REAL COST MANAGEMENT

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ABSTRACT

This dissertation examines how managers make cost decisions under significant economic events. The economic events of interests are the economic crisis from 2008 to 2010 and corporate loan financing. The economic crisis caused many firms to experience sales declines and created tremendous pessimism about prospects of sales rebounding in the future. I find that not all firms were affected equally. Sales-down firms exhibit anti-sticky cost behavior during this period; that is, costs are cut back more steeply as sales fall than they increase as sales rise. Such a behavior during the economic crisis is exactly the opposite of the average sticky cost behavior during normal economic periods documented in prior accounting research. This, in turn, implies that net income and cash flows from operations (as percentage of sales) may increase, rather than decrease for sales-down firms during an economic downturn. In the second study, I use a difference-in-difference research design to examine whether and how managers engage in cost management before and after loan financing. I find that managers significantly cut back operating expenses prior to loan financing. However, cost reduction is asymmetric with respect to the direction of sales changes. Compared with firms experiencing sales increases, firms experiencing sales declines reduce costs to a greater extent prior to financing and also exhibit a reversion in the cost level after financing. The reversion in cost level is negatively related to the percentage of financial covenants that are based on earnings. I do not find consistent evidence supporting that managers engage in accrual management, overproduction or asset sales.

DEDICATION

I dedicate this dissertation to my parents, Weiwu Fang and Sufen Qi.

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CHAPTER 1

INTRODUCTION

This dissertation examines how managers make cost decisions during significant economic events. Significant economic events change a firm's business environment and are very likely to affect many managerial decisions. Cost decisions are one of the main operating decisions that determine the behavior of both concurrent and future earnings and cash flows. In turn, earnings and cash flow–related performance indicators are primary measures used in studies investigating consequences associated with various economic events. However, inferences based simply on earnings and cash flow properties without considering the differential impact of significant economic events on managers' cost decisions for different firms could be biased or even misleading. In this dissertation, the economic events of interest are the economic crisis of 2008–2010 and loan financing. I examine how economic downturn and corporate loan financing affect managerial cost decisions and the associated impact of such decisions on earnings and cash flows.

This dissertation includes two studies. In the first study, I focus on the recent economic crisis, because it brought tumultuous changes in the fortunes of many companies and affected most firms in the same direction due to the market-wide shocks. It is a natural setting for examining how cost decisions are related to managerial sales expectations, for which no perfect firm-level measures exist. Moreover, the crisis period is also a typical example of the fact that ignoring the asymmetric cost behavior between sales-up and sales-down firms could lead to misleading interpretations of financial indicators for the full sample, as the percentage of sales-down firms significantly increased during the period.

In the second study, I choose the setting of loan financing, because it is a major corporate event and a main source of funds for firms' operating and investment activities. Prior literature identified financing activities as one of the major drivers of earnings management (see Kellogg and Kellogg, 1991; Dechow et al., 1996; Dichev, Graham, and Rajgopal, 2012). However, existing studies primarily focused on equity financing and equity-related corporate transactions (e.g., stock repurchases and stock-for-stock acquisitions). In their review, Dechow, Ge, and Schrand (2010) summarized that only one paper up to that time had examined whether raising capital in debt markets provides incentives for earnings management and called for more work within debt markets. In contrast to equity financing, loan financing is more frequent and closely monitored by lenders (see Leary and Roberts, 2005; Eckob et al., 2007). Compared with accrual management and other real activity management, cost management is likely to be the most feasible and least risky strategy in this setting since it is completely under a manager's control and less likely to be detected by outsiders.

For both studies, I investigate managers' cost decisions based on the recent cost accounting literature, which documents an asymmetry in firms' cost behavior with respect to the direction of sales changes. That is, costs increase to a greater extent for each 1% increase in sales than they decline for a 1% decrease in sales. Such asymmetric cost behavior is referred to as "sticky" (Anderson, Banker, and Janakiraman 2003, hereafter ABJ). The reluctance to cut down capacity when sales fall is driven by resource adjustment costs and managers' expectations of future sales. Preserving slack resources in anticipation of sales rebounding leads to additional increase in costs-to-sales ratios and therefore decreases operating profit margins and cash flows when sales decline.

During the crisis period, costs and earnings exhibited unusual patterns. The median net margin ratio for all listed U.S. companies (excluding financial and utility industries) decreased from 2.9% in 2007 to 1.4% in 2009. However, when partitioning the sample into sales-up and sales-down firms each year, I found that the median net margin actually remained the same (4.1%) for sales-up firms, but that there was a much more striking improvement (from -2.6% to -0.2%) for sales-down firms.[1] Why did the median net margin ratio decrease for the full sample when it did not decrease for either of the subsamples? The more important question, however, is why the net margin improved (rather than declined) so dramatically for sales-down firms during the economic crisis when it did not change for sales-up firms.

These patterns are puzzling, since simple credit crunch and pessimism cannot explain why only firms with sales declines showed improvement in the net profit margin ratio. The sudden economic downturn caused a significant reduction in credit supply and major revisions in general expectations about consumer purchasing power, and led to pessimism about the prospect of sales rebounding in the near future. The common belief was that the tightened credit supply and the severity of the pessimism would lead to a cost reduction regardless of whether firms experienced sales increases or decreases during the period.

In the first study, I provide explanations for such unusual net margin patterns observed during the crisis period, using the framework of asymmetric cost behavior. Net margin primarily reflects the relationship between costs and sales. Asymmetric cost behavior theory suggests that costs on average are sticky but could be "anti-sticky" sometimes (e.g., Weiss, 2010); that is, costs decrease proportionately more for sales

[1] These statistics are not tabulated.

decreases than they increase for sales increases. Banker, Byzalov, Ciftci, and Mashruwala (2012, BBCM hereafter) extended this work to consider how managerial optimism (pessimism) about future prospects affects their resource adjustment decisions. BBCM argued that following a prior-period sales increase (decrease), managers' expectations for future sales become more optimistic (pessimistic), which makes them more (less) willing to expand committed resources when current sales increase and less (more) willing to cut committed resources when current sales decrease. Accordingly, the direction of prior-period sales changes affects the resource levels chosen in the prior period, which in turn affects the extent of resource expansion or reduction needed to accommodate the current period change in sales.[2]

During the crisis, financial markets significantly tightened credit policy for both companies and individuals, and the portion of firms reporting sales-down reached an unprecedented level of 56% in 2009, up from 23% in 2007. Since the net margin is much lower when sales decline, the spike in the portion of sales-down firms explains the decrease in the median net margin ratio for the full sample but not for either of the subsamples of sales-down and sales-up firms.

The reason why only sales-down firms exhibited significant improvement in the net margin ratio in 2009 is likely the widespread anti-sticky cost behavior in 2009. An NBER report found that the economic crisis resulted in a 5% increase in unemployment in the U.S. and a fall in the value of the S&P 500 by 40% between 2007 and 2008.[3] A Federal Reserve report suggested that household net worth peaked in late 2007 and then

[2] BBCM also considered other indicators of managerial optimism or pessimism, including order backlogs (Rajgopal et al., 2003), macroeconomic growth (Lev and Thiagarajan, 1993), and forecasts made by financial analysts (Weiss, 2010).

[3] NBER report: http://www.nber.org/bah/2010no3/w16407.html.

fell by 28% in the next two years (Duke, 2011). Some of the effects of the crisis began to be noticed in 2007 and dramatically increased in severity in the fourth quarter of 2008. In turn, the crisis and greater managerial pessimism in late 2008 likely affected subsequent managerial resource decisions, making it likely that anti-sticky behavior was widespread in 2009. Evidence of a subsequent recovery in stock indexes and economic activity beginning in 2010 also suggested that managerial pessimism and anti-sticky cost behavior was likely to peak between 2008 and 2010.[4]

For sales-down firms, a disproportionate decrease in operating costs will consequently result in higher net income and cash flows from operations. The increase in anti-sticky cost behavior for a firm experiencing a sales decline leads to asymmetric changes in the earnings and cash flows between sales-up and sales-down firms. Hence, the cost behavior pattern implies that net income and cash flows from operations (as a percentage of sales) will increase, rather than decrease, for sales-down firms during a severe economic downturn.

To evaluate these predictions, I undertake a series of cost behavior regressions that parsimoniously capture the main features of resource commitment decisions by pessimistic managers using a sample of U.S. firms from Compustat. My model is designed to allow changes in cost behavior during the economic crisis. It examines the relationship of net income, cash flows from operations, and operating expenses with concurrent sales, while allowing for asymmetries to capture stickiness (or anti-stickiness) in the period leading up to the economic crisis, during the period when the crisis was likely to have most affected managerial resource adjustment decisions, and in the

[4] The September 2010 U.S. Federal Reserve Beige Book reported that manufacturing firms were "optimistic" and "…expect business conditions to remain positive or improve in coming months." http://www.federalreserve.gov/fomc/beigebook/2010/20100908/default.htm.

subsequent period. The empirical results support my hypotheses and help explain the anomalous behavior of the net margin ratio. Regression estimates indicate significant stickiness in operating expenses prior to 2008, as documented in prior research studies, but also significant anti-stickiness for sales-down firms during the economic crisis. Further, I document a positive and significant relationship of net income and cash flow from operations, with revenues for sales-down firms, consistent with my expectations. The observed anti-stickiness is strongest for firms with low fixed asset intensity and appears to be driven by decreases in selling, general and administrative expenses (*SG&A*), including research and development, advertising and other *SG&A* expenses. Thus, as predicted by the contrasting economics of optimistic and pessimistic managerial behavior based on the theory of cost asymmetry, cost behavior during the economic crisis is exactly the opposite of the on-average sticky cost behavior during normal economic periods documented in prior accounting research.

The asymmetric cost behavior theory is the only theory I am aware of that directly explains the decrease in operating cost ratio (as well as an increase in earnings and cash flow from operations) during the crisis period for sales-down firms only, with no significant impact on sales-up firms. The theory predicts and explains the surprising observation that sales-down firms reported higher (rather than lower) operating margins during the crisis period than during normal periods. I also consider alternative explanations that provide competing, but more symmetric, explanations for steep cutbacks in costs that may increase net margins for sales-down firms. In an economic crisis, the risk of bankruptcy may increase to a greater extent for firms that experience a sales decline, and provide greater incentives to them to undertake cost cutbacks. In

robustness checks, I control for default risk and funding availability to examine whether my results are driven by financial risk and liquidity. I also control for total assets and industry fixed effects to account for possible scale economies and industry differences. I continue to find that firms exhibit anti-sticky cost behavior (significant at the 1% level) even after controlling for these factors. Finally, I run the regression with an extended sample period from 1992 to 2011 and control for the magnitude of sales decline. Interestingly, I find that managers keep greater slack resources as the magnitude of sales decline increases during the normal periods and only significantly cut back costs during the crisis period. The evidence suggests that significant sales declines are deemed as temporary during the normal periods while they are considered to have more permanent impact during the crisis period.

In the second study, I examine cost management around loan financing. Banks have access to firms' private information prior to issuing loans and closely monitor firms' performance post financing. Predictions on whether and how managers manage financial performance are ambiguous for loan financing. On one hand, managers have incentives to engage in performance management because better financial performance increases the likelihood of loan application approval and can help managers negotiate for more favorable contract terms. On the other hand, if banks can see through the manipulation, financial performance management could even have an adverse impact on a firm's likelihood of receiving loans and getting the desirable contract terms of loans approved. However, as long as banks cannot fully disentangle inflated performance from a firm's true economic performance, managers will still have incentives to engage in performance management since the costs of loan financing usually are lower than those of other

financing options, especially for firms with a high degree of information asymmetry (e.g., Bolton and Freixas, 2000).

Given the features of loan financing, cost management as one of the primary operating decisions is likely to be the most feasible and least risky way for managers to improve financial performance. Prior studies suggest that managers can manage earnings through accruals and real activities. Accrual management affects only reported earnings but has no cash flow effects. Real activity management includes revenue manipulation, cost management and asset sales (e.g., Roychowdhury, 2006; Cohen and Zarowin, 2010). These actions affect both earnings and cash flow. Compared with other real activity management actions, cost management is completely under a manager's control and less likely to be detected by outsiders.

Accrual management alone is not likely to have a significant economic impact on loan financing. Since banks extensively use earnings and cash flow together to construct financial covenants (e.g. Smith, 1993; Demerjian, 2011), they are unlikely to be fooled by inflated earnings without sufficient cash flow. In addition, accrual management is subject to the constraints of U.S. GAAP and can only improve financial performance to a limited extent. Revenue manipulation and asset sales have practical limitations as well. For revenue manipulation, although managers may be able to temporarily boost sales by offering special discounts or extending credit to customers, the outcomes of such decisions are not fully under the control of managers and not sustainable after financing. Gains from abnormal sales of assets are very easy for banks to identify since (1) they are recognized as a separate item in income statements; and (2) banks can require detailed information on the sold assets to evaluate the nature of such transactions.

In contrast, cost management is completely under managerial discretion and more difficult for banks to detect because it is costly for banks to become familiar with a firm's complex operating practices and judge whether resources are allocated efficiently. Moreover, even if banks can identify unusual cost reductions, they might not necessarily interpret it as a signal of earnings management but of managerial efforts to improve cost efficiency.

Therefore, I expect that managers will have incentives to cut down costs before loan financing. Firms that plan to take loans are likely to exhibit a lower cost level than those with similar characteristics but do not take loan financing during the same period. Moreover, cost management is not symmetric. Asymmetric cost theory suggests that managers on average tend to keep capacity slack when sales fall and costs appear to be sticky. They reduce cost stickiness when they are under the pressure to meet earnings targets, such as avoiding reporting losses or meeting analyst forecasts (see Kama and Weiss, 2012; Dierynck et al., 2012). Although loan financing does not pose explicit earnings targets, I expect that managers will reduce cost stickiness when firms experience sales declines. For these firms, managers not only have greater incentives to improve financial performance, but also are more able to do so. Significantly cutting down slack resources is not likely to raise many doubts from banks because there is no model to determine the optimal level of slack resources. In addition, banks may view extensive reduction in slack resources as a favorable signal since such a reduction mitigates the risk of managerial empire building.

I do not expect that excessive cost reduction will persist once firms obtain the loans. Graham et al. (2005) show that CEOs are aware that the manipulation in operating

activities may have an adverse impact of firms' future performance. I expect that managers will tend to restore capacity without violating covenants. The reversion in the cost level will be attenuated by the intensity of covenants based on earnings. Unlike equity financing or bond financing, loan financing potentially compromises managers' control rights over firms. Firms have to comply with covenant requirements to avoid lenders' intervention, which can potentially interrupt a firm's operating and investment activities and lead to management turnover. Therefore, managers will take into account covenant requirements on earnings when make their cost decisions.

I apply a difference-in-difference research design to examine the time series and cross-sectional variation in operating expenses, earnings and operating cash flow for a pooled sample, including both firms taking loan financing and control firms matched by the propensity to take loans. To mitigate the concern that the variation in operating performance is driven by changes in funds available for operating activities or other debt financing activities, I control for the amount of funds available and bond issuances. The difference-in-difference approach also improves estimation efficiency since it captures both cross-sectional and time-series variation in operating performance indicators before and after financing in one step (see Hayashi, 2000).

Consistent with the predictions, loan sample firms show significantly lower operating expenses prior to financing than control firms. When loan sample firms have sales declines, they further cut back operating expenses and exhibit less cost stickiness. Consequently, loan sample firms report higher earnings and operating cash flow than control firms regardless of the direction of sales changes. I also observe cost reduction precede refinancing through loans and bond issuances.

After acquiring loans, loan sample firms exhibit a significant reversion in operating expenses when sales decline. The reversion in costs is negatively related to the covenant intensity on earnings (measured by the percentage of financial covenants that are earnings related). The higher the percentage is, the stronger the monitoring intensity from banks on firms' earnings performance. This evidence suggests that managers tend to retain slack resources as sales fall after financing but they are constrained by covenant requirements.

Furthermore, to compare with prior models, I measure the discretionary accruals, abnormal production, discretionary expenses and abnormal asset sales based on prior models and modified models that control for funds available and asymmetric cost behavior. Results show that actual expenses are consistently lower than expected under alternative models. I don't observe consistent evidence on accrual management or other real activity management.

I conduct a set of robustness checks. First, I repeat the tests using an alternative control sample, matched by year, industry, size and market-to-book. Second, I run the tests using a change regression instead of the level regression. Results remain the same. Third, I also conduct a pseudo financing test. I shift the loan initiation years by randomly generated number of years and do not observe the documented differences in the cost behavior between loan sample firms and control firms. This evidence suggests that loan financing tends to be the main driving force explaining the differences in cost behavior between loan sample firms and control firms.

This study contributes to the literature on earnings management. Studies examining earnings management have extensively focused on equity related corporate

transactions. However, evidence of earnings management around debt financing is sparse. I provide evidence suggesting that managers still engage in cost management, even if when creditors have greater access to firms' private information. Furthermore, cost management is asymmetric with respect to sales-down and sales-up firms. Managers of sales-down firms have greater incentives and discretion in managing costs since firms have higher level of slack resources as sales decline. However, managerial cost decisions are highly related to lenders' monitoring ability. Both covenant intensity and the degree of information asymmetry play an important role in determining cost management.

This study also proposes a new research design to examine both cross-sectional and time-series variation abnormal activities around major corporate financing events. The new research design mitigates measurement errors by incorporating asymmetric cost behavior and controlling for concurrent funds available for operating activities in one step. It also controls for the incentives on operating decisions associated with loan refinancing and bond issuances, which are important features of debt financing that could affect earnings management incentives.

Finally, this study also extends the literature on firms' asymmetric cost behavior. The recent literature suggests that asymmetric cost behavior results from efficient managerial operating decisions. I add to the literature by showing that external loan financing needs temporarily distort managers' cost decisions. More importantly, I document that cost stickiness is negatively related to the intensity of covenants based on earnings post loan financing.

To sum up, the two studies in this dissertation provide empirical evidence on how managerial cost decisions are affected by economic events at market-wide level and firm

level, respectively. There are many accounting papers that consider the difference in the behavior of loss firms relative to profit firms. The recent evidence suggests that the difference between the cost (and earnings) behavior of sales-up and sales-down firms is even starker. The first study expands this line of research by showing that the impact of sales declines on costs and earnings of such firms is moderated by economic conditions. The financial performance for full sample could be misleading without taking asymmetric cost behavior into account. The second study highlights that the differences in cost behavior between sales-up and sales-down firms are also affected by loan financing and the monitoring of lenders.

The remainder of the paper is organized as follows: Chapter 2 reviews the related literature on asymmetric cost theory and earnings management around financing activities. Chapter 3 presents the research hypotheses, research design and results for the study on economic crisis and cost management. Chapter 4 describes the research hypotheses, research design and results for the study on loan financing and cost management. Chapter 5 concludes and discusses future research directions.

CHAPTER 2

REIVEW OF RELATED LITERATURE

2.1 Review of Literature on Managerial Cost Decisions

Several recent research studies beginning with ABJ document that traditional textbook models of cost behavior that posit a mechanistic symmetric response of costs to increases and decreases in sales are flawed and not empirically descriptive. Firms' cost level reflects managers' deliberate decisions on resource allocation. Firms' costs increase by a greater extent as sales rise than they decrease as sales fall by an equivalent amount. Such asymmetric cost behavior is referred to as "cost stickiness".

Prior research suggests that costs appear to be sticky as sales decline because of adjustments costs and managerial optimism. Adjustment costs are incurred when firms add to or reduce various activity resources. For example, firms have to pay severance packages to lay off workers and incur additional negotiation and political costs. When managers plan to expand production capacity and hire new workers, they have to exert efforts and incur non-trivial expenses for recruitment and training (e.g., Bentolila and Bertola, 1990; Azetsu and Fukushige, 2005; Banker, Byzalov and Chen, 2013).

The degree of cost stickiness varies across firms, industries and countries as adjustment costs are a function of firm, industry and country characteristics. For example, firms with high labor intensity usually face higher labor adjustment costs. Jaramillo et al. (1993), Pfann and Palm (1993, 1997), Goux et al. (2001), Azetsu and Fukushige (2005) show that firing costs for labor are significantly higher than hiring costs. In addition, Palm and Pfann (1997) and Cooper and Haltiwanger (2006) find that adjustment costs for fixed assets are higher for decreases than for increases (i.e., partial irreversibility). High

fixed asset intensity often implies reliance on relatively more high-skilled support staff and indirect labor, which is also more difficult to adjust. Banker, Byzalov and Chen (2013) show that costs are stickier in the countries where employment protection legislation provisions are stronger.

Besides adjustment costs, agency conflicts may also partially explain managers' reluctance to cut back resources. Entrenched managers could have incentives to waste resources for their personal benefits or to pursue size scale over efficiency (i.e., empire building) Chen et al. (2011) argue that asymmetry in firms' cost behavior could be also driven by managerial empire building. They document that such value-destroying behavior of managers leading to cost stickiness can be contained by superior corporate governance. More recent studies (e.g., Weiss, 2010; Kama and Weiss, 2012; and Dierynck et al., 2012) show that managers may deviate from original cost decisions when they have incentives to meet or beat earnings targets, such as avoiding reporting losses or meeting analyst forecasts. Meeting earnings targets is important because of equity market pressure to maintain stock price (Keung et al., 2010; Graham et al., 2005; Dichev et al., 2012) and therefore influences asymmetries in a firm's cost behavior.

Since the expected value of future adjustment costs depends on the probability distribution of future sales changes, the optimism or pessimism of managers' outlook also plays a key role in the theory of asymmetric cost behavior (e.g. Kama and Weiss, 2012; BBCM, 2013). If managers observe sales declining but are optimistic about sales rebounding in the near future they are more likely to retain slack resources, leading to cost stickiness. On the other hand, if managers are rather pessimistic about a reversal in sales then they are more likely to choose to cut back slack resources and reduce cost

stickiness. In the extreme, if they are very pessimistic about the future, they are likely to accept the possibility of incurring even further adjustment costs in the future when demand recovers for their products or services. As a result, they are likely to aggressively cut back even more resources in the present. This can lead to anti-sticky cost behavior.

The extent of cost stickiness or anti-stickiness may differ across particular operating expenses because some may be necessary and critical for firms' future growth, especially when sales start to fall. For instance, consider research and development (*R&D*) and advertising expenses. When a firm's sales start to decline, its managers need to adjust strategies to increase the firm's competitiveness. Investing in new products and technology and aggressive marketing strategies may help the firm increase its market share and margins in future periods. Hence, during periods of sales decreases, managers are likely to be reluctant to reduce certain expenditures that are critical for future growth in sales.

2.2 Review of Literature on Earnings Management around Financing Activities

Prior literature documents that managers engage in earnings management under various incentives. Financing needs are considered one of the major drivers of such manipulation (see Kellogg and Kellogg, 1991; Dechow et al., 1996; Dichev, Graham and Rajgopal, 2012). Most studies focus on equity financing and equity-related corporate transactions and document that managers engage in accrual and/or real activity management. Some recent studies question whether the risks of accounting manipulation outweigh the benefits (e.g., Beneish, 1998; Ball and Shivakumar, 2008; Venkataraman, Weber and Willenborg, 2008) and argue that the claimed accrual management around

equity financing is driven by model misspecifications (Armstrong et al., 2008). There is little evidence on whether and how managers engage in earnings management around debt financing.

2.2.1 Accrual Management

Prior studies examine accrual management around both initial public offerings (IPOs) and seasoned equity offerings (SEOs). A large body of the literature finds large positive discretionary accruals during the year around IPOs and SEOs and these accruals are negatively related to future stock returns (e.g., Aharony, Lin and Loeb, 1993; Teoh et al, 1998a; Teoh et al, 1998b; Rangan, 1998). Managers inflate earnings primarily to boost issuing prices and disappoint investors in subsequent periods when accruals reverse. In contrast, Shivakumar (2000) shows that investors rationally undo this upward earnings management. He also shows that findings on abnormal stock returns in prior studies are due to test misspecification, arguing that the earnings management is a rational response to the market's anticipation. DuCharme et al. (2004) further show that abnormal accruals are highest for SEOs that are subsequently sued.

A controversial issue in this line of literature is whether managers have sufficiently strong incentives to manipulate earnings at the time of the IPO so that they can *temporarily* inflate issuing prices. Some argue that accounting manipulation attracts the attention of regulators or shareholders, especially at the time of the IPO (e.g., Beneish, 1998). Ball and Shivakumar (2008) and Venkataraman et al. (2008) provide evidence that financial reporting is more conservative around IPOs due to increased regulatory and legal penalties for misreporting.

Recent empirical studies argue that the documented abnormal positive accruals and their negative association with future stock returns are all driven by model misspecification. Fan (2007) uses a larger sample than Teoh et al. (1998b) and finds that companies with low issue-year discretionary accruals have higher stock returns than companies with high issue-year discretionary accruals. However, she does not find any evidence that the issue-year discretionary accruals and post-issue abnormal stock performance are negatively correlated, using a calendar time portfolio approach and adjusting returns using the Fama and French (1993) factors. Armstrong, Foster and Taylor (2008) show that discretionary accruals in the year of the IPO are not statistically different from zero. They find that the well-documented negative correlation between issue-year discretionary accruals and future returns is an artifact of cash-flow mispricing.

For debt financing, Liu et al. (2010) find that firms report abnormal positive accruals before bond issuances. However, as bond issuance significantly increases the funds available for firms' operating and investment activities, the abnormal accruals measured from the modified Jones model are likely to contain large measurement errors.

2.2.2 Real Activity Management

Real activity management refers to the cases where managers improve financial performance by deviating from normal business practices, such as excessively reducing research and development expenses or selling assets. These decisions not only affect reported earnings but also operating cash flows. Moreover, they may have a significant negative impact on firms' future performance. For example, if managers delay

developing new projects by cutting back *R&D* expenses, firms may lose their competitive advantage in product markets.

In contrast to accrual management, real earnings management has not been as widely studied, although survey evidence shows that managers prefer real activities management (see Graham et al., 2005). For example, 80 percent of survey participants report that they would decrease discretionary spending on *R&D*, advertising, and maintenance to meet an earnings target. Prior literature also documents empirical evidence consistent with the survey evidence. For example, Bartov (1993) finds that firms with an earnings decline report higher profits from asset sales. Dechow and Sloan (1991) show that executives near the end of their tenure reduce R&D expenditures to increase short-term earnings. Roychowdhury (2006) finds evidence suggesting that firms avoid reporting losses by (1) boosting sales through accelerating sales recognition or generating additional unsustainable sales through increased price discounts or more lenient credit terms; (2) overproducing and thereby lowering cost of goods sold; or (3) aggressively reducing aggregate discretionary expenses (defined as the sum of *R&D*, advertising and *SG&A* expenses).

Managers prefer real activity management because (1) it is less likely to be detected by auditors and regulators, and (2) it can improve short term financial performance to a greater extent than accrual management, which is subject to accounting standards. Zang (2012) suggests that managing earnings through ‘‘real’’ actions precedes decisions to manage earnings through accruals. Dietrich et al. (2000) document that for UK investment property, managers time asset sales to smooth reported earnings changes, smooth reported net asset changes and boost fair values before raising new debt.

2.2.3 Real Cost Management

Cost management, one of the main types of real activity management, has some unique features that make it likely to be more prevalent than other activity management practices. First, cost management is completely under managerial discretion, compared with revenue manipulation and asset sales. Managers have full discretion in determining cost level. For revenue manipulation and asset sales, customers' responses to promotions and special discounts and market conditions of assets play an important role in determining how effective these strategies are. Second, cost management is also more difficult for outsiders to detect. If customers respond to sales strategies that temporarily boost revenues, investors can also observe the abnormal practices. Gains from abnormal sales of assets are also easy to identify since they are recognized as a separate item in income statements. In contrast, for outsiders to detect cost management, they have to be very familiar with a firm's complex operating practices.

Notably, cost management is not necessarily only driven by managers' opportunistic incentives in all cases. It could also result from managerial efforts to improve operating efficiency. The literature on real activity management generally assumes that it has an adverse impact on efficiency as firms deviate from normal business practices. However, the literature on asymmetric cost behavior provides extensive evidence suggesting that managers on average make deliberate and dynamic cost decisions to improve operating efficiency instead of fixating on short-term earnings. Their cost decisions are based on firm characteristics and economic conditions, although managers may adjust cost level under certain capital market incentives. Therefore, cost

management could reflect managerial efforts to either reduce inefficiency or manipulate financial performance.

Hence, the evidence on the relationship among cost behavior, the likelihood of detection and future performance is necessary to disentangle underlying managerial incentives of cost management. For example, if managers cut resources to improve cost efficiency, such actions should have little to do with investors' monitoring ability and are positively associated with future performance.

Finally, although prior studies suggest that managers may engage in cost management, they do not incorporate the differences in cost behavior between sales-up and sales-down firms in models to detect abnormal activities. Ignoring the asymmetry in cost behavior will introduce large measurement errors, especially when firms experience significant economic events. The measurement error problem due to model misspecification is one of the main issues that challenge the literature on earnings management.

The first study examines how firms' costs vary with economic conditions. In this setting, cost management is due to managers' pessimism instead of incentives to improve short-term performance. The second study examines how firms' costs vary around loan financing. Cost management in this case is more likely to be driven by incentives to manage short-term financial performance.

CHAPTER 3

ECONOMIC CONDITIONS AND MANAGERIAL COST DECISIONS

3.1 Research Hypotheses

3.1.1 The Impact of the World Economic Crisis on Cost Behavior

The recent world economic crisis resulted in extreme pessimism about future economic prospects. The crisis was driven in large part by the U.S. subprime mortgage crisis in mid-2007, which in turn resulted from a steep decline in U.S. home sales prices following a peak in mid-2006. The subprime mortgage crisis arose because subprime borrowers were unable or unwilling to refinance mortgages that became prohibitively costly because of the significant drop in the collateral and investment value of housing. In turn, this led to a sharp increase in mortgage loan default rates and in property foreclosures, and the subsequent increases in the housing supply caused a further decline in property prices. In 2007 and 2008, the rising loan default rate also caused a steep drop in the valuation of mortgage-backed securities that were sold to both U.S. domestic and international investors. As a result, both mortgage lenders (e.g. commercial banks) and mortgage-backed securities investors suffered large-scale realized and unrealized losses on those investments.[5] By the end of 2008, concerns over the underlying quality of banks' financial assets mounted, interbank lending market froze and the subprime mortgage crisis became an unprecedented financial crisis.[6] The sudden reduction in the wealth of

[5] Unrealized losses occurred when the market value of mortgage-backed securities dropped and companies had not sold the securities. According to U.S. accounting standards, such losses are not recognized in earnings but will compromise banks' capital adequacy (Nissim and Penman, 2007).

[6] Starting with the bankruptcy of Bear Stearns, which was involved in securitization and issued large amounts of asset-backed securities, many financial institutions subsequently encountered financial distress. By October 3, 2008, less than three weeks after Lehman Brothers filed for

many U.S. consumers led to a decline in consumer spending and a significant downward shift in demand for products and services.

The financial crisis resulted in a number of adverse effects on the U.S. economy and U.S. firms. First, the opacity of the financial crisis and the uncertainty concerning its scale increased the widespread pessimism about future economic growth. Expectations about decreases in growth were driven by the inability of firms and individuals to obtain credit because financial institutions significantly raised borrower screening standards (Ivashina and Scharfstein, 2008). Lenders were extremely cautious and conservative in their lending activities as they were under tremendous pressure to lower the riskiness of their assets and struggled to meet regulatory capital requirements. Furthermore, firms and individual borrowers experienced increases in the costs of obtaining capital. The decreases in sales growth when the economic crisis set in were compounded further by decreases in expected future growth resulted in reductions in investment and widespread unemployment. This, in turn, further decreased consumer spending and resulted in even more pessimism about future economic growth prospects.

The adverse effects of the financial crisis had a widespread reach. Europe and Asia were also affected by the collapse in global trade, as well as domestic financial and economic concerns. Advanced economies experienced an unprecedented seven-and-a-half percent decline in real GDP during the fourth quarter of 2008, with expectations that subsequent output would also decline. Developing economies were also affected, albeit to a lesser degree because of reduced global demand for raw materials and consumer goods, and limited investment opportunities because of illiquidity in global capital markets.

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bankruptcy, the U.S. Treasury Department introduced a $700 billion program to bail out the U.S. financial system.

Many emerging economies, such as China, that rely heavily on manufacturing exports were especially affected.[7]

Asymmetric cost behavior theory suggests that managerial perceptions about economic conditions and expectation of future sales should affect resource adjustment decisions (even in the absence of explicit earnings targets). The magnitude and speed of the global financial crisis and the resulting effect on real GDP and consumer demand are likely to have created unprecedented managerial pessimism about future sales prospects and economic growth. This would be true especially for managers of firms experiencing a decline in sales. I predict that downward changes in managerial expectations about future sales and growth prospects should induce managers to make resource adjustment decisions to reduce excess capacity and thus engage in anti-sticky behavior. I am likely to observe these managerial actions and their effects on firm performance during the economic crisis that resulted in increased pessimism about future sales. An evaluation of U.S. GDP growth and the general analysis in the popular press suggests that the first signs of the economic crisis became visible in late 2007, developed through 2008 to peak in the last quarter of 2008, and began to reverse slightly in 2010. Thus I expect to observe widespread anti-sticky cost behavior for sales-down firms in late 2008, the peak in 2009 and deceleration in 2010. I also expect anti-stickiness to be replaced by normal conditions after 2010 as pessimism about future sales began to be replaced with mild optimism.[8] An empirical question is whether the degree of stickiness remains lower than during the pre-

[7] World Economic Outlook: Crisis and Recovery, April 2009, International Monetary Fund.

[8] Real U.S. GDP growth in 2007 was 2.0%, 1.1% in 2008, -2.8% in 2009 and 0.0% in 2010.

crisis period as concerns about a double-dip recession remain a threat to firm growth.[9] This leads to the following hypothesis:

H1: Firms experiencing a sales decline exhibited reduced stickiness during the world economic crisis years from 2008 to 2010, and anti-sticky cost behavior during the peak year of 2009.

Notably, an alternative explanation for anti-stickiness is that managers tend to manipulate financial performance to increase their bonuses (Ibrahim and Lloyd, 2011). However, this explanation is less plausible during the economic crisis period for two reasons. First, many CEOs decided to forgo bonuses voluntarily during the crisis to mitigate negative sentiments among the media and investors toward highly paid executives. Second, given the magnitude of the shocks, it may be infeasible to hide a substantial deterioration in financial performance through earnings management without violating U.S. GAAP. However, earnings management to avoid reporting a loss or earnings decline may persist even during the crisis years. I control for these effects in the empirical analysis to provide a benchmark to compare the magnitude of asymmetric cost behavior.

3.1.2 The Impact of Anti-Stickiness on Earnings and Cash Flow from Operations

Next, I consider how anti-stickiness affects earnings and cash flow from operations. Anti-sticky behavior in operating expenses is likely to result in higher

[9] Source: Beware the double dip. CNNMoney.com August 18, 2009. http://money.cnn.com/2009/08/18/markets/thebuzz/index.htm?postversion=2009081812.

reported contemporaneous earnings for sales-down firms simply because of the algebraic relation linking earnings to operating expenses. Thus for sales-down firms, reported earnings may actually increase when sales fall, mechanically resulting in an increase in profit margins, holding all else equal. While managers of sales-up firms may also cut back on resource costs, the relative magnitude is likely to be greater for sales-down firms due to potentially slack resource capacity. Moreover, anti-stickiness and the associated reduction in costs also mechanically result in greater cash flow from operations to the extent that decreased costs entail lower cash outflows. Therefore, I posit the following hypotheses:

H2a: Sales-down firms are likely to exhibit an increase in earnings (scaled by the beginning total assets) during the peak crisis period.

H2b: Sales-down firms are likely to exhibit an increase in cash flows from operations (scaled by the beginning total assets) during the peak crisis period.

3.1.3 The Impact of Other Factors on Anti-Stickiness

To understand better how firms adjusted their costs in response to the economic crisis, I consider whether the nature of a firm's underlying operating activities can affect the ease with which managers can adjust their resource levels. Reducing costs may be more difficult when a firm's ability to redeploy or transfer resources is low – for instance, when the assets are firm- or industry-specific (Pindyck, 1991), as is often the case with installed plant and machinery. For example, a steel plant is industry specific as it can only be used to produce steel. The costs of disposal for such an asset are likely to be very high. Palm and Pfann (1997) and Cooper and Haltiwanger (2006) find that the adjustment costs

for fixed assets are higher for decreases than for increases (i.e. partial irreversibility). High fixed asset intensity often implies reliance on relatively more high-skilled support staff and indirect labor, which is also more difficult to adjust (e.g. Banker et al., 2013). Hence, although managers have incentives to reduce cost stickiness, they are limited by the extent to which their asset base is redeployable and the extent to which the underlying nature of their business is reliant on relatively fixed resources. Therefore, I expect sales-down firms with high fixed asset intensity to exhibit relatively less anti-sticky cost behavior in the peak crisis years relative to sales-down firms with low fixed asset intensity.

I also assess the possibility that the declining consumer purchasing power, tightened credit supply and pervasive pessimism about future growth during the crisis affected all firms. Firms experiencing sales increases during the crisis may not necessarily be less pessimistic about future growth than firms experiencing sales decreases because sales increases during an economic downturn are less persistent than those during normal economic periods. Therefore, it is possible that the reduction in operating expenses and increases in earnings and operating cash flows may be observed during the crisis for all firms, regardless of whether firms experience sales increases or decreases.

3.2 Research Design and Data

3.2.1 Empirical Models

Since my objective is to link asymmetric cost behavior to changes in earnings, I build on the modified cost stickiness model from Banker, Basu, Byzalov and Chen (2012), who propose a level regression model. My main model is specified as follows:

$$PERF_{i,t} = \beta_0 + \beta_1 Revenue_{i.t} + \beta_2 SD_{i,t} + \beta_3 Year_{2008} * SD_{i,t} + \beta_4 Year_{2009} * SD_{i,t} + \beta_5 Year_{2010} * SD_{i,t} + \beta_6 Year_{2011} * SD_{i,t} + \beta_7 AvoidLoss * SU_{i,t} + \beta_8 AvoidLoss * SD_{i,t} + \beta_9 AvoidED * SU_{i,t} + \beta_{10} AvoidED * SD_{i,t} + \sum_{t=2006}^{2011} \beta_t * Year_t + \varepsilon_{i,t},$$

where *PERF* stands for one of the three performance indicators (*Opex*, *NetInc*, or *CashFlow*) used to test H1, H2a and H2b. *Opex* is operating expenses, *NetInc* is net income and *CashFlow* is the operating cash flows. *Revenue* captures the total reported revenues. All these four performance indicators are deflated by the beginning total assets and inflation-adjusted, measured based on the dollar value of 1994.[10] $SD_{i,t}$ ($SU_{i,t}$) are dummy variables set to 1 if the sales of firm *i* decrease (increase) from year *t-1* to year *t*, and 0 otherwise. I also include two dummy variables that control for the presence of anti-stickiness caused by managerial incentives to avoid reporting losses or earnings declines: *AvoidLoss* and *AvoidED* (see Brown and Higgins, 2001; Kama and Weiss, 2012; Dierynck et al. 2012). *AvoidLoss* is a dummy variable set to 1 if earnings deflated by the beginning market value in year *t* are between 0 and 0.01, and set to 0 otherwise. *AvoidED* is a dummy variable set to 1 if the ratio of the change in net income of firm *i* in year *t* deflated by beginning market value is between 0 and 0.01 and 0 otherwise. $Year_t$ is a dummy variable set to 1 if the observation is from year *t* and 0 otherwise. I cluster standard errors by firm and include year fixed effect since the number of year clusters is less than 10. When the number of cluster is much less than 50, two-way clustering can introduce substantial bias to standard errors (see Rogers, 1993; Wooldridge, 2003; Thompson, 2006; Cameron, Gelbach and Miller, 2006).

The variables of interest are designed to capture asymmetry in sales-down firms' operating expenses during the economic crisis: $Year_{2008}$*SD, $Year_{2009}$*SD, $Year_{2010}$*SD

[10] I deflate by the beginning total assets rather than by concurrent revenues to avoid introducing a variable in the denominator that is functionally related to another independent variable.

and $Year_{2011}$*SD*. I expect the coefficient on *SD* to be positive as prior literature shows that costs are sticky during normal economic condition (i.e. the pre-crisis period). The coefficients on the interaction terms of the period indicators and the sales-down dummy (*SD*), β_3 to β_6, capture incremental cost stickiness, if any, in each period. A positive (negative) coefficient on any of the coefficients for tests where *PERF* is set to *Opex* captures incremental stickiness (or anti-stickiness) in costs for that period. I predict that the coefficients on $Year_{2008}$*SD*, $Year_{2009}$*SD*, and $Year_{2010}$*SD* are negative, which is indicative of reduced cost stickiness during these periods. If the absolute value of any of the negative coefficients is greater than the positive coefficient on *SD*, operating expenses appear to be anti-sticky in that year. If the U.S. economy is seen to have started to recover in year 2010 and managerial pessimism is replaced with mild optimism, I expect relatively more sticky cost behavior once again for sales-down firms, and an insignificant coefficient on $Year_{2011}$*SD* would suggest that cost-stickiness has reverted to that of the pre-crisis years.

When *PERF* is set to *NetInc* or *CashFlow*, I expect the coefficient on *SD* to be negative, as sales-down firms engaged in sticky cost behavior in normal periods of managerial optimism prior to the financial crisis. That is, sticky cost behavior lowers reported earnings and operating cash flow. I predict that coefficients on $Year_{2008}$*SD*, $Year_{2009}$*SD*, and $Year_{2010}$*SD* are all positive because of anti-sticky (or less sticky) cost behavior. Intuitively, greater reductions in costs should result in an increase in net income and operating cash flow. If the U.S. economy is perceived to have started to recover in 2010 and managerial pessimism is replaced with optimism, I expect a return to sticky cost behavior for sales-down firms because it represents the optimal tradeoff between the

cost of slack resources and adjustment costs in the new conditions. Therefore, I expect a *less* positive coefficient on $Year_{2011}$*SD relative to $Year_{2010}$*SD.

As a robustness check, I replicate my tests using the change regression specification from ABJ (2003). A limitation of this approach is that a change regression cannot be directly applied in estimating the level of costs and be linked to earnings or cash flow. For example, if sales first increase by one unit and then decrease by one unit, the ABJ model implies that the persistent level of costs should increase – even though sales will return to the original level over the two-period horizon. Similarly, if sales first decrease by one unit and then increase by one unit, the ABJ stickiness model implies that the level of costs should increase (see Banker et al., 2012).

The ABJ model is as follows:

$$\begin{aligned}\Delta \log Opex_{i,t} = {} & \beta_0 + \beta_1 \Delta \log Revenue_{i.t} + \beta_2 SD_{i,t} * \Delta \log Revenue_{i.t} + \beta_3 Year_{2009} * SD_{i,t} * \Delta \log Revenue \\ & + \beta_4 Year_{2010} * SD_{i,t} * \Delta \log Revenue_{i.t} + \beta_5 Year_{2011} * SD_{i,t} * \Delta \log Revenue \\ & + \beta_6 \Delta GDP_t * SD_{i,t} * \Delta \log Revenue_{i.t} + \beta_7 EmpInt * SD_{i,t} * \Delta \log Revenue_{i.t} \\ & + \beta_8 AvoidLoss_{i,t} * SD_{i,t} * \Delta \log Revenue_{i.t} + \beta_9 AvoidED_{i,t} * SD_{i,t} * \Delta \log Revenue_{i.t} + \varepsilon_{i,t},\end{aligned}$$

where *Opex* is operating expenses and $\Delta logOpex_{i,t}$ is *log* ($Opex_{i,t} / Opex_{i,t-1}$). $\Delta log\ Revenue_{i,t}$ is *log* ($Revenue_{i,t} / Revenue_{i,t-1}$). ΔGDP is the GDP growth in year *t*. *EmpInt* is the employee intensity for firm *i* in year *t*, computed as the number of employees to sales of year *t-1*. The coefficient for $SD*\Delta log\ Revenue$ captures the effect of a negative change in revenues on a change in operating expenses that is incremental to the effect on operating expenses for a positive change in revenues. A positive (negative) coefficient is indicative of anti-stickiness (stickiness) in costs. The more negative the coefficient is, the smaller the reduction in costs when sales decline and the greater the degree of cost stickiness will be. The regression coefficients of interest are the year-specific terms that capture

incremental anti-sticky behavior during the financial crisis: $Year_{2009}$*SD*$\Delta log\ Revenue$, $Year_{2010}$*SD*$\Delta log\ Revenue$, and $Year_{2011}$*SD*$\Delta log\ Revenue$. I expect the coefficient on $Year_{2009}$*SD*$\Delta log\ Revenue$ to be significantly positive and that its absolute value will be greater than that on *SD*$\Delta log\ Revenue$* if firms exhibit anti-stickiness in costs. The value of the coefficients on $Year_{2010}$*SD*$\Delta log\ Revenue$ and $Year_{2011}$*SD*$\Delta log\ Revenue$ is expected to be smaller than that on $Year_{2009}$*SD*$\Delta log\ Revenue$, as the anti-stickiness in costs decreases after 2009. I include controls for GDP growth, employee intensity, and managerial incentives to avoid reporting losses and earnings declines in keeping with prior literature.[11]

3.2.2 Sample Selection and Descriptive Statistics

The sample is the population of COMPUSTAT firms from 2005 to 2011 after excluding firms in the financial and utility industries (SIC codes 4000-4999 and 6000-6999), which yields a sample of nearly 100,000 firm-year observations. I then exclude all firms that report negative total assets and truncate all the variables in the top 1% and the bottom 1%. I also exclude observations with missing values required for my study. This results in the loss of about 58% of the observations, and a final sample of about 40,000 observations. Table 1 presents descriptive statistics for variables of interest. The mean property, plant and equipment (*PP&E*) to total assets ratio is 32%, and the median is 19%. The mean (median) value operating expenses (*Opex*) as a percentage of the total assets is 1.06 (0.86). The cost of goods sold and SG&A expenses on average are 68% and 37% with respect to assets. An average of about 25% of the sample firms report sales

[11] Since the ABJ change regression controls for GDP growth (a macro variable highly related to the time effect), I do not include additional year dummies in the test to avoid the multicollinearity problem.

decreases but as observed earlier, this proposition fluctuates significantly over the sample period.

Table 1: Sample Statistics

All variables are inflation adjusted and measured based on the dollar value of 1994. *Assets* is total assets in millions. *PP&E* is the net plant, property and equipment, scaled by beginning total assets. *EmpInt* is the employee intensity, computed as the number of employees to the sales of prior year. *Opex* is operating expenses scaled by beginning total assets. *NetInc* is net income scaled by beginning total assets. *CashFlow* is cash flows from operations scaled by beginning total assets. *COGS* is the cost of goods sold and *SG&A* is selling, general and administrative expenses, both scaled by beginning total assets. *R&D* is research and development expenses scaled by beginning total assets and *Advert* is advertising expenses scaled by beginning total assets. *OtherSG&A* is total *SG&A* expenses minus *R&D* and *Advert,* all scaled by beginning total assets. $SD_{i,t}$ is a dummy variable set to 1 if sales of firm *i* decreased from t-1 to *t*, and 0 otherwise. *AvoidLoss* is a dummy variable set to 1 if earnings in year *t* deflated by beginning market value are between 0 and 0.01, and 0 otherwise. *AvoidED* is a dummy variable set to 1 if the ratio of the change in net income of firm *i* in year *t* deflated by beginning market value is between 0 and 0.01, and set to 0 otherwise.

Variable	Median	Mean	Std Dev
Assets	294.20	4492.50	25915.65
PP&E	0.19	0.32	0.35
EmpInt	0.00	0.01	0.02
Revenue	0.90	1.06	0.88
Opex	0.86	1.06	0.83
NetInc	0.02	-0.10	0.40
CashFlow	0.07	0.01	0.27
COGS	0.49	0.68	0.70
SGA	0.25	0.37	0.39
R&D	0.00	0.05	0.12
Advert	0.00	0.01	0.03
Other_SGA	0.20	0.30	0.32
SD	0.00	0.25	0.44
AvoidLoss	0.00	0.03	0.16
AvoidED	0.00	0.01	0.12

Figure 1 graphically depicts the median values of changes in the operating expenses to sales ratio from 2005 to 2011 for the full sample and for sales-up and sales-

down partitioning.[12] Consistent with sticky cost theory, the figure shows that sales-down firms report higher operating expenses than sales-up firms on average. Second, during the financial crisis, sales-down firms cut operating expenses by a much larger amount than sales-up firms.

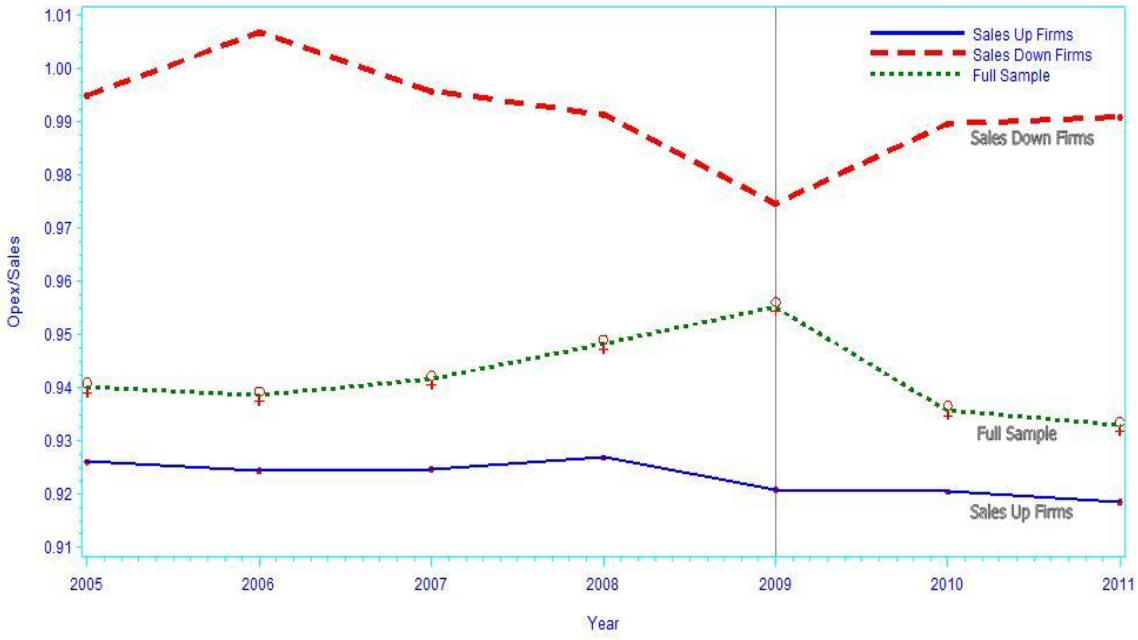

Figure 1: Operating Expenses for U.S. Companies Grouped by the Direction of Sales Change

The figure also reveals a striking pattern about how operating expense fluctuates over the sample period. In 2009, the median operating expense to sales ratio increased for the full sample in spite of the median operating expense to sales ratio decreasing for both sales-up and sales-down firms. Moreover, the percentage of firms that experience increases in the operating expense to sales ratio in 2009 actually decreased to 53% from

[12] The mean value of the operating expenses to sales ratio shows similar patterns as those of the median value.

56% in 2008. This is because (a) the percentage of sales-down firms rose to 57% sharply in 2009 and (b) the operating expenses to sales ratio is higher for sales-down firms than for sales-up firms. Figure 1 highlights the need to examine sticky cost behavior after partitioning the full sample into sales-up and sales-down groups to understand which types of firms are most likely to be affected under the predictions of sticky cost theory.

Figure 2 shows a time trend of the proportion of U.S. companies reporting year-on-year decreases in sales (inflation adjusted) over the period from 2005 to 2011. Before 2008, the average percentage of sales-down firms was 19%. The number climbed to 26% in 2008 and peaked at 56% in 2009. In 2010, the percentage of sales-down firms dropped to 20%, about the same level as that prior to the crisis. The time series changes in the percentage of firms reporting sales-down coincided with the economic fluctuation over this period and are consistent with the fact that most firms were hit by the economic downturn in 2009.

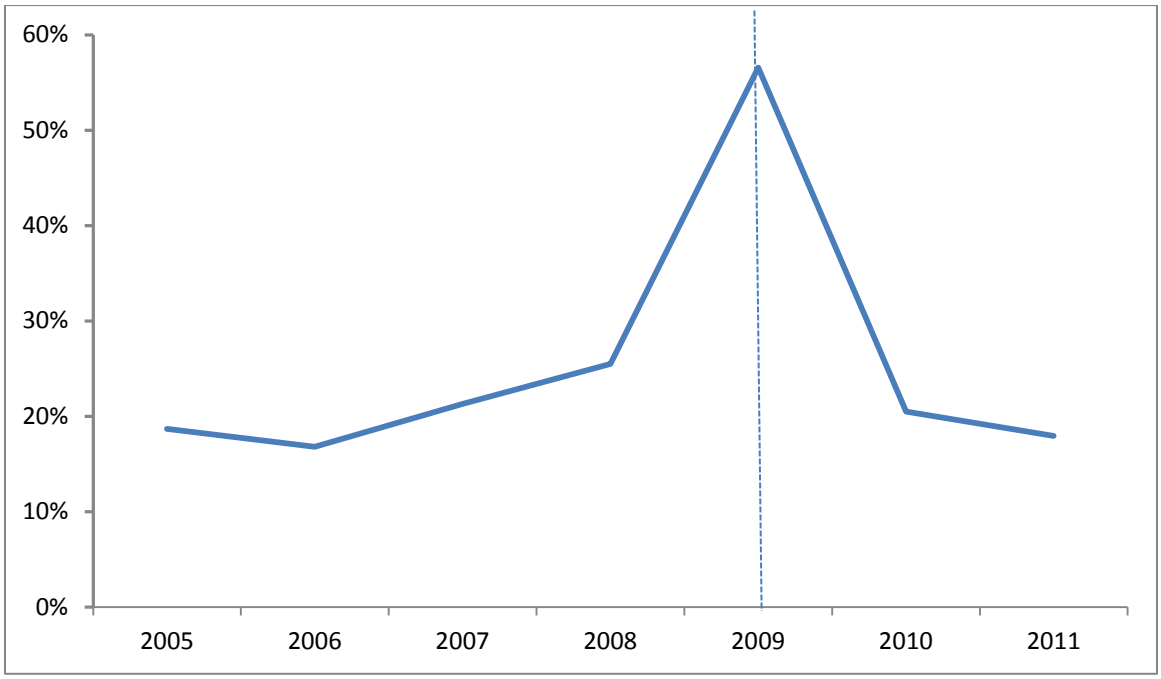

Figure 2: Time Trend of U.S. Firms Reporting Sales Decreases

3.3 Empirical Results

Table 2 reports results from estimating the cost behavior and related regressions of performance indicators for our sample of COMPUSTAT firms. Asymmetric cost behavior theory posits that pessimistic managers are more likely to have reduced stickiness during the economic crisis in 2008, 2009 and 2010 because of the prevalence of lower growth and a decline in demand. The overall results confirm findings from prior research that, on average, firms engaged in sticky cost behavior prior to 2008. However, sales-down firms engaged in anti-sticky cost behavior from 2008 to 2010 but reverted once again to sticky cost behavior after 2010.

Table 2: Cost Stickiness During the Financial Crisis

All variables are inflation adjusted and measured based on the dollar value of 1994. *Opex* is operating expenses, *NetInc* is net income, and *CashFlow* is operating cash flows. *Revenue* captures net sales. All these four performance indicators are deflated by beginning total assets. $Year_t$ is a dummy variable set to 1 if the observation is from year *t* and 0 otherwise. $SD_{i,t}$ ($SU_{i,t}$) is equal to 1 if the sales of firm *i* decreases (increases) from year *t-1* to year *t*, and 0 otherwise. *AvoidLoss*=1 if earnings of year *t* deflated by beginning market value are between 0 and 0.01 and 0 otherwise. *AvoidED*=1 if the ratio of the change in net income of firm *i* in year *t* deflated by beginning market value is between 0 and 0.01 and 0 otherwise. Numbers in parentheses are t-statistics.

	OPEX	NetInc	CashFlow
Revenue	0.851***	0.133***	0.092***
	(135.68)	(19.18)	(20.64)
SD	0.134***	-0.151***	-0.102***
	(10.02)	(-9.26)	(-10.22)
*Year2008*SD*	-0.070***	0.067***	0.046***
	(-3.51)	(2.88)	(3.26)
*Year2009*SD*	-0.240***	0.269***	0.191***
	(-11.86)	(11.25)	(13.25)
*Year2010*SD*	-0.066***	0.078***	0.053***
	(-2.85)	(2.78)	(3.16)
*Year2011*SD*	0.032	-0.012	-0.011
	(1.15)	(-0.38)	(-0.58)
*AvoidLoss*SU*	-0.145***	0.180***	0.111***
	(-18.01)	(24.13)	(16.66)
*AvoidLoss*SD*	-0.184***	0.254***	0.133***
	(-10.72)	(19.65)	(13.20)
*AvoidED*SU*	-0.029	0.090***	0.024**
	(-1.33)	(5.41)	(2.15)
*AvoidED*SD*	-0.096***	0.153***	0.067***
	(-3.28)	(4.73)	(3.67)
Constant	0.282***	-0.331***	-0.157***
	(23.62)	(-25.27)	(-17.80)
S.E. Clustered by Firm	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
Adj R2	0.64	0.04	0.05
N	39612	39612	39612

* p<0.10, ** p<0.05, *** p<0.01

The first column of Table 2 reports the results of regressing performance on *Revenue* and indicators of the direction of sales change and the years of the economic crisis. The coefficient on *Revenue* is positive and significant, suggesting that sales are positively related to operating expenses. The coefficient on *SD* is 0.134, positively related to operating expenses at the 1% significance level, which is consistent with the sticky cost theory that U.S. firms exhibit cost stickiness, on average, under normal economic

conditions prior to 2008. The coefficient on *Year2008*SD* is -0.070, suggesting that cost stickiness is significantly reduced in 2008.

Firms started to exhibit significant anti-stickiness in operating expenses in 2009. The coefficient on *Year2009*SD* is -0.240 and significant at the 1% level. The sum of the coefficients on *SD* and *Year2009*SD* is -0.106. That is, given the same revenue level, sales-down firms report significantly greater reduction in operating expenses compared to cost increases for sales-up firms, consistent with the prediction that operating expenses show strong anti-stickiness in 2009. Similarly, the coefficient for *Year2010*SD* is -0.066, with significance at the 1% level, and the sum of the two coefficients on *SD* and *Year2010*SD* is 0.068. Sales-down firms show an increase in stickiness in operating expenses, consistent with managers acting to revert to the original resource level as the economy recovered. Finally, *Year2011*SD* is insignificantly related to operating expenses, suggesting that cost stickiness reverts to the level that existed prior to 2008.

The results show that sales-down firms exhibit cost stickiness before the crisis but significantly reduced cost stickiness during the crisis. Anti-stickiness in costs peaked in 2009 and declined in 2010. After 2010, as the U.S. economy started to recover, cost stickiness reverts approximately to the pre-crisis level. While the cost asymmetry reverts to that of the pre-crisis period, the untabulated results show that the cost level is significantly lower after 2010 for both sales-down and sales-up firms than it was prior to 2008. One possible explanation could be that managers are still conservative in general about future sales prospects and are reluctant to expand as the U.S. economy has not fully recovered.

Interestingly, an examination of *AvoidLoss*SD* and *AvoidED*SD* reveals that the impact of the economic downturn in 2009 on managers' cost decisions is economically greater than that of managerial incentives to avoid reporting losses and to avoid earnings declines. In addition, I find that, for both sales-up and sales-down firms, managerial incentives to avoid losses and earnings declines appear to be economically similar to each other and have similar implications for cost behavior. This suggests that earnings management incentives not only apply to reduced stickiness (or increased anti-stickiness) for sales-down firms but also represent incentives that apply equally to all firms regardless of the direction of sales change. In the untabulated results, I interact the earnings management variables with the year dummies for the crisis period and find that the economic crisis did not significantly affect these incentives to manage costs.

Columns 2 and 3 of Table 2 present results for models examining the asymmetry in net income and operating cash flow with respect to the direction of sales change. Given that costs behave asymmetrically with respect to sales increases and decreases, net income and cash flow from operations will accordingly behave asymmetrically. A *decrease* in cost stickiness will lead to an increase in net income and operating cash flow. I again include interaction terms of the year and the sales-down dummy to allow the asymmetries in net income and operating cash flow with respect to the direction of sales changes to vary during the economic crisis.

The results confirm the implications of managers of sales-down firms reducing cost stickiness during the economic crisis for net income and operating cash flows. First, before 2008, sales-down firms reported lower earnings and operating cash flow relative to sales-up firms while holding revenue constant. The coefficients on *SD* in the net

income and operating cash flow models are -0.151 and -0.102, respectively, and they are significant at the 1% level. In 2008, as the stickiness in operating expenses significantly decreased, earnings and operating cash flow of sales-down firms were significantly higher than those prior to 2008. The coefficient on *Year2008*SD* is 0.067 for the net income model and 0.046 for the operating cash flow model.

In 2009, as the anti-stickiness in operating expenses peaked, the coefficients on *Year2009*SD* in the net income and operating cash flow models are the most positive compared with the coefficients on *Year2008*SD* and *Year2010*SD*. The coefficient on *Year2009*SD* is 0.269 for the net income model and 0.191 for the operating cash flow model. The net income and operating cash flow of sales-down firms are even higher than those of sales-up firms in 2009, as the sum of the coefficients on *SD* and *Year2009*SD* are all positive. These results are contrary to naive but common beliefs concerning the performance of sales-down firms. After 2010, the net income and operating cash flow of sales-down firms are still significantly higher than in the pre-crisis period, although cost stickiness reverts approximately to the level of the pre-crisis period because the overall cost level decreased for U.S. companies after 2010.

In the untabulated results, I analyze two alternative sources of the large coefficient for *Year2009*SD*. The coefficient may be driven by the increased anti-stickiness of firms that were already sales-down firms in 2008, or it could be driven by the anti-stickiness exhibited by firms experiencing sales declines only in 2009. Following BBCM, I introduce four dummy variables for interactions with the 2009 dummy that also recognize the direction of sales change in the prior period (2008). I find significantly negative coefficients on the interaction terms when sales decreased in 2009, as before.

Interestingly, the coefficient is less negative when sales decreased in 2008 than when sales increased in 2008. While increased anti-stickiness is driven by both groups of firms, it is much higher when a firm experienced a sales decline for the first time during the crisis. When a sales increase in 2009 followed a sales decline in 2008, the coefficient is positive and significant, indicating that managers are already optimistic and exhibiting sticky cost behavior. The coefficient on the interaction term of the year dummy and the indicators of sales change direction is insignificant when sales increased in both 2008 and 2009, indicating that these firms did not change their cost behavior during the crisis.

My next set of analyses is designed to obtain a more thorough understanding of the components of operating expenses that drive anti-sticky cost behavior during the economic crisis. I decompose operating expenses into the following operating expense categories: cost of goods sold (*COGS*) and selling, general, and administrative expenses (*SG&A*). *SG&A* is further decomposed into research and development (*R&D*), advertising (*Advert*), and other *SG&A* expenses *(OtherSG&A)*.

Table 3 presents the results of tests examining the relation between each operating expense category and revenue. Column 1 presents the results for the behavior of *COGS* over time for sales-up and sales-down firms separately. *COGS* exhibits a reduction in stickiness only in 2008, and this reduction is not large enough to show anti-stickiness. Coefficients for *Year2009*SD*, *Year2010*SD*, and *Year2011*SD* are all insignificant. Column 2 presents the results for *SG&A* expenses, which appear to be sticky prior to 2008 and anti-sticky in 2009. I next examine the components of *SG&A* and find that the reduction in *SG&A* expenses is driven by cuts in research and development (*R&D*) expenditures and other *SG&A* expenses. The reduction in *R&D* expenditures for sales-

down firms starts in 2008 and lasts until 2010. Interestingly, I find that sales-down firms have higher advertising expenses than sales-up firms in 2008.

Table 3: Components of Costs and Cost Stickiness During the Financial Crisis

All variables are inflation adjusted and measured based on the dollar value of 1994. *COGS* is the cost of goods sold and *SG&A* is selling, general and administrative expenses. *R&D* is research and development expenses and *Advert* is advertising expenses. *OtherSG&A* is all the other *SG&A* expenses excluding *R&D* and *Advert*. All variables are scaled by beginning total assets. $Year_t$ is a dummy variable set to 1 if the observation is from year *t* and 0 otherwise. $SD_{i,t}$ ($SU_{i,t}$) is equal to 1 if the sales of firm *i* decreases (increases) from year *t-1* to year *t*, and 0 otherwise. *AvoidLoss* = 1 if earnings of year *t* deflated by beginning market value are between 0 and 0.01 and 0 otherwise. *AvoidED* = 1 if the ratio of the change in net income of firm *i* in year *t* deflated by beginning market value is between 0 and 0.01 and 0 otherwise. Numbers in parentheses are t-statistics.

	COGS	SG&A	R&D	Advert	OtherSG&A
Revenue	0.721***	0.119***	-0.005***	0.006***	0.114***
	(102.90)	(14.09)	(-3.63)	(16.44)	(17.01)
SD	0.052***	0.092***	0.014***	-0.000	0.076***
	(7.87)	(5.79)	(4.54)	(-0.11)	(5.99)
*Year2008*SD*	-0.020**	-0.078***	-0.010**	0.003***	-0.062***
	(-1.97)	(-3.47)	(-2.35)	(2.60)	(-3.43)
*Year2009*SD*	0.013	-0.244***	-0.039***	-0.002*	-0.197***
	(1.25)	(-10.72)	(-8.57)	(-1.82)	(-10.77)
*Year2010*SD*	-0.014	-0.039	-0.017***	0.001	-0.014
	(-1.25)	(-1.40)	(-3.29)	(0.72)	(-0.64)
*Year2011*SD*	-0.015	0.010	0.008	0.001	0.008
	(-1.21)	(0.33)	(1.32)	(0.77)	(0.33)
*AvoidLoss*SU*	-0.056***	-0.086***	0.003	0.003***	-0.076***
	(-5.13)	(-6.92)	(0.82)	(2.74)	(-8.04)
*AvoidLoss*SD*	0.006	-0.176***	-0.017***	-0.002	-0.140***
	(0.40)	(-6.96)	(-2.97)	(-1.52)	(-6.14)
*AvoidED*SU*	-0.039**	0.010	-0.010*	0.001	0.034*
	(-2.06)	(0.42)	(-1.76)	(0.71)	(1.80)
*AvoidED*SD*	-0.054**	-0.025	-0.014*	-0.003*	0.010
	(-2.31)	(-0.58)	(-1.69)	(-1.93)	(0.26)
Constant	-0.098***	0.326***	0.063***	0.004***	0.242***
	(-12.69)	(24.65)	(25.26)	(7.44)	(22.92)
S.E. Clustered by Firm	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adj R2	0.83	0.04	0.01	0.05	0.05
N	36696	36696	36502	36444	36535

* p<0.10, ** p<0.05, *** p<0.01

Next, I provide evidence on how fixed asset intensity affects cost behavior. I predict that firms with high (low) fixed asset intensity display relatively less (more) anti-stickiness during the crisis, consistent with the differences in the redeployability and costs associated with the adjustment of existing fixed assets and related labor. I replicate our main tests after partitioning firms by fixed asset intensity based on the median fixed asset intensity, where firms above the median are classified as having high fixed asset intensity. Fixed asset intensity is calculated as net property, plant, and equipment, scaled by the total assets. Panels A and B of Table 4 present the results from empirical tests on firms with high fixed asset intensity and those low fixed asset intensity, respectively. The results are consistent with my predictions.

For the tests on operating expenses, firms with high fixed asset intensity show less tendency to reduce the degree of stickiness than firms with low fixed asset intensity during the crisis. For high fixed asset intensity firms, only the coefficient on *Year2009*SD* is significantly negative at the 1% level. For low fixed asset intensity firms, the coefficients on *Year2008*SD*, *Year2009*SD*, and *Year2010*SD* are all significantly negative at the 1% level. In 2009, both partitions of sales-down firms demonstrate anti-stickiness, but firms in the high fixed asset intensity partition show a significantly lower degree of anti-stickiness than firms in the low fixed asset intensity partition (for *Year2009*SD)*. The results for tests where *NetInc* or *CashFlow* are used to measure performance are consistent with firms' cost behavior.

Table 4: Cost Stickiness around the Financial Crisis for High and Low Fixed Asset Intensity Partitions

All variables are inflation adjusted and measured based on the dollar value of 1994. *Opex* is the operating expenses. *NetInc* is the net income. *CashFlow* is the operating cash flows. All four factors including *Revenue* are scaled by beginning total assets. $Year_t$ is a dummy variable set to 1 if the observation is from year *t* and 0 otherwise. $SD_{i,t}$ ($SU_{i,t}$) is equal to 1 if the sales of firm *i* decreases (increases) from year *t-1* to year *t*, and 0 otherwise. *HiPPE* = 1 if net property, plant, and equipment scaled by total assets is higher than median and 0 otherwise. *AvoidLoss* = 1 if earnings of year *t* deflated by beginning market value are between 0 and 0.01 and 0 otherwise. *AvoidED* = 1 if the ratio of the change in net income of firm *i* in year *t* deflated by beginning market value is between 0 and 0.01 and 0 otherwise. Numbers in parentheses are t-statistics.

Panel A Firms with High Fixed Asset Intensity

	OPEX	**NetInc**	**CashFlow**
Revenue	0.885***	0.091***	0.064***
	(121.32)	(11.50)	(12.38)
SD	0.098***	-0.094***	-0.062***
	(6.06)	(-4.99)	(-5.49)
*Year2008*SD*	-0.028	0.012	0.001
	(-1.14)	(0.39)	(0.03)
*Year2009*SD*	-0.164***	0.171***	0.131***
	(-6.84)	(6.28)	(8.12)
*Year2010*SD*	-0.027	0.026	0.014
	(-0.87)	(0.73)	(0.67)
*Year2011*SD*	0.043	-0.040	-0.031
	(1.21)	(-0.97)	(-1.29)
*AvoidLoss*SU*	-0.072***	0.103***	0.054***
	(-8.71)	(13.71)	(7.29)
*AvoidLoss*SD*	-0.111***	0.161***	0.075***
	(-5.84)	(12.07)	(6.65)
*AvoidED*SU*	-0.012	0.052***	0.001
	(-0.76)	(3.77)	(0.10)
*AvoidED*SD*	-0.020	0.061*	0.010
	(-0.61)	(1.76)	(0.45)
Constant	0.169***	-0.202***	-0.057***
	(11.88)	(-12.96)	(-5.40)
S.E. Clustered by Firm	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
Adj R2	0.72	0.03	0.03
N	20197	20197	20197

* p<0.10, ** p<0.05, *** p<0.01

Panel B Firms with Low Fixed Asset Intensity

	OPEX	NetInc	CashFlow
Revenue	0.833***	0.159***	0.111***
	(90.60)	(15.33)	(16.66)
SD	0.134***	-0.160***	-0.100***
	(7.02)	(-6.72)	(-6.91)
*Year2008*SD*	-0.107***	0.113***	0.080***
	(-3.64)	(3.30)	(3.85)
*Year2009*SD*	-0.262***	0.298***	0.198***
	(-8.58)	(7.98)	(8.92)
*Year2010*SD*	-0.095***	0.119***	0.079***
	(-2.80)	(2.82)	(3.16)
*Year2011*SD*	0.029	-0.001	0.011
	(0.71)	(-0.02)	(0.41)
*AvoidLoss*SU*	-0.210***	0.249***	0.166***
	(-16.07)	(20.36)	(15.28)
*AvoidLoss*SD*	-0.225***	0.309***	0.159***
	(-10.60)	(14.72)	(10.38)
*AvoidED*SU*	-0.037	0.118***	0.046***
	(-0.96)	(3.93)	(2.66)
*AvoidED*SD*	-0.140***	0.204***	0.097***
	(-3.03)	(3.97)	(3.47)
Constant	0.364***	-0.431***	-0.245***
	(21.17)	(-22.05)	(-18.92)
S.E. Clustered by Firm	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
Adj R2	0.59	0.05	0.06
N	18968	18968	18968

* p<0.10, ** p<0.05, *** p<0.01

Next, I use the methodology developed in ABJ to validate the robustness of the findings. I predict that firms will significantly reduce cost stickiness beginning in 2008 and that this will persist until 2010. In the ABJ change regression, a negative coefficient on *SD*ΔLogRevenue* implies cost stickiness. That is, the cost reduction percentage is smaller as sales fall than the percentage of cost increases as sales rise. Table 5 reports the

results. The evidence is consistent with our main results. Columns 1 to 3 present the primary results with all control variables. The coefficient for *SD*ΔLogRevenue* is -0.179 and significant at the 1% level, and that for *Year2009*SD*ΔLogRevenue* is 0.324, suggesting that firms appear to be anti-sticky in costs from 2008 to 2009. In contrast, the coefficient on the three-way interaction term, *Year2010*SD*ΔLogRevenue*, is 0.116 at the 10% significance level, suggesting that stickiness in sales-down firms started to revert from year 2009 to 2010.

Table 5: Cost Stickiness During the Financial Crisis Estimated Using the ABJ Model

$$\begin{aligned}\Delta \log Opex_{i,t} = {} & \beta_0 + \beta_1 \Delta \log Revenue_{i.t} + \beta_2 SD_{i,t} * \Delta \log Revenue_{i.t} + \beta_3 Year_{2009} * SD_{i,t} * \Delta \log Revenue \\ & + \beta_4 Year_{2010} * SD_{i,t} * \Delta \log Revenue_{i.t} + \beta_5 Year_{2011} * SD_{i,t} * \Delta \log Revenue \\ & + \beta_6 \Delta GDP_t * SD_{i,t} * \Delta \log Revenue_{i.t} + \beta_7 EmpInt * SD_{i,t} * \Delta \log Revenue_{i.t} \\ & + \beta_8 AvoidLoss_{i,t} * SD_{i,t} * \Delta \log Revenue_{i.t} + \beta_9 AvoidED_{i,t} * SD_{i,t} * \Delta \log Revenue_{i.t} + \varepsilon_{i,t},\end{aligned}$$

where *Opex* is the operating expenses. $\Delta logOpex_{i,t} = log(Opex_{i,t} / Opex_{i,t-1})$. $\Delta log\ Revenue_{i,t} = log(Revenue_{i,t} / Revenue_{i,t-1})$. $SD_{i,t}$ =1 if deflated sales of firm *i* decreased in year *t*, 0 otherwise. $Year_t$ is a dummy variable set to 1 if the observation is from year *t* and 0 otherwise. *ΔGDP* is GDP growth in year *t*. *EmpInt* is the employee intensity, computed as the number of employees to the sales of prior year. *AvoidLoss* = 1 if earnings of year *t* deflated by beginning market value are between 0 and 0.01 and 0 otherwise. *AvoidED* = 1 if the ratio of the change in net income of firm *i* in year *t* deflated by beginning market value is between 0 and 0.01 and 0 otherwise. Firms in high *PPE* intensity industries are those with net *PP&E* scaled by beginning assets higher than median. All variables are inflation adjusted and measured based on the dollar value of 1994. Numbers in parentheses are t-statistics.

	Full Sample	High PPE Intensity	Low PPE Intensity
	OPEX	**OPEX**	**OPEX**
ΔLogRevenue	0.574***	0.629***	0.492***
	(36.20)	(30.64)	(19.42)
*SD*ΔLogRevenue*	-0.179***	-0.297***	-0.077
	(-3.19)	(-4.01)	(-0.99)
*Year2009*SD*ΔLogRevenue*	0.324**	0.536***	0.279*
	(2.51)	(3.08)	(1.65)
*Year2010*SD*ΔLogRevenue*	0.116*	0.119	0.086
	(1.71)	(0.76)	(1.21)
*Year2011*SD*ΔLogRevenue*	0.036	-0.034	0.073
	(0.68)	(-0.41)	(1.06)
*ΔGDP*SD*ΔLogRevenue*	0.007	0.043	0.005
	(0.30)	(1.32)	(0.19)
*EmpInt*SD*ΔLogRevenue*	-6.199***	-5.344***	-6.661***
	(-6.22)	(-4.75)	(-6.04)
*AvoidLoss*SD*ΔLogRevenue*	0.298***	0.192*	0.455***
	(4.40)	(1.91)	(9.17)
*AvoidED*SD*ΔLogRevenue*	-0.167	-0.370*	0.026
	(-0.99)	(-1.84)	(0.29)
Constant	0.042***	0.046***	0.040***
	(13.38)	(10.86)	(8.70)
S.E. Clustered by Firm	Yes	Yes	Yes
Adj R2	0.51	0.50	0.52
N	30265	15464	14636

* p<0.10, ** p<0.05, *** p<0.01

3.4 Robustness Checks and Additional Analyses

3.4.1 Do Managers Cut Costs to Alleviate Financial Distress?

One may argue that managers cut operating expenses to avoid financial distress in response to the increased credit crunch during the crisis period. Since the tightened credit policy applied to all the firms, both sales-up and sales-down firms faced increasing

difficulty obtaining financing. I find that the credit crunch story cannot explain the asymmetry in cost behavior changes between sales-up and sales-down firms.

To evaluate the impact of financial distress on firms' cost behavior, I estimate the default probability, using the KMV measure proposed by Bharath and Shumway (2008). Average distress levels are indeed higher during the financial crisis (20.2% in 2009 versus 6.5% in 2007), and they are higher for sales-down firms than for sales-up firms (16.8% versus 7.6%, on average). I control for default risk in our regression and report the results in Table 6. Financial distress is only positively associated with the cost level at the 10% significance level during the normal periods but significant at the 1% level during the crisis period. It is also negatively associated with earnings and operating cash flow at the 1% significance level for the whole sample period. Furthermore, asymmetric cost behavior continues to be highly significant at the 1% level even when I explicitly control for the distress level.

Table 6: Operating Performance During the Crisis Controlling for Financial Distress

All variables are inflation adjusted and measured based on the dollar value of 1994. *Opex* is operating expenses, *NetInc* is net income, and *CashFlow* is operating cash flows. *Revenue* captures Net Sales. All four factors including *Revenue* are scaled by beginning assets. $Year_t$ is a dummy variable set to 1 if the observation is from year *t* and 0 otherwise. $SD_{i,t}$ ($SU_{i,t}$) is equal to 1 if the sales of firm *i* decreases (increases) from year *t-1* to year *t*, and 0 otherwise. *Distress* is the average monthly default probability of the fiscal year, estimated from the model by Bharath and Shummway (2008). *AvoidLoss* =1 if earnings of year *t* deflated by beginning market value are between 0 and 0.01 and 0 otherwise. *AvoidED* =1 if the ratio of the change in net income of firm *i* in year *t* deflated by beginning market value is between 0 and 0.01 and 0 otherwise. Numbers in parentheses are t-statistics.

	OPEX	NetInc	CashFlow
Revenue	0.911***	0.079***	0.056***
	(181.60)	(16.03)	(12.86)
SD	0.135***	-0.123***	-0.100***
	(14.00)	(-11.00)	(-11.37)
*Year2008*SD*	-0.059***	0.048***	0.049***
	(-4.06)	(2.97)	(4.10)
*Year2009*SD*	-0.153***	0.149***	0.143***
	(-10.05)	(8.49)	(9.73)
*Year2010*SD*	-0.070***	0.070***	0.062***
	(-4.09)	(3.43)	(4.03)
*Year2011*SD*	-0.011	0.026	0.003
	(-0.50)	(1.25)	(0.16)
Distress	0.029*	-0.071***	-0.037***
	(1.89)	(-3.78)	(-2.65)
*Year2008*Distress*	0.134***	-0.196***	-0.116***
	(5.42)	(-6.74)	(-4.86)
*Year2009*Distress*	0.155***	-0.149***	-0.093***
	(5.71)	(-4.30)	(-3.28)
*Year2010*Distress*	0.167***	-0.200***	-0.134**
	(2.64)	(-2.66)	(-2.08)
*Year2011*Distress*	0.163***	-0.194***	-0.176***
	(3.40)	(-4.06)	(-3.66)
*AvoidLoss*SU*	-0.019***	0.038***	0.034***
	(-3.26)	(7.19)	(5.41)
*AvoidLoss*SD*	-0.082***	0.108***	0.061***
	(-8.47)	(10.98)	(7.10)
*AvoidED*SU*	0.034***	-0.004	-0.015
	(2.95)	(-0.42)	(-1.52)
*AvoidED*SD*	-0.028	0.052***	0.031**
	(-1.35)	(2.65)	(2.31)
Constant	0.067***	-0.105***	-0.016**
	(7.49)	(-11.49)	(-2.03)
S.E. Clustered by Firm	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
Adj R2	0.89	0.09	0.07
N	19848	19848	19848

* p<0.10, ** p<0.05, *** p<0.01

In the untabulated results, I control for funding availability, total assets, and industry fixed effects in the tests to examine whether the results are driven by liquidity, scale economies, and funding constraints. The results concerning the asymmetry in the changes in firms' cost behavior between sales-up and sales-down firms remain the same.

3.4.2 The Impact of Significant Decline in Sales

It is also possible that sales-down firms exhibit, on average, anti-sticky cost behavior during the economic crisis because the magnitude of the sales drop is larger during the crisis than during normal economic periods. Excess capacity caused by a substantial decline in sales can cause anti-stickiness. To test this conjecture, I examine the impact on firms experiencing different magnitudes of sales decline, respectively. I divide firms with sales declines into three groups: small declines (*SD* <10%), median declines (10% <= *SD* <20%), and large declines (>= 20%) in sales for the pre-crisis period to compare with the crisis period. See Table 7.

Table 7: Cost Stickiness Controlling for the Magnitude of Sales Decline

The sample period for this test is from 2005 to 2011. All variables are inflation adjusted and measured based on the dollar value of 1994. *Opex* is operating expenses, *NetInc* is net income, and *CashFlow* is operating cash flows. *Revenue*s captures net sales. All four factors are scaled by beginning assets. *SD<10%* =1 if the sales decline by less than 10% (0 otherwise). *SD10%* =1 if the sales decline by 10% or more but less than 20% (0 otherwise). *SD20%* =1 if the sales decline by more than 20% (0 otherwise). $SD_{i,t}$ ($SU_{i,t}$) is equal to 1 if the sales of firm *i* decreases (increases) from year *t-1* to year *t*, and 0 otherwise. $Year_t$ is a dummy variable set to 1 if the observation is from year *t* and 0 otherwise. *AvoidLoss* = 1 if earnings of year *t* deflated by beginning market value are between 0 and 0.01 and 0 otherwise. *AvoidED* = 1 if the ratio of the change in net income of firm *i* in year *t* deflated by beginning market value is between 0 and 0.01 and 0 otherwise. Numbers in parentheses are t-statistics.

	OPEX	NetInc	CashFlow
Revenue	0.943***	0.042***	0.030***
	(182.51)	(6.90)	(7.97)
SD<10%	0.077***	-0.071***	-0.049***
	(6.73)	(-5.27)	(-5.50)
SD10%	0.146***	-0.154***	-0.098***
	(8.07)	(-6.71)	(-7.40)
SD20%	0.459***	-0.504***	-0.342***
	(18.16)	(-15.61)	(-18.00)
*SD<10%*Year2008*	-0.035	0.030	0.014
	(-1.52)	(1.30)	(0.87)
*SD10%*Year2008*	-0.065***	0.070**	0.037*
	(-2.61)	(2.24)	(1.93)
*SD20%*Year2008*	-0.123***	0.136***	0.102***
	(-3.44)	(2.99)	(3.95)
*SD<10%*Year2009*	-0.136***	0.147***	0.101***
	(-7.90)	(7.17)	(7.54)
*SD10%*Year2009*	-0.177***	0.204***	0.134***
	(-8.01)	(7.29)	(8.24)
*SD20%*Year2009*	-0.369***	0.423***	0.307***
	(-12.39)	(11.31)	(13.70)
*SD<10%*Year2010*	-0.043**	0.038	0.023
	(-2.19)	(1.57)	(1.59)
*SD10%*Year2010*	-0.000	0.035	0.007
	(-0.01)	(0.99)	(0.32)
*SD20%*Year2010*	-0.094**	0.098*	0.077**
	(-1.99)	(1.67)	(2.25)
*SD<10%*Year2011*	0.013	-0.009	-0.002
	(0.51)	(-0.32)	(-0.10)
*SD10%*Year2011*	0.023	-0.019	-0.033
	(0.58)	(-0.39)	(-1.18)
*SD20%*Year2011*	0.052	-0.003	-0.030
	(0.93)	(-0.05)	(-0.77)
*AvoidLoss*SU*	-0.049***	0.082***	0.050***
	(-9.44)	(16.70)	(9.64)
*AvoidLoss*SD*	-0.144***	0.209***	0.101***
	(-8.09)	(15.27)	(9.27)
*AvoidED*SU*	-0.005	0.042***	0.008
	(-0.63)	(6.04)	(0.89)
*AvoidED*SD*	-0.057**	0.107***	0.038**
	(-2.16)	(3.69)	(2.19)
Constant	0.083***	-0.132***	-0.022***
	(9.16)	(-12.87)	(-3.10)
S.E. Clustered by Firm	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
Adj R2	0.78	0.06	0.07
N	35393	35393	35393

* p<0.10, ** p<0.05, *** p<0.01

I find that the same pattern I have reported persists. Interestingly, the evidence reveals that, under normal conditions, a higher sales decline leads to non-linearly increasing stickiness in operating expenses, not anti-stickiness. As shown in Column 1 of the table, when sales decline by less than 10%, the stickiness coefficient is 0.077, on average. When sales decline by 10% or more but less than 20%, the stickiness coefficient increases to 0.146. When sales decline by more than 20%, the coefficient increases to 0.459. However, only under pessimistic conditions such as those during the world economic crisis are firms motivated to start reducing activity resources and costs. In 2008 and 2009, when sales decline by less than 10%, stickiness coefficients decrease, on average, by -0.035 and -0.136, respectively. That is, stickiness in costs drops to 0.042 in 2008 and to -0.059 (and become anti-sticky) in 2009. Moreover, when sales decline by more than 20% in 2008 and 2009, the stickiness coefficient decreases (instead of increasing) by -0.123 and -0.369 to 0.336 and 0.090, respectively (in contrast to 0.459 during normal periods). The effect of pessimism on stickiness starts to decline in 2010. The stickiness coefficient decreases by -0.043 to 0.034, on average, and decreases by only -0.094 (compared with -0.369 in 2009) to 0.365 when sales decline by more than 20% in 2010. In sum, the evidence in Table 7 refutes the claims in prior literature that excess capacity, such as that caused by a substantial decline in sales, causes anti-stickiness. The evidence shows that the signs are reversed when more pessimistic economic conditions prevail.

The effect of pessimism on earnings and cash flow is consistent with that on cost stickiness, as shown above in Table 7. During normal periods, firms experiencing a sales decline exhibit relatively lower earnings and operating cash flow due to sticky costs.

When sales decline by less than 10%, the coefficient on the sales-down dummy is -0.071 for earnings and -0.049 for operating cash flows. When sales decline by more than 20%, the coefficient on the sales-down dummy for earnings (operating cash flow) is -0.504 (-0.342), as cost stickiness increases significantly. However, during the crisis years, there is a reduction in cost stickiness, which results in an increase in both earnings and operating cash flow for firms experiencing a sales decline. The greater the decline in sales is during this pessimistic period, the more positive the impact on earnings and operating cash flow will be. For example, for firms experiencing a sales decline of more than 20%, the stickiness coefficient decreases by -0.369 in 2009, and correspondingly, the coefficient on the sales-down dummy for earnings (operating cash flow) increases by 0.423 (0.307) to -0.081 (-0.035).

My results documenting anti-stickiness hold even after controlling for large sales changes. These results are consistent with the asymmetric cost behavior theory—managers adjust the tradeoff between carrying slack resources costs and future adjustment costs largely due to the increased pessimism during the economic crisis.

3.4.3 Evidence from an Extended Sample Period and Analyst Forecasts

Although the crisis is an unusual period, the consequences of the economic forces for costs are experienced constantly and display considerable variation. Figure 3 shows that, while the recent crisis was the only time that there was anti-stickiness, on average, there was considerable variation in the degree of stickiness, and the variation has increased in the past two decades. For instance, during the Clinton administration, stickiness increased from 1994 to 1996 following the budget agreement that brought

fiscal discipline but decreased from 1997 to 1999 following the Asian economic crisis. There was also a collapse following the dot.com bubble burst and the 9/11 crisis in 2001. Robust business confidence is seen from 2004 to 2006 preceding the global economic crisis.

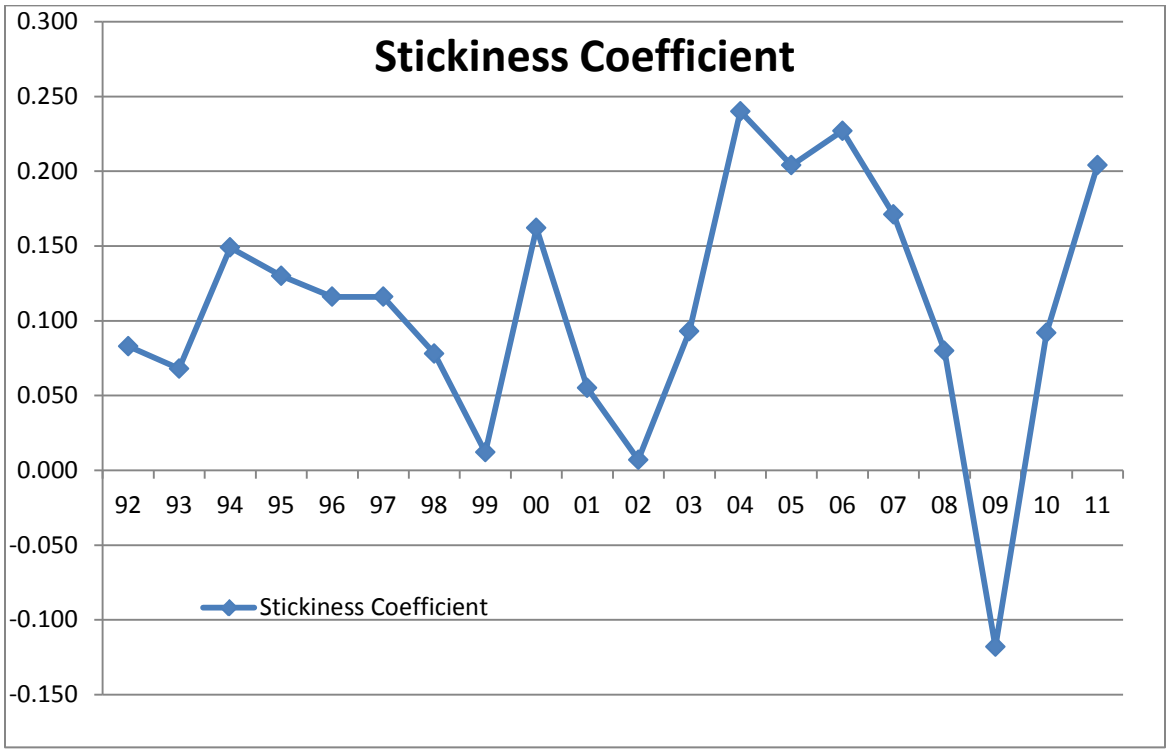

Figure F3: Annual Stickiness Coefficient over 1992-2011

This figure shows the time series variation in stickiness coefficient and average percentage change in sales from 1992 to 2011. The horizontal axis is marked by the last two digits of the years. The vertical axis indicates the value of stickiness coefficient, γ_t, estimated from the following regression and depicted by the blue solid line:

$$Opex_{i,t} = \beta_0 + \beta_1 Revenue_{i.t} + \sum_{1992}^{2011} \gamma_t \, SD_{i,t} * YearDummy_t + \sum_{1993}^{2011} \lambda \, YearDummy_t$$
$$+ \beta_2 AvoidLoss * SU_{i,t} + \beta_3 AvoidLoss * SD_{i,t} + \beta_4 AvoidED * SU_{i,t} + \beta_5 AvoidED * SD_{i,t} + \varepsilon_{i,t},$$

where *Opex* is operating expenses. *Revenue* captures net sales. *Opex* and *Revenue* are scaled by beginning assets. All the variables are inflation adjusted and measured based on the dollar value of 1994. $SD_{i,t}$ ($SU_{i,t}$) is equal to 1 if the sales of firm *i* decreases (increases) from year *t-1* to year *t*, and 0 otherwise. $YearDummy_t$ is equal to 1 if the financial data is from year *t* and 0 otherwise. *AvoidLoss*=1 if earnings of year *t* deflated by beginning market value are between 0 and 0.01 and 0 otherwise. *AvoidED*=1 if the ratio of the change in net income of firm *i* in year *t* deflated by beginning market value is between 0 and 0.01 and 0 otherwise. Standard errors are two-way clustered by firm and year.

I formalize this intuition in the analysis over 1992 to 2011, reported in the first three columns of Table 8. The bottom third of the 20 years between 1992 and 2011 with the lowest average percentage change in sales are classified as *pessimism* years. Analogous to the world economic crisis years, I predict that stickiness will be lower in these years. Table 8 documents results that mimic those during the economic crisis. Operating expenses are higher and net income and operating cash flows are lower for sales-down firms in normal years, and the magnitude of this stickiness rises for steeper sales declines. However, the stickiness drops or is even eliminated in the pessimism years, once again consistent with the results for the recent crisis years.

Table 8: Operating Performance and Analyst Forecast Errors during 1992-2011

All variables are inflation adjusted and measured based on the dollar value of 1994. *Opex* is operating expenses, *NetInc* is net income, and *CashFlow* is operating cash flows. *Revenue*s captures net sales. All four factors are scaled by beginning assets. Analyst forecast errors (AFE) for each firm-year is measured as the (*Actual EPS –Median Forecasted EPS) /Beginning stock price* of all analysts following the firm. The median AFE is computed for each firm in every year. We retrieve analyst annual forecasts issued after the earnings announcement date of prior year and at least 180 days before the forecast period end. *SD<10%* =1 if the sales decline by less than 10% (0 otherwise). *SD10%* =1 if the sales decline by 10% or more but less than 20% (0 otherwise). *SD20%* =1 if the sales decline by more than 20% (0 otherwise). $SD_{i,t}$ ($SU_{i,t}$) is equal to 1 if the sales of firm *i* decreases (increases) from year *t-1* to year *t*, and 0 otherwise. $Pessimism_t$ =1 if the average percentage change in sales over all firms in year *t* is in the bottom third of the sample period (0 otherwise). *AvoidLoss*=1 if earnings of year *t* deflated by beginning market value are between 0 and 0.01 and 0 otherwise. *AvoidED*=1 if the ratio of the change in net income of firm *i* in year *t* deflated by beginning market value is between 0 and 0.01 and 0 otherwise. *LogSize* is the log value of total assets. *Dispersion* is the standard deviation of analyst forecasts, scaled by beginning stock price. *Stdret* is the standard deviation of daily stock returns of the forecasted year. *N_Following* is the number of analysts following the firm within the quarter of forecasts. *Skewness* is the skewness of earnings per share of eight years prior to analyst forecasts. Numbers in parentheses are t-statistics.

	OPEX	NetInc	CashFlow	Analyst Forecast Errors	
Revenue	0.942***	0.045***	0.024***		
	(349.08)	(15.20)	(11.57)		
SD<10%	0.047***	-0.037***	-0.014***	-0.034***	-0.038***
	(9.75)	(-6.74)	(-3.67)	(-13.04)	(-10.39)
SD10%	0.122***	-0.116***	-0.068***	-0.046***	-0.059***
	(15.57)	(-12.92)	(-11.27)	(-10.68)	(-9.00)
SD20%	0.365***	-0.382***	-0.256***	-0.071***	-0.086***
	(34.69)	(-30.30)	(-31.17)	(-11.90)	(-9.65)
$Pessimism_t$	0.001	0.001	-0.025***		-0.025***
	(0.16)	(0.12)	(-4.08)		(-5.75)
$SD<10\%*Pessimism_t$	-0.037***	0.032***	0.019***		0.011**
	(-5.29)	(4.07)	(3.68)		(2.12)
$SD10\%*Pessimism_t$	-0.056***	0.050***	0.034***		0.028***
	(-5.51)	(4.24)	(4.42)		(3.21)
$SD20\%*Pessimism_t$	-0.113***	0.107***	0.095***		0.033***
	(-9.19)	(7.20)	(10.10)		(3.06)
*AvoidLoss*SU*	-0.060***	0.086***	0.046***	0.005	0.002
	(-15.68)	(24.79)	(10.74)	(1.56)	(0.37)
*AvoidLoss*SD*	-0.159***	0.214***	0.110***	0.034***	0.042***
	(-15.58)	(24.49)	(14.79)	(7.67)	(6.21)
*AvoidED*SU*	0.004	0.035***	0.007	0.017***	0.019***
	(0.79)	(6.98)	(1.24)	(4.54)	(4.17)
*AvoidED*SD*	-0.052***	0.115***	0.042***	0.000	0.030
	(-3.59)	(7.22)	(3.35)	(0.00)	(1.45)
$AvoidLoss*SU*Pessimism_t$	0.010*	0.003	0.000		0.012*
	(1.72)	(0.64)	(0.07)		(1.94)
$AvoidLoss*SD*Pessimism_t$	0.020*	-0.022*	-0.015		-0.019**
	(1.68)	(-1.93)	(-1.54)		(-2.19)
$AvoidED*SU*Pessimism_t$	0.013	-0.007	-0.012		-0.006
	(1.38)	(-0.79)	(-1.12)		(-0.79)
$AvoidED*SD*Pessimism_t$	0.021	-0.008	-0.004		-0.070
	(1.11)	(-0.37)	(-0.27)		(-1.03)
LogSize				-0.006***	-0.006***
				(-6.85)	(-7.11)
Dispersion				-0.082	-0.082
				(-1.11)	(-1.11)
Stdret				-2.409***	-2.423***
				(-19.07)	(-19.19)
N_Following				0.001***	0.001***
				(11.69)	(11.79)
Skewness				0.000	0.001
				(0.60)	(0.67)
Constant	0.055***	-0.098***	0.015***	0.071***	0.096***
	(7.45)	(-11.67)	(2.92)	(9.85)	(11.72)
S.E. Clustered by Firm	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adj R2	0.81	0.06	0.05	0.12	0.12
N	115406	115406	115406	38028	38028

* p<0.10, ** p<0.05, *** p<0.01

In Column 1 of Table 8, the stickiness coefficient is 0.047, on average, when sales decline by less than 10%. It increases to 0.122 for a sales decline of more than 10% but less than 20%. The coefficient further increases to 0.365 when sales decline by more than 20%. When pessimism prevails (when the average percentage change in sales over all firms is in the bottom third over 20 years), the stickiness coefficient decreases, on average, by -0.037 to 0.010 when sales decline by less than 10%. When sales decline by more than 10% but less than 20% (by more than 20%), the stickiness coefficient decreases by -0.056 (-0.113) to 0.066 (0.252) compared with 0.122 (0.365) when pessimism does not prevail (when the average percentage change in sales over all firms is high). The effect of prevailing pessimism on earnings and operating cash flow is consistent with that on cost stickiness. Firms experiencing a sales decline exhibit relatively lower earnings and operating cash flow due to sticky costs. When sales decline by less than 10%, the coefficient on the sales-down dummy is -0.037 for earnings and -0.014 for operating cash flows. When sales decline by more than 20%, the coefficient on the sales-down dummy for earnings (operating cash flow) is -0.382 (-0.256) at the 1% significance level, as cost stickiness increases significantly. However, when the average percentage changes in sales is in the bottom third over 20 years, the reduction in cost stickiness results in an increase in both earnings and operating cash flows for firms experiencing a sales decline. Also of interest is the fact that earnings management to avoid reporting losses or earnings declines is generally unaffected by pessimism. The empirical evidence confirms that managers' decisions to maintain excess capacity in the face of a sales decline are determined by prevailing pessimism.

The results of Column 4 and 5 suggest that analysts do not notice this subtle difference. From 1992 to 2011, the earnings surprise (actual minus forecast earnings) for a sales-down firm is predictably even more negative than for sales-up firms, and the magnitude of this effect is larger for a larger decline in sales. This negative effect is attenuated when pessimism prevails, as cost stickiness is reduced during those years. The effect is highly significant for the sample period of 1992 to 2011, even after controlling for other factors documented in prior literature to affect earnings surprises. As shown in Column 5, the coefficient on the sales-down dummy is -0.038 when sales decline by less than 10% and -0.059 (-0.086) when sales decline by more than 10% but less than 20% (more than 20%). Consistent with the fact that analysts do not notice the effect of cost stickiness on earnings, it is not surprising to see analyst forecast errors become more positive as pessimism prevails. Under market pessimism, firms experiencing a sales decline tend to report higher earnings due to reduced cost stickiness than in normal periods. The coefficient on the sales-down dummy increases by 0.011 when sales decline by less than 10% and by 0.028 (0.033) when sales decline by more than 10% but less than 20% (more than 20%).

CHAPTER 4

LOAN FINANCING AND REAL COST MANAGEMENT

4.1 Research Hypotheses

Predictions on whether and how managers manage financial performance are ambiguous for loan financing. On one hand, financial information plays an important role in loan financing, and managers have incentives to engage in income-increasing management. Banks rely on financial reports to evaluate firms' credit risk and construct financial covenants based on the information. Better financial performance increases the likelihood of loan application approval and can help managers negotiate more favorable contract terms, such as lower interest rates or less restrictive covenants. On the other hand, if banks can see through the manipulation, actions related to financial performance management could even have an adverse impact on a firm's likelihood of receiving loans and getting the desirable contract terms of loans approved. However, as long as banks cannot fully disentangle inflated performance from a firm's true economic performance, managers will still have incentives to engage in performance management since the costs of a loan usually are lower than those of other financing options, especially for firms with a high degree of information asymmetry (e.g. Bolton and Freixas, 2000).

Managers can manage earnings through accruals and real activities. Real activity management includes revenue manipulation, cost management, and asset sales (e.g. Roychowdhury, 2006; Cohen and Zarowin, 2010). These actions affect both earnings and cash flow. Accrual management affects only earnings and has no cash flow effects. Accrual management alone is unlikely to have a significant economic impact on loan financing. Since banks extensively use earnings and cash flow together to construct

financial covenants (e.g. Smith, 1993; Demerjian, 2011), they are unlikely to be fooled by inflated earnings without sufficient cash flow. In addition, accrual management is subject to the constraints of U.S. GAAP and can only improve financial performance to a limited extent. Graham et al. (2005) show that CEOs prefer real activity manipulation even if such management may have an adverse impact on firms' future performance.

Compared with other types of cost management, revenue manipulation and asset sales are also less likely to equally effective. For revenue manipulation, although managers may be able to temporarily boost revenues by offering special discounts or extending credit to customers, the outcomes of such decisions are not fully under the control of managers and not sustainable after financing. Moreover, gains from abnormal sales of assets are very easy for banks to identify since (1) they are recognized as a separate item in income statements and (2) banks can require detailed information on the sold assets to evaluate the nature of such transactions. In contrast, cost management is completely under managerial discretion and more difficult for banks to detect because it is costly for banks to become familiar with a firm's complex operating practices and judge whether resources are allocated efficiently. Moreover, even if banks can identify unusual cost reductions, they might not necessarily interpret it as a signal of earnings management but of managerial efforts to improve cost efficiency.

Given the fact that banks have much greater access to firms' private information, I expect that cost management is likely to be the most feasible and least risky way if managers have incentives to improve short-term financial performance before financing.

H1: Firms taking loans exhibit lower expenses than firms with similar characteristics before financing.

Cost management is not necessarily symmetric. Asymmetric cost theory suggests that managers, on average, tend to keep capacity slack when sales fall and costs appear to be sticky. Cutting down on slack resources will lead to higher reported earnings and operating cash flow in the short run. Recent studies by Kama and Weiss (2012) and Dierynck et al. (2012) show that, when managers have incentives to avoid reporting losses and meet analyst forecasts, they will reduce the degree of cost stickiness.

I expect that cost management by reducing the stickiness is less likely to be detected or viewed as performance manipulation by banks because there is no model to determine the optimal level of slack resources, especially for outsiders. Since cost stickiness primarily results from managers' tendency to keep slack resources when sales fall, managers can easily justify a reduction in slack resources as an improvement in cost efficiency. Banks' greater access to private information is not necessarily sufficient to detect such cost management because banks still need to rely on the information (including the potential capacity for expected sales) provided by managers to evaluate a firm's operating efficiency. Managers can withhold critical information regarding firms' potential capacity or make it difficult for lenders to infer the level of slack resources.

Moreover, even if banks can fully estimate the optimal level of slack resources, they do not necessarily prefer a high degree of cost stickiness given agency conflicts between shareholders and debt holders. A high degree of cost stickiness compromises a firm' cash flow as sales fall in the current period but benefits it when sales rebound in the future. As lenders primarily are more concerned about firms' downside risk than upside risk, they are likely to prefer that firms have sufficient cash liquidity at the expense of

limited capacity in the future. Based on the aforementioned reasons, I expect that firms appear to have a lower degree of cost stickiness before loan financing.

H2: Firms taking loans reduce cost stickiness before financing.

Excessively cutting back on slack resources disrupts firms' operating activity and could have negative consequences for firms' future performance (see Gunny, 2005; Graham et al. 2005). Once firms obtain loan financing, managers' incentives to improve short-term performance by distorting operating decisions will drop. Hence, managers are likely to reverse their cost decisions and gradually restore capacity. On one hand, managers' interests are in line with those of shareholders since their compensation and reputation are tied to the firms' long-term performance. If the reduction in slack resources significantly deviates from the efficient level, they will be less willing to cut back on any resources after financing. On the other hand, as downside risk is shared with debt holders, managers are more likely to maintain capacity to prepare for upside risk (e.g. sales rebound). As a result, firms are likely to exhibit an increase in the degree of cost stickiness during the post-financing period.

H3a: Firms are more likely to increase cost stickiness when they obtain loan financing.

However, reversion in the degree of cost decisions is subject to covenant restrictions. Loan contracts usually include financial covenants, which stipulate the acceptable firm financial performance. Financial covenants can be constructed based on financial ratios that are either earnings-related (e.g. interest coverage or debt-to-EBITDA ratio) or non-earnings-related (e.g. leverage or current ratio). If firms fail to meet the

requirements, lenders will have control rights over the firms' business decisions (see Bolton and Dewatripont, 2005). Creditor intervention could result in the early termination of positive net present value projects and the liquidation of assets (see Thadden, 1995; Nini, Smith and Sufi, 2010). As managers are very likely to be forced to cut down on capacity and resources when lenders intervene, they are better off managing the capacity level to avoid covenant violation and lender intervention. Beneish and Press (1993) show that managers engage in earnings management to avoid violating covenants. For example, as discussed in Dierynck et al. (2012), one of the two main reasons that managers of Belgian firms reduce cost stickiness is to avoid bank intervention.[13]

Therefore, I expect that the higher the percentage of financial covenants based on earnings is, the greater the banks' monitoring intensity on earnings and, therefore, the pressure on managers to manage costs and meet the requirement thresholds will be. Reversion in the cost level after financing will be attenuated by the covenant intensity on earnings.

H3b: The cost level after financing is negatively associated with the percentage of financial covenants that are based on earnings.

4.2 Research Design and Data

4.2.1 Sample Selection

The information on loan financing deals is collected from Dealscan. I focus on the deals made between 1996 and 2008 for public firms, as the coverage of Dealscan

[13] Belgian firms are heavily bank-oriented, and reporting losses in two consecutive years will often lead to bank intervention.

becomes much more complete since the mid-1990s.[14] The total number of deals is 37,791. I exclude loan deals with a maturity shorter than three years. This is because (1) the costs of deviating from normal business practices are likely to be higher than the benefits of acquiring a short-term loan and (2) banks face a much lower risk for short-term loans, and improvement in firms' financial performance may not play a very important role in loan approval. The remaining number of deals is 17,008. I further merge information from the Dealscan and COMPUSTAT database, so the number of deals with complete financial information is 10,605, among which 7,515 deals include at least one financial covenant, as reported by Dealscan. Table 9 reports the sample selection process. I focus on this set of deals because Drucker and Puri (2009) show that the information on financial covenants for some of these loan deals is not tracked by Dealscan. I repeat the tests including deals with no financial covenants for robustness checks.

Table 9: Sample Selection of Loan Deals

	No. of Loan Deals
Loan Deals for Public Firms in Dealscan (1996-2008)	37791
substract deals with a maturity shorter than 3 years	17008
substract deals with incomplete financial information	10605
Deals with at least one financial covenant (out of 10605)	7515

To examine the cross-sectional and time-series variation in the cost behavior of loan sample firms, I construct a control sample of firms matched by the propensity of loan financing. For each firm-loan observation, I require the difference in propensity

[14] One of the reasons is that firms have been required to file electronically through EDGAR since 1996, and loan contract information has become easier to collect.

scores between firms with loan financing and control firms to be less than 0.01. I merge the loan initiation information from Dealscan with COMPUSTAT's financial data, excluding financial firms (SIC codes 6000-6999). I estimate a firm's propensity to take loan financing in each year by the following logistic model:

$$P(Loan_{it}) = \beta_0 + \beta_1 logSize_{it} + \beta_2 MTB_{it} + \beta_3 Leverage_{it} + \beta_4 ZSCORE_{it} + \beta_5 ROA_{it} + \beta_6 CAPEX_{it} + \beta_7 PP\&E_{it} + Industry\ Fixed\ Effects + Year\ Fixed\ Effects + \varepsilon_{it}$$

I control for firm size, investment opportunities (measured by market-to-book, *MTB*), financial risk (measured by leverage and *ZSCORE*), performance (measured by return on assets, *ROA*), and capital investment (measured by capital expenditure, *CAPEX*, and net plant, property, and equipment, *PP&E*). Prior literature identifies these factors as common determinants of financing decisions (e.g. Shyam-Sunder and Myers, 1999; Baker and Wurgler, 2002; Frank and Goyal, 2009).

For each firm-loan observation, I select the control firm that has the closest propensity score but no loan financing within two years of the loan initiation year of the treatment firm. The final loan sample includes 4,298 unique firms, and the control sample includes 3,219 unique firms. For each firm-loan year, I extract the financial data from two years preceding the deal to two years after financing. I use the same duration for the matched control firms. I truncate the top and bottom 1% of observations for all variables.

4.2.2 Research Design

I apply a difference-in-difference research design to examine cross-sectional and time-series variation in cost behavior before and after financing on a pooled sample of loan financing firms and propensity-matched control firms. I build on the modified level regression of cost stickiness from Banker, Basu, Byzalov, and Chen (2012). I do not use

the original change regression in ABJ (2003) since the ABJ model cannot be directly applied in estimating the level of costs. For example, if sales first increase by one unit and then decrease by one unit, the ABJ stickiness model implies that the level of costs should increase—even though sales will return to the original level. Similarly, if sales first decrease by one unit and then increase by one unit, the ABJ stickiness model implies that the level of costs should increase (see Banker, Basu and Byzalov, 2012). The main model is specified as follows:

$$
\begin{aligned}
OPEX_{i,t} = {} & \beta_0 + \beta_1 Revenue_{i,t} + \beta_2 Loan + + \beta_3 SD_{i,t} + \beta_4 Loan * SD_{i,t} + \beta_5 PostLoan + \beta_6 Loan * PostLoan \\
& + \beta_7 Loan * PostLoan * SD_{i,t} + \beta_8 EarningsCov\%_{i,t} * Loan * PostLoan \\
& + \beta_9 EarningsCov\%_{i,t} * Loan * PostLoan * SD_{i,t} + \beta_{10} Log(LoanAmt_{i,t}/Equity_{i,t-1}) \\
& + \beta_{11} Secure * PostLoan + \beta_{12} Loan * PriorLoan + \beta_{13} Loan * PostLoan * FutureLoan + \beta_{14} PreBond \\
& + \beta_{15} PostBond + \beta_{16} AvoidLoss_{i,t} + \beta_{17} AvoidLoss_{i,t} * SD_{i,t} + \beta_{18} AvoidED_{i,t} + \beta_{19} AvoidED_{i,t} * SD_{i,t} \\
& + \beta_{20} 1/Assets_{i,t-1} + \beta_{21} Funds_{i,t} + \varepsilon_{i,t},
\end{aligned}
$$

where *OPEX* is the operating expenses, excluding depreciation and amortization, and *Revenue* $_{i,t}$ *is firm i's total sales in year t,* both scaled by the beginning total assets. *Loan* = 1 if a firm is from the loan sample (treatment group) and 0 otherwise. *PriorLoan* = 1 if a firm has other loan financing within two years prior to the data year and 0 otherwise. $SD_{i,t}$ = 1 if deflated sales of firm *i* decreased from the prior year. *PostLoan* = 1 if the data year is later than the loan initiation year and 0 otherwise. *FutureLoan* = 1 if a firm has other loan financing within two years after the data year and 0 otherwise. *PriorLoan* and *FutureLoan* control for managers' incentives to manage costs when a firm has frequent loan financing plans. $EarningsCov\%_{i,t}$ is the percentage of financial covenants that are earnings-related for firm *i* at any year *t*. $LoanAmt_{i,t}$ = the total loan amount raised by firm *i in year t.* $Equity_{i,t}$ = the book equity of firm *i in year t.* I control for loan size relative to the beginning book equity since managers have incentives to show better financial performance when they plan to take larger loans. The potential benefits are higher for

more material financing. *Secure = 1* if the loan is secured with collateral. I expect the coefficient on *Secure* to be positive. However, there could be two interpretations. On one hand, if a firm can provide collateral on loans, banks are likely to have fewer requirements for firms' financial performance, so managers have fewer incentives to manage costs downward. On the other hand, banks are more likely to require collateral if a firm reports a higher cost level. The positive association between cost level and collateral cannot suggest any causality between the two.

PreBond = 1 if the data year is within two years before a firm issues a bond (including the issuance year) and 0 otherwise. *PostBond* = 1 if the data year is within two years after a firm issues a bond (excluding the issuance year) and 0 otherwise. Bond financing is another common type of debt financing, for which the monitoring intensity is relatively low both before and after financing. In contrast to private lenders, public lenders have higher requirements for firms' financial performance since they hold less information about firms and have weaker control rights. Therefore, managers may have also have incentives to manage earnings. $AvoidLoss_{i,t}$ = 1 if the earnings per share of firm *i* deflated by the beginning price of year *t* are between 0 and 0.01 and 0 otherwise. $AvoidED_{i,t}$ = 1 if the change in earnings per share of firm *i* deflated by the beginning price of year *t* is between 0 and 0.01 and 0 otherwise. I include these two variables to control for the incentives of earnings management documented in prior literature. *Funds* is the sum of the beginning cash holding, net debt issuance, and net equity issuance, and All variables are inflation-adjusted and measured based on the dollar value in 1994.

I am primarily interested in the coefficients on the variables regarding the relative cost behavior between the loan and control firms around the financing period. When the

dependent variable is operating expenses, the coefficients on the indicator of a loan financing firm (*Loan*) and the two-way interaction term of the loan sample firm indicator and the sales-down dummy (*Loan*SD*) are expected to be negative, suggesting that loan sample firms show a lower level of costs before loan financing. The coefficients on the variables indicting cost reversion after financing, *Loan*SD*PostLoan* and *EarningsCov%*Loan*PostLoan*SD*, are expected to be positive and negative, respectively. The more positive the coefficient on *Loan*SD*PostLoan* is, the greater the reversion in the cost stickiness will be.

I do not use traditional real activity management models to estimate abnormal operating activities because funds available for firms' operating activities will significantly change around financing and models based on an average industry-year relation are very likely to contain large measurement errors. Ball and Shivakumar (2008) argue that external financing is by definition associated with changes in net operating assets. Shan, Taylor, and Walter (2012) show that accrual management models contain significant errors without controlling for financing activities.

The main advantage of the difference-in-difference research design is that it captures both cross-sectional and time-series variation in operating performance, while controlling for the funds available before and after financing in one step. In contrast to prior models, which estimate abnormal performance in two steps (i.e., constructing an expectation model and then examining the residual of the model), this approach mitigates measurement errors due to major corporate events by controlling for concurrent funds available for operating activities. It also control for the incentives on operating decisions associated with loan refinancing and bond issuances, which are important features of debt

financing that could affect earnings management incentives. In addition, examining both cross-sectional and time-series variation in operating performance in one step also improves estimation efficiency (see Hayashi, 2000).

4.3 Results and Robustness Checks

4.3.1 Descriptive Statistics

Table 10 reports descriptive statistics for the loan sample and control samples matched by the propensity to take loans. The average of propensity scores is 0.004. Except for the dummy variables, all the other variables are scaled by the beginning assets and inflation-adjusted. Compared with the propensity-matched control sample, firms with loan financing have better operating performance in terms of revenues, operating expenses, earnings, and operating cash flow. The differences in performance are consistent with the predictions that firms need to exhibit better performance to raise private debts. The percentages of loan financing firms with sales decreases and approaching losses are also lower. In addition, firms with loan financing have comparable investment levels to those of control firms but with lower funds available. Insufficient funds are likely to be one of the reasons that firms take loans.

Table 10: Sample Statistics

All the variables including *Revenues* are scaled by beginning assets. All variables are inflation adjusted and measured based on the value of dollar in 1994. $SD_{i,t}$=1 if deflated sales of firm *i* decreased in year *t*, and 0 otherwise. OPEX is operating expenses excluding depreciation and amortization. COGS is cost of goods sold and SG&A, selling, general and administrative expenses. *EARNINGS* is the earnings before extraordinary items. *CFO* is operating cash flows, excluding cash flow from extraordinary items. *TAC* is the total accrual level. Funds is the sum of beginning cash holding, net debt issuance and net equity issuance. Investment is the sum of capital expenditure, acquisition expenses, increases in investment minus the total of sale of investment and sale of property, plant and equipment. *AvoidLoss*=1 if the earnings per share of firm *i* in year *t* deflated by beginning price are between 0 and 0.01 and 0 otherwise. *AvoidED* =1 if the change in earnings per share of firm *i* in year *t* deflated by beginning price is between 0 and 0.01 and 0 otherwise.

	Loan Sample Firms		Control Sample Firms	
Average Propensity Scores: 0.004				
Variable	**Median**	**Mean**	**Median**	**Mean**
Revenues	1.213	1.423	1.003	1.209
OPEX	1.062	1.280	0.920	1.165
EARNINGS	0.044	0.021	0.028	-0.061
CFO	0.093	0.090	0.073	0.027
TAC	-0.057	-0.069	-0.058	-0.088
Funds	0.105	0.237	0.206	0.510
SD	0.000	0.308	0.000	0.349
AvoidLoss	0.000	0.009	0.000	0.014
AvoidED	0.000	0.006	0.000	0.017

3.3.2 Empirical Results

Table 11 reports the results on how the relation between operating expenses and sales differs between firms taking loans and control firms before and after loan financing. Columns 1 and 2 report the results with different control variables. The results are very similar under the two alternative models. The coefficients on *Loan* and *Loan*SD* are both significantly negative at the 1% level for the full sample and the sub-sample. That is, during the pre-financing period, firms taking loans show lower operating expenses than control firms. When loan financing firms have sales decreases, they cut expenses to an even greater extent. Consistent with asymmetric cost literature, the coefficient on the sales-down dummy, *SD*, is significantly positive at the 1% significance level.

The results concerning cost behavior after financing show that loan sample firms exhibit a significant reversion in cost stickiness. As shown in Column 2, the coefficient on *Loan*PostLoan*SD* is 0.019 at 5% significance level. Loan sample firms with sales-up do not show significant increases in costs relative to control firms. Moreover, the cost level after financing is negatively related to the percentage of financial covenants that are earnings-related. The higher the percentage is, the stronger the monitoring intensity on

earnings is. The coefficients on *EarningsCov%*Loan*PostLoan* and *EarningsCov%*Loan*PostLoan*SD* are -0.028 and -0.023. This evidence suggests that managers still have incentives to manage costs downward under the pressure of meeting covenant requirements.

In addition, results on loan refinancing and bond issuances indicators are also consistent with managers engage in cost management for financing. The coefficients on *Loan*PostLoan*FutureLoan* and *PreBond* are -0.027 and -0.023 at 1% significance level, respectively. This result suggests that managers tend to keep costs low if they plan to refinance through loans or issue bonds within two years. The coefficients *Loan*PriorLoan* and *PostBond* are insignificant, suggesting that prior loan financing or bond issuances have no additional effects on current cost management.[15]

Table 11: Cross-Sectional and Time Series Variations in Operating Expenses

This table shows the results of difference-in-difference tests. The treatment group is the firms with loan financing and control firms are matched by the propensity to take loan financing as of the year prior to the loan initiation year of the treatment firm. For each firm-loan observation, I obtain the financial data of the treatment firm two years before and after the loan initiation year. The financial data of matched control firms is from the same period. *OPEX* is operating expenses excluding depreciation and amortization and *Revenue* $_{i,t}$ *is the firm i's total sales in year t*, both scaled by beginning total assets. *Loan*=1 if a firm is from loan sample (treatment group) and 0 otherwise. $SD_{i,t}$=1 if deflated sales of firm *i* decreased from prior year. *PostLoan*=1 if the data year is later than the loan initiation year and 0 otherwise. *EarningsCov%*$_{i,t}$ is the percentage of financial covenants that are earnings related for firm *i* at any year *t*. LoanAmt$_{i,t}$ = the total loan amount raised by firm *i in year t.* Equity$_{i,t}$ = book equity of firm *i in year t. Secure=1 if the loan is secured with collateral. PriorLoan*=1 if a firm has other loan financing within two years prior to the data year and 0 otherwise. *FutureLoan*=1 if a firm has other loan financing within two years after the data year and 0 otherwise. *PreBond* =1 if the data year is within two years before a firm issues bond (including the issuance year) and 0 otherwise. *PostBond*=1 the data year is within two years after a firm issues bond (excluding the issuance year) and 0 otherwise. *AvoidLoss*$_{i,t}$=1 if the earnings per share of firm i deflated by beginning price of year t are between 0 and 0.01 and 0 otherwise. *AvoidED*$_{i,t}$ =1 if the change in earnings per share of firm i deflated by beginning price of year t is between 0 and 0.01 and 0 otherwise. Funds is the sum of beginning cash holding, net debt issuance and net equity issuance, scaled by beginning assets. All variables are inflation adjusted and measured based on the dollar value in 1994.

[15] I also control for lagged sales and investment activities (measured as the sum of capital expenditures, acquisition expenses, and increases in investment minus the total for sales of investment and sales of property, plant, and equipment) for robustness checks and results remain the same.

	Predicted Sign	OPEX	OPEX
Revenue		0.961***	0.957***
		(420.30)	(387.17)
Loan	**H1:** -	-0.064***	-0.049***
		(-11.31)	(-8.34)
SD		0.085***	0.083***
		(17.74)	(16.12)
*Loan*SD*	**H2:** -	-0.012**	-0.011**
		(-2.35)	(-1.99)
PostLoan		0.009***	0.011***
		(2.69)	(3.02)
*Loan*PostLoan*		0.012*	0.008
		(1.86)	(1.21)
*Loan*PostLoan*SD*	**H3a:** +	0.020***	0.019**
		(2.83)	(2.53)
*EarningsCov%*Loan*PostLoan*	**H3b:** -	-0.025***	-0.028***
		(-3.30)	(-3.44)
*EarningsCov%*Loan*PostLoan*SD*	**H3b:** -	-0.024***	-0.023**
		(-2.67)	(-2.38)
Log(LoanAmt$_{i,t}$/Equity$_{i,t-1}$)		-0.012***	-0.011***
		(-5.74)	(-5.06)
*Secure*Post*		0.035***	0.030***
		(10.14)	(8.21)
*Loan*PriorLoan*		0.003	0.003
		(0.96)	(0.90)
*Loan*PostLoan*FutureLoan*		-0.034***	-0.027***
		(-9.94)	(-7.53)
PreBond			-0.023***
			(-6.97)
PostBond			0.002
			(0.72)
AvoidLoss			0.011**
			(2.28)
*AvoidLoss*SD*			-0.035***
			(-5.57)
AvoidED			0.020**
			(2.37)
*AvoidED*SD*			-0.004
			(-0.22)
1/Assets$_{i,t-1}$			0.349***
			(5.20)
Funds			-0.002**
			(-2.07)
Constant		-0.061***	-0.061***
		(-7.52)	(-6.93)
S.E. Clustered by Firm		Yes	Yes
Year Fixed Effects		Yes	Yes
Adj. R2		0.97	0.97
N		48185	42037

* p<0.10, ** p<0.05, *** p<0.01

Table 12 shows the differences in earnings, operating cash flow, and total accruals between loan financing firms and control firms. When loan financing firms have sales increases, their earnings are significantly higher than those in the control sample. The coefficients on the dummy variable, *Loan*, are 0.034, 0.039, and -0.006 when the dependent variables are earnings, operating cash flow, and total accruals, respectively. That is, an increase in earnings is associated with a comparable increase in operating cash flow and a small decrease in total accrual. When loan financing firms have sales decreases, their earnings, operating cash flow and total accruals are significantly higher than those in the control samples. The coefficients on the interaction term, *Loan*SD*, are 0.017, 0.009, and 0.008 when the dependent variables are earnings, operating cash flow, and total accruals, respectively. The coefficient on *Loan*SD* when the dependent variable is total accruals is significant, suggesting that there could also be some accrual management for firms taking loan financing with sales decreases.

Moreover, during the post-financing period, earnings and operating cash flow are positively associated with covenant intensity on earnings. The coefficient on total accrual level is insignificant. The evidence suggests that managers consider both earnings and operating cash flow to meet covenant requirements. Accrual management is unlikely to be the primary earnings management strategy.

The coefficients on the interaction terms, *AvoidLoss*SD* and *AvoidED*SD*, are significantly positive, results that are consistent with the literature suggesting that managers' managerial incentives to avoid reporting losses and earnings declines by reducing the degree of cost stickiness, leading to the reporting of higher earnings.

Table 12: Cross-Sectional and Time Series Variations in Earnings, Cash Flow and Accruals

This table shows the results of difference-in-difference tests for **loan deals with maturity greater than three years and with at least one financial covenant.** The treatment group is the firms with loan financing and control firms are matched by the propensity to take loan financing as of the year prior to the loan initiation year of the treatment firm. For each firm-loan observation, I obtain the financial data of the treatment firm two years before and after the loan initiation year. The financial data of matched control firms is from the same period. OPER stands for the indicators of operating performance, EARNINGS, CFO and TAC. *EARNINGS* is the earnings before extraordinary items. *CFO* and *TAC* stand for operating cash flows and the total accrual level, excluding extraordinary items. These variables as well as *Revenues* are scaled by beginning assets. *Loan*=1 if a firm is from loan sample (treatment group) and 0 otherwise. $SD_{i,t}$=1 if deflated sales of firm *i* decreased from prior year. *PostLoan*=1 if the data year is later than the loan initiation year and 0 otherwise. $EarningsCov\%_{i,t}$ is the percentage of financial covenants that are earnings related for firm *i* at any year *t*. $LoanAmt_{i,t}$ = the total loan amount raised by firm *i in year t.* $Equity_{i,t}$ = book equity of firm *i in year t. Secure=1 if the loan is secured with collateral. PriorLoan*=1 if a firm has other loan financing within two years prior to the data year and 0 otherwise. *FutureLoan*=1 if a firm has other loan financing within two years after the data year and 0 otherwise. *PreBond* =1 if the data year is within two years before a firm issues bond (including the issuance year) and 0 otherwise. *PostBond*=1 the data year is within two years after a firm issues bond (excluding the issuance year) and 0 otherwise. $AvoidLoss_{i,t}$=1 if the earnings per share of firm i deflated by beginning price of year t are between 0 and 0.01 and 0 otherwise. $AvoidED_{i,t}$ =1 if the change in earnings per share of firm i deflated by beginning price of year t is between 0 and 0.01 and 0 otherwise. Funds is the sum of beginning cash holding, net debt issuance and net equity issuance, scaled by beginning assets. All variables are inflation adjusted and measured based on the dollar value in 1994.

	Predicted Sign on Earnings	EARNINGS	CFO	TAC
Revenue		0.036***	0.014***	0.022***
		(19.47)	(7.73)	(16.65)
Loan	+	0.034***	0.039***	-0.006*
		(6.02)	(7.47)	(-1.67)
SD		-0.068***	-0.040***	-0.028***
		(-13.11)	(-8.96)	(-9.10)
*Loan*SD*	+	0.017***	0.009*	0.008**
		(3.12)	(1.92)	(2.12)
PostLoan		-0.006	-0.004	-0.002
		(-1.55)	(-1.24)	(-0.72)
*Loan*PostLoan*		0.012*	0.003	0.009*
		(1.91)	(0.46)	(1.90)
*Loan*PostLoan*SD*	-	-0.013	-0.001	-0.012*
		(-1.58)	(-0.14)	(-1.80)
*EarningsCov%*Loan*PostLoan*	+	0.021***	0.018**	0.004
		(3.08)	(2.49)	(0.64)
*EarningsCov%*Loan*PostLoan*SD*		0.000	-0.010	0.010
		(0.01)	(-1.14)	(1.18)
Log(LoanAmt$_{i,t}$/Equity$_{i,t-1}$)		-0.005***	-0.001	-0.004**
		(-2.83)	(-0.65)	(-2.21)
*Secure*Post*		-0.043***	-0.029***	-0.014***
		(-13.87)	(-9.25)	(-5.72)
*Loan*PriorLoan*		0.006*	0.001	0.005**
		(1.92)	(0.19)	(2.15)
*Loan*PostLoan*FutureLoan*		0.013***	0.015***	-0.002
		(3.68)	(4.47)	(-0.63)
PreBond		0.014***	0.016***	-0.002
		(5.25)	(5.59)	(-0.93)
PostBond		0.000	-0.006**	0.006***
		(0.17)	(-2.35)	(2.88)
AvoidLoss		-0.003	-0.008	0.005
		(-0.99)	(-1.47)	(0.98)
*AvoidLoss*SD*		0.058***	0.021***	0.037***
		(12.97)	(2.86)	(5.22)
AvoidED		0.000	-0.011	0.012
		(0.02)	(-1.27)	(1.54)
*AvoidED*SD*		0.035***	0.033***	0.002
		(3.03)	(2.83)	(0.16)
1/Assets$_{i,t-1}$		-0.282***	-0.258***	-0.024
		(-3.99)	(-4.19)	(-1.44)
Funds		0.002**	0.002**	0.000
		(2.29)	(2.49)	(0.36)
Constant		-0.028***	0.059***	-0.087***
		(-3.31)	(7.56)	(-16.12)
S.E. Clustered by Firm		Yes	Yes	Yes
Year Fixed Effects		Yes	Yes	Yes
Adj. R2		0.15	0.09	0.06
N		42037	42037	42037

* p<0.10, ** p<0.05, *** p<0.01

4.3.3 Robustness Checks and Additional Discussions

I conduct three sets of robustness tests. First, for every firm-loan observation, we construct a portfolio of control firms, matched by industry, size decile, and market-to-book quintile as of the year before loan initiation.[16] I construct the matching sample in this way so that control firms have similar growth options and investment opportunities as the loan sample firms have. Second, I use the original cost stickiness model by Anderson et al. (2003) and control for GDP growth and managerial incentives to avoid reporting losses and earnings decline and assets and employee intensities.

$$\begin{aligned}\Delta \log OPER_{i,t} = {} & \beta_0 + \beta_1 \Delta \log Revenue_{i.t} + \beta_2 SD_{i,t} * \Delta \log Revenue_{i.t} + \beta_3 Loan * SD_{i,t} * \Delta \log Revenue_{i.t} \\ & + \beta_4 Post * SD_{i,t} * \Delta \log Revenue_{i.t} + \beta_5 Loan * Post * SD_{i,t} * \Delta \log Revenue_{i.t} + \\ & + \beta_6 EarningsCov\%_{i,t} * SD * \Delta \log Revenue_{i.t} + \beta_7 \Delta GDP_t * SD * \Delta \log Revenue_{i.t} \\ & + \beta_8 AvoidLoss_{i,t} * SD * \Delta \log Revenue_{i.t} + \beta_9 AvoidED_{i,t} * SD_{i,t} * \Delta \log Revenue_{i.t} \\ & + \beta_{10} AssetInt * SD_{i,t} * \Delta \log Revenue_{i.t} + \beta_{11} EmpInt * SD_{i,t} * \Delta \log Revenue_{i.t} + \varepsilon_{i,t},\end{aligned}$$

where $\Delta logOPER_{i,t} = log\ (OPER_{i,t}/OPER_{i,t-1})$. $\Delta log\ Revenue_{i,t} = log\ (Revenue_{i,t}/Revenue_{i,t-1})$. *GDPgw* is the GDP growth in year *t*. *AssetInt* is the asset intensity for firm *i* in year *t*, computed as the log of the ratio of total assets to sales. *EmpInt* is the employee intensity for firm *i* in year *t*, computed as the log of the ratio of the number of employees to sales. The results remain the same in both tests.

Third, I also conduct a pseudo-financing test. I shift the loan initiation years by a randomly generated number of years and examine whether the differences in the cost behavior between the loan sample firms and the control firms still exist. However, I do not observe the same patterns with the time window shift.

To compare the results from models proposed in prior literature, I replace the dependent variables with measures of abnormal activities, including four measures

[16] The industry is matched by the first two digits of the SIC code.

defined in prior literature: discretionary accruals, abnormal production level, discretionary expenses, and abnormal gains from the sale of assets. All variables are scaled by the beginning assets. The expected activities are estimated by the following models, estimated by industry and year:

Expected accruals by the modified Jones model (Dechow, Sloan and Sweeney, 1995)

$$\frac{TAC_{it}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{\Delta SALES_{it} - \Delta AR_{i,t}}{Assets_{i,t-1}} + k_3 \frac{PPE_{i,t}}{Assets_{i,t-1}} + \varepsilon_{it}, \quad (1)$$

Expected production level (Roychowdury, 2006)

$$\frac{PROD_{it}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{it}}{Assets_{i,t-1}} + k_3 \frac{\Delta SALES_{it}}{Assets_{i,t-1}} + k_4 \frac{\Delta SALES_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{it}, \quad (2)$$

Expected expenses (Roychowdury, 2006)

$$\frac{DISX_{it}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{i,t}}{Assets_{i,t-1}} + k_3 \frac{\Delta SALES_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{it}, \quad (3)$$

Expected sale of assets (Gunny, 2010)

$$\frac{GAIN_{it}}{Assets_{i,t-1}} = k_0 + k_1 \frac{1}{Assets_{i,t-1}} + k_2 MV_t + k_3 Q_t + k_3 \frac{INTFunds_{it}}{Assets_{i,t-1}} + k_4 \frac{ASALES_{i,t}}{Assets_{i,t-1}} + k_5 \frac{ISALES_{it}}{Assets_{i,t-1}} + \varepsilon_{it}, \quad (4)$$

where *TAC* stands for the total accrual level, excluding extraordinary items. *AR* is accounts receivable. *PPE* is gross property, plant, and equipment. *PROD* is the production costs, defined as the sum of the costs of goods sold and change in inventory during the year. *DISX* is *SG&A* expenses, including research and development and advertising expenses. *Gain* is the income from asset sales, multiplied by -1 (negative for gains and positive for losses, according to COMPUSTAT). *MV* is the natural log of market value. *Q* is Tobin's Q, defined as (market value of equity + book value preferred stock + book value of long-term debt in current liabilities)/total assets. *INTFunds* is the

sum of beginning cash holding, net debt issuance and net equity issuance.[17] *ASALES* is the long-lived assets sales, and *ISALES* is the long-lived investment sales.

I further use three modified models for expected expenses to estimate abnormal accruals and real activities. Following Kothari, Leone and Wasley (2005) and Cohen, Pandit, Wasley and Zach (2011), I estimate the abnormal accruals and real activities using the performance matched approach proposed by these two studies. In addition, I also follow the model by Gunny (2010), who incorporates the asymmetric cost behavior theory in estimating expected *SG&A* expenses

Expected expenses (Gunny, 2010)

$$\frac{Expenses_{it}}{Assets_{i,t-1}} = k_0 + k_1 \frac{1}{Assets_{i,t-1}} + k_2 MV_t + k_3 Q_t + k_3 \frac{INTFunds_{it}}{Assets_{i,t-1}} + k_4 \frac{\Delta SALES_{i,t}}{Assets_{i,t-1}} + k_5 \frac{\Delta SALES_{it}}{Assets_{i,t-1}} * SD + \varepsilon_{it} \quad (5)$$

Banker et al. (2012) suggest that sticky cost theory implies that the level of expenses will be different given the same sales level, depending on whether prior sales are higher or lower than current sales. Interacting sales down dummy with changes in sales ignores the path of sales changes and therefore cannot be used to estimate the level of expected expenses. Given their arguments, I modify Gunny's model as follows:

Expected expenses by the modified Gunny's Model:

$$\frac{Expenses_{it}}{Assets_{i,t-1}} = k_0 + k_1 \frac{1}{Assets_{i,t-1}} + k_2 MV_t + k_3 Q_t + k_3 \frac{INTFunds_{it}}{Assets_{i,t-1}} + k_4 \frac{SALES_{i,t}}{Assets_{i,t-1}} + k_5 \frac{\Delta SALES_{it}}{Assets_{i,t-1}} + k_6 SD + \varepsilon_{it} \quad (6)$$

Roychowdury (2006) uses the lagged sales in the model to estimate the current expenses. However, according to cost stickiness theory, the expected expenses level

[17] The original definition of "*INTFunds*" in Gunny's model is the sum of net income before extraordinary items, R&D expenses, and depreciation and amortization. I use the alternative measure since the sum of cash holding and capital raised through financing activities is a direct measure of internal funds available for operating and investment activities. The measure is commonly used in the literation on corporate financing polices.

should be largely determined by concurrent sales and whether sales increase or decrease from year *t-1* to year *t*. Using only the information of past sales in the regression cannot capture the non-linear relation between expenses and sales. To better compare with the results by the model in this paper, I modify Roychowdury's model to incorporate the cost stickiness effect and estimate the performance matched abnormal expenses, following Cohen et al. (2011).

Expected expenses by the modified Roychowdury's Model:

$$\frac{DISX_{it}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{i,t}}{Assets_{i,t-1}} + k_3 SD + \varepsilon_{it} . \quad (7)$$

Panel A of Table 13 reports the average abnormal accruals and real activities from year -2 to year +2 for loan financing firms by models (1) to (4). Abnormal accruals and real activities are measured as the actual levels minus the expected levels. Discretionary accruals are significantly positive around financing and the magnitude is lower after financing than prior to financing. Discretionary expenses, abnormal production and abnormal gains from asset sales are all significantly negative. Panel B of Table 13 reports the average abnormal accruals and real activities that are based on performance matching. In contrast, discretionary accruals are significantly negative around financing and become more negative after financing than prior to financing. This result is similar to the results on abnormal accruals around IPO by Ball and Shivakumar (2008), who show that equity financing firms report more conservatively. Discretionary expenses are still significantly negative, while abnormal production is significantly positive since the financing year. These results are consistent with cost management that managers reduce discretionary expenses and overproduce to lower costs of goods sold. In addition, abnormal gains from asset sales are insignificant from zero.

Panel C of Table 13 reports the average abnormal expenses that are based on alternative modified models. Although the magnitude of abnormal expenses varies under different models, average abnormal expenses are all negative. That is, actual expenses are significantly lower than expected levels under various models. Moreover, the time series variation of abnormal expenses follows a similar pattern across the models. That is, abnormal expenses become more negative as a firm approaches financing year and less negative once it obtains the loan. These results are consistent with the expectation that earnings management incentives drop once a firm obtains the external financing.

Overall results from prior models and the modified models support my predictions that managers primarily engage in cost management for loan financing but not accrual management or asset sales.

Table 13: Abnormal Operating Activities from Prior Research

Abnormal_Activities include four measures defined in prior literature: discretionary accruals, abnormal production level, discretionary expenses and abnormal gains from the sale of assets. All variables are scaled by beginning assets. Expected activities are estimated by the following models, estimated by industry and year. *TAC* stands for the total accrual level, excluding extraordinary items. *AR* is accounts receivable. *PPE* is gross property, plant, and equipment. *PROD* is the production costs, defined as the sum of the costs of goods sold and change in inventory during the year. *DISX* is *SG&A* expenses, including research and development and advertising expenses. *Gain* is the income from asset sales, multiplied by -1 (negative for gains and positive for losses, according to COMPUSTAT). *MV* is the natural log of market value. *Q* is Tobin's Q, defined as (market value of equity + book value preferred stock + book value of long-term debt in current liabilities)/total assets. *INTFunds* is the sum of beginning cash holding, net debt issuance and net equity issuance. *ASALES* is the long-lived assets sales, and *ISALES* is the long-lived investment sales.

Panel A Abnormal Activities for Loan Sample Firms by Model (1) to (4)

	Year -2	Year -1	Year 0	Year+1	Year +2
Discretionary Accrual	**0.027**	**0.030**	**0.026**	**0.024**	**0.024**
t-test: μ=0	*21.07***	*24.14***	*20.89***	*19.27***	*18.88***
Discretionary Expenses	**-0.101**	**-0.102**	**-0.100**	**-0.111**	**-0.121**
t-test: μ=0	*-38.74***	*-40.36***	*-39.63***	*-44.2***	*-47.9***
Abnormal Production	**-0.013**	**-0.012**	**-0.004**	**-0.007**	**-0.004**
t-test: μ=0	*-5.32***	*-4.9***	*-1.62*	*-3.26***	*-1.71**
Abnormal Asset Sales	**-0.0004**	**-0.0004**	**-0.0003**	**-0.0004**	**-0.0004**
t-test: μ=0	*-6.05***	*-6.37***	*-3.54***	*-5.17***	*-5.00***

Panel B Performance Matched Abnormal Activities for Loan Sample Firms

	Year -2	Year -1	Year 0	Year+1	Year +2
Discretionary Accrual	**-0.014**	**-0.011**	**-0.015**	**-0.016**	**-0.016**
t-test: μ=0	*-8.41***	*-6.62***	*-9.31***	*-9.76***	*-10.31***
Discretionary Expenses	**-0.004**	**-0.014**	**-0.009**	**-0.026**	**-0.030**
t-test: μ=0	*-0.76*	*-2.71***	*-1.87**	*-5.32***	*-5.9***
Abnormal Production	**0.004**	**0.007**	**0.017**	**0.015**	**0.024**
t-test: μ=0	*0.71*	*1.36*	*3.17***	*2.74***	*4.55***
Abnormal Asset Sales	**0.0002**	**0.0000**	**-0.0001**	**-0.0001**	**0.0000**
t-test: μ=0	*0.67*	*-0.01*	*-0.33*	*-0.59*	*0.03*

Panel C Abnormal Activities for Loan Sample Firms by Alternative Models

	Year -2	Year -1	Year 0	Year+1	Year +2
Discretionary Expenses (Gunny's Model)	**-0.001**	**-0.001**	**-0.009**	**-0.001**	**0.006**
t-test: μ=0	*-0.45*	*-0.42*	*-3.74***	*-0.63*	*2.43***
Discretionary Expenses (Modified Gunny's Model)	**-0.011**	**-0.012**	**-0.020**	**-0.007**	**-0.005**
t-test: μ=0	*-4.93***	*-5.65***	*-9.08***	*-3.26***	*-2.45***
Discretionary Expenses (Modified Roychowdury's Model Matched by Performance)	**-0.004**	**-0.009**	**-0.018**	**-0.021**	**-0.016**
t-test: μ=0	*-1.01*	*-2.06***	*-4.27***	*-4.9***	*-3.7***

CHAPTER 5

CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

5.1 Conclusions

In the first study, I provide evidence regarding how cost behavior is driven by managers' deliberate decisions and how that relationship changes with economic conditions. Recent research on asymmetric cost behavior shows that resource adjustments are affected by managers' assessments of future prospects. For example, the world economic crisis that began in 2008 caused major revisions in general expectations and beliefs about future growth, leading to pessimism about the prospect of sales rebounding in the near future.

My results indicate that anti-stickiness prevails during economic crises. Such behavior during economic crises is exactly the opposite of sticky cost behavior during the normal economic periods that were documented in prior accounting research. Anti-stickiness in costs during crises, in turn, results in an increase in net income and operating cash flow from operations (controlling for revenue) for firms where sales are depressed during an economic downturn. This contradicts naive (but common) beliefs regarding the performance of firms with depressed sales. However, such behavior is predicted by and consistent with the economic arguments underlying asymmetric cost behavior theory.

I also consider how cost stickiness is affected for firms in situations such that costs cannot be reduced because of the underlying operating structure of the firm. First, I consider predictions about anti-stickiness under asymmetric cost behavior theory for firms with high (low) fixed asset intensities. Firms with high (low) fixed asset intensities are likely to face high (low) adjustment costs if capacity is adjusted. Consistent with

asymmetric cost behavior theory, I find that firms with high (low) capital asset intensities exhibit relatively lower (more) anti-stickiness during economic crises. Second, I consider how sticky cost behavior changes for the COGS component of costs relative to SG&A expenses. As firms typically face greater difficulty reducing the operating costs associated with manufacturing or sale of goods relative to their ability to reduce the other more discretionary resources included in *SG&A*, I predicted and found that *COGS* exhibits less anti-sticky behavior during economic crises relative to other costs, including *R&D* or other non-advertising *SG&A* expenses.

I also provide evidence comparing the impact of the economic downturn on managers' cost decisions with those of other well-documented earnings management incentives that affect managerial actions. I show that the impact of the economic downturn in 2009 on managers' cost decisions is economically of a similar magnitude as the impact of managerial incentives to avoid reporting loss or earnings declines. Therefore, the findings are likely to be of importance also to research in financial accounting to the extent that it is an element of managerial behavior that affects financial reporting practices and the forecasting of earnings.

In sum, this paper documents that cost behavior is complex and affected by both managerial incentives and managerial perceptions. In turn, both incentives and perceptions are likely to be influenced by both firm-level effects and macro-level economic conditions. Despite the complexity associated with understanding costs, the underlying economic arguments from asymmetric cost behavior theory allow us to offer predictions about the drivers of cost behavior. As a result, we can also make predicts about earnings and operating cash flow performance, even under exceptional conditions

such as those that prevailed during the world economic crisis. The findings suggest that future research using asymmetric cost behavior theory could provide valuable additional insights about the understanding of financial accounting numbers.

In the second study, I examine firms' cost behavior surrounding loan financing. I find that managers engage in real cost management prior to loan financing and document similar incentives for bond financing. Moreover, cost management is not symmetric for loan financing. Firms with sales down exhibit a greater reduction in operating expenses, given the sales level. Once firms obtain financing, I find that there is a reversal in cost level only when covenant intensity on earnings is not very high. Results suggest that managers tend to restore capacity post financing and are less willing to cut resources further as sales fall. However, they are still under pressure to meet covenant requirements on earnings.

This study also contributes to the literature on earnings management. Studies examining earnings management have extensively focused on corporate transactions related to equity. Debt financing is more prevalent than equity financing, and evidence of debt financing is sparse. I provide evidence suggesting that managers still engage in earnings management, even when creditors have access to firms' private information.

I also propose a new research design to examine abnormal activities around major corporate financing events. Operating decisions (such as cost behavior) could significantly change due to funds available. Therefore, prior models based on average industry and year effects could potentially contain large measurement errors in estimating normal accrual and real activity levels if they ignore significant changes in the funds available and asymmetric cost behavior.

5.2 Directions for Future Research

Several questions remained unanswered. First, for the studies on cost behavior concerning financing, the evidence documented does not differentiate between two scenarios: (1) creditors cannot see through real cost management or (2) creditors view cost management as a favorable signal. To provide some indirect evidence regarding whether capital market participants can see through cost management when responding to earnings information, I can examine whether financial analysts anticipate the effects of abnormal operating expenses on earnings. Institutional investors and analysts are sophisticated users of firms' financial reports. If they cannot fully see through cost management prior to financing, lenders may also have difficulty in detecting such management.

Second, it is not clear how cost management is related to firms' future operating performance. On the one hand, deviating from normal business practices preceding financing may distort operating efficiency and adversely affect future performance. On the other hand, debt financing, as an important external corporate governance mechanism, may reduce managerial entrenchment and lead to monitoring of managers to improve efficiency. Therefore, predictions regarding how cost management relates to firms' future operating performances are ambiguous.

Third, current studies are designed to examine loan financing while simultaneously controlling for bond financing. However, firms of different characteristics may strategically choose different financial leveraging levels and financing options based on market conditions, expected borrowing costs and constraints and potential risks. Cost management may also reflect operating decisions to coordinate with financing strategies.

As financing will affect firms' financial structure or debt structure, financial risk will inevitably change. Managers are likely to manage costs to adjust operating risk in response to changes in financial risk. Therefore, in addition to performance management, managers' cost management may also relate to risk management, which is a new research area that can be further explored.

REFERENCES CITED

Anderson, M., Banker, R., and Janakiraman, S., 2003. Are Selling, General, and Administrative Costs 'Sticky'? *Journal of Accounting Research*, 41, 47–63.

Armstrong, C., Foster, G. and Taylor, D. J., 2008. Earnings Management Around Initial Public Offerings: A Re-Examination (February 19, 2008). Rock Center for Corporate Governance Working Paper No. 23. Available at SSRN: http://dx.doi.org/10.2139/ssrn.1147328.

Aharony, J., Lin, C. J. and Loeb, M. P., 1993. Initial public offerings, accounting choices, and earnings management. *Contemporary Accounting Research*, 10, 61-81.

Azetsu, K. and Fukushige, M., 2005. The Estimation of Asymmetric Adjustment Costs for the Number of Workers and Working Hours: Empirical Evidence from Japanese Industry Data. Working paper.

Baker, M. and Wurgler, J., 2002. Market timing and capital structure, *Journal of Finance* 57, 1-32.

Balakrishnan, R., Peterson, M. J., and Soderstrom, N. S., 2004. Does Capacity Utilization Affect the 'Stickiness' of Costs? *Journal of Accounting, Auditing and Finance* 19, 283–299.

Ball, R., Robin, A., and Sadka, G., 2008. Is financial reporting shaped by equity markets or by debt markets? An international study of timeliness and conservatism. *Review of Accounting Studies*, 13, 168–205.

Ball, R. and Shivakumar, L., 2008. Earnings quality at initial public offerings. *Journal of Accounting and Economics*, 45, 324-349.

Banker, R. D., Byzalov, D., and Plehn-Dujowich, J. M., 2012. Sticky Cost Behavior: Theory and Evidence. Working Paper. *Temple University.*

Banker, R. D., Ciftci, M., and Mashruwala, R., 2011. The effect on prior-period sales changes on sticky cost behavior. Working Paper. *Temple University.*

Banker, R. D., Basu, S., Byzalov D. and Chen L., 2012. Direction of Sales Change and Asymmetric Timliness of Earnings. Working Paper. *Temple University.*

Banker, R. D., Byzalov D., and Plehn-Dujowich, J. M., 2011. Sticky Cost Behavior: Theory and Evidence. Working Paper. *Temple University.*

Banker, R. D., Bylalov, D., Ciftci, M., and Mashruwala, R., 2012. The Effect on Prior-period Sales Changes on Sticky Cost Behavior. Working Paper. *Temple University.*

Banker, R. D., Byzalov D., and Chen, T., 2013. Employment Protection Legislation, Adjustment Costs and Cross-Country Differences in Cost Behavior. Forthcoming, *Journal of Accounting and Economics.*

Bartov, E., 1993. The timing of asset sales and earnings manipulation. *The Accounting Review,* 68, 840–855.

Beneish, M. D., 1998. Discussion of Are Accruals during Initial Public Offerings Opportunistic?. *Review of Accounting Studies*, 3, 209-221.

Beneish, M. and Press, E., 1993. Costs of technical violation of accounting-based debt covenants. *The Accounting Review*, 68, 233–257.

Bentolila, S. and Bertola, G., 1990. Firing costs and labor demand: How bad is Eurosclerosis? *Review of Economic Studies,* 57, 381-402.

Bharath, S. T. and Shumway, T., 2008. Forecasting default with the Merton distance to default model. *Review of Financial Studies,* 21, 1339–1369.

Bharath, S. T *,* Sunder, J., and Sunder, S. V., 2008. Accounting Quality and Debt Contracting. *The Accounting Review,* 83 (1), 1–28.

Bolton, P. and Dewatripont, M., 2005. Contract Theory. *The MIT Press*, Cambridge.

Bolton, P., Freixas, X., 2000. Equity, bonds, and bank debt: Capital structure and financial market equilibrium under asymmetric information. *Journal of Political Economy* 108 (2), 324–351.

Brown, L. D. and Higgins, H. N., 2001. Managing Earnings Surprises in the US versus 12 Other Countries. *Journal of Accounting and Public Policy*, 20 (4–5), 373-398.

Cameron, C. A., Gelbach, J. and Miller, D. L., 2008. Bootstrap-Based Improvements for. Inference with Clustered Errors. *The Review of Economics and Statistics*, 90 (3), 414-427.

Chen, C. X., Lu, H., and Sougiannis, T., 2011. Managerial Empire Building, Corporate Governance, and the Asymmetrical Behavior of Selling, General, and Administrative Costs? *Contemporary Accounting Research*, 29 (1),252-282.

Christensen, H. and Nikolaev, V., 2012. Capital versus Performance Covenants in Debt Contracts. *Journal of Accounting Research. Forthcoming.*

Cohen, D., Pandit, S., Wasley, C., Zach, T., 2011. Measuring real activity management. Working paper.

Cohen, D. and Zarowin, P., 2010. Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics*, 50, 2-19.

Cooper, R. and Haltiwanger J., 2006. On the nature of capital adjustment costs. *Review of Economic Studies,* 73, 611-633.

Dechow, P. and Sloan, R., 1991. Executive incentives and the horizon problem: an empirical investigation. *Journal of Accounting and Economics*, 14, 51–89.

Dechow, P. M., Sloan, R., and Sweeney, A., 1995. Detecting Earnings Management. *The Accounting Review,* 70 (2), 193-225.

Dechow, P. M., Sloan, R., and Sweeney, A., 1996. Causes and consequences of earnings manipulation: an analysis of firms subject to enforcement actions by the SEC. *Contemporary Accounting Research,* 13, 1–36.

Dechow,P. M., Ge, W., and Schrand, C., 2010. Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, 50 (2–3), 344-401.

Demerjian, P., 2011. Accounting standards and debt covenants: Has the "balance sheet approach" damaged the balance sheet? *Journal of Accounting and Economics,* vol. 52, issue 2, pages 178-202

Demiroglu, C. and James, C. M., 2010. The information content of bank loan covenants. *Review of financial Studies,* 23, 3700-3737.

Denis, D. J. and Mihov V. T., 2003. The choice among bank debt, non-bank private debt and public debt: evidence from new corporate borrowings. *Journal of Financial Economics,* 70, 3-28.

Dichev. I., Graham J., and Rajgopal S., 2012. Earnings Quality: Evidence from the Field. Working paper.

Dierynck, B., Landsman, W. R., and Renders, A., 2012. Do Managerial Incentives Drive Cost Behavior? Evidence about the Role of the Zero Earnings Benchmark for Labor Cost Behavior in Private Belgian Firms. *The Accounting Review* 87, 1219-1246.

Dietrich, J., Harris, M., and Muller, K., 2000. The reliability of investment property fair value estimates. *Journal of Accounting and Economics*, 30, 125–158.

Drucker, S. and Puri, M., 2009. On loan sales, loan contracting, and lending relationships. *Review of Financial Studies,* 22, 2835-2872.

DuCharme, L. L., Malatesta, P. H., and Sefcik, S. E., 2004. Earnings management, stock issues, and shareholder lawsuits. *Journal of Financial Economics,* 71, 27–49.

Duke, E. A., 2011. Changed Circumstances: The Impact of the Financial Crisis on the Economic Condition of Workers Near Retirement and of Business Owners. Speech at the Federal Reserve Bank of Virginia.

Eckbo, B. S., Masulis, R. W., and Norli, O., 2007, Security offerings, *Handbook of Corporate Finance: Empirical Corporate Finance*, Volume 1 Chapter 6, North-Holland/Elsevier.

Fama, E. F. and K. R. French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics,* 33, 3–56.

Fan, Q., 2007. Earnings management and ownership retention for initial public offering firms: theory and evidence, *Accounting Review,* 82, 27-64.

Frank, M. and Goyal, V. K., 2009. Capital Structure Decisions: Which Factors Are Reliably Important? *Financial Management*, 38, 1–37.

Frankel, R., Kim, B. H., Ma, T., and Martin X., 2011. Bank Monitoring and Accounting Recognition: The case of aging-report requirements. Working paper, *Washington University*.

Hale, G. and Santos, J. A. C., 2008. The decision to first enter the public bond market: The role of firm reputation, funding choices, and bank relationships. *Journal of Banking & Finance,* 32 (9), 1928-1940,

Hayashi, 2000. Econometrics. *Princeton University Press*.

Graham, J. R., Harvey, C. R., and Rajgopal, S., 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, 40, 3–73.

Goux D., Maurin, E., and M. Pauchet. 2001. Fixed-term contracts and the dynamics of labour demand. *European Economic Review*, 45, 533-552.

Gunny, K., 2005. What are the consequences of real earnings management? Working Paper, *University of Colorado*.

Gunny, K., 2010. The relation between earnings management using real activities manipulation and future performance: Evidence from meeting earnings benchmarks. Contemporary Accounting Research 27 (3): 855-888.

James, C., 1987. Some evidence on the uniqueness of bank loans. *Journal of Financial Economics,* 19, 217-235.

Ibrahim S. and Lloyd C., 2011. The Association between Non-financial Performance Measures in Executive Compensation Contracts and Earnings Management. *Journal of Accounting and Public Policy*, 30 (3), 256-274.

Ivashina V. and Scharfstein D., 2008. Bank Lending during the Financial Crisis of 2008. *Journal of Financial Economics*, 97 (3), 319-338.

Kama, I. and Weiss, D., 2012. Do managers' deliberate decisions induce sticky costs? *Journal of Accounting Research.* Forthcoming.

Kellogg, I.and Kellogg, L. B., 1991. Fraud, Window Dressing, and Negligence in Financial Statements. Commercial Law Series, *McGraw-Hill*, Montreal.

Keung, E., Lin, Z. and Shia M., 2010. Does the Stock Market See a Zero or Small Positive Earnings Surprise as a Red Flag? *Journal of Accounting Research*, 48, 91–121.

Kothari, S., Leone, A., Wasley, C., 2005. Performance matched discretionary accrual measures. *Journal of Accounting and Economics* 39 (1), 163–197.

Leary, M.T., and Roberts, M.R., 2005. Do firms rebalance their capital structures? *The Journal of Finance*, 60, 2575-2619.

Lev, B. and Thiagarajan. S.R., 1993. Fundamental Information Analysis. *Journal of Accounting Research*, 31, 190–215.

Liu Y., Ning, Y., and Davidson, W., 2010. Earnings Management Surrounding New Debt Issues. *The Financial Review*, 45, 659–681.

Luo M., 2008. Unusual Operating Cash Flows and Stock Returns. *Journal of Accounting and Public Policy*, 27 (5) 420-429.

Jiang, J., 2008. Beating Earnings Benchmarks and the Cost of Debt. *The Accounting Review*, 83 (2), 377–416.

Nini, G., Smith, D., Sufi, A., 2012. Creditor Control Rights, Corporate Governance, and Firm Value. Review of Financial Studies. Vol. 25.2012, 6, p. 1713-1761.

Nissim, D. and Penman S., 2007. Fair Value Accounting in the Banking Industry. Columbia Business School Center for Excellence in Accounting and Security Analysis Occassional Paper Series. Working paper.

Pfann, G.A. and Palm F.C., 1993. Asymmetric Adjustment Costs in Non-linear Demand Models for the Netherlands and U.K. Manufacturing Sectors. *Review of Economic Studies*, 60, 397-412.

Pindyck, R. S., 1991. Irreversibility, Uncertainty, and Investment. *Journal of Economic Literature,* 29, 1110-1148.

Rajgopal, S., Venkatachalam , M., and Kothari, S.P., 2003. The Value Relevance of Network Advantages: The Case of E-commerce Firms. *Journal of Accounting Research,* 41, 135–162.

Ramakrishnan, R. and Thakor, A., 1984. Information reliability and a theory of financial intermediation. *Review of Economic Studies,* 22 , 415-432.

Rangan, S., 1998. Earnings management and the performance of seasoned equity offerings. *Journal of Financial Economics,* 50, 101–122.

Rogers, William H. 1993. Regression standard errors in clustered samples. *Stata Technical Bulletin,* 13, 19-23.

Roychowdhury, S., 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics,* 42, 335–370.

Shan Y., Taylor S., and Walter T., 2012. Earnings Management or Measurement Error? The Effect of External Financing on Unexpected Accruals. Working Paper. *University of Technology, Sydney.*

Shivakumar, L., 2000. Do firms mislead investors by overstating earnings before seasoned equity offerings? *Journal of Accounting and Economics,* 29, 339–371.

Shyam-Sunder, L. and Myers, S. C., 1999. Testing static tradeoff against pecking order models of capital structure, *Journal of Financial Economics*, 51, 219-244.

Smith, C., 1993. A Perspective on Accounting-Based Debt Covenant Violations. The Accounting Review. Vol. 68, No. 2 (Apr., 1993), pp. 289-303.

Teoh, S. H., Wong, T. J., and Rao, G. R., 1998a. Are accruals during initial public offerings opportunistic? *Review of Accounting Studies* 3, 175-208.

Teoh, S. H., Welch, I., and Wong, T. J., 1998b, Earnings management and the long-run underperformance of initial public offerings. *Journal of Finance*, 53, 1935-1974.

Thadden, V., 1995. Long-Term Contracts, Short-Term Investment and Monitoring. *The Review of Economics Studies,* Vol. 62. No. 4, 557-575.

Thompson, S., 2011. Simple Formulas for Standard Errors that Cluster by Both Firm and Time. *Journal of Financial Economics*, 99, 1-10.

Venkataraman, R. J., Weber, J., and Willenborg M., 2008. What if auditing was not ‘a

low margin business'? Auditors and the IPO clients as natural experiments. *Accounting Review*, forthcoming.

Watts, R., 2003. Conservatism in accounting Part I: Explanations and implications. *Accounting Horizons*, 17, 207–21.

Weiss, D. 2010. Cost Behavior and Analysts' Earnings Forecasts. *Accounting Review*, 85 (4), 1441-1471.

Wooldridge, J. M. 2003. Cluster-Sample Methods in Applied Econometrics. *The American Economic Review*, 93 (2), 133-138.

Zang, A., 2012. Evidence on the Trade-Off between Real Activities Manipulation and Accrual- Based Earnings Management. *The Accounting Review*, 87 (2), 675-703.

APPENDICES

A. Variable Definitions

Variable	Definition
Revenue	Total sales, deflated by beginning assets.
Opex	Operating expenses, deflated by beginning assets.
NetInc	Earnings, deflated by beginning assets.
CashFlow	Cash flows from operations, deflated by beginning assets.
COGS	Cost of goods sold, deflated by beginning assets.
SG&A	Selling, general and administrative expenses, deflated by beginning assets.
R&D	Research and development expenses, deflated by beginning assets.
Advert	Advertising expenses, deflated by beginning assets.
OtherSG&A	All *SG&A* expenses minus *R&D* and *Advert*, deflated by beginning assets.
SU	= 1 if total sales for firm *i* increase from *t-1* to *t*, and 0 otherwise.
SD	= 1 if total sales for firm *i* decrease from *t-1* to *t*, and 0 otherwise.
ΔGDP	GDP growth in year *t*.
AvoidLoss	=1 if earnings deflated by beginning market value for firm *i* in year *t* are between 0 and 0.01, and 0 otherwise.
AvoidED	=1 if the ratio of the change in net income deflated by beginning market value for firm *i* in year *t* is between 0 and 0.01, and 0 otherwise.
AssetInt	Asset intensity for firm *i* in year *t*, computed as the log of the ratio of total assets over sales.
EmpInt	Employee intensity for firm *i* in year *t*, computed as the number of employees over sales of year *t-1*.
Distress	The average monthly default probability of the fiscal year, estimated from the model by Bharath and Shummway (2008).
Earnings	earnings before extraordinary items, deflated by beginning assets
Loan	=1 if a firm is from the loan sample, 0 otherwise
PriorLoan	=1 if a firm has other loan financing within two years prior to the data year and 0 otherwise.
PostLoan	=1 if the observation is from the fiscal year after a firm enters loan contracts, 0 otherwise
FutureLoan	=1 if a firm has other loan financing within two years after the data year and 0 otherwise.
$LoanAmt_{i,t}$	the total loan amount raised by firm *i* in year *t*. $Equity_{i,t}$ = book equity of firm *i* in year *t*.
Secure	=1 if the loan is secured with collateral.
PreBond	=1 if the data year is within two years before a firm issues bond (including the issuance year) and 0 otherwise.
PostBond	=1 the data year is within two years after a firm issues bond (excluding

	the issuance year) and 0 otherwise.
EarningsCov%	the number of earnings related covenants facing by firm *i* at year *t*, divided by total number of financial covenants. If the firm-year is before the loan initiation year or the firm in control sample, $EarningsCov\%_{i,t}$ is equal to 0.
TAC	the total accrual level, scaled by beginning assets
MTB	market value of equity divided by book value of equity
Leverage	total long term debt, divided by market value of equity
PP&E	the net value of plant, property and equipment, scaled by beginning total assets
Funds	the sum of beginning cash holding, net debt issuance and net equity issuance, scaled by beginning assets.