the divestiture via an improved bargaining position.

Next, I evaluate whether upstream deconsolidation reduces selling power by testing if customers whose suppliers have higher barriers to entry prior to upstream deconsolidation will experience greater favorable changes in cash flow margins (abnormal cash flow-to-market value of assets) in the two years subsequent to an announcement of upstream deconsolidation. I test this conjecture using the variable *supp\_herf* in Table 19. In Columns 1 and 3 of Table 19, the coefficient is negative (negative t-stat) and significant, with respect to its effect on pre-divestiture customer industry profitability. However in Columns 2 and 4, the variable *supp\_herf* becomes statistically insignificant, suggesting its effect becomes more positive subsequent to the upstream divestiture event. In contrast to the results from Table 19, *supp\_herf* is statistically insignificant in Columns 1-4 in Table 20. The results suggests that supplier industry concentration has no impact on customer industry value prior to the divestiture event nor subsequent to the divestiture event. Hence, the results from Table 20 provide mixed evidence in support of the supplier expropriation hypothesis, suggesting that higher supplier concentration prior to the divestiture is associated with customer improvements in accounting performance but has no long-term implications for customer value.

I, now, focus on determining whether the supplier expropriation effects can be attributed to industry demand or whether supplier structural barriers are important to witnessing these effects. I test whether significant upstream divestiture activity reduces selling power. If so, I can expect customers whose suppliers have higher barriers to entry prior to upstream deconsolidation to experience greater favorable changes in cash flow margins (abnormal cash flow-to-market value of assets) in the two years subsequent to an announcement of upstream deconsolidation. I examine the following proxies for supplier barriers to entry, *supp\_ks*, *supp\_capex*, and *supp\_advert* in Table 20. I find evidence that one of the three barriers to entry, *supp\_capex* is, for the most part, positive and significant, Tables 19 and 20.



The evidence is mixed with respect to *supp\_ks*, therefore, I conclude that there is weak evidence to suggest that *certain* supplier barriers to entry influence customer profitability subsequent to upstream divestiture activity. Thus, overall supplier pricing power and barriers appears to play to some modest role in customer industry profitability subsequent to an upstream divestiture event, which further substantiates the supplier expropriation hypothesis. Next, I determine whether customer improvements in profitability and value can be attributed to supplier bargaining power by examining the impact customer industry abnormal input costs.

Now, I explore whether customers of dependent supplier industries experience greater declines in abnormal costs-of-goods sold margins in the two years subsequent to an upstream deconsolidation relative to customers of less dependent supplier industries in Table 21. Table 21 provides us estimates of equations (8) and (9) using OLS with robust standard errors clustered at the supplier two-digit SIC level and year dummies to evaluate customer industry pre- and post-divestiture abnormal cost structure. The dependent variable in both equations (8) and (9) is abnormal cost-of-goods sold margin, *ACGSM*. The *ACGSM* of an industry is defined as that industry's median cost-of-goods sold-to-sales ratio minus the cost-of-goods sold-to-sales ratio of the median industry in the economy. The cost-of-goods sold-to-sales ratio is defined as the ratio of cost of goods sold (Compustat item 30) to sales (Compustat item 12). I consider the supplier expropriation hypothesis and, again, focus on my attention on the supplier dependence dummy, *SD*. In Column 1 of Table 21, the dependent variable is the average *ACGSM* in customer industries over the two years preceding the downstream divestiture event. In Column 1 of Table 21, the coefficient on *SD* is positive and significant, at the 10% level, prior to the upstream divestiture event. In Column 2 of Table 21, the dependent variable is the average abnormal cost-of-goods sold margin, *ACGSM*, in customer industries over the two years following the upstream divestiture event. In comparison, in Column 2 of Table 21, the coefficient on *SD* is positive and statistically insignificant. The magnitude of the coefficient suggests that the average abnormal input costs (cost-of-goods sold margin) for customers industries with dependent suppliers decline by about 2.3% relative to customers with non-dependent supplier industries following an upstream divestiture event. Therefore, the results from Table

21 support the conjecture that customers of dependent supplier industries enjoy greater declines in abnormal input costs in the two years subsequent to an upstream deconsolidation relative to customers of less dependent supplier industries. Overall, the evidence from the upstream divestiture sample provides moderate to strong evidence in support of the customer opportunism/supplier expropriation hypothesis.

### **3.5. Conclusion**

This study executes the first broad, cross-industry investigation of the product market effects of horizontal divestitures on supplier (customer) industries via their impact on profitability, value, and prices (profitability, value, and input costs). I document moderately strong evidence that upstream divestitures erode supplier selling power and impact customer profitability, value, and cost structures. Customers exploit suppliers dependent on customers industries for sales in their production process in the years after major upstream divestiture activity. Customers of dependent suppliers experience noteworthy increases in profitability and value, and significant declines in average input costs in the years subsequent to the divestiture event. I also report that certain supplier barriers to entry, supplier capital expenditures play a role in customer profitability. Suppliers with high capital investment requirements contribute to greater customer profitability and value, suggesting mild evidence that upstream divestitures reduce upstream countervailing power.

This study also presents modest evidence that corroborates the notion that horizontal deconsolidation activity affords pivotal buyers the opportunity to reposition themselves with respect to dependent suppliers in concentrated industries with substantial fixed costs. Suppliers with pivotal buyers endure considerable drops in profitability and value in the two years following large downstream divestiture activity. I document, as well, weak evidence that suppliers with pivotal buyers suffer noticeable declines in selling prices, in the two years subsequent to significant downstream divestiture activity.

This study reports little to moderate evidence to support the indication that opportunistic rivals take advantage of divesting firms diminished market power, which then generates offsetting within-industry increases and decreases in input costs. Lastly, this study documents little to no support for the

notion that opportunistic suppliers take advantage of the diminished buying power of dependent customer industries in the years subsequent to significant downstream divestiture activity.

To demonstrate that these results are not a repercussion of efficiency enhancements or industry demand, I investigate the role of both supplier and customer market structure and power on suppliers' prices and customer profitability and value. I provide mixed qualitative evidence that suppliers with high four-firm industry concentration ratios prior to downstream deconsolidation experience greater price reductions in the years following the downstream divestiture event. These results indicate that downstream divestiture activity potentially creates an opportunity for pivotal buyers to reverse their pivotal position and exploit their suppliers' weakened bargaining position.

To my understanding, this is the first study to document that dependent suppliers play an important role in customer industry operating performance and cost structure following significant upstream divestiture activity. This is also the first paper to develop and report evidence in support of the pivotal buyer repositioning hypothesis, in the context of horizontal divestitures, supplementing the work of Raskovich (2003) and Adilov and Alexander (2006). Finally, this study complements the findings of Fee and Thomas (2004), Shahrur (2005), and Bhattacharyya and Nain (2011) by reporting that, in addition to horizontal consolidation, horizontal deconsolidation activity has implications for supplier profitability, value, and pricing power *and* customer profitability, value, and cost structure.

## CHAPTER 4: CONCLUSIONS

This dissertation explores the impact of horizontal divestitures on economically linked firms exploiting, both, firm and industry level data. The second chapter of this dissertation examines the product market effect of a sample of horizontal asset sales from 1988 to 2005 on *actual* corporate customers, suppliers, and industry rivals using a sample of firms that classifies corporate customers, suppliers, and industry competitors of firms proposing horizontal asset sales. The second essay of this dissertation performs an extensive empirical cross-industry investigation of the product market effects of 46 downstream (35 upstream) quarterly horizontal divestiture events from 1979-2010 on supplier (customer) industries via their impact on profitability, value, and prices (profitability, value, and input costs). Prior studies examine the product market effects of horizontal acquisitions, vertical acquisitions and divestitures, but this stream of literature fails to account for the impact of horizontal divestitures on product market relationships. This line of research is important because extant literatures tend to view events such as mergers, acquisitions, and other important corporate events in isolation.

The second chapter of this dissertation investigates the firm level effects of horizontal asset sales by investigating the wealth effects at announcement and post-divestiture changes in abnormal operating performance around divestitures for divesting firms, customers, and suppliers. I document evidence that divestiture related wealth effects for divesting parent firms are associated with efficiencies resulting from the reduction of firm bureaucracy and financing constraints. I also provide evidence that managers need to consider balancing post-divestiture productivity gains with potential declines in profitability due to reduced bargaining power with suppliers. Horizontal asset sales are distinct from vertical divestitures, since I find evidence that parent firm divestiture gains are not shared by their industry rivals, corporate customers and suppliers. In contrast, vertical divestitures generate positive wealth effects for divesting firms and are shared by industry rivals, corporate customers, and suppliers.

The second chapter of this dissertation also finds that horizontal asset sales have negative wealth effects for industry rivals, corporate customers, and certain subsamples of suppliers. In addition, the evidence suggests that factors such as customer (supplier) switching costs and industry structure tend to

play an important role in the wealth effects of customers (suppliers) at announcement of upstream (downstream) divestitures. I report that customers less reliant on divesting firms experience significantly more negative median abnormal returns and more negative than positive abnormal returns than reliant customers. However, I find that downstream horizontal asset sales are damaging to suppliers with high switching costs but are valuable to supplier portfolios with lower switching costs.

The third chapter of this dissertation documents the opportunistic behavior of economically linked firms, such as customers and suppliers, in the context of horizontal divestitures. I conduct a complete empirical cross-industry analysis of the product market effects of horizontal divestitures on upstream (downstream) industries by exploring profits, value, and prices (profits, value, and input costs). I find that opportunistic customers take advantage of supplier dependence in the years following significant upstream divestiture activity. Consequently, these customers enjoy significant increases in profitability, value, and a considerable drop in input costs relative to customers of non-dependent suppliers.

Additionally, the third chapter of this dissertation indicates that suppliers with pivotal buyers suffer unfavorable changes in profitability and value in the years subsequent to downstream divestiture activity relative to suppliers with non-pivotal buyers. The evidence suggests that pivotal buyers capitalize on significant downstream divestiture activity to reverse their pivotal position and eliminate cross-subsidization by suppliers and non-pivotal buyers within their industry. The third chapter of this dissertation fails to present sufficient evidence to substantiate supplier and rival opportunism subsequent to downstream horizontal deconsolidation.

Collectively, the second and third chapters of this dissertation indicate that horizontal divestiture activity prompts opportunistic behavior. I document, at the firm level, that opportunistic upstream firms (supplier) take advantage of divesting downstream firms reduced size to gain a temporary bargaining advantage due to reduced countervailing power. In contrast, my cross-industry sample suggests that significant downstream activity prompts exploited pivotal buyers, to seize an opportunity to reverse their pivotal position, reducing supplier profitability and value. Whereas, significant upstream divestiture

activity encourages customer industries to take advantage of dependent suppliers to reduce customer input costs and improve customer profitability and value. This evidence complements the findings of Fee and Thomas (2004), Shahrur (2005), and Bhattacharyya and Nain (2011), which suggests that horizontal divestitures can undermine countervailing power that is increased via horizontal acquisition activity. Also, the second chapter of this dissertation reveals that downstream firm level horizontal divestitures can reduce buying power, while, the third chapter reveals that significant upstream (supplier) divestiture activity can lead to reduced selling power. These findings reiterate the importance of considering economic linkages when examining restructuring activities. These findings are of concern for corporate executives, financial analysts, investors, and corporate stakeholders of economically linked firms undergoing significant restructuring activity.

## APPENDIX A: VARIABLE DEFINITIONS

### Firm-level Horizontal Asset Sale Definitions

#### Horizontal Asset Sale Deal Characteristics

*CASH* – An indicator variable that is equal to one if the deal was all cash deal, and equal to zero otherwise.

*REL\_SIZE* – The net transaction value of the asset sale scaled by the prior year's market value of equity.

*SAME\_INDUSTRY* – An indicator variable that is equal to one if the division/segment/business unit was sold to an acquirer with same 4-digit SIC code and equal to zero, otherwise.

#### Definitions of Firm-level Characteristics

*ALTMAN\_Z\_SCORE* – The sum of 3.3 \* earnings before interest and taxes scaled by 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.

*Cash flow-to-sales* – The ratio of operating income (Compustat item 13) to sales (Compustat item 12)

*Costs of goods sold-to-sales (COGSSALE)* – The ratio of cost of goods sold (Compustat item 30) to sales (Compustat item 12).

*Employees* – The number of firm employees (Compustat item 29)

*Employee-to-sales (EMPSALE)* – The ratio of the number of firm employees (Compustat item 29) to sales. (Compustat item 12).

*NEED\_FOR\_FUNDS* – The difference between capital expenditures (Compustat item 128) and the sum of operating income before depreciation (Compustat item 13) and change in net working capital (Compustat item 4 less Compustat item 5).

*Selling, General, & Administrative expense-to-sales (SGASALE)* – The ratio of selling, general, and administrative expense (Compustat item 189) to sales (Compustat item 12).

*TOBINS\_Q* – The ratio of the firm's market value of assets to the book value of firm 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)) scaled by total assets (item 6).

*Wage-to-sales (WAGESALE)* – The product of the number of firm employees (Compustat item 29) and the national average wage in a given year obtained from the Social Security Administration (Imrohorglu and Tüzel, 2014) divided by sales (Compustat item 12).

#### Definitions of Firm-level Industry Characteristics

*Ind. Herf* – *Herfindahl Index* is the sum of the squared sales market shares of firms in the given industry calculated from Compustat business segments.

*Ind. Herf* > 1800 – Deals that occurred in industries (4-digit SIC code) in which the pre-divestiture Herfindahl Index was greater than 1800.

*Ind. Herf* ≤ 1800 – Deals that occurred in industries (4-digit SIC code) in which the pre-divestiture Herfindahl Index was less than or equal to 1800.

$\Delta$  *Ind. Herf.* < -100 are those deals that resulted in a change in the industry Herfindahl Index that were below -100.

$\Delta$  *Ind. Herf.* ≥ -100 are those deals that resulted in a change in the industry Herfindahl Index that were greater than or equal to -100.

#### Definition of Firm-level Customer Characteristics

*Reliant* – 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%.

*Non-concentrated customers* – Corporate customers that have a 4-digit industry Herfindahl Index that is less than or equal to 1800.

*Concentrated customers* – Corporate customers that have a 4-digit industry Herfindahl Index that is greater than 1800.

#### Definitions of Firm-level Supplier Characteristics

*Non-concentrated suppliers* – Suppliers that have a 4-digit industry Herfindahl that is less than or equal to 1800.



*Concentrated suppliers* – 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* – Suppliers that disclose more than one large public customer in the Compustat Customer Segment Database.

*Suppliers w/single large customer* – Suppliers that disclose only one large public customer in the Compustat Customer Segment Database.

### **Industry-level Horizontal Divestiture Definitions**

#### **Industry-Level Characteristics**

*Abnormal Cash Flow to Enterprise Value (ACFEV)* – The cash flow-to-enterprise value ratio is defined as the ratio of earnings before interest, taxes, depreciation, and amortization (Compustat item 13) to the sum of the book value of total assets (Compustat item 6), market value of equity (Compustat item 199) \* (Compustat item 61), less the sum of book value of common equity (Compustat item 60) and cash and short term investments (Compustat item 1).

*Abnormal cash flow margins (ACFM)* – Industry's median cash flow-to-sales ratio minus the cash flow-to-sales ratio of the median industry in the economy. The cash flow-to-sales ratio of a firm is the ratio of operating income (Compustat item 13) to sales (Compustat item 12).

*Abnormal Cash Flow-to-Market Value of Assets (ACFMVA)* – Industry's median cash flow-to-market value of assets ratio minus the cash flow-to-market value of assets ratio of the median industry in the economy. The cash flow-to-market value of assets is defined as the ratio of operating income (Compustat item 13) to the sum of the book value of total assets (Compustat item 6), market value of equity (Compustat item 199) \* (Compustat item 61), less the book value of common equity (Compustat item 60).

*Abnormal Cost-of-Goods Sold Margins (ACGSM)* – Industry's median cost-of-goods sold-to-sales ratio minus the cost-of-goods sold-to-sales ratio of the median industry in the economy. The cost-of-goods

sold-to-sales ratio is defined as the ratio of cost of goods sold (Compustat item 30) to sales (Compustat item 12).

*Abnormal Fixed Costs (AFCS)* – Industry’s median fixed costs-to-sales ratio minus the fixed costs-to-sales ratio of the median industry in the economy. The fixed costs-to-sales ratio is the ratio of selling, general, and administrative expense (Compustat item 189) to sales ratio (Compustat item 12).

*Abnormal Return on Assets (AROA)* – Industry’s median return on assets minus the return on assets of the median industry in the economy. The return on assets is defined as the ratio of operating income (Compustat item 13) to the book value of total assets (Compustat item 6).

*Advertising Expense* – Industry’s total advertising expense (Compustat item 45) divided by the industry’s total sales.

*Capital intensity* – Industry’s total assets (Compustat item 6) divided by industry sales (Compustat item 12).

*Capital expenditure* – Industry’s total capital expenditure (Compustat item 128) divided by the industry’s total assets (Compustat item 6).

*Customer Dependence (CD)* – Dummy variable that equals one if the supplier’s customer industry belongs to the top quintile of  $f_{jm}$ , the percentage of customer industry  $m$ ’s inputs purchased from the upstream industry,  $j$ , and zero otherwise.

$f_{mj}$  – The percentage of divesting supplier industry  $j$ ’s output sold to the customer industry  $m$ . Higher values of  $f_{mj}$  indicate that the divesting supplier industry  $j$  is more dependent on the downstream (customer) industry for buying its output.

$f_{jm}$  – The percentage of supplier industry  $m$ ’s input purchased by the divesting customer industry for the sample of downstream divestitures.

*Four-firm concentration ratio* – Sum of sales for the top four-firms divided by industry total sales.

*Herfindahl Index* – Sum of the squared sales market shares of firms in the given industry calculated from Compustat business segments.

*Real PPI (RPPI)* – Producer Price Index (PPI) data for supplier industries are obtained from the Bureau of Labor Statistics (BLS). The PPI for each supplier is deflated using the GDP price deflator.

*Pivotal buyer (PB)* – Dummy variable that equals one if supplier industry belongs to the top tercile ( $1/3^{\text{rd}}$ ) of  $f_{mj}$ , the fraction of industry  $j$ 's output sold to the downstream divesting industry, the supplier's average Herfindahl index in the two years prior to the divestiture is greater than 1800, and abnormal fixed costs-to-sales ratio is in the top half of the distribution, and zero otherwise. The Supplier high concentration and high fixed costs dummy equals one if the supplier's average Herfindahl index in the two years prior to the divestiture is greater than 1800 and abnormal fixed costs to sales ratio is in the top half of the distribution, and zero otherwise.

*rppi* – Log differences of RPPI.

*rppi\_inp<sup>1</sup>* – real PPI of the supplier industry's top input.

*rppi\_inp<sup>2</sup>* – real PPI of the supplier industry's second top input.

*Supplier Dependence (SD)* – Dummy variable that equals one if the customer industry has a supplier with  $f_{mj}$  in the top quintile and zero otherwise.

*TV/TMVE* – Total SDC divestiture deal transaction value less value (TV) of all horizontal acquisitions announced in that quarter exceeds five percent of industry total market value of equity (TMVE). TV is the total value of consideration paid by the acquirer excluding fees and expenses (in millions). TMVE is the total market capitalization (in millions) MVE is  $csho * prcc\_f$  (Compustat item 199) \* (Compustat item 61) in a given quarter of a year.

*wage* – Log differences of average hourly earnings of production workers compiled by the BLS.

#### Economy Characteristics Definitions

*tp* – Obtained from the Federal Reserve Board, measures log differences of the real output of the manufacturing, mining, and electric and gas utilities industries.

**APPENDIX B: FILES AND DATABASES**

U.S. Bureau of Labor Statistics (BLS)

U.S. Bureau of Economic Analysis (BEA) 1992 and 1997 Benchmark Input-Output Tables

Federal Reserve Board

U.S. Census Bureau's SIC-NAICS Correspondence Tables

Compustat Name File

Compustat Fundamentals Table

Compustat (Business) Segment Database

Compustat (Customer) Segment Database

CRSP Stockname File

CRSP Daily Price File

CRSP Daily Stock Index File

Securities Data Company (SDC) Mergers and Acquisitions Database

SEC Edgar Database

Lexis/Nexis Academic

Wall Street Journal Newswire

## APPENDIX C: TABLES

Table 1

## Summary of empirical predictions 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.

	Divesting firms	Rivals	Customers	Suppliers
<i>Panel A: Primary Hypotheses</i>				
Positive industry demand shock: Transfer ownership of less productive assets to those who can put the assets to better use	Positive	Positive or Negative (information or competitive advantage)	Positive	Zero to Positive (suppliers unaffected or more valuable customer generates greater demand for inputs)
Financing	Positive	Positive or negative (more pronounced amongst financially constrained firms)	Positive	Positive
Diseconomies of scale / Efficiency	Positive	Positive or Negative (Positive information or competitive advantage) (More pronounced among larger rivals firms (assets or employees)	Zero to negative (firm seeks additional efficiencies gains from customers or improved coordination from decreased size results in net effect of zero)	Zero to negative (suppliers unaffected, reduced size engenders fewer orders, or firm seeks additional efficiency gains via reduced contracting costs)
Financial distress	Negative to Zero	Positive or negative (more pronounced amongst distressed firms)	Negative (more pronounced among customers of distressed firms)	Negative (more pronounced among suppliers of distressed firms)

**Table 1 (continued)**

	Divesting firms	Rivals	Customers	Suppliers
<i>Panel B: Product Market Considerations (Balance tradeoff with motive)</i>				
Monopolistic collusion: Decreased ability of industry competitors to coordinate a reduction in output and higher prices	Negative (reduced monopoly rents) More/less pronounced among 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 (Rivals w/less leverage vs. Rivals w/more leverage)	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. NTV is the Net Transaction Value of the deal (exclude deal fees). 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	Employees (thousands)
<i>Panel A: frequency of deals by Year</i>							
1988	1	1.23	331.57	50.07	54.45	0.03	9.40
1989	1	1.23	36.95	38.57	2.49	0.07	0.40
1991	5	6.17	6,041.11	5,922.24	238.93	0.04	11.06
1992	5	6.17	571.06	1,673.47	53.17	0.06	7.81
1993	2	2.47	3,126.04	6,780.67	154.05	0.02	36.88
1994	1	1.23	939.92	2,530.83	67.02	0.03	2.57
1996	2	2.47	465.63	865.64	46.78	0.15	1.30
1997	4	4.94	10,489.62	7,248.09	99.78	0.15	37.31
1998	1	1.23	329.09	857.67	31.52	0.04	0.23
1999	9	11.11	5,254.68	7,190.47	69.11	0.07	36.66
2000	3	3.70	460.60	467.17	30.19	0.21	1.81
2001	5	6.17	9,345.28	6,380.51	255.62	0.05	66.56
2002	6	7.41	8,639.27	4,447.30	134.66	0.02	53.57
2003	10	12.35	25,234.59	11,581.49	262.34	0.94	73.11
2004	6	7.41	3,225.37	5,512.67	89.57	0.03	31.72
2005	14	17.28	13,794.63	9,370.32	185.96	0.06	36.33
All deals	81	100.00	10,801.58	7,399.85	172.87	0.17	37.54
<i>Panel B: frequency of deals by industry</i>							
Petroleum and Natural Gas	24	29.63	4,668.98	6,619.70	236.25	0.08	4.79
Healthcare	10	12.35	2,742.99	5,821.20	87.27	0.07	58.06
Electronic Equipment	10	12.35	24,803.23	13,934.61	170.86	0.92	48.58
Pharmaceutical Products	8	9.88	42,087.53	13,247.41	112.29	0.03	26.55
Restaurants, Hotels, Motels	7	8.64	9,570.20	8,651.47	126.40	0.01	141.57
Business Services	6	7.41	586.49	443.28	57.70	0.10	1.78

**Table 2 (continued)**

Retail	5	6.14	10,621.74	8,229.74	474.07	0.10	90.40
Other	11	13.58	2,462.80	2,964.47	113.76	0.08	17.58
<i>Panel C: frequency of deals by deal characteristics</i>							
Method of payment							
Cash	31	38.27	7,776.74	7,016.98	226.17	0.34	35.72
Stock	3	3.70	618.38	387.55	8.15	0.08	0.42
Mixed	3	3.70	1,937.59	1,661.90	238.04	0.26	6.74
Unknown	44	54.32	14,231.39	8,538.94	142.10	0.06	43.45
Intra vs inter industry transaction							
Intra-industry transaction	43	53.09	13,736.25	8,051.02	190.65	0.07	27.63
Inter-industry transaction	38	46.91	7,480.76	6,663.01	152.74	0.29	48.75



**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 Computers	11	7.86%	6	9,122.41	5	513.06
	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**  
**Mean (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				
	All	Industry Her. >1800	Industry Herf. ≤1800	Δ Industry Herf. < -100	Δ Industry Herf. ≥ -100
<i>Panel A: abnormal returns to divesting parent firms</i>					
Mean abnormal return	1.58%	2.32%	1.15%	2.50%	1.04%
t-statistic	2.50**	2.51**	1.31	2.04*	1.41
Median abnormal return	0.79%**	1.04%**	0.71%	1.19%*	0.75%
Positive, negative	50, 31**	19, 11	31, 20	18, 12	32, 19*
<i>Panel B: Abnormal returns on announcement for rival portfolios: single-segment only</i>					
Mean abnormal return	-1.09%	-1.99%	-0.58%	-1.87%	-0.63%
t-statistic	-1.85*	-1.80*	-0.86	-1.93*	-0.84
Median abnormal return	-0.59%	-2.01%*	-0.17%	-0.89%	-0.32%
Positive, negative	36, 44	11, 18	25, 26	13, 17	23, 27
<i>Panel C: Abnormal returns on announcement for rival portfolios: single- and multiple-segment</i>					
Mean abnormal return	-1.49%	-1.45%	-1.51%	-1.28%	-1.62%
t-statistic	-1.87**	-1.27	-1.90*	1.28	-1.76*
Median abnormal return	-0.52%**	-1.67%	-0.45%*	-0.52%	-0.89%*
Positive, negative	33, 47	12, 17	21, 30	14, 16	19, 31
<i>Panel D: abnormal returns to individual customers</i>					
Mean abnormal return	-0.58%	0.09%	-0.81%	-0.92%	-0.29%
t-statistic	-1.00	0.09	-1.13	-1.49	-0.32
Median abnormal return	-0.96%*	-1.00%	-0.79%	-1.07%**	-0.75%
Positive, negative	14, 28**	4, 7	10, 21*	5, 14*	9, 14
<i>Panel E: abnormal returns to customer portfolios</i>					
Abnormal return	-0.59%	0.09%	-0.89%	-0.92%	-0.23%
t-statistic	-0.94	0.09	-1.08	-1.49	-0.19
Median abnormal return	-1.03%	-1.00%	-1.06%	-1.07%**	-0.77%
Positive, negative	12, 24*	4, 7	8, 17	5, 14*	7, 10

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

**Table 4 (continued)**

	All	Industry Herf. >1800	Industry Herf. <=1800	$\Delta$ Industry Herf. < -100	$\Delta$ Industry Herf. >= -100
<i>Panel F: abnormal returns to individual suppliers</i>					
Mean abnormal return	0.34%	1.95%	-0.56%	1.66%	-0.58%
t-statistic	0.41	1.24	-0.59	1.31	-0.53
Median abnormal return	-0.04%	-0.04%	-0.04%	0.22%	-0.60%
Positive, negative	47, 51	16, 19	31, 32	21, 19	26, 32
<i>Panel G: abnormal returns to supplier portfolios</i>					
Mean abnormal return	0.68%	2.44%	-0.60%	1.46%	0.29%
t-statistic	0.64	1.21	-0.56	0.72	0.23
Median abnormal return	-0.32%	0.28%	-0.72%	0.41%	-0.60%
Positive, negative	20, 25	10, 9	10, 16	8, 7	12, 18

**Table 5**  
**Changes in abnormal operating performance of 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 (Compustat item 13) to sales (Compustat 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.  $\Delta$  Industry Herf. < -100 are those deals that resulted in a change in the industry Herfindahl Index that were below -100.  $\Delta$  Industry Herf.  $\geq$  -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 Herf. >1800	Industry Herf. <=1800	$\Delta$ Industry Herf. < -100	$\Delta$ Industry Herf. $\geq$ -100
<i>Panel A: changes in divesting firm median industry-adjusted cash-flow to sales</i>					
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
<i>Panel B: changes in individual customer median industry-adjusted cash-flow to sales</i>					
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.

Table 5 (continued)

	All	Industry Herf. >1800	Industry Herf. <=1800	$\Delta$ Industry Herf. < -100	$\Delta$ Industry Herf. >= -100
<i>Panel C: changes in customer portfolio median industry-adjusted cash-flow to sales</i>					
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
<i>Panel D: changes in individual supplier median industry-adjusted cash-flow to sales</i>					
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
<i>Panel E: changes in supplier portfolio median industry-adjusted cash-flow to sales</i>					
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 (Compustat item 30) to sales (Compustat item 12). SG&A to sales is defined as the ratio of selling, general, and administrative expense (Compustat item 189) to sales (Compustat item 12). Employee to sales is defined as the ratio of the number of firm employees (Compustat item 29) to sales (Compustat item 12). Wage-to-sales is defined as the product of the number of firm employees (Compustat item 29) and the national average wage in a given year obtained from the Social Security Administration (Imrohoroglu and Tüzel, 2014) divided by sales (Compustat 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.  $\Delta$  Industry Herf. < -100 are those deals that resulted in a change in the industry Herfindahl Index that were below -100.  $\Delta$  Industry Herf.  $\geq$  -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. $\leq$ 1800	$\Delta$ Industry Herf. < -100	$\Delta$ Industry Herf. $\geq$ -100
<i>Panel A: changes in divesting firm median industry-adjusted cost of goods sold-to-sales</i>					
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
<i>Panel B: changes in divesting firm median industry-adjusted SG&amp;A expenses to sales for divesting firms</i>					
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.

**Table 6 (continued)**

	All	Industry Herf. >1800	Industry Herf. <=1800	Δ Industry Herf. < -100	Δ Industry Herf. >= -100
<i>Panel C: changes in divesting firm median industry-adjusted employees to sales (thousands per million (\$)) * 100</i>					
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
<i>Panel D: changes in divesting firm median industry-adjusted wage to sales</i>					
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
<i>Panel E: changes in individual customer cost of goods sold to sales</i>					
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

**Table 6 (continued)**

	All	Industry Herf. >1800	Industry Herf. <=1800	$\Delta$ Industry Herf. < -100	$\Delta$ Industry Herf. >= -100
<i>Panel F: changes in customer portfolio cost of goods sold-to-sales</i>					
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% <sup>**</sup>	-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

<sup>\*\*\*</sup>, <sup>\*\*</sup>, and <sup>\*</sup> denote significance at the 0.01, 0.05, and 0.10 level, respectively.



**Table 7**  
**Performance differences for customer subsamples**

*Non-concentrated customers* classifies corporate customers that have a 4-digit industry Herfindahl that is less than or equal to 1800. *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.

<i>Panel A: performance differences between non-concentrated and concentrated individual customers</i>			
	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	
<i>Panel B: performance differences between non-concentrated and concentrated for customer portfolios</i>			
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	
<i>Panel C: performance differences between reliant and non-reliant individual customers</i>			
	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	
<i>Panel D: performance differences between reliant and non-reliant customer portfolios</i>			
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.  $\Delta$  *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*

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

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

**Table 8 (continued)**

<i>Panel B: performance differences between non-concentrated and concentrated for individual suppliers</i>			
	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	
<i>Panel C: performance differences between non-concentrated and concentrated for supplier portfolios</i>			
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	
<i>Panel D: performance differences between terminated and retained individual suppliers</i>			
	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	
<i>Panel E: performance differences between terminated and retained supplier portfolios</i>			
	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.

**Table 8 (continued)**

	Suppliers w/single large customer	Suppliers w/multiple customers	Difference
<i>Panel F: performance differences between individual suppliers with a single large customer and multiple large customers</i>			
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	
<i>Panel G: performance differences between supplier portfolios with a single large customer and multiple large customers</i>			
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  
Regressions of divesting firms' abnormal returns

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 (Imrohorglu and Tuzel, (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
<i>TOBINS_Q</i>	-1.397** (-2.21)									-1.376 (-1.43)	-1.867 (-1.61)	-1.929 (-1.62)
<i>NEED_FOR_FUNDS</i>		5.649*** (3.44)									7.221*** (3.05)	7.654** (2.26)
<i>ALTMAN_Z_SCORE</i>			-0.230 (-0.90)							0.119 (0.31)	0.308 (0.85)	0.345 (0.85)
<i>COGSSALE</i>				1.649 (0.78)							-7.193** (-2.25)	-7.904* (-1.94)
<i>EMPSALE</i>					98.430* (1.74)					140.381** (2.37)	168.598*** (2.72)	
<i>WAGESALE</i>						3.906* (1.75)						6.507** (2.58)
<i>SGASALE</i>							4.330* (1.75)			5.447* (1.97)		-1.030 (-0.24)
<i>Ind_Herf&gt;1800</i>								0.476 (0.31)		0.451 (0.27)	1.165 (0.71)	1.157 (0.69)
<i>Δ Ind_Herf&lt;-100</i>								1.168 (0.69)		1.864 (1.11)	1.004 (0.60)	1.013 (0.58)
<i>CASH</i>									6.440* (2.54)	2.459* (1.74)	2.844* (2.05)	2.896** (2.01)
<i>REL_SIZE</i>									2.756** (1.97)	3.551 (1.28)	4.152 (1.57)	4.270 (1.66)
<i>SAME_INDUSTRY</i>									-0.250 (-0.19)	0.444 (0.28)	-0.189 (-0.12)	-0.186 (-0.12)
<i>Intercept</i>	3.897 (3.27)	2.311 (2.95)	2.704 (2.33)	1.010 (0.76)	1.361 (1.72)	1.276 (1.58)	0.842 (1.03)	1.236 (1.26)	0.102 (0.09)	-1.218 (-0.56)	4.554 (1.31)	5.013 (1.32)
<i>R<sup>2</sup></i>	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**  
**Summary of hypotheses and empirical predictions for quarterly horizontal divestiture events**

Panel A: Summary of downstream divestiture hypotheses and empirical predictions

	<b>Hypotheses</b>		
	<b>(1)</b> <b>Supplier Opportunism / Customer Expropriation Hypothesis</b>	<b>(2)</b> <b>Customer Opportunism / Pivotal Buyer Repositioning Hypothesis</b>	<b>(3)</b> <b>Rival Opportunism / Waterbed Effect Hypothesis</b>
<b>Operating Performance</b>	<i>H<sub>1</sub> Suppliers of dependent customer industries experience greater favorable changes in abnormal cash flow margins (cash flow-to-market value) in the two years following an announcement of downstream deconsolidation</i>	<i>H<sub>5</sub> More dependent and concentrated supplier industries experience greater adverse changes in abnormal cash flow margins (cash flow-to-market value) in the two years following an announcement of downstream deconsolidation</i>	<i>H<sub>9</sub> Supplier or customer dependence has no effect on abnormal cash flow margins (cash flow-to-market value) in the two years following an announcement of downstream deconsolidation</i>
<b>Producers' Prices</b>	<i>H<sub>2</sub> Suppliers of dependent customer industries experience larger increases in selling prices (real producers' prices) subsequent to downstream deconsolidation</i>	<i>H<sub>6</sub> Dependent supplier industries experience larger declines in selling prices (real producers' prices) subsequent to downstream deconsolidation</i>	<i>H<sub>10</sub> Neither supplier nor customer industry dependence have an impact on selling prices (real producers' prices) subsequent to downstream deconsolidation</i>
<b>Industry Structure Concentration</b>	<i>H<sub>3</sub> If downstream deconsolidation diminishes buying power, customer industries with higher levels of concentration prior to downstream deconsolidation will undergo larger price increases in selling prices following downstream deconsolidation</i>	<i>H<sub>7</sub> If downstream deconsolidation reverses a pivotal buyer's pivotal position, supplier industries with higher concentration prior to downstream deconsolidation will undergo a greater reduction in selling prices following downstream deconsolidation</i>	<i>H<sub>11</sub> If downstream deconsolidation induces asymmetric customer buying power, supplier industries with higher levels of concentration prior to downstream deconsolidation will lead to offsetting selling price increases of less powerful customer and decreases in selling prices for more powerful customers following downstream deconsolidation</i>
<b>Efficiency and Industry Demand Considerations</b>	<i>H<sub>4</sub> If downstream deconsolidation diminishes buying power, concentrated supplier industries with greater barriers to entry prior to deconsolidation will enjoy larger increases in selling prices following downstream deconsolidation of concentrated customer industries</i>	<i>H<sub>8</sub> If downstream deconsolidation allows pivotal buyers to reposition themselves, supplier industries with greater barriers to entry prior to deconsolidation will suffer larger declines in selling prices following downstream deconsolidation of customer industries</i>	<i>H<sub>12</sub> If downstream deconsolidation leads to asymmetric buying power, concentrated supplier industries with greater barriers to entry prior to deconsolidation will be able to better discriminate selling prices following downstream deconsolidation of concentrated customer industries</i>

**Table 10 (continued)**

Panel B: Summary of Upstream Divestiture Hypotheses and Empirical Predictions

<b>Hypotheses</b>	
<b>(4)</b>	
<b>Customer opportunism / Supplier expropriation hypothesis</b>	
<b>Operating Performance</b>	<i>H<sub>13</sub> Customers of dependent supplier industries experience greater favorable changes in abnormal cash flow margins (abnormal cash flow-to-market value of assets) in the two years subsequent to an upstream deconsolidation relative to customers of non-dependent supplier industries.</i>
<b>Producers' Prices</b>	<i>H<sub>14</sub> Customers of dependent supplier industries experience greater declines in abnormal costs-of-goods sold margins in the two years subsequent to an upstream deconsolidation relative to customers of less dependent supplier industries.</i>
<b>Industry Structure Concentration</b>	<i>H<sub>15</sub> If upstream deconsolidation reduces selling power, customers whose suppliers have higher concentration prior to upstream deconsolidation will experience greater favorable changes in cash flow margins (abnormal cash flow-to-market value of assets) in the two years subsequent to an announcement of upstream deconsolidation.</i>
<b>Industry Demand Considerations</b>	<i>H<sub>16</sub> If upstream deconsolidation reduces selling power, customers whose suppliers have higher barriers to entry prior to upstream deconsolidation will experience greater favorable changes in cash flow margins (abnormal cash flow-to-market value of assets) in the two years subsequent to an announcement of upstream deconsolidation.</i>

**Table 11**  
**Description of industries that experience a horizontal divestiture event**

Panel A lists the industries that experience a downstream horizontal divestiture event between 1979 and 2010, the Fama and French 48 industry classification, the year and quarter of the divestiture event, the size of the divestiture event, and the number of deals contributing to the divestiture event. A horizontal divestiture is defined as a divestiture between two firms within the same primary four-digit SIC code. An industry is classified as having experienced a divestiture event in a given quarter if the total transaction value (TV) of all horizontal acquisitions announced in that quarter exceeds five percent of industry total market value of equity (TMVE). TV is the total value of consideration paid by the acquirer excluding fees and expenses (in millions). TMVE is the total market capitalization (in millions).

SIC	Fama and French 48-Industry Description	Year	Quarter	TV/TMVE	No. of deals
2086	Soda	1981	4	2.019	1
3559	Mach	1981	4	0.083	1
3585	Mach	1982	3	0.089	1
3949	Toys	1982	4	0.776	1
3845	MedEq	1983	2	1.713	1
3537	Autos	1984	3	0.129	1
3442	BldMt	1984	4	0.131	1
3613	ElcEq	1985	4	0.061	1
3448	BldMt	1986	1	0.588	1
3585	Mach	1986	2	0.053	1
3821	LabEq	1986	2	0.343	1
3532	Mach	1987	1	0.139	1
3555	Mach	1988	2	0.101	1
3564	Mach	1988	2	0.289	1
3715	Autos	1989	1	0.422	1
3845	MedEq	1989	3	0.074	1
3821	LabEq	1990	2	2.050	1
3533	Mach	1990	3	0.084	2
3843	MedEq	1991	3	0.055	1
3845	MedEq	1992	1	0.052	1
3564	Mach	1992	3	0.050	1
2086	Soda	1993	2	0.081	1
3334	Steel	1993	2	0.075	1
2511	Hshld	1993	4	0.306	1
7819	Fun	1994	1	0.056	1
2013	Food	1995	2	0.147	1
3579	Comps	1995	2	0.060	1
2732	Books	1996	1	0.057	1
3448	BldMt	1996	1	0.067	1
3751	Hshld	1996	3	0.089	1
2851	Chems	1996	4	0.061	1
3715	Autos	1997	1	0.065	1
3724	Aero	1997	1	0.057	1
3532	Mach	1997	2	0.681	1
2721	Books	1997	4	0.150	1
3334	Steel	1997	4	0.197	1
3743	Ships	1997	4	0.115	1
2741	Books	2000	1	3.998	1
2891	Chems	2000	2	0.431	1
3743	Ships	2001	3	0.268	1
2273	Txtls	2003	3	0.061	1
3715	Autos	2003	3	0.107	1
7371	BusSv	2004	1	0.128	1
2211	Txtls	2005	1	0.059	1
3272	BldMt	2010	1	1.183	1
2842	Hshld	2010	3	0.061	1



**Table 11 (continued)**

Panel B lists the industries that experience an upstream horizontal divestiture event between 1979 and 2010, the Fama and French 48 industry classification, the year and quarter of the divestiture event, the size of the divestiture event, and the number of deals contributing to the divestiture event. A horizontal divestiture is defined as a divestiture between two firms within the same primary four-digit SIC code. An industry is classified as having experienced a divestiture event in a given quarter if the total transaction value (TV) of all horizontal acquisitions announced in that quarter exceeds five percent of industry total market value of equity (TMVE). TV is the total value of consideration paid by the acquirer excluding fees and expenses (in millions). TMVE is the total market capitalization (in millions).

SIC	Fama and French 48-Industry Description	Year	Quarter	TV/TMVE	No. of Deals
2086	Soda	1981	4	2.019	1
3559	Mach	1981	4	0.083	1
3585	Mach	1982	3	0.089	1
3949	Toys	1982	4	0.776	1
3537	Autos	1984	3	0.129	1
3442	BldMt	1984	4	0.131	1
3613	ElcEq	1985	4	0.061	1
3448	BldMt	1986	1	0.588	1
3585	Mach	1986	2	0.068	1
3532	Mach	1987	1	0.139	1
3555	Mach	1988	2	0.101	1
3564	Mach	1988	2	0.289	1
3715	Autos	1989	1	0.422	1
3845	MedEq	1989	3	0.078	1
3821	LabEq	1990	2	0.170	1
3533	Mach	1990	3	0.084	2
3843	MedEq	1991	3	0.055	1
3845	MedEq	1992	1	0.068	1
3564	Mach	1992	3	0.064	1
2086	Soda	1993	2	0.100	1
3334	Steel	1993	2	0.075	1
2013	Food	1995	2	0.147	1
3579	Comps	1995	2	0.060	1
2732	Books	1996	1	0.057	1
3448	BldMt	1996	1	0.082	1
2851	Chems	1996	4	0.061	1
3715	Autos	1997	1	0.065	1
3724	Aero	1997	1	0.057	1
3532	Mach	1997	2	0.681	1
3334	Steel	1997	4	0.059	1
3743	Ships	1997	4	0.115	1
2741	Books	2000	1	3.998	1
3743	Ships	2001	3	0.360	1
2273	Txtls	2003	3	0.061	1

**Table 12**  
**Distributions of dependent and non-dependent customers, pivotal and non-pivotal buyers, dependent and non-dependent suppliers**

Panel A of this table describes the fraction of customer input purchased by divesting industry for dependent and non-dependent customers and provides the distribution of  $f_{jm}$ , the percentage of supplier industry  $m$ 's input purchased by the divesting customer industry for the sample of *downstream divestitures*. Panel B of this table describes the fraction of supplier output sold to the divesting industry for pivotal buyers and non-pivotal buyers and provides the distribution of  $f_{mj}$ , the percentage of supplier industry  $j$ 's output sold to the divesting industry  $m$ . Panel C provides the distribution of  $f_{mj}$ , the percentage of divesting supplier industry  $j$ 's output sold to the customer industry  $m$  for dependent suppliers and non-dependent suppliers of customer industries for upstream divestitures. Higher values of  $f_{jm}$  indicate that the divesting customer industry is more dependent on the supplier industry,  $m$ , for purchasing its input. Dependent customers are defined as those with suppliers with  $f_{jm}$  in the top quintile. Remaining suppliers are classified as those with non-dependent customers. Higher values of  $f_{mj}$  indicate that the supplier industry  $j$  is more dependent on the divesting industry for buying its output. Pivotal buyers identify those suppliers with high fixed costs, (above median abnormal selling, general, and administrative expense-to-sales), high pre-divestiture supplier concentration (pre-divestiture supplier Herfindahl index greater than or equal to 1800), and with  $f_{mj}$  in the top tercile (upper one-third). Remaining suppliers are classified as non-pivotal buyers. Remaining suppliers are classified as non-pivotal buyers.

Panel A					
$f_{jm}$	N	Minimum (%)	Maximum (%)	Mean (%)	Median (%)
Dependent customers	51	0.87	23.71	4.56	2.67
Non-dependent customers	223	0.00	2.18	0.28	0.03
All	274	0.00	23.71	1.07	0.19
Panel B					
$f_{mj}$	N	Minimum (%)	Maximum (%)	Mean (%)	Median (%)
Pivotal buyers	34	0.04	13.63	1.57	0.39
Non-pivotal buyers	240	0.00	22.08	0.52	0.00
All	274	0.00	22.08	0.65	0.03
Panel C					
$f_{mj}$	N	Minimum (%)	Maximum (%)	Mean (%)	Median (%)
Dependent suppliers	7	6.3	22.1	11.5	9.2
Non-dependent suppliers	28	0.1	5.2	1.4	0.8
All	35	0.1	22.1	3.5	1.1

**Table 13**  
**Supplier accounting based abnormal operating performance**

This table presents a multivariate analysis of accounting based measures of supplier industry abnormal operating performance: abnormal cash flow margins (ACFM) and abnormal return on of assets (AROA). ACFM of an industry is defined as that industry's median cash flow-to-sales ratio minus the cash flow-to-sales ratio of the median industry in the economy. The cash flow-to-sales ratio of a firm is the ratio of operating income (Compustat item 13) to sales (Compustat item 12). The return on assets is defined as the ratio of operating income (Compustat item 13) to the book value of total assets (Compustat item 6). In Column 1, the dependent variable is the average ACFM in supplier industries over the two years preceding the downstream divestiture event. In Column 2, the dependent variable is the average ACFM in supplier industries over the two years following downstream divestiture. In Column 3, the dependent variable is the average AROA in supplier industries over the two years preceding the downstream divestiture event. In Column 4, the dependent variable is the average AROA in supplier industries over the two years following downstream divestiture. The customer dependence dummy equals one if the supplier's customer industry belongs to the top quintile of  $f_{jm}$ , the percentage of customer industry  $m$ 's inputs purchased from the upstream industry,  $j$ , and zero otherwise. The Pivotal buyer dummy equals one if supplier industry belongs to the top tercile ( $1/3^{\text{rd}}$ ) of  $f_{mj}$ , the fraction of industry  $j$ 's output sold to the downstream divesting industry, the supplier's average Herfindahl index in the two years prior to the divestiture is greater than 1800, and abnormal fixed costs-to-sales ratio is in the top half of the distribution, and zero otherwise. The Supplier high concentration / HFC (high fixed costs) dummy, equals one if the supplier's average Herfindahl index in the two years prior to the divestiture is greater than 1800 and abnormal fixed costs to sales ratio is in the top half of the distribution, and zero otherwise. Abnormal fixed costs of an industry is defined as that industry's median fixed costs-to-sales ratio minus the fixed costs-to-sales ratio of the median industry in the economy. The fixed costs-to-sales ratio is the ratio of selling, general, and administrative expense (Compustat item 189) to sales ratio (Compustat item 12). The supplier dependence dummy equals one if the supplier industry belongs to the top tercile of  $f_{mj}$ , the fraction of industry  $j$ 's output sold to the downstream divesting industry and zero otherwise. Herfindahl Index is the sum of the squared sales market shares of firms in the given industry calculated from Compustat business segments. Capital intensity is industry total assets (Compustat item 6) divided by industry sales (Compustat item 12). Capital expenditure is the industry's total capital expenditure (Compustat item 128) divided by the industry's total assets (Compustat item 6). Advertising expense is the industry's total advertising expense (Compustat item 45) divided by the industry's total sales. T-statistics based on robust standard errors clustered at the two-digit SIC level are in parentheses. Year dummy variables used in regression (not shown). All the continuous variables are winsorized at the 99th percentile The superscripts a, b, and c indicate significance at the 1%, 5% and 10% levels respectively.

	1	2	3	4
	Dependent variable: Supplier ACFM before downstream divestiture	Dependent variable: Supplier ACFM after downstream divestiture	Dependent variable: Supplier AROA before downstream divestiture	Dependent variable: Supplier AROA after downstream divestiture
Intercept	-0.035 (-1.28)	<b>-0.052<sup>b</sup></b> (-1.91)	0.000 (-0.01)	-0.036 (-1.10)
Customer dependence dummy	0.010 (0.79)	-0.016 (-1.21)	0.018 (1.31)	-0.003 (-0.20)
Pivotal buyer dummy	<b>0.100<sup>a</sup></b> (5.63)	0.022 (1.17)	<b>0.101<sup>a</sup></b> (4.29)	0.019 (0.88)
Supplier high concentration/ HFC dummy	<b>-0.063<sup>a</sup></b> (-9.04)	<b>-0.031<sup>c</sup></b> (-3.11)	<b>-0.059<sup>a</sup></b> (-11.37)	<b>-0.027<sup>b</sup></b> (-2.60)
Supplier dependence dummy	-0.014 (-0.89)	-0.012 (-0.94)	<b>-0.026<sup>c</sup></b> (-1.88)	--0.011 (-0.51)

Table 13 (continued)

Customer Herfindahl index	-0.000 (-0.19)	<b>0.000<sup>c</sup></b> (1.82)	0.000 (0.10)	0.000 (1.08)
Customer capital intensity	0.007 (0.65)	0.016 (1.28)	0.004 (0.47)	0.010 (0.77)
Customer capital expenditure	0.062 (0.45)	-0.068 (-0.53)	0.062 (0.43)	-0.068 (-0.64)
Customer advertising expense	0.128 (0.18)	0.251 (0.47)	-0.042 (-0.07)	0.213 (0.64)
Supplier Herfindahl index	-0.000 (-0.97)	0.000 (0.17)	-0.000 (-0.98)	<b>0.000<sup>c</sup></b> (1.90)
Supplier capital intensity	0.023 (1.10)	<b>0.025<sup>b</sup></b> (2.17)	-0.019 (-1.17)	-0.007 (-0.54)
Supplier capital expenditure	<b>0.472<sup>c</sup></b> (1.95)	0.229 (1.45)	<b>0.454<sup>b</sup></b> (2.57)	0.351 (1.11)
Supplier advertising expense	<b>-1.136<sup>b</sup></b> (-2.75)	-0.586 (-1.50)	-0.289 (-1.01)	-0.540 (-1.16)
R-squared	0.28	0.10	0.32	0.11
F-statistic	8.98 <sup>a</sup>	2.30 <sup>b</sup>	11.23 <sup>a</sup>	2.70 <sup>a</sup>
Observations	293	272	293	272

**Table 14**  
**Supplier market value based abnormal operating performance**

This table presents a multivariate analysis of value based measures of supplier industry abnormal operating performance: abnormal cash flow to market value of assets (ACFMVA) and abnormal cash flow to enterprise value (ACFEV). ACFMVA of an industry is defined as that industry's median cash flow-to-market value of assets ratio minus the cash flow-to-market value of assets ratio of the median industry in the economy. The cash flow-to-market value of assets is defined as the ratio of operating income (Compustat item 13) to the sum of the book value of total assets (Compustat item 6), market value of equity (Compustat item 199) \* (Compustat item 61), less the book value of common equity (Compustat item 60). The cash flow-to-enterprise value ratio is defined as the ratio of earnings before interest, taxes, depreciation, and amortization (Compustat item 13) to the sum of the book value of total assets (Compustat item 6), market value of equity (Compustat item 199) \* (Compustat item 61), less the sum of book value of common equity (Compustat item 60) and cash and short term investments (Compustat item 1). In Column 1, the dependent variable is the average ACFMVA in supplier industries over the two years preceding the downstream divestiture event. In Column 2, the dependent variable is the average ACFMVA in supplier industries over the two years following downstream divestiture. In Column 3, the dependent variable is the average ACFEV in supplier industries over the two years preceding the downstream divestiture event. In Column 4, the dependent variable is the average ACFEV in supplier industries over the two years following downstream divestiture. The customer dependence dummy equals one if the supplier's customer industry belongs to the top quintile of  $f_{jm}$ , the percentage of customer industry  $m$ 's inputs purchased from the upstream industry,  $j$ , and zero otherwise. The Pivotal buyer dummy equals one if supplier industry belongs to the top tercile (1/3<sup>rd</sup>) of  $f_{mj}$ , the fraction of industry  $j$ 's output sold to the downstream divesting industry, the supplier's average Herfindahl index in the two years prior to the divestiture is greater than 1800, and abnormal fixed costs-to-sales ratio is in the top half of the distribution, and zero otherwise. The Supplier high concentration / HFC (high fixed costs) dummy equals one if the supplier's average Herfindahl index in the two years prior to the divestiture is greater than 1800 and abnormal fixed costs to sales ratio is in the top half of the distribution, and zero otherwise. Abnormal fixed costs of an industry is defined as that industry's median fixed costs-to-sales ratio minus the fixed costs-to-sales ratio of the median industry in the economy. The fixed costs-to-sales ratio is the ratio of selling, general, and administrative expense (Compustat item 189) to sales ratio (Compustat item 12). The supplier dependence dummy equals one if the supplier industry belongs to the top tercile of  $f_{mj}$ , the fraction of industry  $j$ 's output sold to the downstream divesting industry and zero otherwise. Herfindahl Index is the sum of the squared sales market shares of firms in the given industry calculated from Compustat business segments. Capital intensity is industry total assets (Compustat item 6) divided by industry sales (Compustat item 12). Capital expenditure is the industry's total capital expenditure (Compustat item 128) divided by the industry's total assets (Compustat item 6). Advertising expense is the industry's total advertising expense (Compustat item 45) divided by the industry's total sales. T-statistics based on robust standard errors clustered at the two-digit SIC level are in parentheses. Year dummy variables used in regression (not shown). All the continuous variables are winsorized at the 99th percentile. The superscripts a, b, and c indicate significance at the 1%, 5% and 10% levels respectively.

	1	2	3	4
	Dependent variable: Supplier ACFMVA before downstream divestiture	Dependent variable: Supplier ACFMVA after downstream divestiture	Dependent variable: Supplier ACFEV before downstream divestiture	Dependent variable: Supplier ACFEV after downstream divestiture
Intercept	-0.007 (-0.36)	-0.016 (-0.75)	-0.005 (-0.20)	-0.018 (-0.77)
Customer dependence dummy	0.014 (1.50)	0.004 (0.37)	0.015 (1.41)	-0.003 (-0.22)
Pivotal buyer dummy	<b>0.035<sup>c</sup></b> (1.97)	-0.002 (-0.24)	<b>0.047<sup>b</sup></b> (2.79)	-0.001 (-0.08)
Supplier high concentration / HFC dummy	<b>-0.036<sup>a</sup></b> (-5.39)	<b>-0.019<sup>b</sup></b> (-3.08)	<b>-0.043<sup>a</sup></b> (-11.21)	<b>-0.019<sup>b</sup></b> (-2.70)

Table 14 (continued)

Supplier dependence dummy	-0.009 (-0.91)	0.001 (0.01)	<b>-0.013</b> (-1.13)	0.006 (0.03)
Customer Herfindahl index	-0.000 (-0.03)	0.000 (1.21)	0.000 (0.77)	0.000 (1.39)
Customer capital intensity	<b>0.014<sup>c</sup></b> (1.87)	0.003 (0.56)	<b>0.015<sup>c</sup></b> (1.97)	0.004 (0.77)
Customer capital expenditure	0.094 (1.16)	-0.031 (-0.36)	0.051 (0.60)	-0.058 (-0.69)
Customer advertising expense	-0.170 (-0.49)	0.090 (0.66)	-0.179 (-0.47)	0.122 (0.87)
Supplier Herfindahl index	<b>0.000<sup>c</sup></b> (2.05)	<b>0.000<sup>a</sup></b> (3.03)	<b>0.000<sup>a</sup></b> (2.41)	<b>0.000<sup>c</sup></b> (1.97)
Supplier capital intensity	<b>-0.022<sup>b</sup></b> (-2.90)	-0.014 (-1.67)	<b>-0.027<sup>a</sup></b> (-2.99)	<b>-0.018<sup>c</sup></b> (-2.02)
Supplier capital expenditure	<b>0.192<sup>c</sup></b> (2.03)	0.126 (0.66)	<b>0.270<sup>a</sup></b> (2.52)	0.201 (0.96)
Supplier advertising expense	-0.367 (-1.72)	-0.207 (-0.86)	<b>-0.449<sup>b</sup></b> (-2.47)	-0.320 (-1.06)
R-squared	0.32	0.21	0.39	0.19
F-statistic	10.90 <sup>a</sup>	5.89 <sup>a</sup>	14.79 <sup>a</sup>	4.91 <sup>a</sup>
Observations	293	272	293	272

**Table 15**  
**Supplier selling prices: Univariate analysis**

Panel A of this table compares prices in supplier industries during the two years before and two years following divestiture in a downstream industry for all supplier industries, dependent customers and non-dependent customer groups. Panel B of this table compares prices in supplier industries during the two years before and two years following divestiture in a downstream industry for suppliers with pivotal buyers and non-pivotal buyers. Producer Price Index (PPI) data for supplier industries are obtained from the Bureau of Labor Statistics (BLS). The PPI for each supplier is deflated using the GDP price deflator to obtain the Real PPI (RPPI). The table includes all divestiture industry-supplier industry pairs for which RPPI data are available. Dependent customers are supplier industries with the top 1/5th of values for  $f_{jm}$ , the fraction of industry  $j$ 's output sold to the downstream divesting industry. Non-dependent customers of supplier industries include all remaining supplier industries. U.S. Census Bureau's 1992 and 1997 benchmark Input-Output tables are used to calculate customer dependence. T-statistics are provided in parentheses. Pivotal buyers identify those suppliers with high fixed costs, (above median abnormal selling, general, and administrative expense-to-sales), high pre-divestiture supplier concentration (pre-divestiture supplier Herfindahl index greater than or equal to 1800), and as dependent (those suppliers with  $f_{mj}$  in the top tercile). Remaining suppliers are classified as non-pivotal buyers. Remaining suppliers are classified as non-pivotal buyers. U.S. Census Bureau's 1992 and 1997 benchmark Input-Output tables are used to calculate supplier dependence. T-statistics are provided in parentheses. Bold font indicates significance at least at the 10% percent level. The superscripts a, b and c indicate significance at the 1%, 5% and 10% levels respectively

Panel A					
	1		2		3
	Before downstream divestiture		After downstream divestiture		Change
	N	RPPI	N	RPPI	$\Delta$ RPPI
All supplier industries	172	176.2	159	173.2	-3.0 (-0.43)
Dependent customers	33	158.1	27	156.7	-1.4 (-0.18)
Non-dependent customers	139	180.5	132	176.6	-3.9 (-0.47)
Difference		<b>-22.4<sup>a</sup></b> (-2.87)		<b>-19.9<sup>b</sup></b> (-2.45)	2.5 (0.22)
Panel B					
	1		2		3
	Before downstream divestiture		After downstream divestiture		Change
	N	RPPI	N	RPPI	$\Delta$ RPPI
Pivotal buyers	19	171.2	18	173.6	2.4 (0.24)
Non-pivotal buyers	153	176.8	141	173.2	-3.6 (-0.47)
Difference		-5.6 (-0.64)		0.4 (0.04)	6.0 (0.49)

**Table 16**  
**Supplier selling prices: Multivariate analysis**

This table presents a multivariate analysis of selling prices in the supplier industry during the four years surrounding the downstream divestiture event. For each supplier of a deconsolidating industry, I obtain the Producer Price Index (PPI) from the Bureau of Labor Statistics (BLS) starting from two years before the downstream divestiture event to two years after the downstream divestiture event. The PPI series are adjusted for inflation using the GDP price deflator to obtain RPPI. Columns 1-3 contain estimates of panel regressions. In Column 1 (Column 2) the data are restricted to the 24 months preceding (following) the downstream divestiture event. Column 3 contains estimates of the full panel of the 48-month period. The dependent variable in Columns 1-3 is the monthly RPPI in log-differences. The dummy variable, *CD*, identifies divesting downstream industries that are highly dependent on suppliers for inputs: *CD* equals 1 if the fraction of customer input,  $f_{jm}$ , purchased by the downstream industry lies in the top quintile and 0 otherwise. The dummy variable, *PB*, identifies supplier industries that are characterized as having a pivotal buyer crucial to their production process: *PB* equals 1 if suppliers have above median abnormal selling, general, and administrative expense-to-sales, an average pre-divestiture supplier Herfindahl index greater than 1800, and suppliers with  $f_{mj}$  in the top tercile; 0 otherwise. Abnormal fixed costs of an industry is defined as that industry's median fixed costs-to-sales ratio minus the fixed costs-to-sales ratio of the median industry in the economy. The fixed costs-to-sales ratio is the ratio of selling, general, and administrative expense (Compustat item 189) to sales ratio (Compustat item 12). For a given supplier, the Post-Divestiture Dummy (*PD*) equals 1 in the months following the downstream event and 0 for the months preceding. The control variables  $rppi\_inp^1$  and  $rppi\_inp^2$  represent the real PPI of the supplier industry's two primary inputs, again in log differences. The variable *wage* represents log differences of average hourly earnings of production workers compiled by the BLS. *tp*, obtained from the Federal Reserve Board, measures log differences of the real output of the manufacturing, mining, and electric and gas utilities industries. The panel regression includes a time trend, industry dummies at the two-digit SIC level and year dummies. T-statistics are based on Newey-West standard errors. Column 4 presents estimates of a cross-sectional regression in which the dependent variable is a supplier industry's average log RPPI over the two years after the downstream divestiture minus the average log RPPI over the two years prior to the downstream divestiture. For control variables, I calculate the change in average input prices, wages and total production in the same manner. The explanatory variables of interest is the customer dependence dummy, *CD*, and pivotal buyer dummy, *PB*. In Columns 4, t-statistics (in parentheses) are based on robust standard errors clustered at the two-digit SIC level. In all regressions, bold font indicates significance at least at the 10% percent level. The superscripts a, b, and c indicate significance at the 1%, 5% and 10% levels respectively.

	1	2	3	4
Dependent variable: change in supplier RPPI	Panel: before downstream divestiture	Panel: after downstream divestiture	Full Panel (difference-in difference)	Cross-sectional
Intercept	-0.045 (-0.58)	<b>-0.242<sup>a</sup></b> (-2.79)	<b>-0.151<sup>b</sup></b> (-2.32)	-0.010 (-0.78)
Customer dependence dummy ( <i>CD</i> )	0.000 (0.18)	<b>0.002<sup>b</sup></b> (2.14)	0.001 (0.68)	-0.098 (-1.01)
Pivotal buyer dummy ( <i>PB</i> )	0.002 (1.19)	<b>-0.002<sup>c</sup></b> (-1.76)	0.000 (0.00)	-0.039 (-0.65)
Input price 1 ( $rppi\_inp^1$ )	<b>0.559<sup>a</sup></b> (5.49)	<b>0.228<sup>a</sup></b> (3.10)	<b>0.310<sup>a</sup></b> (4.28)	-1.828 (-0.27)
Input price 2 ( $rppi\_inp^2$ )	<b>0.077<sup>b</sup></b> (2.15)	<b>0.062<sup>c</sup></b> (1.74)	<b>0.062<sup>b</sup></b> (2.28)	-0.459 (-0.44)
Wages ( <i>wage</i> )	0.023 (0.89)	<b>0.065<sup>b</sup></b> (2.29)	<b>0.060<sup>a</sup></b> (2.67)	<b>12.047<sup>a</sup></b> (17.19)
Total production ( <i>tp</i> )	<b>0.139<sup>b</sup></b> (2.02)	<b>0.370<sup>a</sup></b> (7.07)	<b>0.305</b> (6.49)	-0.144 (-0.34)
Post-divestiture ( <i>PD</i> )			-0.001 (-0.96)	
<i>CD</i> x <i>PD</i>			0.001 (0.39)	
<i>PB</i> x <i>PD</i>			-0.001 (-0.82)	
R-squared	.21	0.35	0.38	.54
Observations	1,871	2,524	4,395	29



**Table 17**  
**Changes in supplier selling prices and customer market power prior to downstream deconsolidation**

This table investigates the linkage between the change in supplier selling prices post-downstream deconsolidation and several measures of customer pricing power. I identify the 10 most dependent suppliers of each of the 46 industries that underwent a divestiture event between 1979 and 2010. For each supplier to a deconsolidating industry, I obtain the Producer Price Index (PPI) from the Bureau of Labor Statistics (BLS) starting from two years prior the downstream divestiture event to two years after the downstream divestiture event. The PPI series are adjusted for inflation using the GDP price deflator to obtain RPPI. All six columns present estimates of the cross-sectional regression in which the dependent variable is a supplier industry's average log RPPI over the two years' post-downstream deconsolidation minus the average log RPPI over the two years prior. The change in average input prices ( $rppi\_inp^1$  and  $rppi\_inp^2$ ), wages ( $wage$ ), and total production ( $tp$ ) are calculated in a similar fashion.  $cust\_con$  is the four-firm concentration ratio of the customer industry prior to the downstream divestiture and  $cust\_herf$  its Herfindahl index. The following variables are obtained from Compustat as of the year prior to downstream deconsolidation:  $cust\_con$  is sum of sales for the top four-firms divided by industry total sales for the customer industry,  $cust\_herf$  is the sum of the squared sales market shares of firms in the customer industry calculated from Compustat business segments,  $cust\_ks$  is customer industry total assets divided by customer industry total sales,  $cust\_capex$  is equal to customer industry capital expenditures divided by customer industry assets,  $cust\_advert$  is customer advertising expenses divided by customer industry total sales. t-Statistics (in parentheses) are based on robust standard errors clustered at the two-digit SIC level. In all regressions, bold font indicates significance at least at the 10% level. The superscripts a, b, and c indicate significance at the 1%, 5%, and 10% levels, respectively.

	1	2	3	4	5
Intercept	-0.029 (-0.60)	-0.067 (-0.91)	<b>0.382<sup>c</sup></b> (1.85)	-0.056 (-0.74)	-0.031 (-0.49)
Customer 4-firm concentration ratio ( $cust\_con$ )	0.001 (0.84)				
Customer Herfindahl index ( $cust\_herf$ )		0.000 (1.12)			
Customer capital intensity ( $cust\_ks$ )			<b>-0.379<sup>c</sup></b> (-2.00)		
Customer capital expenditures ( $cust\_capex$ )				0.632 (1.00)	
Customer advertising expenses ( $cust\_advert$ )					1.468 (0.61)
Input price 1 ( $rppi\_inp^1$ )	-6.616 (-1.22)	-5.830 (-1.14)	-3.394 (-0.83)	-6.494 (-1.14)	-7.007 (-0.85)
Input price 2 ( $rppi\_inp^2$ )	-0.442 (-0.41)	-0.409 (-0.40)	-1.794 (-1.28)	-0.480 (-0.42)	-0.651 (-0.59)
Wages ( $wage$ )	<b>11.429<sup>c</sup></b> (1.82)	<b>11.277<sup>c</sup></b> (1.82)	4.126 (0.60)	<b>11.325<sup>c</sup></b> (1.73)	11.161 (1.56)
Total production ( $tp$ )	0.675 (0.69)	0.759 (0.89)	-1.707 (-1.20)	0.321 (0.29)	1.142 (1.18)
Observations	25	25	23	23	23
R-squared	0.25	0.26	0.39	0.25	0.23

**Table 18**  
**Changes in supplier selling prices and supplier pricing power prior to downstream deconsolidation**

This table investigates the linkage between the change in supplier selling prices post-downstream deconsolidation and several measures of supplier pricing power. I identify the 10 most dependent suppliers of each of the 46 industries that underwent a divestiture event between 1979 and 2010. For each supplier to a deconsolidating industry, I obtain the Producer Price Index (PPI) from the Bureau of Labor Statistics (BLS) starting from two years prior the downstream divestiture event to two years after the downstream divestiture event. The PPI series are adjusted for inflation using the GDP price deflator to obtain RPPI. All six columns present estimates of the cross-sectional regression in which the dependent variable is a supplier industry's average log RPPI over the two years' post-downstream deconsolidation minus the average log RPPI over the two years prior. The change in average input prices ( $rppi\_inp^1$  and  $rppi\_inp^2$ ), wages ( $wage$ ), and total production ( $tp$ ) are calculated in a similar fashion.  $sup\_con$  is the four-firm concentration ratio of the supplier industry prior to the downstream divestiture and  $sup\_herf$  is its Herfindahl index. The following variables are obtained from Compustat as of the year prior to downstream deconsolidation:  $sup\_con$  is sum of sales for the top four-firms divided by industry total sales for the supplier industry,  $sup\_herf$  is the sum of the squared sales market shares of firms in the supplier industry calculated from Compustat business segments,  $sup\_ks$  is supplier industry total assets divided by supplier industry total sales,  $sup\_capex$  is equal to supplier industry capital expenditures divided by supplier industry assets,  $sup\_advert$  is supplier advertising expenses divided by supplier industry total sales. t-Statistics (in parentheses) are based on robust standard errors clustered at the two-digit SIC level. In all regressions, bold font indicates significance at least at the 10% level. The superscripts a, b, and c indicate significance at the 1%, 5%, and 10% levels, respectively.

	1	2	3	4	5
Intercept	-0.017 (-0.45)	0.076 (0.66)	0.165 (1.49)	-0.048 (-0.53)	-0.076 (-1.38)
Supplier 4-firm concentration ratio ( $sup\_con$ )	<b>-0.008<sup>a</sup></b> (-2.82)				
Supplier Herfindahl index ( $sup\_herf$ )		-0.000 (-1.33)			
Supplier capital intensity ( $sup\_ks$ )			<b>-0.154<sup>c</sup></b> (-1.73)		
Supplier capital expenditures ( $sup\_capex$ )				0.717 (0.42)	
Supplier advertising expenses ( $sup\_advert$ )					8.521 (1.66)
Input price 1 ( $rppi\_inp^1$ )	<b>-10.612<sup>c</sup></b> (-2.01)	<b>-7.253<sup>c</sup></b> (-1.77)	-7.867 (-1.63)	-5.586 (-0.94)	<b>-9.425<sup>c</sup></b> (-1.77)
Input price 2 ( $rppi\_inp^2$ )	0.279 (0.26)	-1.016 (-0.87)	-0.466 (-0.42)	-0.957 (-0.91)	0.362 (0.34)
Wages ( $wage$ )	<b>36.836<sup>a</sup></b> (3.08)	<b>15.138<sup>b</sup></b> (2.34)	<b>26.409<sup>b</sup></b> (2.20)	<b>10.649</b> (1.57)	<b>13.813<sup>b</sup></b> (2.15)
Total production ( $tp$ )	0.363 (0.36)	0.706 (0.70)	0.460 (0.45)	1.046 (1.15)	0.283 (0.24)
Observations	25	25	23	23	23
R-squared	0.53	0.32	0.36	0.23	0.37

**Table 19**  
**Customer accounting based abnormal operating performance**

This table presents a multivariate analysis of abnormal cash flow margins (ACFM) customer industries. ACFM of an industry is defined as that industry's median cash flow-to-sales ratio minus the cash flow-to-sales ratio of the median industry in the economy. The cash flow-to-sales ratio of a firm is the ratio of operating income (Compustat item 13) to sales (Compustat item 12). In Columns 1 and 3, the dependent variable is the average ACFM in supplier industries over the two years preceding the upstream divestiture event. In Columns 2 and 4, the dependent variable is the average ACFM in supplier industries over the two years following the upstream divestiture event.  $f_{mj}$  is the percentage of divesting supplier industry  $j$ 's output sold to the customer industry  $m$ . Higher values of  $f_{mj}$  indicate that the divesting supplier industry  $j$  is more dependent on the downstream (customer) industry for buying its output. The supplier dependence dummy equals one if the customer industry has a supplier with  $f_{mj}$  in the top quintile and zero otherwise. Herfindahl Index is the sum of the squared sales market shares of firms in the supplier industry calculated from Compustat business segments. Capital intensity is industry total assets (Compustat item 6) divided by industry sales (Compustat item 12). Capital expenditure is the supplier industry's total capital expenditure (Compustat item 128) divided by the industry's total assets. Advertising expense is the supplier industry's total advertising expense (Compustat item 45) divided by the industry's total sales. T-statistics based on robust standard errors clustered at the two-digit SIC level are in parentheses. Year dummy variables used in regression (not shown). The superscripts a, b, c and indicate significance at the 1%, 5% and 10% levels respectively.

	1	2	3	4
	Dependent variable: Customer ACFM before downstream divestiture	Dependent variable: Customer ACFM after downstream divestiture	Dependent variable: Customer ACFM before downstream divestiture	Dependent variable: Customer ACFM after downstream divestiture
Intercept	-0.034 (-1.63)	-0.150 (-1.82)	<b>-0.056<sup>a</sup></b> (-4.12)	<b>-0.175<sup>c</sup></b> (-2.12)
Supplier dependence dummy	0.005 (0.12)	<b>0.049<sup>c</sup></b> (2.13)		
$f_{mj}$			0.003 (1.53)	<b>0.005<sup>c</sup></b> (1.97)
Supplier Herfindahl index	<b>-0.000<sup>b</sup></b> (-2.49)	0.000 (1.12)	<b>-0.000<sup>b</sup></b> (-2.58)	0.000 (1.20)
Supplier capital intensity	<b>0.050<sup>a</sup></b> (4.31)	0.041 (1.59)	0.054 (4.90)	<b>0.047<sup>c</sup></b> (2.09)
Supplier capital expenditure	<b>0.249<sup>c</sup></b> (1.87)	0.382 (1.39)	<b>0.313</b> (2.76)	<b>0.542<sup>b</sup></b> (2.81)
Supplier advertising expense	-3.036 (-0.93)	0.288 (0.12)	-2.356 (-0.73)	0.661 (0.25)
R-squared	0.33	0.30	0.36	0.32
F-statistic	9.03 <sup>a</sup>	160.06 <sup>a</sup>	9.46 <sup>a</sup>	10.69 <sup>a</sup>
Observations	51	38	51	38

**Table 20**  
**Customer market valued based abnormal operating performance**

This table presents a multivariate analysis of abnormal cash flow-to-market value of assets (ACFMVA) of customer industries. ACFMVA of an industry is defined as that industry's median cash flow-to-market value of assets ratio minus the cash flow-to-market value of assets ratio of the median industry in the economy. The cash flow-to-market value of assets is defined as the ratio of operating income (Compustat item 13) to the sum of the book value of total assets (Compustat item 6), market value of equity (Compustat item 199) \* (Compustat item 61), less the book value of common equity (Compustat item 60). In Columns 1 and 3, the dependent variable is the average ACFMVA in customer industries over the two years preceding the upstream divestiture event. In Columns 2 and 4, the dependent variable is the average ACFMVA in customer industries over the two years following the upstream divestiture event.  $f_{mj}$  is the percentage of divesting supplier industry  $j$ 's output sold to the customer industry  $m$ . Higher values of  $f_{mj}$  indicate that the divesting supplier industry  $j$  is more dependent on the downstream (customer) industry for buying its output. The supplier dependence dummy equals one if the customer industry has a supplier with  $f_{mj}$  in the top quintile and zero otherwise. Herfindahl Index is the sum of the squared sales market shares of firms in the supplier industry calculated from Compustat business segments. Capital intensity is industry total assets (Compustat item 6) divided by industry sales (Compustat item 12). Capital expenditure is the supplier industry's total capital expenditure (Compustat item 128) divided by the industry's total assets. Advertising expense is the supplier industry's total advertising expense (Compustat item 45) divided by the industry's total sales. t-statistics based on robust standard errors clustered at the two-digit SIC level are in parentheses. Year dummy variables used in regression (not shown). The superscripts a, b, c and indicate significance at the 1%, 5% and 10% levels respectively.

	1	2	3	4
	Dependent variable: Customer ACFMVA before downstream divestiture	Dependent variable: Customer ACFMVA after downstream divestiture	Dependent variable: Customer ACFMVA before downstream divestiture	Dependent variable: Customer ACFMVA after downstream divestiture
Intercept	-0.033 (-1.38)	<b>-0.106<sup>c</sup></b> (-2.31)	<b>-0.046<sup>c</sup></b> (-2.17)	-0.122 (-2.64)
Supplier dependence dummy	0.002 (0.07)	<b>0.023<sup>c</sup></b> (1.95)		
$f_{mj}$			0.002 (1.18)	<b>0.003<sup>c</sup></b> (2.22)
Supplier Herfindahl index	-0.000 (-0.36)	0.000 (1.19)	0.000 (0.25)	0.000 (1.34)
Supplier capital intensity	0.006 (0.50)	0.001 (0.04)	0.008 (0.66)	0.005 (0.18)
Supplier capital expenditure	<b>0.547<sup>a</sup></b> (5.43)	<b>1.254<sup>a</sup></b> (7.62)	<b>0.588<sup>a</sup></b> (5.83)	<b>1.346<sup>a</sup></b> (8.28)
Supplier advertising expense	-2.033 (-0.93)	-0.738 (-0.48)	-1.602 (-0.78)	-0.447 (-0.29)
R-squared	0.26	0.33	0.28	0.35
F-statistic	8.68 <sup>a</sup>	17.17 <sup>a</sup>	9.03 <sup>a</sup>	34.53 <sup>a</sup>
Observations	51	38	51	38

**Table 21**  
**Customer abnormal input cost structure**

This table presents a multivariate analysis of abnormal cost-of-goods sold margins (ACGSM) of customer industries. ACGSM of an industry is defined as that industry's median cost-of-goods sold-to-sales ratio minus the cost-of-goods sold-to-sales ratio of the median industry in the economy. The cost-of-goods sold-to-sales ratio is defined as the ratio of cost of goods sold (Compustat item 30) to sales (Compustat item 12). In Column 1, the dependent variable is the average ACGSM in customer industries over the two years preceding the upstream divestiture event. In Column 2, the dependent variable is the average ACGSM in customer industries over the two years following upstream divestiture event.  $f_{mj}$  is the percentage of divesting supplier industry  $j$ 's output sold to the customer industry  $m$ . Higher values of  $f_{mj}$  indicate that the divesting supplier industry  $j$  is more dependent on the downstream (customer) industry for buying its output. The supplier dependence dummy equals one if the customer industry has a supplier with  $f_{mj}$  in the top quintile and zero otherwise. Herfindahl Index is the sum of the squared sales market shares of firms in the supplier industry calculated from Compustat business segments. Capital intensity is industry total assets (Compustat item 6) divided by industry sales (Compustat item 12). Capital expenditure is the supplier industry's total capital expenditure (Compustat item 128) divided by the industry's total assets. Advertising expense is the supplier industry's total advertising expense (Compustat item 45) divided by the industry's total sales. t-statistics based on robust standard errors clustered at the two-digit SIC level are in parentheses. Year dummy variables used in regression (not shown). The superscripts a, b, c and indicate significance at the 1%, 5% and 10% levels respectively.

	1	2
	Dependent variable: Customer ACGSM before downstream divestiture	Dependent variable: Customer ACGSM after downstream divestiture
Intercept	<b>-0.106<sup>c</sup></b> (-2.31)	-0.050 (-0.41)
Supplier dependence dummy	<b>0.023<sup>c</sup></b> (1.95)	0.091 (0.99)
Supplier Herfindahl index	0.000 (1.19)	0.000 (1.19)
Supplier capital intensity	0.001 (0.04)	-0.041 (-0.98)
Supplier capital expenditure	<b>1.254<sup>a</sup></b> (7.62)	1.015 (1.34)
Supplier advertising expense	-0.738 (-0.48)	<b>-9.444<sup>c</sup></b> (-1.94)
R-squared	0.33	0.35
F-statistic	17.17 <sup>a</sup>	5.19 <sup>b</sup>
Observations	51	38

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**ABSTRACT****ESSAYS ON HORIZONTAL DIVESTITURES AND PRODUCT MARKET RELATIONSHIPS**

by

**NORKEITH ERVIN SMITH****December 2015****Advisor:** Dr. Ranjan D'Mello**Major:** Business Administration (Finance)**Degree:** Doctor of Philosophy

This dissertation is the first to study the product effect of horizontal divestitures on upstream and downstream firms. This first essay examines product market impact of a sample of horizontal asset sales from 1988 to 2005 on corporate customers, suppliers, and industry rivals. I create a sample of firms that classifies corporate customers, suppliers, and industry competitors of firms proposing horizontal asset sales, and employ this data set to investigate the wealth effects at announcement. This study also considers post-divestiture changes in abnormal operating performance for divesting firms, customers, and suppliers.

I document evidence that divestiture related wealth effects for divesting parent firms are associated with efficiencies resulting from the reduction of firm bureaucracy I provide evidence that managers must balance post-divestiture productivity gains with potential declines in profitability due to reduced bargaining power with suppliers. Unlike prior evidence from vertical divestitures (Jain, Kini, and Shenoy, 2011), this study documents that parent firm divestiture gains are not shared by their industry rivals, corporate customers and suppliers. I also find that these events have negative implications for the valuation of industry rivals, corporate customers, and certain subsamples of suppliers. In addition, the evidence suggests that factors such as customer (supplier) switching costs and industry structure tend to play an important role in the wealth effects of customers (suppliers) at announcement of upstream (downstream) divestitures.

The second essay of my dissertation investigates this topic by exploring quarterly horizontal divestiture activity at the industry level by aggregating firm level divestitures by industry using a sample of horizontal divestitures from 1979-2010. This essay documents the opportunistic behavior of certain product market participants, such as customers and suppliers, in the context of horizontal divestitures. I perform an extensive empirical cross-industry investigation of the product market effects of horizontal divestitures on supplier (customer) industries via their impact on profitability, value, and prices (profitability, value, and input costs).

The second essay presents evidence that opportunistic customers exploit supplier dependence in the years following significant upstream divestiture activity. As a result, these customers enjoy significant increases in profitability, value, and a considerable decline in input costs relative to customers of non-dependent suppliers. Additionally, I also find that suppliers with pivotal buyers suffer unfavorable changes in profitability and value in the years subsequent to downstream divestiture activity relative to suppliers with non-pivotal buyers. This evidence suggests that pivotal buyers capitalize on significant downstream divestiture activity to reverse their pivotal position and eliminate cross-subsidization by suppliers and non-pivotal buyers within their industry.

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