Strategic Competition and Sequential Horizontal Mergers

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VARIABLE DEFINITIONS

Variable Name	Definition
Challenged	Indicator variable identifying challenged merger deals
c&i_spread	Spread between the Commercial Loan rates and the Federal Funds rate.
Cluster1	Intensity of Merger activity in the first stage, Ratio of *Nofm1* to *Nofacqs*
Cluster2	Intensity of Merger activity in the second stage, Ratio of *Nofm2* to *Nofacqs*
csm	Sundaram, John and John's (1996) Competitive Strategy Measure
csm_dum	Dummy indicating Strategic Complements and Substitutes, Equals 1 if *csm*>0, 0 if *csm*<0
Deal_Val	Deal value in millions of $ as reported on SDC
Dormant	Time elapsed in number of calendar days since the most recent merger in the industry
Rivalret	Abnormal Returns to portfolios of rival firms at the time of an initial bid
*Rivalret*csm*	Interaction term between *Rivalret* and *csm*
Rivalposret_dummy	Indicator variable for externalities imposed on rival firms, Equals 1 if *Rivalret*>0, 0 if *Rivalret*<0
HHI	Sales based Herfindahl Index (Market Share Concentration Index), Market Share calculated based on COMPUSTAT Data 12 (Sales)
Ib_dum	Indicator variable identifying initial bids. If a bid occurs after at least a year(360 calendar days) has lapsed with no bids in an industry
Demand Shock	Industry Median Percentage change in sales
Demand_Shock _Sq	Square of Demand Shock
mb	Market to Book Ratio
mb_sd	Standard Deviation of Industry Market to Book ratio
Log Assets	Log of Data6 (Assets)
Log_Deal Value	Log of *Deal_val*
lognumfirms	Log of number of firms in a 4-digit SIC industry
Profitability Shock	Industry median absolute change in Profit Margin
m1	Indicator variable identifying industries with a sequential merger
M1	First Stage Acquirers All bids that occur within 120 days following the initial bid along with the initial bid are classified as the first stage bidders
M2	Second Stage Acquirers All bids that follow the first stage bidders but before 720 days from the initial bid are classified as the second stage bidders
mb_rel	Ratio of Market to Book ratio between acquirer and target firm
Meth_pmt	Indicator variable identifying merger deals where cash was the only method of payment
Nofacqs	Total number of Acquirers in a 4 Digit SIC industry across Sample period
Nofm1	Number of Acquirers in the first stage
Nofm2	Number of Acquirers in the Second Stage
stage	Difference in calendar days between an initial bid to the acquisition bid in question for each industry
stage1	Indicator variable identifying whether acquirer belongs to first stage
tender_dum	Indicator variable identifying whether acquisition bid was a tender offer
Timecomp	Time till completion of merger from time of announcement

CHAPTER I INTRODUCTION

'Until recently, QVC's only real rival was Home Shopping Network (HSN), which had revenues of $1 billion in 1993. A year ago QVC-in what looked like an attempt to create a fifth big American TV network-tried to buy HSN ……. the deal was abandoned when QVC set its sights on Paramount instead. Other, fresher rivals, such as ValueVision, Catalog 1 and TSM, are now crowding in.' The Economist (Jul 9, 1994)

Temporally separated merger decisions within an industry may not necessarily be independent events. The literature on merger waves and casual observation attests to this fact. Fundamental economic shocks and cheaper capital are attributed as causes of this cascading effect in merger activity. See Harford (2004). Devoid of economic shocks will merger attempts by one firm encourage other firms to pursue similar strategies? Further, do firms anticipate rival reactions in making their own merger decisions? This study aims to advance the continuing debate on the incentives to merge and the resulting impact on firm values within the strategic paradigm of merger related decision making. In oligopolistic settings, the incentives to merge may depend on the strategic variable firms choose to compete with, quantity or price. Stigler (1950) finds that, in the absence of merger related efficiencies, mergers may generally be unprofitable compared to the alternative of being an outsider (non-merging firm). This result derives from the fact that the merged firm would exercise its increased market power and reduce output to a level

that is typically lower than the total output of the stand alone firms and thus providing the non-merging rival firms with an incentive to free ride and increase their own output and industry profits. Salant, Switzer and Reynolds (1983) re-examine the incentives to merge in a non-cooperative oligopolistic game setting with quantity competition and find that mergers are not profitable in a stigleresque sense. Others such as Deneckere and Davidson (1985) find that this result is reversed if price competition is assumed. A primary factor that is responsible for this reversal in the incentive to merge is the slope of the reaction functions, how firms react to pricing or quantity decisions of rival firms. In price competition, rival actions reinforce the price change induced by an initial merger. Whereas in quantity settings, rival actions are inversely related to outcome of the initial merger. This fundamental difference in the assumed framework of oligopolistic competition has been shown to moderate various firm level investment, financing and managerial compensation decisions.

While the studies discussed above focus on single-merger analysis more recent research examine sequential merger decisions. The common theme amongst these studies is that incentives to merge may not only depend on the competitive structure of the industry but also on the expected impact of further consolidation in the industry. Examples of research in this direction include Caves (1991), Fauli-Oller (1995) and Gowrisankaran (1996). A general framework of sequential merger analysis is contained

in Nilssen and Sorgard (1998) who argue that '…a merger that is unprofitable in isolation maybe carried through if it encourages a subsequent merger that has a positive effect on the first group, or if it discourages one that has a negative such effect…..'. Sequential merger theories predict that sequential horizontal merger decisions would be interrelated and such mergers have implications on firm values and welfare. Despite theoretical speculation and media[1] interest, empirical tests are limited.

Recent research on merger waves revolves around the question of whether mergers are efficient reactions to industry-level or economy-wide shocks or information asymmetry driven or if they are merely speculative, that is the use of overvalued equity to make acquisitions. The 'urge to merge' could be independent of the motive to efficiently reallocate assets as a consequence of economic shocks. The evidence of heightened merger activity accompanied by high stock market valuations suggests alternative speculative motives. Jovanovic and Rousseau (2002) show that exogenous industry-wide

[1] An article in the Wall Street Journal (Jan 3, 1995) on heightened merger activity suggests that mergers serve as a mechanism to compete more aggressively in the product markets. The article quotes Allen Schwartz, head of investment banking for Bear, Stearns and Co. "A dominant theme [In mergers] in 1994 was critical mass. Companies were trying to raise market share to be more competitive." Yet another article in the Wall Street Journal (Mar 10,2000) quotes Patrick Fallon, head of the technology banking group at Donaldson, Lufkin & Jenrette Inc. "There's a ferocious land grab under way out there, everyone is trying to be the first mover in their niche of the market, and then consolidate it through acquisitions." Merger attempts by one firm may encourage other firms to pursue similar strategies. An article in The Economist (Jul 9, 1994) describing the multi-media merger of QVC and CBS states that, 'Until recently, QVC's only real rival was Home Shopping Network (HSN), which had revenues of $1 billion in 1993. A year ago QVC-in what looked like an attempt to create a fifth big American TV network-tried to buy HSN ……. the deal was abandoned when QVC set its sights on Paramount instead. Other, fresher rivals, such as ValueVision, Catalog 1 and TSM, are now crowding in.'

or economy-wide shocks can create the need to reallocate assets through mergers and find that the merger waves of the last century were highly correlated with economy wide re-allocation cycles. While the neoclassical 'shock driven merger' theory has substantial empirical support, alternative explanations of the clustering effect of mergers within industries as a consequence of stock market mis-valuation are contained in Shleifer and Vishny (2002) and Rhodes-Kropf et al (2005). Empirical tests of the valuation models' predictions leads to the conclusion that while industry shocks may as well be the fundamental motivation to merge, mis-valuation affects how mergers are propagated through the economy. Harford (2004) pits the predictions of the neoclassical economic shock and the market valuation theories against each other and rejects the valuation based theories. He finds that the correlation between high market valuation and merger activity is only due to the fact that stock market values reflect the degree of capital availability. He concludes that economic shocks alone do not drive merger waves but shocks that coincide with the increased availability of capital to engage in reallocation drive them. These explanations are however void of the implications of strategic competition on sequential mergers between competing firms in an industry[2]. Whether it is profitable for the sequential adoption of mergers in an industry may depend on the nature of competition and the nature of externalities imposed by the mergers on rival firms. The

[2] Yan (2006) develops a theoretical model that incorporates product market competition into the standard Neo Classical framework to show that value-maximization need not be violated for there to be value-destroying mergers. However, in his study he does not test if product market competition drives sequential merger decisions.

strategic value of being a first mover or of delaying the merger decision may cause mergers within an industry to be interrelated.

The expected reaction of rival firms to a merger and the resulting impact on rival profitability due to a merger can be used to describe horizontal mergers as a sequential action-reaction game within an industry. Nilssen and Sorgard (1998), Fridolfsson and Stennek (2005) and others show that strategic motivations affect sequential merger decisions and have implications for market values and performance of merging firms. Nilssen and Sorgard (1998) cite Marc D. Granetz, Global Head of Mergers & Acquisitions at Credit Suisse First Boston, to motivate their theoretical framework of sequential horizontal mergers. Granetz noted that "Mergers and acquisitions activity has to a great extent involved change that became imperative for companies because another company acted first".

The principal idea in this study is that in oligopolistic settings, a horizontal merger has spill-over effects on rivals and that firms trade off between merger-induced monopoly gains and losses against efficiency gains and losses in making merger decisions. When the spill-over gains to rival firms dominates efficiency gains from a merger, rival firms maybe less likely to pursue their own mergers. Firms take this expected reaction, also referred to as *conjectural variation*, of rival firms into account when making merger

decisions[3]. Therefore, given that a merger has occurred in an industry, the likelihood that the initial merger will be followed by a sequential merger is conditional on the nature of merger induced externalities and the expected reaction of rival firms. When merger induced externalities are positive, the likelihood of a sequential merger is lower. I refer to this expectation as the '*Accommodation Hypothesis*'.

The primary objective of this study is to test the interrelatedness of sequential horizontal merger decisions described above. Strategic competition theory predicts that acquirers in violation of the accommodation principle should be penalized by the stock markets. Predictions related to acquirer returns are also tested in this study. I develop a unique algorithm based on dormant time periods between mergers within 4-digit SIC industries to identify sequential and non-sequential (stand alone) horizontal mergers between 1980 and 2004. Following Eckbo (1983), Song and Walkling (2005), Shahrur (2004), Fee and Thomas (2004) and others I use the market reaction to rival firm's stocks on announcement of a merger as a proxy for merger induced externalities. In addition I control for expected reactions of rivals using Sundaram, John and John's (1996) competitive strategy measure, *csm,* which captures the nature of strategic interactions in an industry as the slope of the reaction function of rival firms. When this slope is positive firms are said to compete in strategic complements and when it is negative firms compete

[3] *Conjectural Variation* is a term used to describe the expected reaction of strategic players in single period product market games.

in strategic substitutes. Empirical proxies of strategic interactions in the product markets have been employed by Sundaram, John and John (1996), Kedia (2006) and Lyandres (2006) to analyze R&D investment, managerial compensation and capital structure decisions respectively. I use this measure in addition to traditional controls for market structure such as industry concentration indices.

The findings in this study are partially consistent with the '*Accommodation hypothesis*'. Controlling for the type of competition in the product markets I find that the likelihood of sequential horizontal mergers is inversely related to the externality imposed on rival firms by an initial merger. I do not find evidence consistent with the stylized empirical results of Yan (2006), Carow, Heron and Saxton (2006) and others who find that early movers in merger waves are better off than late movers. The wealth effects for acquiring firms measured as their announcement period abnormal returns are not different between first and second stage acquisitions. These results for acquirer returns are not affected in multivariate settings and hence I conclude that overall the evidence is only partially consistent with strategic competition theory.

The remainder of this study is organized as follows. Chapter 2 contains a review of the literature and the development and statements of my specific hypotheses. Chapter 3 discusses the sources of data and the research design employed in this study. Results of

my empirical tests are presented in Chapter 4 and Chapter 5 concludes with some remarks on the possible reasons for the weak evidence in favor of the predictions of strategic competition theory on sequential horizontal mergers.

CHAPTER 2 REVIEW OF LITERATURE

This study is related to at least two strains of the literature. Firstly, it contributes to the merger literature by testing the strategic motivations in horizontal mergers and its implication on the interpretation of merger related gains. Secondly, the role of strategic interactions in merger decisions is related to the growing body of literature on the relationship between product market competition and the outcomes of various corporate financial and investment decisions. I review the merger literature first and then discuss theories of strategic competition and finally I develop and present my testable hypotheses.

2.1 The Theories and evidence on mergers

The merger literature is vast and hence I restrict my survey to some of the important and recent results of merger studies. The research on mergers has primarily focused on the motivation to merge and the resulting impact on stockholder wealth and firm performance. I classify the extant literature under two broad categories, the traditional theories and the theories of merger waves, for expositional reasons only and not to imply that these theories are unrelated.

2.1.1 Traditional Merger Theories and Evidence

While the primary motivation to merge seems to be to exploit economies of scale or scope there is somewhat contradictory evidence that mergers maybe evidence of empire building behavior of managers. If mergers are truly motivated by synergistic gains then the market values of the merging firms should be positively impacted. An early survey of merger related gains in Jensen and Ruback (1983) concludes that mergers are in general wealth creating. While bidding firms on average make negative abnormal returns targets make positive returns and the combined firm returns are on an average slightly positive. More recent evidence contained in Andrade, Mitchell and Stafford (2002) confirms these results and show that they remain consistent even in mergers of the nineties. However the post merger market performance is found to be poor in many studies. Rau and Vermaelen (1998) find evidence consistent with over extrapolation of past performance on the part of both the managers and investors in that high MB firms perform poorly in the three years following a merger. Early studies by Asquith (1983), Agrawal, Jaffe and Mandelker (1992) and Loughran and Vijh (1997) find that the stockholders of the acquiring firm experience negative long run returns while Franks, Harris and Titman (1991) do not find such negative performance. Similar evidence is found in studies on the post merger operating performance of bidding firms. On one hand, Healy, Palepu and Ruback (1992) find that the post merger operating performance improves relative to an industry benchmark. On the other hand Ravenscraft and Scherer

(1989) find no such operating performance improvements. Barber and Lyon (1997), Mitchell and Stafford (2000) and others point out that methodological issues plague these long run event studies and therefore make these results unreliable. The first issue is the joint hypothesis problem that stock market efficiency and models of market equilibrium are jointly determined. The second issue pertains to the fact that mergers are not random events and tend to cluster in time which could lead to positive cross correlation of abnormal returns. The above evidence casts some doubt on the efficacy of the synergy based motivations of mergers.

Roll (1986) proposed that managerial hubris and empire building tendencies may lead managers to make poor acquisitions as evidenced in the acquirer's announcement returns and post merger performance. Jensen (1986) contends that due to agency problems managers of firms with excess free cash are prone to undertake value decreasing investments. These explanations moderately reconcile the anomalies in the empirical evidence on merger related gains. However, the finding that mergers in general can be wealth destroying raises important corporate governance concerns which have been addressed in various studies. Holmstrom and Kaplan (2003) study the role of governance in the mergers of the 80s and the 90s and conclude that the mergers of the 80's was primarily driven by the external governance mechanisms, i.e. the threat of a takeover, but in the 90's the internal governance mechanisms such as the increase in

equity based managerial compensation and greater board involvement were responsible. Evidence of value destruction in mergers is contained in Moeller, Schlingemann and Stulz (2001) who find that a few large firms are responsible for a majority of the losses made in acquisitions. They conclude that, while the evidence is consistent with the view of Jensen (2003) that high valuations give management more discretion to make poor acquisitions, it is not sufficient to explain the change in returns associated with acquisition announcements, as these firms have comparable valuations when they announce previous mergers or acquisitions that are associated with positive abnormal returns. While synergies, managerial hubris and agency problems may important drivers of mergers, the clustering of mergers within industries and the phenomenon of aggregate merger waves leaves some unanswered questions.

2.1.2 Merger Wave Theories and Evidence

Scherer (1980), in his analysis of the three great merger waves that occurred between 1887 and 1968, observes that while real economic motivations may drive mergers, speculative motives may be equally relevant. Exogenous industry-wide or economy-wide shocks can create the need to reallocate assets. Mergers may be an efficient response to such shocks and lead to a wave of mergers. However, during periods of high overvaluations in the stock markets, firms may find it profitable to use their overvalued stock as currency to buy other firms and this could also lead to the clustering

of merger activity during periods of high stock market overvaluations. The uncertainties regarding the motivations to merge leads to ambiguity in merger related policy making. Any merger among firms competing in the same market is a step, however large or small, toward increased concentration and may bestow abnormal market power on certain firms. The true motives to merge and the potential for monopolistic gains through mergers are hard to detect based on the effects achieved as the correlation between intent and outcomes may be far from perfect. The ongoing debate on the recent waves of mergers and the associated gains still revolve around the above mentioned issues.

Recent empirical evidence on merger waves has revived the efficacy of economic motivations in mergers and shows that exogenous industry-wide or economy-wide shocks can create the need to reallocate assets. The process of reallocation may lead to new entry into the industry, mergers of less efficient firms with more efficient firms and the exit of inefficient firms. Hence the clustering of mergers within industries is interpreted as a simultaneous reaction to exogenous shocks. Jovanovic and Rousseau (2002) show that merger waves are highly correlated with economy wide re-allocation cycles and that exits precede merger waves. Similar evidence can be found in Andrade, Mitchell and Stafford (2002) and Mitchell and Mulherin (1996) who find that regulatory, technological or other economic shocks precede merger waves.

While the neoclassical 'shock driven merger' theory has substantial empirical support, valuation based theory of mergers also explain why mergers could cluster within industries as a consequence of stock market mis-valuation. Informational inefficiencies of the stock market may cause firms to be either undervalued or overvalued with respect to their true values. Managers that recognize their overvaluation may use their stock as cheap currency to make acquisitions of firms who maybe relatively less overvalued. Shleifer and Vishny (2002) argue that despite the evidence of negative announcement returns to bidding firms, bidders may have made wealth maximizing decisions. They show that high stock market valuations along with uncertainty about true synergy values could encourage managers to buy less over-valued firms with stock. The overvaluation argument however suffers from the caveat that target shareholders might not accept such overvalued equity in payment unless the premium is so high so as to eliminate the acquirer's gains. However during periods of economic turbulence that is accompanied by rapid upward trends in stock prices, the target shareholders, engendered by a mutuality of interest, can become myopic. Target managers with short horizons will be willing to accept over valued equity in payment. This could lead to a wave like phenomenon in mergers during periods of high overvaluation. Ang and Cheng (2003) find evidence consistent with this hypothesis and find that bidder returns, during high stock market valuations, corrected for market reversals exceed those of similarly valued non-merging matched firms. Rhodes-Kropf et al (2005) develop a model of rational managerial

behavior and uncertainty about sources of mis-valuations which could cause market performance to be correlated with merger waves. They find evidence consistent with the models predictions and conclude that while industry shocks may as well be the fundamental motivation to merge mis-valuation affects how mergers are propagated through the economy. Harford (2004) pits the predictions of the neoclassical economic shock and the market valuation theories against each other and finds support for the neoclassical motivations. He finds that the role of market valuation in the tests was as a proxy for overall capital market liquidity. He concludes that economic shocks alone do not drive merger waves but shocks that coincide with the availability of capital to engage in reallocation drive them. All these theories are void of the implications of strategic interactions in merger decisions across time within industries.

2.2 Strategic Competition and Mergers

2.2.1 Background on the Strategic Competition literature

The industrial organization literature has spawned a wide range of theoretical models that deal with strategic competition and its impact on firm decisions. The notion of strategic competition in sequential games in oligopolistic settings was simultaneously introduced by Bulow et al (1985) and Fudenberg and Tirole (1984). As these authors have pointed out strategic competition can be used to understand many results in the oligopoly literature. An accessible exposition of strategic competition and its applications

to business strategies is contained in Tirole (1988). The fundamental proposition of strategic competition theories is that a firm's financial and investment decisions are influenced by the expected reaction of rival firms and is aimed at making product market competition less aggressive.

Strategic competition and its role in corporate financial and investment decisions are explored in a number of studies. Brander and Lewis (1986) show that debt serves as a mechanism to pre-commit how a firm will compete in the product markets and that product market competition could in turn be an important determinant of capital structure. In a model of sequential choice of capital structure and output strategy they show that as firms increase their debt levels the managers would have greater incentives to pursue aggressive output strategies that would raise returns in the good states and lower returns in the bad states. Shareholders would ignore the low returns in the bankrupt states as debt holders would be the residual claimants. Firms may also adopt aggressive output strategy to force rival firms into bankruptcy. Empirical evidence of this type of relationship between financial structure and product market competition can be found in Chevalier (1995a, 1995b) who finds evidence consistent with the theory in the LBO era of eighties. The supermarket industry subject to active leveraged buyouts evidenced increased price levels as a result of aggressive output strategies in local markets. Lyandres (2006) examines the relationship between product market competition, capital

structure choice and aggressiveness of operating strategies and finds that a firm's optimal leverage is related to the degree to which its operating strategy affects its rival's value functions and resulting optimal output market choices.

Fershtman and Judd (1987) and Aggarwal and Samwick (1999) develop theoretical models to show how managerial incentive contracts can be used to draw desired reactions from rival firms. Tilting the manager's compensation away from profit maximization and towards sales maximization gives incentives to the manager to pursue an aggressive output strategy. Aggarwal and Samwick (1999) and Kedia (2006) provide empirical evidence in support of the view that strategic interactions in the industry explain the lack of pay for relative performance and the use of stock based incentives in managerial contracts. They conclude that compensation contracts are designed to soften product market competition and hence place positive weight on both own firm and rival performance.

Sundaram, John and John (1996) test the implications of the theories of strategic interactions in Fudenberg and Tirole (1985) and Bulow et al (1984) in the market reactions to firm level R&D investments. They find that their measure of strategic

competition, whether industry competition is tough or accommodative[4], explains the pattern of announcement returns to firms initiating new R&D spending and to their rivals. Using the competition measure developed in Sundaram et al (1996), Chen and Ho (1997), Chen, Ho, Ik and Lee (2002) and Chen, Ho and Ik (2005) test the implications of strategic competition theories on the market reactions to new product introductions and capital expenditures and find supporting evidence.

More recently various studies have examined the role of intra industry dynamics in corporate decision making. Mackay and Phillips (2005) find that firm level real and financial decisions are inversely related to the same decisions made by other firms in the industry and more so in concentrated industries. Haushalter, Klasa and Maxwell (2006) find that firm level investment and financing decisions are related to the extent that investment opportunities are interdependent within an industry. The above discussion suggests that the importance of strategic interactions in corporate financial and investment decisions cannot be understated.

[4] The definitions of tough and accommodative competition are based on the reaction by rival firms to a strategic initiative by one firm. If rivals react aggressively then competition is tough and less aggressive reactions would represent accommodative competition.

2.2.2 Strategic Competition and Sequential Mergers

Farrell and Shapiro (1990) show that in the absence of 'true' synergies through mergers the incentive to increase output post merger is the same as it was pre merger. Therefore if efficiency gains are not merger specific a merger may not result in welfare of the consumers[5]. Farrell and Shapiro (1990) call this the No-Synergies Theorem. In 1997 the Department of Justice and Federal Trade Commission revised its Horizontal Merger guidelines particularly in regards to efficiencies in mergers. These revisions were made to clarify the existing practices at the agencies regarding merger efficiencies. In an examination of the revision of the horizontal merger guidelines, Farrell and Shapiro (2000) discuss the impact of pre-merger competition on merger related welfare effects. They claim that conjectural variation[6], how one firm expects other firms to react to its output decision is crucial in evaluating the efficiency and welfare gains associated with mergers. They contend that for a merger to induce welfare gains the merging firms must expect that output expansions will be matched not ignored or accommodated by competing firms.

[5] Farrell and Shapiro (1990) define 'true' synergies as those that can be attained only through a merger and that which cannot be achieved through the natural competitive process.

[6] Conjectural Variation is a term used to describe the expected reaction of rival firms in single period models. However in this paper we will be concerned with expected reaction of rival firms in a two period model and the term strategic competition or strategic interaction will be used in this context and not conjectural variation.

The relationship between pre-merger competition and the motives to merge and related welfare gains are considered in a number of different studies including Deneckere and Davidson (1985), Caves (1991), Fauli-Oller (1995), Gowrisankaran (1996), Spector (2001) Nilssen and Sorgard (1998) and others. Nilssen and Sorgard's (1998) model provides a comprehensive treatment of how strategic competition, the expected reaction of rival firms, affect merger decisions and its policy implications. Nilssen and Sorgard (1998) extend the strategic competition taxonomy of Fudenberg and Tirole (1984) to horizontal merger decisions and show how strategic considerations affect sequential mergers by competing firms[7]. The impact of a merger on the reaction of rival firms and the resulting impact on profitability are used to describe mergers as a sequential action-reaction game within an industry. They derive two factors that affect the strategic motive to merge. The first factor is whether a merger encourages or discourages rival mergers. And the second factor is whether rival mergers increases or decreases own profit. Due to the strategic nature of the merger decision, firms may undertake unprofitable mergers or might pass up on profitable mergers in order to soften the reaction of rival firms. In a related paper Fridolffson and Stennek (2005) show that strategic motivations affect merger decisions and have implications for market values and performance of merging firms. If mergers tend to have negative externalities on non merging firms then it may be optimal to preempt rival mergers through own mergers even if they are unprofitable.

[7] The Appendix contains a detailed discussion of Nilssen and Sorgard's (1998) Sequential Horizontal Mergers theory.

They use their framework to specifically resolve the empirical puzzle that while mergers raise current share values they reduce long term profitability. They also point out that long term profitability measures that control for common shocks by adjusting with rival firm performance may overlook externalities imposed by merging firms on non-merging firms and hence maybe biased.

Other related studies that recognize preemption as a motive to merge include Toxvaerd (2003), Morellec and Zhdanov (2004), Gorton, Kahl and Rosen (2004) and Bernile, Lyandres and Zhdanov (2006). Toxvaerd's (2003) model of merger waves is based on a dynamic preemption game where acquirers compete for scarce targets. Value in delaying may result in the acquirer gaining from more favorable future market conditions at the risk of being preempted by rivals. Morellec and Zhdanov (2004) incorporate competition and imperfect information in the corporate control market and determine the terms and timing of takeovers by solving option exercise games between bidding and target shareholders. While Toxvaerd (2003) and Morellec and Zhdanov (2004) model the nature of competition in the corporate control markets the present study examines the role of product market competition and the incidence of mergers. Gorton, Kahl and Rosen (2004) argue that mergers and merger waves can occur when managers prefer that their firms remain independent rather than be acquired. If managers value private benefits of control sufficiently then a technological or regulatory change that

makes acquisitions profitable in some future states of the world can induce a preemptive wave of unprofitable, defensive acquisitions. Bernile, Lyandres and Zhdanov (2006) develop a real options framework to show that effect of mergers on equilibrium industry structure can explain abnormally high takeover intensity during periods of expansion and recession relative to intermediate states of the economy. While their model specifically addresses the issue of potential entry of new firms into the industry given the industry growth cycle, this study is aimed at testing the incentives to merge given potential rival mergers.

Since strategic value of either being a first mover or of delaying the merger decision may cause mergers within an industry to be interrelated, the optimality of sequential adoption of mergers by many firms in the industry may depend on the severity of competition and the nature of externalities imposed by the mergers on rival firms. Evidence suggestive of the importance of strategic motives is scattered in the literature. Carow, Heron and Saxton (2004) test whether there are any benefits to early movers in merger waves and find that early movers earn superior returns than late movers. If these early movers were expecting subsequent mergers then they would have taken the resulting impact on profitability into account; even if the individual profitability of subsequent mergers are positive they should have no detrimental impact on the early movers. If such a detrimental impact were expected then the initial mergers will not be

undertaken. Such considerations can make the merger decisions in an industry to depend on the nature of strategic competition between firms.

In an article titled 'Too Fat to Dance' in The Economist (May 31, 1997), the author cautions against the proposed merger of AT&T with SBC, which was itself formed as a merger of two Baby Bell firms, Southwestern Bell and PacTel.

'The new firm would be comfortably the biggest in America…….. It is worse than just big; it is also the wrong pairing. All the other proposed mergers that the regulators have approved joined companies that were not direct competitors; only the AT&T/SBC deal would cross this crucial boundary. The point of last year's telecoms law [The Telecommunications Act of 1996 which relaxed the restriction of cross-holding across the cable and telephone companies] was to bring competition to local markets. That was supposed to come primarily from the giant long-distance companies and cable-TV firms, which had the necessary money and reach. AT&T, with $80 billion in annual revenues, is the biggest and as such should have been the Bells' worst enemy. If it instead marries two of the biggest Bells, it will eliminate the biggest potential competitor to them in their own markets……. But why let the two main combatants join the same side before the battle begins?'

While this outsider perspective raises important policy issues, the insiders' perspective to the merger of the two firms is strategically optimal. Eliminating the competition in each others markets ensures that the 'anticipated' consolidation in the industry would be non-threatening if not beneficial to the merged firm. A Wall Street Journal article (1 Jul, 1997) on the same proposed merger of AT&T and SBC recalls a similar situation in 1993 when the proposed merger of cable giant TCI with Bell Atlantic

grabbed the headlines. John Malone, CEO of TCI, in defense of the proposed merger said,

> "In [TCI's] markets we will be offering telephony services against the incumbent telephone company, and they undoubtedly will retaliate by offering video services against us. And in the Bell Atlantic markets we'll undoubtedly be offering video services against the incumbent operator, and they will undoubtedly align with other telephone companies to provide telephone service against Bell Atlantic".

In other words, the logic of the merger suggests that it would force others to respond. Eventually however, neither the AT&T/SBC merger nor the TCI/Bell Atlantic merger materialized. In fact, AT&T ended buying TCI and Bell Atlantic merged with NYNEX and later with GTE to form the former Verizon.

If mergers are indeed interrelated within an industry then, failing to incorporate the sequential nature of mergers may lead to incorrect if not incomplete conclusions as to the impact on firm values. Song and Walkling (2003) find that market reactions at the time of an initial bid in an industry reveals information about potential bidders in the same industry. Additionally they find that the initial and subsequent bidder returns are similar in sign, proportion and magnitude. This evidence is suggestive of the interrelatedness of merger decisions. Announcement return studies that find negative returns on average to bidders conclude that mergers are wealth destroying to the bidder shareholders. But if bids are related across time then these studies may have overlooked

some crucial and more interesting insights in mergers. Preemptive or accommodative motivations can explain why firms might undertake seemingly unprofitable mergers. Akdogu (2003) studies the recent telecom merger wave and finds that mergers tend to have negative externalities on non-merging rival firms and cites this as evidence that unprofitable mergers may be undertaken to preempt rival mergers. It is also possible that mergers are undertaken to encourage rival mergers with positive externalities. If mergers impose externalities on other firms, then not only are announcement studies that fail to account for externalities misleading, but also the long term event study estimates controlling for common shocks using rival firm performance maybe biased. Therefore evaluation of the profitability of mergers needs to be conditioned on the externalities that mergers impose on other firms in the industry. While overvaluation or economic shocks may affect merger decisions, strategic interactions may have independent implications on how merger decisions are made and on merger related gains.

2.3 Hypothesis Development

The objective of this study is to present and test the predictions of strategic competition theory as applied to horizontal mergers. The theory addresses two issues: 1) The likelihood of a sequential merger event and 2) The impact of strategic behavior on firm values. The influential factors in both issues are the nature of competition that prevails in the industry prior to the merger and merger induced externalities.

A horizontal merger in an oligopolistic market naturally results in decreased output for the merged firm. That is, the post merger output of the merged entity is lower than the sum of the stand alone pre-merger outputs of the acquirer and target firms. This result is fairly well established in the Industrial Organization literature, see Stigler (1950). In oligopolistic settings a merger bestows increased market power on the merged firm. This increase in market power, however small, results in a reduction of quantity and causes a marginal increase in industry price levels, which is enjoyed by the rival firms as well. In the **absence of** any efficiency gains and barring any legal restrictions a merger may be preferable only if rival firms follow suit and adhere to the increased (decreased) price (output) levels. Generally, rival strategies are symmetrical in price competition and asymmetrical in quantity competition. An important issue is whether mergers allow firms to commit to strategies to accommodate or to deter rival firms in the **presence of** efficiency gains. The resolution to this issue relies on the nature of merger induced externalities. In order to develop my hypotheses I first discuss how the type of strategic competition, price versus quantity competition, moderates merger decisions within an industry and then elaborate on the role of externalities in the merger game.

2.3.1 The role of strategic competition in sequential horizontal mergers

In strategic complement industries, where the reaction functions have a positive slope, the underlying variable with which firms compete is price. Now consider a two stage decision process where two disjoint sets of firms, M1 and M2 respectively, make sequential merger decisions in such an industry. On the one hand, if a merger reduces the marginal cost of producing and thus lowers the merged firm's price then this would trigger aggressive price competition in the product market and the first stage decision maker, M1, trades off the benefit of a merger with the costs of aggressive price competition that would follow the merger decision. If the net benefit outweighs the costs then the first stage decision (M1's decision) should be to merge and be aggressive to deter rival firms. The second stage decision (M2's decision) is now dependent on whether there are any efficiency gains to be sought through a merger so that it can be better off than in the no-merger situation. On the other hand, if the merged firm's increased market power allows for an increase in prices then rival firms should stay put and benefit from the increased price level.

In the case of strategic substitutes, where the reaction functions have a negative slope, the underlying variable is quantity or capacity. A merger may either provide output increasing technologies or output decreasing market power. If a merger provides output increasing technologies then this would trigger an output reducing action or a passive

reaction from the rival firms and hence M1 should be aggressive and merge. As in strategic complements, the second stage firm's decision to merge is dependent on whether a merger would make it better off than in the no-merger situation. If the merger bestows enough market power to the first stage decision maker to cut back on output then this would result in an increase in output by rival firms which hurts the first stage decision maker and it will not merge.

2.3.2 The role of externalities in sequential horizontal mergers

The 'Market power' and the 'Productive efficiency' hypotheses are generally offered to explain the gains to merging firms and their rivals in horizontal mergers. Eckbo (1983) and Stillman (1983) postulate that while the market power hypothesis[8] predicts positive externality on rival firms, the effect of efficiency motivated mergers is ambiguous. On the one hand, efficiency based mergers may signal a positive 'in-play' effect (prospective target effect) or opportunities for productivity increases through mergers. As Song and Walkling (2000, 2005) find this could lead to an upward revision in stock prices of rival firms in anticipation of subsequent rival mergers. On the other hand, a merger may lead to a gain in competitive advantage to the merging firms and result in negative externalities for rivals. See Akdogu (2005). As noted in Eckbo (1983) it is not possible to distinguish between the two hypotheses solely based on the market

[8] The market power hypothesis is essentially a collusion hypothesis, i.e. mergers result in anticompetitive output/prices.

reaction for rivals at the time of an initial merger. However, it is possible to form expectations about rival reactions to an initial merger under the two hypotheses as illustrated in Table 1[9]. The optimal rival reaction to a merger under the market power hypothesis is accommodation. By being passive, rivals would gain from the monopoly rents accruing either from industry-wide collusion or through dominant firm pricing[10]. Under the efficiency hypothesis it is optimal for rivals to pursue own mergers as they may represent an efficient way to increase productivity or just to remain competitive[11]. Thus externalities could affect sequential horizontal merger decisions[12] and externalities may in itself be an important driver of merger activity.

{Insert Table 1here}

. Under the market power hypothesis the optimal reaction of rival firms should be to maintain the status quo and not pursue their own mergers. However, an initial merger may signal a competitive disadvantage and induce subsequent rival mergers. This discussion leads to my first empirical implication of the strategic competition theory on sequential merger decisions.

[9] This table has been adapted from Eckbo's (1983) tests for collusion in mergers
[10] Whether collusion is successful or not may depend on the nature of strategic interactions in the product markets.
[11] Andrade, Mitchell and Stafford (2004) note that subsequent rival mergers may also result from information cascading effects developed in Bikchandani et al (1992). Rival firms, rightly or wrongly, could interpret a merger as a signal to pursue their own mergers.
[12] In this study I use the terms mergers and acquisitions interchangeably

H1: *If accommodation was intended then the likelihood of a sequential merger decision is negatively related to the externality imposed by early mergers on rival firms.*

While externalities have a direct impact on the subsequent rival firm decision this relationship maybe moderated by the nature of competition in the product market prior to the initial merger. When competition is in strategic complements (strategic substitutes) and there are positive (negative) externalities from the initial merger then the likelihood of further consolidation is increased. This relationship is summarized in the following hypothesis.

H2: *The likelihood of a sequential merger decision is positively related to the interaction between the nature of competition and the externality imposed by early mergers on rival firms.*

The first two hypotheses jointly represent the *accommodation hypothesis*. The violation of the accommodation principle would imply value destroying actions with predictable effects on the stock market reactions to acquisition announcements.

Sundaram, John and John (1996) and Chen, Ho, Ik and Lee (2002) find that the announcement period returns to R&D and new product introductions, respectively, should be positive in strategic substitutes and could be negative or zero in strategic complements. The returns to acquirers in sequential mergers depends on strategic intention of M1, whether accommodation was intended or not. Therefore the theoretical expectation is one of a difference between announcement period returns of acquirers in M1 and M2 in each type of competitive structure. In strategic complement industries M1 decides to merge only if the benefits from the merger itself outweigh the costs of aggressive price competition. While in strategic substitutes, the M1 decides to merge irregardless of efficiency or market power gains. Therefore I expect that in strategic complements early mergers fare better than the late movers while they are equally worse or better off in strategic substitute industries.

H3: *In Strategic Complements, the first stage acquirers are better off than the second stage acquirers.*

H4: *In Strategic Substitutes, the first and second stage acquirers earn similar announcement period returns.*

Initial mergers with positive externalities should invoke a passive reaction from rival firms. This is the essence of the accommodation principle. When this status quo is

not maintained then the stock market should penalize the subsequent acquirers with lower announcement period returns. The following two hypotheses capture this expectation.

H5: *For mergers with a positive externality the announcement return to first stage acquirers are greater than that of the second stage acquirers.*

H6: *For mergers with negative externality first and second stage acquirers earn similar announcement period returns.*

CHAPTER 3 DATA AND METHODOLOGY

The objective of this study is to present and test the predictions of strategic competition theory as applied to horizontal mergers. In oligopolistic settings, the incentives to merge may depend on the strategic variable firms choose to compete with, quantity or price. Stigler (1950) finds that, in the absence of merger related efficiencies, mergers may generally be unprofitable compared to the alternative of being an outsider (non-merging firm). This result derives from the fact that the merged firm would exercise its increased market power and reduce output to a level that is typically lower than the total output of the stand alone firms and thus providing the non-merging rival firms with an incentive to free ride and increase their own output and industry profits. Salant, Switzer and Reynolds (1983) re-examine the incentives to merge in a non-cooperative oligopolistic game setting with quantity competition and find that mergers are not profitable in a stigleresque sense.

Others such as Deneckere and Davidson (1985) find that this result is reversed if price competition is assumed. A primary factor that is responsible for this reversal in the incentive to merge is the slope of the reaction functions, how firms react to quantity or pricing decisions of rival firms. Horizontal mergers have spill-over effects on rivals and

firms trade off between merger-induced monopoly gains and losses against efficiency gains and losses in making merger decisions. When the spill-over gains to rival firms dominates efficiency gains from a merger, rival firms maybe less likely to pursue their own mergers. Firms take this expected reaction, also referred to as *conjectural variation*, of rival firms into account when making merger decisions. Therefore, given that a merger has occurred in an industry, the likelihood that the initial merger will be followed by a sequential merger is conditional on the nature of merger induced externalities and the expected reaction of rival firms.

This section elaborates on the sources of data, sample selection criteria, my algorithm to identify sequential horizontal mergers and on my experimental design.

3.1 Data

The data for this study comes from three sources. The merger sample is from the Securities Data Corporation's Mergers and Acquisitions database (SDC), the firm level data are from the Standard and Poor's COMPUSTAT Industrial Annual financial data and the stock price data for announcement studies from the CRSP database. The computation of a principal variable in this study that measures the competitive nature of the industry requires 10 consecutive time series data of firm level Net Income and Sales. For cases where there are gaps in the time series data I augment the COMPUSTAT data

with hand collected data either from the Moody's Industrial Manuals or from the company's SEC 10-K filings.

3.1.1 The merger sample

I extract data on mergers from SDC between 1980 and 2004 using the following criteria

1. Only mergers between firms in the same 4-digit Primary SIC code[13,14] as reported on COMPUSTAT are included.
2. Deal value as reported on SDC is greater than $50 Million
3. The acquirer did not own more than 50% of target's stock prior to merger announcement.
4. Only those transactions that SDC describes as an acquisition of a majority equity interest in the target firm are included.
5. Acquirers and Targets are publicly traded companies
6. Financial and Public Utility firms are excluded (SIC 6000-6999 and 4900-4999)
7. Only completed transactions as reported on SDC are included.

[13] The literature is unclear as to what constitutes a horizontal merger. Some studies use the 4-digit SIC classification while others use the 2-digit or the Fama-French industry classification to identify horizontal mergers. Kahle and Walkling (1996) find that the COMPUSTAT and CRSP industry classification leads to substantial disagreement in identifying horizontal mergers. I note however that, CRSP 4-Digit SIC matches 70% of my sample that is based on COMPUSTAT 4-Digit SIC based matching while SDC 4-Digit SIC based matching results in less than 30%.

[14] The 4 digit SIC code used in this study to match acquirer and target industries are those reported as the most recent SIC code and not the historical SIC codes. Compustat reports the historical primary SIC code only from 1987 onward.

This results in 792 horizontal merger announcements whose distribution across the sample period in 4-Digit SIC industries is illustrated in **Figure 1**. I note that horizontal mergers in my sample are in general more concentrated in the 1990s than in the 1980s time period. Table 2 provides the distribution of mergers across the sample period as well. Mergers prior to 1990 represent approximately 15% of the total number mergers in this sample. This is consistent with Andrade, Mitchell and Stafford (2004) who also report a sharp increase in the number horizontal mergers in the 1990s. The distribution of mergers across industries is also consistent with the merger wave literature that aggregate merger waves are caused by clustering of mergers in a few industries. But the number of industries represented in the late 1990's is larger than the number industries in the 1980's. As reported in Table 2, I note that the top 6 industries, based on number of mergers (*nofacqs*), represent almost 35% of my merger sample. There are two industries that represent a major proportion of the total sample of mergers. The prepackaged software (SIC 7372) and the Oil and Gas (SIC 1311) industries represent approximately 20% of the total merger sample. Pharmaceuticals (SIC 2834), Telecommunications 4813 Computer Programming (SIC 7370) and the Semiconductor (SIC 3674) industries account for roughly 15% of the total sample.

{Insert **Figure 1**here}
{Insert Table 2here}

3.1.2 Identification of Sequential and Non-Sequential Mergers

In order to test the hypothesis that merger induced externalities may encourage or discourage further consolidation in the industry it is necessary to identify industries where mergers appeared to occur in sequence and where there were only stand alone mergers. The merger wave literature has developed various methods to rank merger activity on the basis of relative intensity of merger activity within industries and at the aggregate level and to identify the peak and troughs in merger activity. However, these methods do not directly address the empirical needs of this study. Therefore I develop my own algorithm whose purpose is to identify mergers that occur in isolation and mergers that occur sequentially. Amongst the mergers that occur sequentially it is necessary to further classify the mergers as early or first stage mergers and late or second stage movers.

For each 4-digit SIC industry I estimate the dormant time periods between merger bids across the entire sample period. If a bid occurs after at least a year (360 calendar days) has lapsed with no bids in an industry, I classify the bid as an 'initial bid'[15]. See Figure 2. All bids that occur within 120 calendar days following the initial bid along with the initial bid are classified as the first stage bidders. The choice of the 120-day criterion is based on the average time to completion of mergers from the announcement date for the sample of mergers used in this study. This criterion allows me to group firms that

[15] This method of identifying initial bids is used by Song and Walkling (2005) to test their Bidder Anticipation Hypothesis.

choose to merge within a short window of time as the first stage decision makers. All bids that occur between 121 and 720 calendar days from the initial bid are classified as the second stage bidders. Bids that occur after 720 calendar days from the initial bid (t=0) but before the next initial bidder are excluded from the sample. The duration of a sequential merger decision is thus approximately two years. The choice to end the time line 720 calendar days from an initial bid is based on the stylized observation in the merger wave literature that the typical merger wave peaks within two year clusters. See Mitchell and Mulherin (1996), Carow, Heron and Saxton (2006) and Harford (2004).

The purpose of this algorithm is to identify mergers that occur in isolation and mergers that occur sequentially. Amongst the mergers that occur sequentially it is necessary to further classify the mergers as early mergers and late movers. If actual firm behavior is not consistent with these approximations then I could have misclassified the mergers. I note that other researchers conducting a similar study may use a different procedure to identify sequential mergers. However, I am unaware of any existing study that formalizes an algorithm to identify and classify sequential mergers. The procedure developed here is consistently applied, objective and replicable.

{ Insert Figure 2 here}

I identify 195 initial bids using the above algorithm whose distribution across the sample period is presented in Table 2. Consistent with the distribution of mergers in **Figure 1** the distribution of initial bidders is more concentrated in the late 1990s.

Due to the nature of the algorithm some industries that are in the original sample of mergers have no identifiable initial bidders and hence are not represented in my final sample. To illustrate this point I use the example of the Computer Programming industry (SIC 7372) which represents about 4% of the total sample but did not have any identifiable initial bidders. The acquisition activity in this industry spanned between 1999 and 2003 and the maximum dormant time period between mergers was 245 days. Based on the algorithm at least 360 days has to have lapsed without an acquisition bid in the industry for a bid to qualify to become an initial bidder. The first acquisition in this industry during my sample period occurred on January 19th, 1999 and all the acquisitions that ensued occurred within 360 days of each other. Additionally some industries where there were frequent acquisitions and for which there were multiple initial bidders are not necessarily fully represented in the final sample due to the fact that some acquisitions occur beyond the 720 day cut off point with no additional initial bids. Consider the Oil and Gas industry (SIC 1311) that had a total of 46 acquisitions with 6 initial bidders whose distribution is spread evenly throughout my sample period. This industry had acquisitions that occurred in 17 out of the 24 years in my sample. To illustrate the effect of the 720 day cut off from the initial bid consider the initial bid identified for this

industry that occurred on the 7th of April, 1997. Following this initial bid there were 33 acquisitions that ensued without another identifiable initial bid till the end of my sample period in 2004. The mergers that are retained in my final sample is the initial bid itself along with 11 acquisitions that followed until the 13th of January of 1999. All the remaining 22 acquisitions that occurred after this point are eliminated from the sample as they are not classifiable into my first or second stage acquirer definitions.

Accounting for such eliminations I retain a final sample of 121 initial bids, reported in Table 3, for whom all required data for the computation of the measures described in the following section are available through the COMPUSTAT database[16]. 35 of the 121 initial bids are followed by sequential mergers and the remaining 86 are non-sequential or stand alone mergers. There are a total of 234 mergers in my final sample of all horizontal mergers including the first stage and the second stage bidders. This sample represents roughly 30% of the all the horizontal mergers extracted from SDC as described in the previous sub-section.

[16] The computation of a principal variable in this study, *csm*, which measures the competitive nature of the industry, requires 10 consecutive time series data of firm level Net Income (Data 172) and Sales (Data 12) and industry level Sales. In 108 cases out of the 195 initial bids complete time series data are not available. Relaxing the 10 consecutive time series data requirement to at least seven consecutive data points allows me to repopulate 21 missing *csm* values. For initial bids that are missing data in the middle of the time series I either fill in the gaps with hand collected data or by substituting in with the industry average *csm.* The hand collected data come either from the Moody's Industrial Manuals or directly from the company's SEC filings. Thus I have a final sample of 121 Initial Bids that span a total of 234 mergers across my sample period.

Each initial bidder is matched with a set of industry rivals in the same 4-digit industry. This procedure allows estimation of event period abnormal returns to a portfolio of rival firms at the time of the announcement of the initial bid. The empirical tests that are discussed below use these announcement effects as a proxy for merger induced externalities. There is an average of 34 rival firms (median=32, min=2, max=170) in each initial bidder industry excluding the acquirer and the target firm engaged in the initial bid.

3.2 Experimental Design and Variable Construction

3.2.1 Experimental Design for testing H1 and H2

The objective of this study is to test the predictions of strategic competition theory as applied to horizontal mergers. Horizontal mergers have spill-over effects on rivals and firms trade off between merger-induced monopoly gains and losses against efficiency gains and losses in making merger decisions. When the spill-over gains to rival firms dominates efficiency gains from a merger, rival firms maybe less likely to pursue their own mergers. Firms take this expected reaction, also referred to as *conjectural variation*, of rival firms into account when making merger decisions. Therefore, given that a merger has occurred in an industry, the likelihood that the initial merger will be followed by a sequential merger is conditional on the nature of merger induced externalities and the expected reaction of rival firms. The two principal hypotheses in this study are as follows:

H1: *If accommodation was intended then the likelihood of a sequential merger decision is negatively related to the externality imposed by early mergers on rival firms.*

H2: *The likelihood of a sequential merger decision is positively related to the interaction between the nature of competition and the externality imposed by early mergers on rival firms.*

These two hypotheses together comprise my '*Accommodation Hypothesis'*. The impact on rival firms at the time of an initial bid is positive when there are market power gains that spill over to the rest of the industry. Such mergers should be met passively by rival firms if accommodation was indeed intended. Therefore the likelihood of a sequential merger in an industry is lower when rival firms experience a positive externality from an initial bid. The effect of externalities on sequential merger decisions is also moderated by the type of competition that prevails in the product markets. In industries that compete in strategic complements positive merger-related externalities increases the likelihood of a sequential merger. In order to test *H1* and *H2* I run event time industry level logistic regressions of the general form given in the following equation.

$$Logit\{P(Y_{it}=1\} = \beta_0 + \beta_1 Rivalposret\_dummy_{t-1} + \beta_2 csm_{t-1} + \beta_3 Rivalret*csm_{t-1} + \beta_4 Z_{t-1} \quad \textbf{(1)}$$

In the above equation, Y_{it}, is the dependent variable which takes on the value of 1 if an initial merger was followed by a second stage merger decision and a value of 0 if

there were no sequential mergers in an industry following an initial bid. I measure Y_{it}, as a dummy variable equal to one when there is at least one merger in the second stage following an initial bid and equal to 0 otherwise. This definition of the dependent variable maybe biased if the relative number of mergers across industries is different. Therefore I also measure the dependent variable as a dummy variable that is equal to 1 when the number of mergers in the second stage, *nofm1*, is greater than the average number of acquisitions, *avgacqs*, in the industry across the entire sample.

The choice of a logistical regression to model sequential merger decisions has some limitations as well. Measuring the dependent variable in the binary form may misrepresent the relative intensity of the merger activity in the second stage. For robustness I also measure the dependent variable as the merger intensity in the second stage, ratio of number of mergers in the second stage, *nofm2*, to the total number of mergers in an industry, *nofacqs.* This dependent variable is truncated from below at zero. The model under this alternative measure of the dependent variable is then estimated using a Tobit regression.

On the right hand side of the equation the first independent variable, *Rivalposret_dummy*, is a dummy variable that takes on the value of 1 if the portfolio of rival firms made positive returns at the time of an initial bid and a value of 0 if the returns

were negative. As noted in Eckbo (1983) a horizontal merger alters the nature of competition in the merging firms' industry either through changes in product or input prices and this will in turn cause a revision in valuation of rival firms. Therefore measures of the abnormal returns earned by rivals at the time of a merger act as a proxy for the merger induced externalities. The second independent variable, *csm*, is Sundaram, John and John's (1996) measure of strategic competition. The third term, *Rivalret*csm*, is an interaction variable between the nature of externalities and the strategic competition variable.

The impact on rival firms at the time of an initial bid is positive when there are market power gains that spill over to the rest of the industry. Such mergers should be met passively by rival firms if accommodation was indeed intended. The likelihood of a sequential merger in an industry is thus lower when rival firms experience a positive externality from an initial bid and therefore I expect that the coefficient of $Rivalposret\_dummy_{t-1}$ is less than zero, $\beta_1<0$ (*Hypothesis 1*). The nature of competition in the product markets, whether firms compete in strategic complements or substitutes has an independent effect on the likelihood of a sequential merger. Theory predicts that firms that compete in strategic complements (substitutes) have symmetrical (asymmetrical) strategic actions and leads to my expectation that the coefficient of *csm* is greater than zero, $\beta_2 > 0$. In industries that compete in strategic complements the inverse relationship between the merger-related externalities and the likelihood of a sequential merger is

weakened and hence I expect the coefficient on the interaction term is greater than zero, $\beta_3 > 0$ (*Hypothesis 2*). It is possible that the weakening relationship between externalities and the likelihood of the merger decision in strategic complements would drive β_3 to a value of 0 and not necessarily greater than zero. The measurement of the principal variables and the choice set of control variables, Z_{t-1}, are explained below.

Competitive Strategy Measure

Each initial bid identified by my algorithm is matched with financial data on COMPUSTAT. In order to control for the product market competition I use a measure of competition developed by Sundaram et al (1996). This measure requires 10 years of lag data in its computation. Sundaram, John and John (1996) distinguish firms as competing in strategic substitutes (competition in quantity) or complements (competition in prices) by estimating a Competitive Strategy Measure (*csm*), defined as the responsiveness of the change in a firm's marginal profits relative to its own output, with respect to a change in competitors output. Therefore, if the profit-function of firm *i* can be denoted as

$$\prod^i = \prod (x_i, x_j) \qquad \textbf{(2)}$$

Where x_i and x_j are the strategic actions of firm *i* and its rival, firm *j* then *csm* is given by

$$\prod^i_{ij} = \partial^2 \prod (x_i, x_j) / \partial x_i \partial x_j \qquad \textbf{(3)}$$

In equation (3) the term on the right hand side represents the second cross partial derivative of firm i's profit with respect to the change in firm j's strategic action. If $\prod^i_{ij} < 0$ then firm *i* is said to compete in strategic substitutes and if $\prod^i_{ij} > 0$ then firm *i* is said to

compete in strategic complements. Sundaram et al estimate the *csm* as the coefficient of correlation between change in a firm's profit margin (measured as Data12 (Net Income)/Data172 (Sales)) and change in the Sales of the competition (change in aggregate industry sales)[17] using ten years of quarterly data.

$$CSM = Corr\left\{\Delta\prod_1 / \Delta S_{1,} \Delta S_2\right\} \qquad \textbf{(4)}$$

Equation (5) represents the time series correlation of the change in profit margin for one firm with the change in aggregate sales for the industry between two consecutive time periods. This coefficient of correlation is a direct proxy of the second derivative of profit with respect to own quantity and the competitors' quantity as defined by Bulow, Geanokoplos and Kemplerer (1984). I use the *csm* measure both as a continuous variable and as a dummy, *csm_dum*, to classify firms as competing in strategic substitutes and complements. Table 2 shows the classification of each initial bid industry into strategic complements and substitutes[18].

[17] I use annual data to estimate *csm* as the quarterly data requirement seriously limits my sample size. As noted in Kedia (2006) and Lyandres (2006) measuring *csm* using quarterly versus annual data does bias the *csm* estimates.

[18] Lyandres (2006) points out Sundaram et al's CSM measure maybe biased if there are common elements that affect all firms in an industry similarly. I use Lyandres's (2006) Adjusted CSM measure as an alternative proxy and find that similar results are obtained. The Appendix contains a discussion of the difference in the Sundaram et al CSM measure and Lyandres's adjusted CSM. A limitation in regards to Lyandres's measure is that it does not allow for time variance in strategic interactions. This could pose a significant problem as, seen in Table 2 for certain industries (SIC 4813, 2834, 5311 etc.), the classification industries based on CSM changes across time.

Estimation of event period announcement returns to rivals

Announcement period abnormal returns are estimated using the market model. Expected returns to a firm are estimated over a period of 100 days prior to a merger announcement and the abnormal return itself is computed as the difference between the return earned on announcement and the estimated expected return. I cumulate these differences over a 3-day (-1, +1) event window surrounding the announcement date of the merger. I estimate the abnormal return to firm i (AR_{it}) as

$$AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt} \quad \textbf{(5)}$$

where R_{mt} is the return on the CRSP value-weighted index on day t, R_{it} is the realized return to firm i on day t, and α_i and β_i are parameters estimated using the market regression model. I use an estimation period of 250 days starting on day -300 relative to the acquisition announcement date. A minimum of 100 daily returns is required failing which the firm is omitted from the sample. The announcement date is the date on which a bidder makes a public announcement regarding acquisition and is obtained from the SDC database. To estimate rival abnormal returns at the time of an initial bid, I follow past studies such as Eckbo (1983) and Song and Walkling (2005) and form equally weighted portfolios which controls for contemporaneous cross-correlation of returns. I also conduct nonparametric generalized sign tests to test the significance of the percentage of positive abnormal returns.

The announcement period abnormal returns of a portfolio of rivals at the time of an initial bid are used as a proxy for the externalities imposed on rival firms due to an initial bid. This proxy has been used by Eckbo (1983) and more recently by Shahrur (2004), Song and Walkling (2005) and Fee and Thomas (2004) to measure the marginal impact on rival firms due to a merger in the industry. The rationale behind this proxy is that a horizontal merger alters the nature of competition in the merging firms' industry either through changes in product or input prices and in turn causes a revision in valuation of rival firms. Therefore measures of the abnormal returns earned by rivals at the time of a merger act as a proxy for the merger induced externalities. I define rival firms as all the firms in the same 4-digit SIC code reported on COMPUSTAT other than acquirer and target firm engaged in the initial bid. I use these announcement period returns to rival portfolios both as a continuous variable, *Rivalret*, and as a dummy variable *Rivalposret_dummy,* which takes on the value of 1 if the portfolio of rival firms made positive returns at the time of an initial bid and a value of 0 if the returns were negative[19].

In what follows I describe the various control variables used in the logit regression models. The choice of the control variables are based on the merger wave studies that model likelihood of industry level merger waves. At least three fundamental

[19] Using the sign of the rival portfolio's abnormal return to create the dummy may mis-represent the variation in these returns across different industries. In un-tabulated results I find that Sign tests for the abnormal returns to rivals are consistent with the sign on the abnormal returns to rival portfolios in the announcement studies.

factors have been identified that affects the likelihood of merger waves. Firstly, Jovanovic and Rousseau (2002) show that exogenous industry-wide or economy-wide shocks can create the need to reallocate assets through mergers and find that the merger waves of the last century were highly correlated with economy wide re-allocation cycles. Secondly, the evidence of heightened merger activity accompanied by high stock market valuations suggests alternative speculative motives. The clustering effect in mergers within industries as a consequence of stock market mis-valuation is contained in Shleifer and Vishny (2002) and Rhodes-Kropf et al (2005). Thirdly, Harford (2004) finds that the correlation between high market valuation and merger activity is only due to the fact that stock market values reflect the degree of capital availability. He concludes that economic shocks alone do not drive merger waves but shocks that coincide with the increased availability of capital to engage in reallocation drive them.

Demand and Profitability Shocks

Exogenous industry shocks maybe important drivers of merger activity. Bernile, Lyandres and Zhdanov (2006) find that during expansionary and recessionary stages of an industry's life cycle a firm's decision to merge has no impact on the incentives for new entry into the industry. While in the intermediate stages mergers may increase the threat of new entry. Therefore they expect higher merger intensity on the two extremes of the industry life cycle. Consistent with their predictions, Bernile, Lyandres and Zhdanov (2006) find a U-Shaped relationship between merger intensity and industry growth rates

especially amongst horizontal mergers. Following Bernile, Lyandres and Zhdanov (2006) I use the industry median sales growth rate, *Demand Shock,* and its square, *Demand_Shock _Sq* , prior to an initial merger to control for this relationship in my logit models. Independent of these demand shock effects the incentive to merge may also be affected by shocks to the profitability of the industry in general. Therefore I also control for profitability shocks using the industry median absolute change in profit margin, *Profitability Shock*, (Data 172 (Net Income)/Data 12(Sales)).

Market Valuation Effects

The merger wave literature recognizes that valuation errors and uncertainty in the equity markets positively affect merger intensity and the likelihood of merger waves. See Harford (2005) and Rhodes-Kropf et al (2005). I include the industry median equity Market to Book ratio, *mb*, calculated as Data 25(Common Shares outstanding)*Data 199(Fiscal Year Closing Stock Price) /Data 60(Book Value of Equity), and the industry year standard deviation of the Market to Book ratio, *mb_sd*, as additional controls in the logit models.

Credit Availability

Harford (2005) finds that credit availability, or the economy wide cost of capital affects the likelihood of a merger wave. I follow Harford (2005) who argues on the basis Lown et al.'s (2000) results that the rate spread between commercial and industrial loans

and the federal funds rate maybe used as a proxy for overall capital liquidity or ease of financing in the economy. I use this spread between commercial and industrial loan and the federal funds rate, *c&i_spread*, as an inverse proxy for credit availability[20].

3.2.2 Experimental Design for testing H3, H4, H5 and H6

The returns to acquirers in sequential mergers depend on strategic intention of the first stage decision maker, M1, that is whether accommodation was intended or not. Firm behavior in line with the predictions of strategic competition is consistent with firm level value maximization. If the accommodation principle is valid then acquirers in violation of the principle are expected to be negatively impacted. Therefore the theoretical expectation is one of a difference between announcement period returns of acquirers in the first and second stage decision makers in each type of competitive structure. Additionally initial mergers with positive externalities should invoke a passive reaction from rival firms. This is the essence of the accommodation principle. When this status quo is not maintained then the stock market should penalize the subsequent acquirers with lower announcement period returns. For sake of convenience I restate hypotheses, *H3* through *H6* here.

H3: *In Strategic Complements, the first stage acquirers are better off than the second stage acquirers.*

[20] I thank Jarrad Harford for providing this data

H4: *In Strategic Substitutes, the first and second stage acquirers earn similar announcement period returns.*

H5: *For mergers with a positive externality the announcement return to first stage acquirers are greater than that of the second stage acquirers.*

H6: *For mergers with negative externality first and second stage acquirers earn similar announcement period returns.*

To test the above hypotheses I use a simple OLS regression model of acquirer returns of the general form represented in the following equation.

$$Acq\_ret_{it} = \beta_0 + \beta_1 Rivalposret\_dummy_t + \beta_2 CSM_{t-1} + \beta_3 Stage1_{t-1} + \beta_4 X_{t-1} + \upsilon_t \qquad \textbf{(6)}$$

The dependent variable, $Acq\_ret_{it,}$ is the 3-day (-1,+1) announcement period abnormal return to acquirers. On the right hand side, the independent variables include the principal variables, $Rivalposret\_dummy_t$ and $CSM_{t-1,}$ from the logit model explained above and a set of control variables, X_{t-1}, explained below, that have been shown to affect acquirer returns. The third term on the right hand side, *Stage1*, is an indicator variable that identifies whether an acquirer belongs to the first stage. The stylized results in the merger wave literature are that early mergers in merger waves fare better than the late movers. See Yan (2006) and Carow, Heron and Saxton (2006). Therefore I expect that in general the coefficient on *Stage1* is greater than zero, $\beta_3 > 0$. *H3* and *H4* imply

differential announcement period returns to the first stage and second stage bidders based on whether they compete in strategic complements or substitutes. In strategic complements the first stage mergers are better off than the second stage mergers. Therefore in the strategic complement sub-sample I expect that the coefficient on *Stage1* is greater than zero $\beta_3 > 0$ (*Hypothesis 3*) and that *Stage1* does not have a significant effect on acquirer's returns in the strategic substitute sub sample, that is $\beta_3 = 0$ (*Hypothesis 4*). Violation of the accommodation principle implies that second stage mergers, M2, that occur in the sub-sample of initial bids with positive externalities are value destroying decisions and therefore I expect that $\beta_3 > 0$ (*Hypothesis 5*), that is first stage mergers, M1 fare better than the second stage mergers, M2. If externalities are negative then I expect that β_3 is not different from zero, $\beta_3 = 0$ (*Hypothesis 6*), that is there is no difference in the announcement effects between the first stage, M1 and second stage mergers, M2. I discuss the construction of the independent variable and the set of control variables, X_{it} and the motivation behind choice of the control variables in what follows.

Estimation of event period announcement returns

Announcement period abnormal returns of initial bidders and all acquiring firms are estimated using the market model. Expected returns to a firm are estimated over a period of at least a 100 days prior to a merger announcement and the abnormal return itself is computed as the difference between the return earned on announcement and the

estimated expected return. I cumulate these differences over a 3-day (-1, +1) event window surrounding the announcement date of the merger. I estimate the abnormal return to firm i (AR_{it}) as

$$AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt} \quad (7)$$

where R_{mt} is the return on the CRSP value-weighted index on day t, R_{it} is the realized return to firm i on day t, and α_i and β_i are parameters estimated using the market regression model. I use an estimation period of 250 days starting on day -300 relative to the acquisition announcement date. A minimum of 100 daily returns is required failing which the firm is omitted from the sample. The announcement date is the date on which bidder makes a public announcement regarding acquisition and is obtained from the SDC database. As mentioned earlier, estimation of abnormal returns to rivals I follow past studies such as Eckbo (1983) and Song and Walkling (2005) and form equally weighted portfolios which controls for contemporaneous cross-correlation of returns. I also conduct nonparametric generalized sign tests to test the significance of the percentage of positive abnormal returns.

Dormant time period prior to an acquisition bid

Song and Walkling (2006) find that the announcement period abnormal returns are positively associated with a measure of time elapsed between the most recent merger in an industry and the merger in question. Song and Walkling (2006) contend that less anticipated mergers are received more favorably in the stock markets. I include a similar

measure, *Dormant*, that measure the difference in calendar days between the most recent merger in the industry and the merger in question.

Initial Bidder dummy

In the Acquirer Return OLS regression models I include an indicator variable, *ib_dum*, which identifies acquisitions made by initial bidders. I include this indicator variable in addition to controlling for anticipation effects of Song and Walkling (2006) as according to the principal prediction of sequential horizontal merger theory developed by Nilssen and Sorgard(1998), firms may engage in value destroying acquisitions if it results in rival mergers with positive externalities or if it discourages one with a negative such effect.

Acquirer size and market valuation effects

Moeller et al (2005) finds that large firms are more likely to undertake value destroying mergers and so I include a control of acquirer size, *log assets*, as the log of firm assets (Data6 Assets). In addition I also include the market to book ratio of equity, *amb*, as firms with overvalued equity are more likely to use stock to make acquisitions. Rhodes-Kropf et al (2005) find that uncertainty in the stock market can lead to mis-valuations which in turn could lead even rational managers to undertake value destroying acquisitions. Therefore I include the standard deviation of the equity market to book

ratio, *mb_sd*, amongst the firms in the industry prior to the merger to control for stock market mis-valuations. I also control for the relative size of acquirer to target using the ratio of the market to book ratios, *mb_rel*, of the acquirer and the target firm as Rau and Vermaelen (1998) find that acquisitions of low Market to Book firms by high Market to Book firms positively fare better than if the acquisitions were made by low Market to Book firms.

Market Concentration Index

To control for industry concentration I use a sales based Herfindahl concentration index that is commonly used to measure market share concentration. I define the index as

$$H_i = \sum_{i=1}^{N} S^2{}_i \qquad \textbf{(8)}$$

Where H_i is the index value for industry *I* and S_i is the ratio of own firm sales to total industry sales (market share) in the same 4-digit SIC code. The Herfindahl index not only captures the impact of the number of firms in an industry but also their relative market shares on the degree of product substitutability. Industries in which smaller numbers of firms have disproportionately large market shares will exhibit greater product differentiation. Greater product differentiation would reduce the impact of a rival firms action on own firm's marginal profitability and hence would be void of strategic

interactions. However this measure does not allow us to classify firms as competing in Strategic Substitutes and Complements but only allows us to identify the potential for strategic interactions. Aggarwal and Samwick (1998) use the Herfindahl-Hirschman (HH) index contained in the Census of Manufactures where the index is computed as the sum of the squared shares of the industry's total value of shipments for the largest 50 firms. The HH index is available only for manufacturing industries in 5 year intervals. To overcome these limitations the measure of industry concentration here is based on the Sales data available on COMPUSTAT (Data 12 Sales). The sales based Herfindahl index is reported for each initial bidder industry in Table 3.

{Insert Table 3here}

Demand and Profitability Shocks

Industries experiencing demand and/or profitability shocks are more likely to witness higher merger activity. See Harford (2004). I use the industry median sales growth rate (*Demand Shock*) the industry median absolute change in profit margin (Data 172 (Net Income)/Data 12(Sales)) to control for firms experiencing demand or profitability shocks who may be more likely to gain from a merger.

Merger Characteristics

In addition to the control variables listed above I also include merger specific characteristics. I use the log of deal value as a proxy for the deal size as it is found that larger acquisitions fare worse than smaller acquisitions. I use an indicator variable, *tender_dum*, to identify whether an acquisition bid was made through a tender offer. I also include dummies to identify whether a merger was challenged by the merger authorities as reported on SDC and if the merger was a cash-only deal to control for the method of payment.

CHAPTER 4 RESULTS

This chapter discusses the results of my empirical tests described in the previous chapter. The objective of this study is to present and test the predictions of strategic competition theory as applied to horizontal mergers. The two principal hypotheses in this study that comprise my 'Accommodation Hypothesis' are that the likelihood of a sequential merger in an industry is lower when rival firms experience a positive externality from an initial bid and that in industries that compete in strategic complements this inverse relationship between the merger-related externalities and the likelihood of a sequential merger is weakened.

4.1 Likelihood of Sequential Horizontal Mergers

In order to test *H1* and *H2* I run event time industry level logistic regressions of the general form stated earlier in equation (1) which is reproduced below.

$$Logit\{P(Y_{it}=1\} = \beta_0 + \beta_1 Rivalposret\_dummy_{t-1} + \beta_2 csm_{i-1} + \beta_3 Rivalret * csm_{i-1} + \beta_4 Z_{t-1} \quad \textbf{(9)}$$

Table 4 and Table 5 present the summary statistics and the correlation coefficients of the dependent, the principal independent and the control variables, Z_{it} for

the 121 initial bids retained in my final sample. Panel A of Table 4 reports that the mean values of *csm* is negative indicating that the average industry in my sample compete in strategic substitutes. The industry average *csm*, *indavgcsm*, computed as the average *csm* on a industry year basis is also negative on an average. Also reported in Panel A is a measure of market share concentration, *hhi*, measured as the Herfindahl Index of Sales based market shares and the average *hhi* for the 121 initial bidders in my sample is about 1670. Panel B presents the merger characteristics. Comparing the mean values of *cluster1* and cluster2 which measures the intensity of merger in the first and second stage respectively indicates that on an average merger intensity is higher in the first stage than in the second stage. There are on an average 10 acquisition bids, *nofacqs*, in an industry across my sample period. The impact of an initial bid on rival firms, *Rivalret*, is on an average 0.55% with a standard deviation of about 2.66%. Panel C describes the control variables set, Z_{it}. *Demand Shock* and *Profitability Shock*, represent demand and profitability shocks in an industry measured as the industry median sales growth and industry median change in profit margins. The latter variable, *Profitability Shock*, is measured in absolute terms and the average median absolute spread between the profit margins in two consecutive time periods before an initial bid in the industry is about 8%. The former variable, *Demand Shock* measures shocks to industry demand as the median percentage change in Sales between two consecutive time periods prior to an initial bid. The average *Demand Shock* is close to a positive 10% which indicates that a typical industry with an initial bid experiences a positive demand shock. The average market to

book ratio, *mb* is 2.4 with a standard deviation of 3.14%. The spread between the Commercial & Industrial Loan rate and the federal funds rate, *c&i_spread*, is on average 1.57%, with a low of .80% and a high of 2.51%.

{Insert Table 4 and Table 5here}

Table 5 presents the correlations between the dependent and the independent variables. As expected, *csm* and the *indavgcsm* are positively correlated and *lognumfirms* and *HHI* are negatively correlated. The dependent variable, *m2,* an indicator variable identifying sequential mergers is negatively correlated with *cluster1* and positively with *cluster2*. While the positive correlation is a natural expectation as the number of mergers increases in an industry the occurrence of a sequential merger is more likely, the negative correlation between *cluster1* and *m2* is not readily explained. *Cluster1* and *Cluster2* do not have the predicted correlations with *Demand Shock* and *Demand_Shock _Sq* as theorized by Bernile et al (2006) that there should be u-shaped relationship between demand shocks and merger intensity.

4.1.1 Do externalities affect sequential merger decisions?

To test the accommodation hypotheses in *H1* and *H2* I run industry level event time regressions described in Equation (7) for each initial bid and these results are

reported in Table 6. The dependent variable, in columns 1,2 and 3, is a binary variable that takes on the value of 1 if there was at least one merger in the second stage decision and 0 otherwise. In column 4, the dependent variable is a dummy variable that is equal to 1 when the number of mergers in the second stage, *nofm1*, is greater than the average number of acquisitions, *avgacqs*, in the industry across the entire sample. In the last column, the dependent variable is measured as the merger intensity in the second stage, *cluster2*, ratio of number of mergers in the second stage (*nofm2*) to the total number of mergers in an industry (*nofacqs).* This dependent variable is truncated from below at zero. The model under this alternative measure of the dependent variable is then estimated using a Tobit regression.

The primary independent variable is a dummy identifying merger related positive and negative externalities measured as the 3-day abnormal return earned by a portfolio of rival firms at the time of the initial bid. This measure is used as a proxy for the externality imposed by a merger on the rest of the industry. Other controls[21] include an economic shock variable defined as the median percent change in the Profit margin in the industry prior to the initial bid, demand shock variables[22] defined as industry median percentage change in sales and its square, the industry median market to book ratio, a proxy for

[21] The choice of the control variables in these logit regressions are motivated from merger wave studies reviewed in Chapter 2.
[22] Bernile, Lyandres and Zhnadov(2006) find that the takeover intensity is especially high during high and low product market demand conditions leading to a U-shaped relationship between merger activity and demand shocks.

capital availability[23] measured as the spread between the Commercial and Industrial loans rates and the federal funds rate and a measure of strategic competition described in the last section.

{Insert Table 6 here}

Two principal findings emerge from these results. Firstly, the externality dummy is consistently inversely related to the likelihood of a sequential merger decision in all the variations of the original model. This result is consistent with the accommodation hypothesis, *H1* that rival firms would choose to passively react to mergers that may increase the monopoly rents to all incumbent firms in the industry. Secondly, there is moderate support that the likelihood of a sequential merger is negatively related to capital availability proxy. This result is consistent with the merger wave literature in that the economy wide cost of capital moderates the timing of merger activity. *H2* predicts that the coefficient on the interaction term, *Rivalret*csm*, should be positive. I find that this variable is not statistically significant in any of the models. As mentioned earlier this insignificance does not necessarily imply inconsistency with the strategic competition theory as the weakening effect of externalities on the likelihood of sequential mergers may simply drive β_3 to a value of zero. To verify the robustness of these results I examine

[23] I thank Jarrad Harford for providing this data

the impact of externalities in sub-samples that are classified on the basis of their market structure in the following section.

4.1.2 Does Pre-Merger Industry Competition Matter?

As hypothesized earlier in the paper the likelihood of sequential adoption of mergers in an industry maybe moderated by the pre-merger industry market structure. However neither the strategic interactions variable nor the interaction term between externalities and strategic competition has a significant effect on the likelihood of sequential mergers in Table 6. In order to verify the robustness of this relationship I parse the initial bidders based on their *csm* values and re-run the logit model. I separate the strategic complement industries from the strategic substitute industries. The results from these regressions are reported in Table 7. In columns 1 and 2, I measure externalities as dummy variable, *Rivalposret_dummy* that is equal to 1 if the rival portfolio abnormal returns are positive and 0 otherwise. In columns 3 and 4 I measure externalities as a continuous variable, which is the actual abnormal return to rival portfolios. The externality proxy is no longer consistently negatively related to the likelihood of sequential mergers. Overall, based on the results in Table 6 and Table 7 I conclude that I find moderate support for *H1* and no evidence consistent with *H2*.

{Insert Table 7here}

4.2 Announcement Returns to Acquirers and Rivals

This section presents the tests of hypothesis *H3, H4, H5* and *H6*. The returns to acquirers in sequential mergers depends on strategic intention of M1, whether accommodation was intended or not. If the accommodation principle is valid then mergers by firms in violation of the principle are expected to be negatively impacted. Therefore the theoretical expectation is one of a difference between announcement period returns of acquirers in M1 and M2 in each type of competitive structure. Additionally initial mergers with positive externalities should invoke a passive reaction from rival firms. This is the essence of the accommodation principle. When this status quo is not maintained then the stock market should penalize the subsequent acquirers with lower announcement period returns.

I first present and interpret the univariate evidence from event studies in the following sub-section and then conduct multivariate tests in the form of OLS regressions of acquirer returns.

4.2.1Univariate Evidence from Event Studies

I conduct event period announcement studies for the acquirers and rivals in my sample and for sub-sample classifications based on whether the acquirer was a first stage acquirer, the nature of industry competition and the nature of externalities imposed by early mergers on rival firms. These results are presented in Table 8.

4.2.2 Testing Hypothesis H3 and H4

Table 8 reports the announcement period abnormal returns of acquiring firms and their rivals. I use the market model to estimate the expected returns over a period of 100 days prior to a merger announcement. The abnormal return is computed as the difference between the return earned on announcement and the expected return. I cumulate these differences over a 3-day and a 2-day event window.

Panel A of Table 8reports the acquirer's announcement returns which are on average negative (-2.18%) and consistent with past literature which reports zero or small negative returns to acquirers. The average return to the initial bidders is negative (-2.38%) also. This result differs from the evidence in Song and Walkling (2005) who find that the initial bidders in their sample earn positive abnormal returns on announcement[24]. I note two possible reasons why this difference may arise. Firstly, Song and Walkling's tests include both vertical and horizontal mergers. And secondly, their sample includes

[24] In un-tabulated results I replicate Song and Walkling's method and find that for a sample of 416 Initial bidders the abnormal announcement return is on average positive to the tune of 0 .74% which is significant at the 1% level.

acquisition of private targets. Panel B reports the announcement returns to the first stage and second stage mergers and the associated abnormal returns to rival firms. In general the first stage mergers are not received with more favorable stock market reactions at the time of announcement than the second stage mergers. Column (3) of Table 3 presents the P-value for a single tailed difference in mean t-test between the two groups, M1 and M2. The result here suggests that in general the first stage acquirers are not better off than the second stage acquirers.

{Insert Table 8 here}

I find that the rival firms of the first stage acquirers make an average of 0.45% while the rival firms of the second stage acquirers make a small negative return, (-0.04)%. The pattern of positive announcement returns to rival firms is similar to those reported in Shahrur (2006) and Fee and Thomas (2006) who find that the average returns to rival firms is positive. The interesting result however is that the positive returns to rivals are reversed at the time of the second stage decision to merge. This is consistent with the hypothesis that mergers that violate the principle of accommodation are detrimental to industry incumbents lending additional support to *H1*.

Panels C and D classify the acquiring firm's industries into those that compete in strategic complements and strategic substitutes respectively. According to *H3* first stage acquirers in strategic complements should be better off than the second stage acquirers and the returns should be indistinguishable between the two groups in strategic substitutes. Column 4 of Panel C reports the p-value for the difference in mean t-test between the first stage acquirers and the second stage acquirers. This difference is not statistically significant. Similar results are reported for strategic substitutes in column 4 of Panel D. These results while inconsistent with *H3* are consistent with *H4*. Overall the returns to acquirers under the two competitive regimes show that both first stage and second stage acquirers equally bad.

4.2.2 Testing Hypotheses H5 and H6

According to *H5* and *H6* the first stage and second stage acquirer's returns should be different depending on whether the externalities imposed on rival firms by early mergers are positive or negative. Panels E and F of Table 8 report the announcement returns to the two groups classified into mergers with a positive or negative externality. For initial bids with positive externalities, the first stage acquirers fare better than the second stage acquirers as indicated by a P-value of .09 for the difference in mean t-test between the two groups. This difference is not statistically different for initial bids with negative externalities. This result not only lends support for *H5* and *H6* but also further

solidifies the accommodation hypothesis, *H1* that when the accommodation principle is violated the market penalizes the late movers.

4.2.3 Multivariate Evidence from OLS regressions

While the univariate evidence on acquirer returns is partially consistent with the predictions of strategic competition on sequential mergers, definite conclusions cannot be drawn unless the univariate effects persist in a multivariate setting. To test hypotheses *H3* through *H6* I use a simple OLS regression model of acquirer returns of the general form in Equation (2) that is reproduced below.

$$Acq\_ret_{it} = \beta_0 + \beta_1 Rivalposret\_dummy_t + \beta_2 CSM_{t-1} + \beta_3 Stage1_{t-1} + \beta_4 X_{t-1} + \upsilon_t \qquad \textbf{(10)}$$

Table 9 and Table 10 present the summary statistics and the correlation coefficients of the dependent and independent variables. Panel A of Table 9restates the findings in Table 8 that acquirer returns are negative on an average while the rival returns are generally positive. Panel B reports the average values of the *csm* variables and also that on an average there are about two mergers in the first and the second stage following an initial bid. Panel C reports the summary statistics for the control variables set, X_{it}. It should be noted that the acquirer regression models have lower sample size that total number of acquisitions represented by the 121 initial bids in my sample. Particularly the

requirement of the relative market to book ratio, *mb_rel*, and merger characteristics such as the method of payment, *meth_pmt*, whether the acquisition bid was challenged, *challenged*, or even the deal value, *deal_val*, imposes some loss in data points. In order to account for this differential sample size and its effect on the regression estimates I report two sets of regression models for a complete sample and a sub-sample in Table 11 and Table 12 respectively.

Table 10 reports the correlations and cross correlations between the dependent and independent variables. None of the correlations seem to indicate any serious multi-collinearity issues in my OLS regressions.

{ Insert Table 9and Table 10 here }

Table 11[25] reports OLS regression results of announcement returns to acquiring firms controlling for various factors that were discussed in the previous chapter. The full models are estimated in columns 1 and 2. Acquirers are separated into sub samples based

[25] In the regressions estimated in Table 11 and Table 12 there could be some concern with the model specification particularly with respect to the announcement returns to the initial bidders and the externality measure which are calculated contemporaneously and could lead to biased coefficient estimates. To allay this concern I also run the regression model excluding the initial bidders and find that the coefficient estimates are qualitatively similar. These results are reported in the Appendix.

on the sign of their *csm* and on the sign of the announcement return to rival portfolios at the time of the initial bid, *Rivalret* in columns 3,4 and 5,6 respectively.

{Insert Table 11here}

The principal variable of interest is *Stage1*, which is a dummy variable that identifies first stage bidders including the initial bidder. In general this variable is expected to have a positive relationship with the acquirer returns. This positive relationship is expected to be primarily driven by acquirers in strategic complements (*H3* and *H4*) and those that experienced positive externalities (*H5* and *H6*). Because hypotheses 3 through 6 imply differential effects between sub-groups I have also reported the F-Statistic, at the bottom of Table 11, produced by the interaction terms between *Stage1* and competition measure and *Stage1* and the externality proxy. This statistic is constructed under the estimation of the full model. These F-stats fail to reject the null hypothesis that *Stage1* has differential effect between the subgroups based on the competitive strategy measure and the externality measure[26]. Overall, the coefficient on *Stage1* is insignificant in all specifications of the model lending no support to hypotheses 3 through 6. Despite the fact that the majority of the variables, except for the market to book ratio of the acquiring firm and the market concentration index, are statistically

[26] The Appendix contains a further discussion of this issue. In addition I report a variation of the model reported in Table 11 to test for the differential impact of *Stage1* between the subsamples.

insignificant the over model fit is good as indicated by the F-Stats reported at the bottom of the table along with the sample sizes and the R-Squared values[27].

{Insert Table 12here}

While the acquirer return regressions in Table 11provides no support for my predictions it is possible that the regression models are incomplete without controlling for merger specific characteristics. To ensure robustness of these results I report the acquirer return OLS regressions in Table 12 including additional variables but for a smaller sample. These models perform worse than those presented in Table 11. While the coefficient on *Stage1* remains insignificant the effects of acquirer market to book and market concentration continue to persist. Overall these multivariate results lend little or no support to validate the theoretical expectation that violation of the accommodation principle has any market value consequences.

[27] Some of the adjusted R-squared values reported in Table 11and Table 12 are negative. This is possible whenever the model contains predictors that do not add sufficiently to the model. The penalty becomes larger in the adjusted R-squared calculation for such models. It is possible for the adjusted R-squared to *decrease* with the addition of predictor variables, even if the R-squared increases slightly.

CHAPTER V CONCLUSION

This study is unique in its approach to the analysis of horizontal mergers. While the extant empirical literature examines cross sections of merger events or on the clustering effect in mergers, this study introduces a different perspective on merger decisions. Horizontal mergers, viewed as sequential events in an industry, allow for competitive dynamics with predictable effects on market values of merging and non merging rival firms. Merger decisions across time could be interdependent as merger induced externalities may encourage or deter subsequent rival mergers. Mergers that increase monopoly rents to rivals may induce an accommodative rival reaction whereas mergers that signal productivity increases through mergers may induce subsequent rival mergers.

Using an algorithm based on dormant time periods between mergers within industries I identify sequential and non-sequential (stand alone) horizontal mergers. Controlling for the type of competition in the product markets, I find evidence that is partially consistent with the accommodation hypothesis. The hypotheses and the summary of findings in this study are presented in Table 13. As noted in the table, I find that the likelihood of sequential horizontal mergers is inversely related to the externality imposed on rival firms by an initial merger. I do not find evidence consistent with the

predictions of Yan (2006), Carow, Heron and Saxton (2006) and others who find that early movers in merger waves are better off than late movers. The wealth effects for acquiring firms measured as their announcement period abnormal returns are not different between first and second stage acquisitions. Further expected differences in the announcement period returns to first and second stage acquirers in strategic complements versus strategic substitutes and in mergers with positive versus negative externalities are not empirically supported. These results for acquirer returns are not affected in multivariate settings and hence I conclude that overall the evidence is only partially consistent with the predictions of strategic competition theory.

The benefits of a large sample approach such as the one used in this study to analyze merger behavior across a panel of industries that represent different kind of product markets suffers from shortcomings in certain aspects of the research design. Firstly, measuring the extent of strategic interactions using any of the available proxies could be biased if the definition of an industry does not capture all the relevant market participants. In this study an industry is defined on the basis of the primary 4-digit SIC code that is reported on COMPUSTAT. In addition to the fact that the effect of private firm participants in the industry is overlooked, the classification of industries to identify horizontal mergers does not map one on one to the same 4-digit SIC code as reported on the CRSP database. Kahle and Walkling (1996) find substantial disagreement between COMPUSTAT and CRSP in identifying horizontal mergers. Recent studies on Merger waves rely on the Fama-French industry classification, which is based on 2-digit level

SIC codes to identify horizontal and non-horizontal mergers. While this classification mitigates some of the known issues in the 4-digit SIC classification it is still plagued by the problem faced in this study. The 2-digit codes must be obtained either through COMPUSTAT or the CRSP databases. The extent of disagreement between CRSP and COMPUSTAT at the two digit level is unknown but based on Kahle and Walkling's (1996) findings the Fama-French classification is probably as effective as the 4-digit classification used in this study.

A second limitation is related to the algorithm used to identify sequential and stand alone mergers in this study. There is no theoretical basis for the choice of dormant periods or duration of the first and the second stage mergers. The threshold values are based on stylized empirical findings in the literature. If actual firm behavior is not consistent with these approximations then I could have misclassified the mergers. The definition of a sequential merger event irregardless of merger intensities may overestimate the frequency of these events. Additionally a large number of mergers were eliminated from my initial bid sample (roughly 37%) due to the frequency of stand alone mergers that occurred before the next initial bid in the industry and the lack of sufficient historical data for younger firms. The impact of these lost observations may have significantly compromised the strength of the results in this study.

A third limitation is in regards to the competitive interaction measures used in this study. While Sundaram, John and John's (1996) Competitive Strategy Measure and

Lyandres's (2006) adjusted Competitive Strategy Measure are a definite improvement over a simple market share concentration index these measures are still imperfect. Sundaram et al's measure suffers from a mis-classification problem while Lyandres's measure does not allow for time variance in the nature of competition within an industry.

While the results in contained in this study provide weak support for strategic behavior in merger decisions, it does provide a new perspective to evaluating the profitability and welfare aspects in mergers. As direction for future research a case study type approach, where one can control for appropriate industry classification and the type of competition prevailing in the product market, may result in more robust results and fruitful insights. Further more identifying and studying industries that are more likely to display oligopolistic type behavior may enhance the empirical results found in this study.

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FIGURES

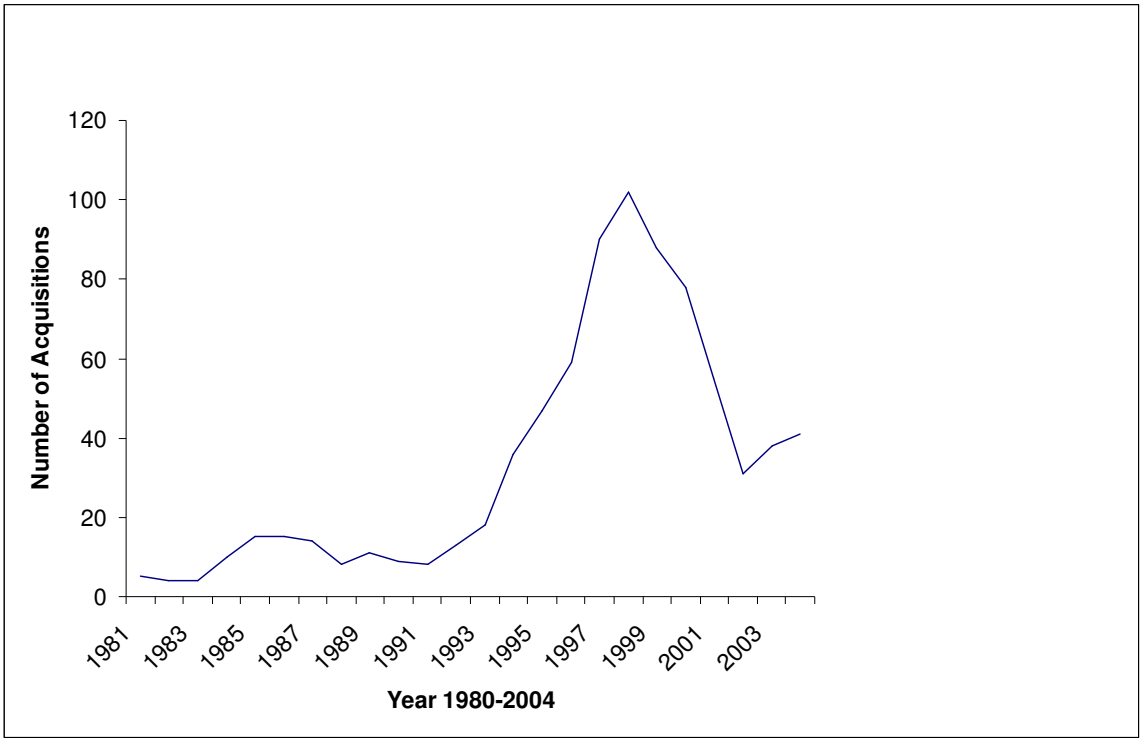


Figure 1 Distribution of Horizontal Mergers in 4-Digit SIC Industries between 1980-2004

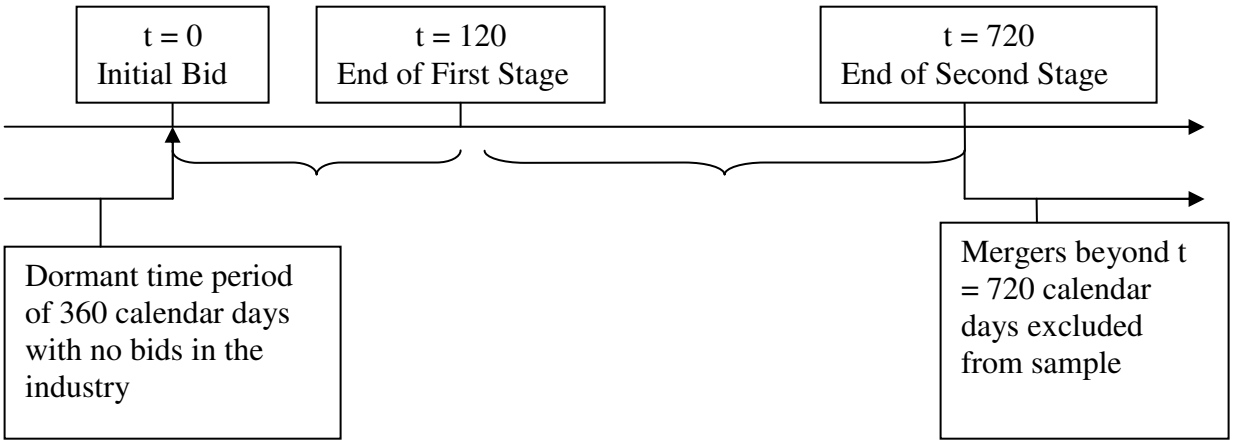


Figure 2 Identification of Sequential Horizontal Merger Decisions

TABLES

Table 1 Reaction of Rival firms to an Initial Merger

If an initial merger imposes positive externalities on rival firms then the optimal reaction of rival firms should be to maintain the status quo and not pursue their own mergers. However negative externalities may signal a competitive disadvantage and induce subsequent rival mergers. The 'Market power' and the 'Productive efficiency' hypotheses are generally offered to explain the gains to merging firms and their rivals in horizontal mergers. Eckbo (1983) and Stillman (1983) postulate that while the market power hypothesis predicts positive externality on rival firms, the effect of efficiency motivated mergers is ambiguous.

	Effect on Rival Firms	**Reaction of Rival Firms**
Market Power Hypothesis	*Positive* (Increase in Monopoly Rents)	*Accommodation* Merger encourages industry wide collusion or dominant firm pricing
Productive Efficiency Hypothesis	*Negative* (Competitive Disadvantage)	*Rival Merger* Merger may encourage rivals to pursue their own mergers in order to remain competitive
	Positive (Prospective Target/Opportunities for productivity increases)	*Rival Merger* Merger may encourage rivals to pursue their own mergers in order to benefit from productivity increases

Table 2 Distribution of Acquisitions and Initial Bidders across sample period

Panel A of this table presents the distribution of acquisition bids, the number of initial bids and the number of unique 4-digit SIC industries represented in the sample across the sample period. Panel B presents the top 6 industries and number of acquisition bids and initial bidders in those industries.

Panel A

Year	N	% of total	# of Initial Bidders	# of Unique 4-Digit SIC Industry
1981	5	0.63%	0	2
1982	4	0.51%	1	1
1983	4	0.51%	0	1
1984	10	1.26%	0	2
1985	15	1.89%	2	2
1986	15	1.89%	3	3
1987	14	1.77%	6	1
1988	8	1.01%	3	2
1989	11	1.39%	3	2
1990	9	1.14%	2	2
1991	8	1.01%	4	1
1992	13	1.64%	6	2
1993	18	2.27%	6	4
1994	36	4.55%	7	4
1995	43	5.43%	11	4
1996	59	7.45%	12	5
1997	87	10.98%	19	7
1998	102	12.88%	22	7
1999	88	11.11%	17	7
2000	78	9.85%	21	6
2001	55	6.94%	16	6
2002	31	3.91%	5	5
2003	38	4.80%	14	4
2004	41	5.18%	15	5
Total	**792**	**100%**	**195**	**85**

Panel B

Industry Name	4-Digit SIC	# of Acquisitions	% of Total	# of Initial Bidders	% of Total
Prepackaged Software	7372	111	14.02%	4	2.05%
Oil and Gas	1311	46	5.81%	6	3.08%
Pharmaceuticals	2834	37	4.67%	3	1.54%
Telecommunications	4813	29	3.66%	5	2.56%
Computer Programming	7370	27	3.41%	0	0.00%
Semiconductor	3674	21	2.65%	4	2.05%
Total		**271**	**34.22%**	**22**	**11.28%**

Table 3 Distribution of Initial Bids and Merger Characteristics 1980-2004

hhi is a sales based Herfindahl index measured prior to an initial bid in an industry. *nofm1* and *nofm2* are the number of mergers in the first stage and second stage respectively. *dormant* is the difference, in calendar days, between the announcement date of an initial bid and the earliest merger prior to that.. Timecomp is the difference, in calendar days, between the merger announcement date and the merger completion date. *csm_dum* is a dummy variable identifying industries that compete in strategic substitutes (*csm*<0) and complements (*csm*>0) based on the *csm* measure of Sundaram et al (1996). *cluster1* (*cluster2*) is a measure of merger intensity defined as the ratio of *nofm1* (*nofm2*) and the total number of acquisitions in a 4 –digit SIC industry across the entire sample period.

4-Digit SIC	Industry Name	Year	*csm_dum*	*nofm1*	*nofm2*	*dormant*	*timecomp*	*hhi*	*cluster1*	*cluster2*
2082	MALT BEVERAGES	1982	0	1	0	457	133	0.2719	0.3333	0.0000
2621	PAPER MILLS	1985	1	1	0	504	318	0.0847	0.2000	0.0000
3841	SURGICAL,MED INSTR,APPARATUS	1985	1	1	0	1400	157	0.2858	0.0909	0.0000
5311	DEPARTMENT STORES	1986	1	1	0	1771	105	0.1880	0.1111	0.0000
5411	GROCERY STORES	1986	0	1	0	720	118	0.0712	0.0714	0.0000
2834	PHARMACEUTICAL PREPARATIONS	1987	1	1	0	660	723	0.0532	0.0270	0.0000
3944	GAMES,TOYS,CHLD VEH,EX DOLLS	1987	1	1	0	1218	42	0.2901	0.2500	0.0000
5411	GROCERY STORES	1987	0	1	2	511		0.0672	0.0714	0.1429
3630	HOUSEHOLD APPLIANCES	1988	1	1	0	945	94	0.2947	0.3333	0.0000
7990	MISC AMUSEMENT & REC SERVICE	1988	1	1	0	882	273	0.0819	0.0588	0.0000
2834	PHARMACEUTICAL PREPARATIONS	1989	0	1	0	582	69	0.0548	0.0270	0.0000
2844	PERFUME,COSMETIC,TOILET PREP	1989	0	1	0	1041	119	0.2030	0.5000	0.0000
4813	PHONE COMM EX RADIOTELEPHONE	1989	0	1	3	2141	264	0.0565	0.0345	0.1034
5331	VARIETY STORES	1990	1	1	0	2031	88	0.2030	0.2000	0.0000
3944	GAMES,TOYS,CHLD VEH,EX DOLLS	1991	1	1	0	1245	183	0.1867	0.2500	0.0000
4512	AIR TRANSPORT, SCHEDULED	1991	0	1	0	1673	129	0.0604	0.0833	0.0000
7812	MOTION PIC, VIDEOTAPE PRODTN	1991	1	1	0	1334	32	0.2869	0.2500	0.0000
4011	RAILROADS,LINE-HAUL OPERATNG	1992	0	1	0	1333	262	0.0694	0.1667	0.0000
4813	PHONE COMM EX RADIOTELEPHONE	1992	1	2	1	435	286	0.0562	0.0690	0.0345
5122	DRUGS AND PROPRIETARY-WHSL	1992	0	1	0	2853	153	0.2087	0.1667	0.0000
1311	CRUDE PETROLEUM & NATURAL GS	1993	1	1	4	555	28	0.1461	0.0217	0.0870
2211	BRDWOVEN FABRIC MILL, COTTON	1993	1	1	0	2863	111	0.1286	0.5000	0.0000
3312	STEEL WORKS & BLAST FURNACES	1993	1	1	1	535	243	0.0695	0.1250	0.1250
7372	PREPACKAGED SOFTWARE	1993	0	2	6	364	91	0.0405	0.0180	0.0541
4011	RAILROADS,LINE-HAUL OPERATNG	1994	0	1	0	646	450	0.0691	0.1667	0.0000
4813	PHONE COMM EX RADIOTELEPHONE	1994	0	1	2	514	220	0.0601	0.0345	0.0690
5065	ELECTRONIC PARTS,EQ-WHSL,NEC	1994	0	1	0	519	68	0.1448	0.1667	0.0000
2621	PAPER MILLS	1995	1	1	0	3500	148	0.0775	0.2000	0.0000
3572	COMPUTER STORAGE DEVICES	1995	0	1	0	1063	138	0.1263	0.2000	0.0000
3576	COMPUTER COMMUNICATION EQUIP	1995	0	2	5	387	78	0.0675	0.1333	0.3333
3674	SEMICONDUCTOR,RELATED DEVICE	1995	0	1	0	3095	89	0.1331	0.0476	0.0000
3812	SRCH,DET,NAV,GUID,AERO SYS	1995	0	1	1	2708	35	0.1788	0.2500	0.2500

4-Digit SIC	Industry Name	Year	*csm_dum*	*nofm1*	*nofm2*	*dormant*	*timecomp*	*hhi*	*cluster1*	*cluster2*
3825	ELEC MEAS & TEST INSTRUMENTS	1995	0	1	0	2934	86	0.1305	0.1429	0.0000
4011	RAILROADS,LINE-HAUL OPERATNG	1995	0	1	0	399	406	0.0709	0.1667	0.0000
4833	TELEVISION BROADCAST STATION	1995	0	2	0	1180	193	0.1305	0.5000	0.0000
5311	DEPARTMENT STORES	1995	0	2	1	3342	58	0.2186	0.2222	0.1111
1381	DRILLING OIL AND GAS WELLS	1996	0	1	0	591	139	0.0548	0.1111	0.0000
3320	IRON AND STEEL FOUNDRIES	1996	0	1	0	5239	45	0.2050	0.5000	0.0000
3571	ELECTRONIC COMPUTERS	1996	0	1	0	2762	129	0.2465	0.2000	0.0000
4832	RADIO BROADCASTING STATIONS	1996	1	3	2	377	218	0.0955	0.3333	0.2222
8062	GEN MED & SURGICAL HOSPITALS	1996	1	1	0	743	105	0.4235	0.1000	0.0000
1311	CRUDE PETROLEUM & NATURAL GS	1997	0	6	6	705	123	0.1276	0.1304	0.1304
2060	SUGAR & CONFECTIONERY PRODS	1997	0	1	0	5450	118	0.2944	0.5000	0.0000
2621	PAPER MILLS	1997	1	2	0	658	100	0.0944	0.4000	0.0000
3312	STEEL WORKS & BLAST FURNACES	1997	1	2	2	541	147	0.0641	0.2500	0.2500
3661	TELE & TELEGRAPH APPARATUS	1997	0	1	3	1298	146	0.3302	0.0714	0.2143
3674	SEMICONDUCTOR,RELATED DEVICE	1997	0	2	1	647	112	0.1346	0.0952	0.0476
3714	MOTOR VEHICLE PART,ACCESSORY	1997	1	1	3	392	34	0.0624	0.0909	0.2727
3826	LAB ANALYTICAL INSTRUMENTS	1997	0	1	0	1784	151	0.1337	0.2500	0.0000
5065	ELECTRONIC PARTS,EQ-WHSL,NEC	1997	1	1	0	1094	119	0.1798	0.1667	0.0000
5311	DEPARTMENT STORES	1997	0	1	2	572	93	0.1722	0.1111	0.2222
5331	VARIETY STORES	1997	1	1	0	2556	72	0.3572	0.2000	0.0000
1040	GOLD AND SILVER ORES	1998	1	1	1	431	113	0.0741	0.1667	0.1667
2451	MOBILE HOMES	1998	0	1	0	510	85	0.2041	0.5000	0.0000
2750	COMMERCIAL PRINTING	1998	0	1	0	1177	40	0.1485	0.3333	0.0000
3089	PLASTICS PRODUCTS, NEC	1998	1	1	0	2998	154	0.0990	0.5000	0.0000
3576	COMPUTER COMMUNICATION EQUIP	1998	1	1	0	448	95	0.1417	0.0667	0.0000
3663	RADIO,TV BROADCAST, COMM EQ	1998	1	1	3	659	77	0.2467	0.1429	0.4286
3845	ELECTROMEDICAL APPARATUS	1998	1	3	0	518	93	0.1026	0.3333	0.0000
3944	GAMES,TOYS,CHLD VEH,EX DOLLS	1998	1	1	0	2794	97	0.6054	0.2500	0.0000
4512	AIR TRANSPORT, SCHEDULED	1998	0	1	2	414	286	0.0692	0.0833	0.1667
4812	RADIOTELEPHONE COMMUNICATION	1998	0	1	4	529	107	0.0568	0.0714	0.2857
5065	ELECTRONIC PARTS,EQ-WHSL,NEC	1998	0	1	1	377	98	0.2027	0.1667	0.1667
5331	VARIETY STORES	1998	0	1	1	372	130	0.3707	0.2000	0.2000
5812	EATING PLACES	1998	1	1	0	920	67	0.0747	0.1250	0.0000
7200	PERSONAL SERVICES	1998	0	1	0	755	166	0.1265	0.5000	0.0000
3674	SEMICONDUCTOR,RELATED DEVICE	1999	0	2	7	367	159	0.0999	0.0952	0.3333
4832	RADIO BROADCASTING STATIONS	1999	0	1	0	362	331	0.1503	0.1111	0.0000
4841	CABLE AND OTHER PAY TV SVCS	1999	1	2	1	1438	210	0.1221	0.4000	0.2000
5122	DRUGS AND PROPRIETARY-WHSL	1999	0	1	0	2379	105	0.2033	0.1667	0.0000
7011	HOTELS,MOTELS,TOURIST COURTS	1999	0	1	0	644	85	0.1551	0.1250	0.0000

4-Digit SIC	Industry Name	Year	*csm_dum*	*nofm1*	*nofm2*	*dormant*	*timecomp*	*hhi*	*cluster1*	*cluster2*
7311	ADVERTISING AGENCIES	1999	0	1	2	3847	115	0.1283	0.2000	0.4000
8711	ENGINEERING SERVICES	1999	0	1	0	1248	50	0.0759	0.5000	0.0000
1040	GOLD AND SILVER ORES	2000	0	1	0	556	204	0.0993	0.1667	0.0000
1531	OPERATIVE BUILDERS	2000	1	1	4	790	75	0.0686	0.1429	0.5714
2330	WOMENS,MISSES,JRS OUTERWEAR	2000	0	2	0	1322	344	0.2044	0.6667	0.0000
2711	NEWSPAPER:PUBG, PUBG & PRINT	2000	1	2	0	2468	91	0.0797	0.6667	0.0000
2851	PAINTS, VARNISHES, LACQUERS	2000	0	1	0	1575	177	0.2601	0.3333	0.0000
2860	INDUSTRIAL ORGANIC CHEMICALS	2000	0	1	0	830	45	0.1061	0.5000	0.0000
2911	PETROLEUM REFINING	2000	1	2	3	564	358	0.0642	0.1818	0.2727
3411	METAL CANS	2000	0	1	0	2663	119	0.2300	0.3333	0.0000
3523	FARM MACHINERY AND EQUIPMENT	2000	0	1	0	553	147	0.2103	0.5000	0.0000
3559	SPECIAL INDUSTRY MACHY, NEC	2000	0	2	3	418	77	0.1162	0.2000	0.3000
3663	RADIO,TV BROADCAST, COMM EQ	2000	1	1	0	394	46	0.1809	0.1429	0.0000
3845	ELECTROMEDICAL APPARATUS	2000	1	1	0	712	134	0.2106	0.1111	0.0000
4213	TRUCKING, EXCEPT LOCAL	2000	1	1	0	925	200	0.0565	0.3333	0.0000
7812	MOTION PIC, VIDEOTAPE PRODTN	2000	0	1	0	3202	368	0.3051	0.2500	0.0000
1040	GOLD AND SILVER ORES	2001	0	1	0	369	172	0.0976	0.1667	0.0000
1381	DRILLING OIL AND GAS WELLS	2001	0	2	0	840	92	0.0637	0.2222	0.0000
2836	BIOLOGICAL PDS,EX DIAGNSTICS	2001	0	2	0	413	43	0.1161	0.2500	0.0000
3825	ELEC MEAS & TEST INSTRUMENTS	2001	1	2	1	2079	77	0.2404	0.2857	0.1429
3826	LAB ANALYTICAL INSTRUMENTS	2001	0	1	0	1421	120	0.0820	0.2500	0.0000
3841	SURGICAL,MED INSTR,APPARATUS	2001	1	1	0	669	66	0.1978	0.0909	0.0000
5065	ELECTRONIC PARTS,EQ-WHSL,NEC	2001	1	1	0	633	78	0.1911	0.1667	0.0000
5812	EATING PLACES	2001	1	1	0	419	102	0.0610	0.1250	0.0000
7373	CMP INTEGRATED SYS DESIGN	2001	1	2	0	1155	69	0.2585	0.2500	0.0000
8071	MEDICAL LABORATORIES	2001	1	1	3	2612	134	0.2408	0.2000	0.6000
3350	ROLLING & DRAW NONFER METAL	2002	1	1	0	2088	142	0.2331	0.5000	0.0000
3845	ELECTROMEDICAL APPARATUS	2002	0	1	0	535	107	0.2431	0.1111	0.0000
5122	DRUGS AND PROPRIETARY-WHSL	2002	0	1	0	455	201	0.3218	0.1667	0.0000
7990	MISC AMUSEMENT & REC SERVICE	2002	0	1	0	897	208	0.0577	0.0588	0.0000
1381	DRILLING OIL AND GAS WELLS	2003	0	1	0	734	261	0.0873	0.1111	0.0000
3576	COMPUTER COMMUNICATION EQUIP	2003	0	1	1	882	28	0.5316	0.0667	0.0667
3577	COMPUTER PERIPHERAL EQ, NEC	2003	0	1	0	1443	147	0.3136	0.5000	0.0000
3812	SRCH,DET,NAV,GUID,AERO SYS	2003	0	1	0	2874	81	0.3820	0.2500	0.0000
3845	ELECTROMEDICAL APPARATUS	2003	1	1	1	591	81	0.2529	0.1111	0.1111
5311	DEPARTMENT STORES	2003	1	1	0	1852	90	0.1898	0.1111	0.0000
7363	HELP SUPPLY SERVICES	2003	1	1	0	1567	188	0.1837	0.1667	0.0000
3357	DRAWNG,INSULATNG NONFER WIRE	2004	1	1	0	3884	162	0.1376	0.5000	0.0000
3533	OIL & GAS FIELD MACHY, EQUIP	2004	0	1	0	1610	211	0.1333	0.5000	0.0000

4-Digit SIC	Industry Name	Year	*csm_dum*	*nofm1*	*nofm2*	*dormant*	*timecomp*	*hhi*	*cluster1*	*cluster2*
3661	TELE & TELEGRAPH APPARATUS	2004	0	1	0	822	194	0.2004	0.0714	0.0000
3825	ELEC MEAS & TEST INSTRUMENTS	2004	1	1	1	679	95	0.2093	0.1429	0.1429
3842	ORTHO,PROSTH,SURG APPL,SUPLY	2004	1	1	0	1680	102	0.0808	0.2500	0.0000
4812	RADIOTELEPHONE COMMUNICATION	2004	0	1	0	1164	240	0.0751	0.0714	0.0000
5912	DRUG & PROPRIETARY STORES	2004	0	1	0	2282	430	0.1818	0.1111	0.0000
7310	ADVERTISING	2004	1	1	0	5725	121	0.1596	0.5000	0.0000
7311	ADVERTISING AGENCIES	2004	1	1	0	1274	175	0.1998	0.2000	0.0000
7359	EQUIP RENTAL & LEASING, NEC	2004	1	1	0	1981	100	0.1181	0.5000	0.0000
7373	CMP INTEGRATED SYS DESIGN	2004	0	1	0	836	137	0.2897	0.1250	0.0000
7841	VIDEO TAPE RENTAL	2004	1	1	0	6055	159	0.5233	0.5000	0.0000
7990	MISC AMUSEMENT & REC SERVICE	2004	0	2	1	667	325	0.0595	0.1176	0.0588
	SUM			149	85					
	MIN			1	0	362	28	0.0405	0.0180	0.0000
	MAX			6	7	6055	723	0.6054	0.6667	0.6000
	MEDIAN			1	0	882	119	0.1376	0.1667	0.0000
	MEAN			1.2314	0.7025	1380.95	148.5583	0.1670	0.2233	0.0602

Table 4 Summary Statistics of Sequential Merger Determinants, Z_{it} Variables

All independent variables except *c&i_spread* are measured prior to the occurrence of an initial bid in the industry. *Demand Shock* is the industry median percentage change in sales. *Demand_Shock _Sq* is the square of *Demand Shock*. *mb* and *mb_sd* are the industry median Market to Book ratio and the standard deviation of Market to Book ratios within the industry. *c&i_spread* is the spread between the Commercial and industrial loans and the federal funds rate. *Rivalret* value weighted announcement abnormal return to a portfolio of rival firms at the time of the initial bid in the industry *.csm* is the Sundaram et al (1996) *csm* competition measure. *indavgcsm* is the average *csm* across all firms in an industry year. *M2* is an indicator variable for the occurrence of a sequential merger. Cluster1 (Cluster2) is a measure of merger intensity defined as the ratio of *nofm1* (*nofm2)* and the total number of acquisitions in a 4 –digit SIC industry across the entire sample period. *nofacqs* is the total number of acquisitions in an industry across the entire sample period.

	N	Mean	SD	Min	Max
Panel A					
Industry Structure Variables					
csm	121	-0.0282	0.3031	-0.8259	0.7393
indavgcsm	121	-0.0239	0.1306	-0.3019	0.3930
hhi	121	0.1670	0.1065	0.0405	0.6054
lognumfirms	121	4.4641	0.8683	2.6391	6.8469
Panel B					
Industry Merger Characteristics					
m2	121	0.2893	0.4553	0	1
cluster1	121	0.2233	0.1554	0.0180	0.6667
cluster2	121	0.0602	0.1198	0	0.6
Rivalret	121	0.0055	0.0266	-0.0534	0.1408
nofacqs	121	9.6942	12.4217	2	111
Panel C					
Z_{it} Variables					
Demand Shock	121	0.0991	0.1061	-0.1650	0.4676
Demand_Shock _Sq	121	0.0210	0.0315	0.0000	0.2186
lpm_medabs~g	121	0.0774	0.1280	0.0022	1.2429
mb	121	2.4010	3.1446	0.5996	31.6708
mb_sd	121	17.0379	63.4754	0.1679	490.3105
c&i_spread	121	1.5791	0.2818	0.8050	2.5150

Table 5 Pearson Correlation Coefficients amongst the determinants of Sequential Mergers

All independent variables except *c&i_spread* are measured prior to the occurrence of an initial bid in the industry. *Demand Shock* is the industry median percentage change in sales. *Demand_Shock _Sq* is the square of *Demand Shock*. *mb* and *mb_sd* are the industry median Market to Book ratio and the standard deviation of Market to Book ratios within the industry. *C&i_spread* is the spread between the Commercial and industrial loans and the federal funds rate. *Rivalret* value weighted announcement abnormal return to a portfolio of rival firms at the time of the initial bid in the industry *.csm* is the Sundaram et al (1996) *csm* competition measure. *indavgcsm* is the average CSM across all firms in an industry year. *cluster1* (*cluster2*) is a measure of merger intensity defined as the ratio of *nofm1* (*nofm2*) and the total number of acquisitions in a 4 –digit SIC industry across the entire sample period. *m2* is an indicator variable for the occurrence of a sequential merger. *nofacqs* is the total number of acquisitions in an industry across the entire sample period.

	m2	***csm***	***indav~sm***	***hhi***	***lognumfirms***	***cluster1***	***cluster2***	***nofacqs***	***Demand Shock***	***ld12gr~2***	***lpm_me~g***	***mb***	***mb_sd***	***ci_sr~d***
m2	1													
csm	-0.0061	1												
indavgcsm	0.1879*	0.1569*	1											
hhi	-0.2204*	-0.0138	-0.2216*	1										
lognumfirms	0.4079*	-0.0966	0.3369*	-0.3203*	1									
cluster1	-0.4583*	0.1364*	-0.1202	0.2000*	-0.5976*	1								
cluster2	0.7059*	0.1657*	0.0308	-0.1271	0.0439	-0.2246*	1							
nofacqs	0.3623*	-0.1750*	0.4169*	-0.3028*	0.7404*	-0.4747*	-0.0566	1						
Demand Shock	0.2084*	-0.0406	0.0255	-0.1810*	0.123	-0.0847	0.2990*	0.1406*	1					
Demand_Shock _Sq	0.1967*	0.0043	0.0264	-0.1752*	0.0333	-0.0202	0.2587*	0.0619	0.8766*	1				
lpm_medabs~g	-0.0554	-0.0127	0.1596*	0.0168	0.3043*	-0.0455	-0.111	0.0724	-0.0605	-0.0286	1			
mb	0.0612	-0.1101	0.0848	-0.002	0.1523*	-0.0433	0.1524*	0.0139	0.1981*	0.1427*	0.2610*	1		
mb_sd	-0.0289	-0.1521*	-0.023	0.1379*	0.0442	0.0648	-0.0113	-0.066	-0.1547*	-0.071	0.1804*	0.0533	1	
c&i_spread	-0.1702*	-0.018	-0.0944	0.1604*	-0.1686*	0.1547*	-0.0293	-0.1905*	-0.1300*	-0.0005	0.1104	0.0895	0.2425*	1

** indicates significance at the 5% level at least*

Table 6 Regressions predicting the likelihood of a sequential merger in an industry

In columns 1,2 and 3 the dependent variable is *m2*, an indicator variable for the occurrence of a sequential merger. In column 4 the dependent variable, *cluster2_dum* is a dummy that takes on the value of 1 when the number of mergers in the second stage is greater than the average number of acquisitions in the industry across the entire sample period and 0 otherwise. In column 5 the dependent variable,*cluster2,* is the merger intensity calculated as *nofm1* divided by *nofacqs* and is truncated below at 0. The estimation model in column 5 is a Tobit regression. All independent variables except *c&i_spread* are measured prior to the occurrence of an initial bid in the industry. *Demand Shock* is the industry median percentage change in sales. *Demand_Shock _Sq* is the square of *Demand Shock*. *mb* and *mb_sd* are the industry median Market to Book ratio and the standard deviation of Market to Book ratios within the industry. *c&i_spread* is the spread between the Commercial and industrial loans and the federal funds rate. *Rivalposret_dummy* is dummy variable equal to 1 when then value weighted announcement return to a portfolio of rival firms at the time of the initial bid in the industry is positive and equal to 0 otherwise. *csm* is the Sundaram, John and John (1996) competition measure. *Rivalret*csm* is the interaction between rival return dummy and the competition measure.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
	m1	*m1*	*m1*	*cluster2_dum*	*cluster2*
Rivalposret_dummy	-0.8469*	-0.8614*	-0.8604*	-1.0519*	-0.1143$
	(0.0470)	(0.0440)	(0.0450)	(0.0220)	(0.1030)
csm		0.5127	0.5819	0.7740	0.1560
		(0.4660)	(0.4200)	(0.3110)	(0.1800)
Rivalret*csm			-19.7799	-17.8503	-3.588
			(0.5430)	(0.6260)	(0.4980)
Demand Shock	1.1770	1.4750	1.5471	2.9883	0.5707
	(0.7370)	(0.6750)	(0.6630)	(0.4670)	(0.3540)
Demand_Shock _Sq	3.0749	2.4744	2.2755	0.1218	-0.0762
	(0.7740)	(0.8180)	(0.8330)	(0.9920)	(0.9670)
lpm_medabs~g	-0.0675	-0.1844	-0.2231	-0.5804	-0.1903
	(0.9720)	(0.9260)	(0.9120)	(0.7910)	(0.6110)
mb	-0.0672	-0.0664	-0.0734	-0.0193	-0.0027
	(0.5720)	(0.5820)	(0.5400)	(0.8410)	(0.8380)
mb_sd	0.0024	0.0029	0.0028	0.0013	0.0006
	(0.4660)	(0.3920)	(0.4030)	(0.7540)	(0.3060)
c&i_spread	-1.3449$	-1.3320	-1.3066	-1.7470*	-0.1940
	(0.1090)	(0.1120)	(0.1190)	(0.0540)	(0.1580)
_cons	1.5854	1.5640	1.5445	1.9094	0.1687
	(0.2500)	(0.2550)	(0.2620)	(0.1940)	(0.4450)
N	121	121	121	121	121
LR chi2	7.89	8.43	8.81	12.04	9.45
Prob > chi2	0.342	0.3929	0.455	0.2112	0.397
Pseudo R2	0.0542	0.0579	0.0605	0.0888	0.0941

$,,** indicates significance at the 10%,5% and 1% respectively*
Two tail p-values reported in parentheses under the coefficients

Table 7 Logit regressions predicting sequential horizontal mergers in stratified samples based on market structure

The binary dependent variable, *m1* is equal to 1 when a sequential acquisition bid occurs in an industry and is equal to 0 otherwise. All independent variables except *c&i_spread* are measured prior to the occurrence of an initial bid in the industry. *Demand Shock* is the industry median percentage change in sales. *Demand_Shock _Sq* is the square of *Demand Shock*. *mb* and *mb_sd* are the industry median Market to Book ratio and the standard deviation of Market to Book ratios within the industry. *c&i_spread* is the spread between the Commercial and industrial loans and the federal funds rate. *Rivalposret_dummy* is dummy variable equal to 1 when then value weighted announcement return to a portfolio of rival firms at the time of the initial bid in the industry is positive and equal to 0 otherwise. *Rivalret* is the value weighted announcement returns to rival firms at the time of an initial bid. *csm* is the Sundaram, John and John (1996) competition measure.

	(1)	**(2)**	**(3)**	**(4)**
	csm>0	***csm<0***	***csm>0***	***csm<0***
Rivalposret_dummy	-0.9211	-0.7997		
	(0.1690)	(0.1780)		
winar1			-26.8882$	-13.9004
			(0.0820)	(0.3360)
Demand Shock	2.5844	-4.1043	2.4151	-3.9181
	(0.6160)	(0.4820)	(0.6480)	(0.5050)
Demand_Shock _Sq	5.8444	10.1958	8.5460	10.8498
	(0.7380)	(0.5420)	(0.6260)	(0.5250)
lpm_medabs~g	5.3845	-0.8480	6.4218	-0.7032
	(0.3010)	(0.7370)	(0.2370)	(0.7830)
mb	-0.1892	0.0071	-0.1937	0.0132
	(0.4210)	(0.9440)	(0.3990)	(0.8940)
mb_sd	0.0094	0.0017	0.0105	0.0021
	(0.4560)	(0.6680)	(0.4770)	(0.6120)
c&i_spread	-0.2084	-3.3237*	-0.3109	-3.2051*
	(0.8670)	(0.0220)	(0.8000)	(0.0260)
_cons	-0.5455	4.8852*	-0.9579	4.2618$
	(0.7870)	(0.0390)	(0.6220)	(0.0620)
N	53	68	53	68
LR chi2	6.54	8.6	8.34	7.72
Prob > chi2	0.4785	0.2829	0.3033	0.3584
Pseudo R2	0.1035	0.1043	0.1321	0.0936

P-Values are in parentheses below the coefficients
*$ significant at 10%; * significant at 5%; ** significant at 1%*

Table 8 Announcement Period Abnormal Returns to Acquirers and Rival Firms in Horizontal Mergers between years 1980-2004

Columns 1 and 2 present the announcement returns to acquirers or rival firms over the (-1,1) and (-1,0) window respectively. Column 3 presents the number of firms in each event study sample. Column 4 contains the difference in mean test, *p-values* between the first and second stage acquirer abnormal return (-1,+1) in various sub samples. Panel A presents the announcement return to the acquirers in horizontal mergers and the initial bidders , panel B presents the announcement returns to first stage and second stage movers and their rival firms. Panels C and D presents the sample in Panel B sratified by whether they are strategic complements or substitutes. Panels E and F stratifies the sample in Panel B by the sign on *rival_ret*.

	(1) *(-1,1)*	(2) *(-1,0)*	(3) *n*	(4) *H0:M2-M1 <0*
Panel A				
Horizontal Acquirers	(2.18)**	(1.74%)**	234	
Initial Bidders	(2.38)**	(1.36)**	121	
Rival Portfolio	0.62**	0.40**	121	
Panel B				
M1Acquirers Only	(2.10)**	(1.29)**	150	
M2 Acquirers Only	(1.94)**	(2.30)**	84	*P-Val=0.3049*
M1 Rivals	0.45**	0.46***	150	
M2 Rivals	(0.04)*	(0.14)*	84	*P-Val=0.0686*
Panel C *Strategic Complements*				
All Acquirers	(1.91)**	(1.50)**	96	
M1 Acquirers Only	(1.92)*	(1.08)**	65	
M2 Acquirers Only	(1.89)**	(2.43)***	31	*P-Val=0.4007*
M1 Rivals	0.61**	1.29**	65	
M2 Rivals	(0.03)*	(0.11)$	31	*P-Val=0.1353*
Panel D *Strategic Substitutes*				
All Acquirers	(2.47)**	(1.49)**	138	
M1 Acquirers Only	(2.24)**	(1.45)**	85	
M2 Acquirers Only	(2.88)**	(1.70)**	53	*P-Val=0.3363*
M1 Rivals	0.336*	0.18*	85	
M2 Rivals	(0.04)**	(0.14)**	53	*P-Val=0.1713*
Panel E *Positive Externality*				
All Acquirers	(2.47)**	(1.91)**	122	
M1	(0.91)**	(0.88)**	85	
M2	(3.33)**	(3.08)**	37	*P-Val=0.0985*
Panel F *Negative Externality*				
All Acquirers	(2.95)**	(2.00)**	112	
M1	(3.69)**	(1.84)**	65	
M2	(1.91)**	(2.25)**	47	*P-Val=0.7240*

The symbols $, and ** denote statistical significance at the 10%, 5%, 1% levels, respectively, using a 1-tail t/Z test.*

Table 9 Summary Statistics for the determinants of Acquirer Returns, X_{it} Variables

Acq_ret1 and *Acq_ret2*,respectively, are the acquirer's CAR over a (-1,1) and (-1,0) window surrounding the announcement date of the acquisition. . *Rivalret* is the value weighted announcement return to a portfolio of rival firms at the time of the initial bid in the industry over (-1,1) window. *csm* is the competitive strategy measure of Sundaram et al (1996). *ib_dum* is a dummy identify if the acquirer was the first to make a bid in the industry. *Stage* is the number of days since an initial bid in an industry. *Stage1* is a dummy identifying if the acquirer belongs to the first stage decision maker group. *amb* is the acquirers equity market to book ratio. *t_mb* is the target's equity market to book ratio. *mb_rel* is ratio of the acquirer and target MB ratio. *tender_dum* is a dummy if the acquisition was conducted through a tender offer or not. *lognumfirms* is log of the number of firms in the industry prior to the initial bid. *dormant* is the number days there were no mergers in the industry prior to the current merger. *timecomp* is the difference in days between the acquisition announcement date and the completion date. *challenged* is a dummy variable if SDC identifies the acquisition bid if the merger was challenged by the merger authorities. *meth_pmt* is a dummy variable indicating whether the acquisition was made with cash only and *deal_val* is the value of the deal as reported by SDC.

	N	Mean	SD	Min	Max
Panel A Measures of Acquirer and Rival Returns					
Acq_ret1	234	-0.0229	0.0812	-0.4856	0.2530
Acq_ret2	234	-0.0182	0.0684	-0.3169	0.3983
Rivalret	234	0.0028	0.0244	-0.0534	0.1408
Panel B					
csm	234	-0.0250	0.3084	-0.8259	0.7393
indavgcsm	234	-0.0014	0.1263	-0.3019	0.3930
nofm1	234	1.6453	1.1893	1	6
nofm2	234	1.9316	2.1953	0	7
stage1	234	0.6410	0.4807	0	1
Panel C Xit Variables					
stage	234	137.8932	197.5232	0	715
ib_dum	234	0.5171	0.5008	0	1
dormant	234	778.7735	1060.4540	0	6055
timecomp	233	140.1760	95.5325	0	723
amb	228	2.8549	3.5633	0.5996	32.3789
tmb	226	2.0157	1.7778	0.5388	18.5757
mb_rel	221	1.4806	1.1629	0.3038	12.0564
tender_dum	234	0.2222	0.4166	0	1
hhi	234	0.1452	0.0979	0.0405	0.6054
lognumfirms	234	4.8042	0.9737	2.6391	6.8469
Challenged	175	0.0628	.2434	0	1
Deal_val	175	241.8250	274.7109	1	998.1620
Meth_pmt	175	0.1885	0.3932	0	1

Table 10 Pearson Correlation Coefficients amongst the determinants of Acquirer's announcement returns

Acq_ret1 is the acquirer's CAR over a (-1,1) window surrounding the announcement date of the acquisition. . *Rivalret* is the value weighted announcement return to a portfolio of rival firms at the time of the initial bid in the industry over a (-1,1)) window. *csm* is the competitive strategy measure of Sundaram et al (1996). *ib_dum* is a dummy identify if the acquirer was the first to make a bid in the industry. *Stage* is the number of days since an initial bid in an industry. *Stage1* is a dummy identifying if the acquirer belongs to the first stage decision maker group. *amb* is the acquirers equity market to book ratio. *T_mb* is the target's equity market to book ratio. *Mb_rel* is ratio of the acquirer and target MB ratio. *tender_dum* is a dummy if the acquisition was conducted through a tender offer or not. *lognumfirms* is log of the number of firms in the industry prior to the initial bid. *dormant* is the number days there were no mergers in the industry prior to the current merger.

	carwin~1	***winar1***	***csm***	***indav~sm***	***stage***	***stage1***	***ib_dum***	***dormant***	***amb***	***tmb***	***mb_rel***	***tender~m***	***hhi***	***Lg~frms***
carwindow1	1													
winar1	0.0593	1												
csm	0.024	0.0319	1											
indavgcsm	-0.0895	0.0815	0.1569*	1										
nofm1	0.0251	-0.2039*	-0.2062*	0.1355*										
nofm2	-0.0158	-0.2011*	-0.1272	0.2792*										
stage	-0.073	-0.0942	0.0585	0.1881*	1									
stage1	0.0335	0.0975	-0.0105	-0.1438*	-0.8406*	1								
ib_dum	0.0111	0.1166	-0.0106	-0.1845*	-0.7239*	0.7744*	1							
dormant	0.0462	0.1236	0.0192	-0.1716*	-0.4097*	0.4363*	0.5889*	1						
amb	-0.1057	0.041	-0.1098	0.0856	0.1572*	-0.1464*	-0.1369*	-0.0701	1					
tmb	-0.1301	-0.0036	-0.0756	0.1696*	0.2191*	-0.2065*	-0.2194*	-0.1804*	0.5173*	1				
mb_rel	-0.1663*	0.128	-0.1243	-0.0678	-0.0047	-0.001	0.0012	0.0499	0.6952*	-0.1131	1			
tender_dum	0.1219	0.0263	-0.0006	-0.0599	-0.1504*	0.1214	0.1051	0.1298*	-0.1051	-0.1237	-0.0068	1		
hhi	-0.0909	0.0279	-0.0138	-0.2216*	-0.2165*	0.1659*	0.2303*	0.3483*	-0.0019	-0.0548	0.098	0.1712*	1	
lognumfirms	-0.1294*	-0.1900*	-0.0966	0.3369*	0.3326*	-0.2821*	-0.3622*	-0.4423*	0.1527*	0.2115*	0.0266	-0.1988*	-0.3203*	1

** indicates significance at the 5% level at least*

Table 11 OLS Regressions of Acquirer's announcement period abnormal returns

The dependent variable is the acquirer's CAR over a three day window surrounding the announcement date of the acquisition. . *Rivalposret_dummy* is a dummy variable equal to 1 when the value weighted abnormal announcement period return to a portfolio of rival firms at the time of the initial bid in the industry is positive and equal to 0 otherwise. *csm* is the competitive strategy measure of Sundaram, John and John (1996). *dormant* is number of days an industry had no acquisitions. *Stage* is the number of days since an initial bid in an industry. *Stage1* is a dummy identifying if the acquirer belongs to the first stage decision maker group. *mb_rel* is ratio of the acquirer and target MB ratio. *tender_dum* is a dummy if the acquisition was conducted through a tender offer or not. *hhi* is the sales based Herfindahl index measuring industry concentration. *log assets* is the log of Firm Assets (Data6)

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
			CSM>0	***CSM<0***	***Rivalret>0***	***Rivalret<0***
dormant	0.0000		0.0000	0.0000	0.0000	0.0000**
	(0.2480)		(0.8930)	(0.5030)	(0.1900)	(0.0160)
ib_dum	-0.0169	-0.0080	-0.0254	-0.0036	-0.0051	-0.0293
	(0.3710)	(0.6430)	(0.3960)	(0.8840)	(0.8380)	(0.3000)
stage1	0.0168	0.0159	0.0318	0.0077	0.0330	0.0083
	(0.3480)	(0.3720)	(0.2670)	(0.7390)	(0.1740)	(0.7500)
csm	0.0007	0.0017			-0.0068	0.0106
	(0.9670)	(0.9230)			(0.7830)	(0.6640)
Rivalposret_dummy	.01013	.0097	.0052	.01268		
	(0.3620)	(0.3810)	(0.7790)	(0.3880)		
amb	-0.0045$	-0.0045$	-0.0044	-0.0044	-0.0025	-0.0062$
	(0.0810)	(0.0790)	(0.5210)	(0.1180)	(0.5100)	(0.0730)
mb_rel	-0.0026	-0.0023	-0.0218	0.0006	0.0000	-0.0183$
	(0.6950)	(0.7250)	(0.2600)	(0.9360)	(0.9970)	(0.1080)
log assets	0.0037	0.0036	0.0046	0.0025	-0.0038	0.0053
	(0.2920)	(0.3060)	(0.3880)	(0.6060)	(0.4380)	(0.3020)
hhi	-0.0887	-0.0709	0.0616	-0.1789*	0.0669	-0.2219*
	(0.1310)	(0.2110)	(0.5110)	(0.0210)	(0.3940)	(0.0120)
_cons	-0.0380	-0.0386	-0.0353	-0.0246	-0.0085	-0.0099
	(0.217)	(0.2100)	(0.4880)	(0.5490)	(0.8380)	(0.8410)
Number of obs	221	221	91	130	118	103
F	2.03	2.12	1.03	2.1	0.96	3.55
Prob > F	0.037	0.0354	0.4205	0.0413	0.4735	0.0008
R-squared	0.0802	0.0743	0.0913	0.1226	0.0744	0.2577
Adj R-squared	0.0408	0.0392	0.0027	0.0641	-0.0027	0.1851
F-test H0:Stage1*csm=0	F-Value=0.15, P>F=0.7030					
F-test H0:Stage1*rivalret=0	F-Value=0.69 P>F=0.4055					

$,,** denote significance at the 10%, 5% and 1% levels respectively. P-Values are in parentheses below the coefficients.*

Table 12 OLS Regressions of Acquirer's abnormal returns controlling for merger-specific characteristics

The dependent variable is the acquirer's CAR over a three day window surrounding the announcement date of the acquisition. . *Rivalposret_dummy* is a dummy variable equal to 1 when the value weighted abnormal announcement period return to a portfolio of rival firms at the time of the initial bid in the industry is positive and equal to 0 otherwise. *csm* is the competitive strategy measure of Sundaram, John and John (1996). *dormant* is number of days an industry had no acquisitions. *Stage* is the number of days since an initial bid in an industry. *Stage1* is a dummy identifying if the acquirer belongs to the first stage decision maker group. *mb_rel* is ratio of the acquirer and target MB ratio. *tender_dum* is a dummy if the acquisition was conducted through a tender offer or not. *hhi* is the sales based Herfindahl index measuring industry concentration. *log assets* is the log of Firm Assets (Data6). *challenged* is a dummy variable if SDC identifies the acquisition bid if there were multiple bids. *meth_pmt* is a dummy variable indicating whether the acquisition was made with cash only and *deal_val* is the value of the deal as reported by SDC.

	(1)	**(2)** ***CSM>0***	**(3)** ***CSM<0***	**(4)** ***Rivalret>0***	**(5)** ***Rivalret<0***
dormant	0.0000	0.0000	0.0000	0.0000$	0.0000$
	(0.5080)	(0.2650)	(0.7730)	(0.0920)	(0.0670)
ib_dum	-0.0326	-0.0658	-0.0290	-0.0140	-0.0401
	(0.1940)	(0.1490)	(0.3950)	(0.6880)	(0.2490)
stage1	0.0218	0.0678	0.0199	0.0373	0.0070
	(0.3740)	(0.1140)	(0.5400)	(0.2920)	(0.8260)
csm	-0.0003			-0.0111	0.0216
	(0.9900)			(0.7370)	(0.4560)
Rivalposret_dummy		.01359	.0178		
		(0.575)	(0.3400)		
cluster1	0.0324	-0.0600	0.0909	0.1122	-0.0089
	(0.5550)	(0.5360)	(0.2330)	(0.1120)	(0.9150)
Demand Shock	0.0082	0.0154	-0.0436	-0.0652	0.1040
	(0.8980)	(0.8810)	(0.6140)	(0.4930)	(0.2320)
lpm_medabs~g	-0.0282	-0.2922	-0.0329	-0.1040	0.0231
	(0.6180)	(0.1400)	(0.6070)	(0.5970)	(0.6920)
amb	-0.0042	0.0011	-0.0046	-0.0001	-0.0077$
	(0.2830)	(0.9170)	(0.3060)	(0.9920)	(0.0910)
mb_rel	-0.0101	-0.0411	-0.0031	0.0133	-0.0213
	(0.3450)	(0.1180)	(0.8110)	(0.3870)	(0.1350)
log assets	0.0044	0.0045	0.0026	-0.0094	0.0062
	(0.3920)	(0.5720)	(0.7150)	(0.2310)	(0.3240)
hhi	-0.0879	0.0492	-0.2004*	0.1293	-0.2769**
	(0.2030)	(0.6610)	(0.0340)	(0.1960)	(0.0040)
tender_dum	0.0224	0.0019	0.0421	-0.0175	0.0394$
	(0.1990)	(0.9410)	(0.1110)	(0.4690)	(0.0870)
challenged	-0.0364	-0.0718*	-0.0021	0.0117	-0.0985**
	(0.1850)	(0.0380)	(0.9700)	(0.7400)	(0.0150)
meth_pmt	0.0054	0.0355	-0.0304	0.0156	-0.0104
	(0.7730)	(0.2050)	(0.2750)	(0.5770)	(0.6510)
log_deal Value	0.0041	0.0066	0.0026	-0.0001	0.0032
	(0.2120)	(0.2470)	(0.5210)	(0.9840)	(0.4420)
_cons	-0.0504	-0.0314	-0.0208	0.0064	-0.0221
	(0.3220)	(0.6930)	(0.7700)	(0.9320)	(0.7300)
Number of obs	163	65	98	84	79
F-Stat	1.12	1.28	0.95	0.85	3.14
Prob > F	0.3449	0.2518	0.5057	0.6221	0.0007
R-squared	0.1024	0.2641	0.1387	0.1576	0.4278
Adj R-squared	0.0108	0.0581	-0.0066	-0.0282	0.2915

$,,** denote significance at the 10%,5% and 1% respectively. P-Values are reported in parentheses below the coefficients*

Table 13 Summary of Findings

This table summarizes the empirical evidence in support for each of the hypotheses. The first column presents the statement of my hypotheses contained in Chapter 3. The second column presents a brief outline of the outcome of the empirical tests.

Hypothesis	Finding
H1: If accommodation was intended then the likelihood of a sequential merger decision is negatively related to the externality imposed by early mergers on rival firms	Externalities are negatively related to the likelihood of a sequential mergers
H2: The likelihood of a sequential merger decision is positively related to the interaction between the nature of competition and the externality imposed by early mergers on rival firms.	There are no effects of strategic competition on the sequential merger outcome.
H3: In Strategic Complements, the first stage acquirers are better off than the second stage acquirers.	I find no support in univariate tests that early movers fare better in strategic complements than the late movers. These effects fail to be significant in multivariate settings either.
H4: In Strategic Substitutes, the first and second stage acquirers earn similar announcement period returns.	I find evidence that early movers and late movers are equally worse of in strategic substitutes.
H5: For mergers with a positive externality the announcement return to first stage acquirers are greater than that of the second stage acquirers.	I find evidence consistent with this prediction in univariate tests and no supporting evidence in multivariate settings
H6: For mergers with negative externality first and second stage acquirers earn similar announcement period returns.	I find univariate support for this prediction but the result does not hold up in multivariate settings.

APPENDIX

A1. Nilssen and Sorgard's (1998) sequential horizontal merger theory

The starting point of Nilssen and Sorgard's (1998) model is the effect a merger has on the profits earned by non-merging firms in the same industry; this effect is positive if there is no cost saving to gain for the merging firms but may be negative for sufficiently large savings on variable costs following a merger. Suppose that two different mergers are about to form and that these formations take place in sequence. The firms involved in the first merger may want to encourage or discourage the second merger, depending on how the latter affects the profits of non-merging firms. In the model there are two disjoint sets of firms, the stage one decision makers, M1 and the stage two decision makers, M2. M2 observes the decision made by M1 and accordingly make their decision. M1 makes their merger decision after taking into account the expected reaction from M2 and the resulting impact on its own profitability. M1 makes its optimal choice depending on whether it wants M2 to merge or not[28]. This model yields four possible outcomes, numbered 1 through 4 as illustrated in Table A1.1.

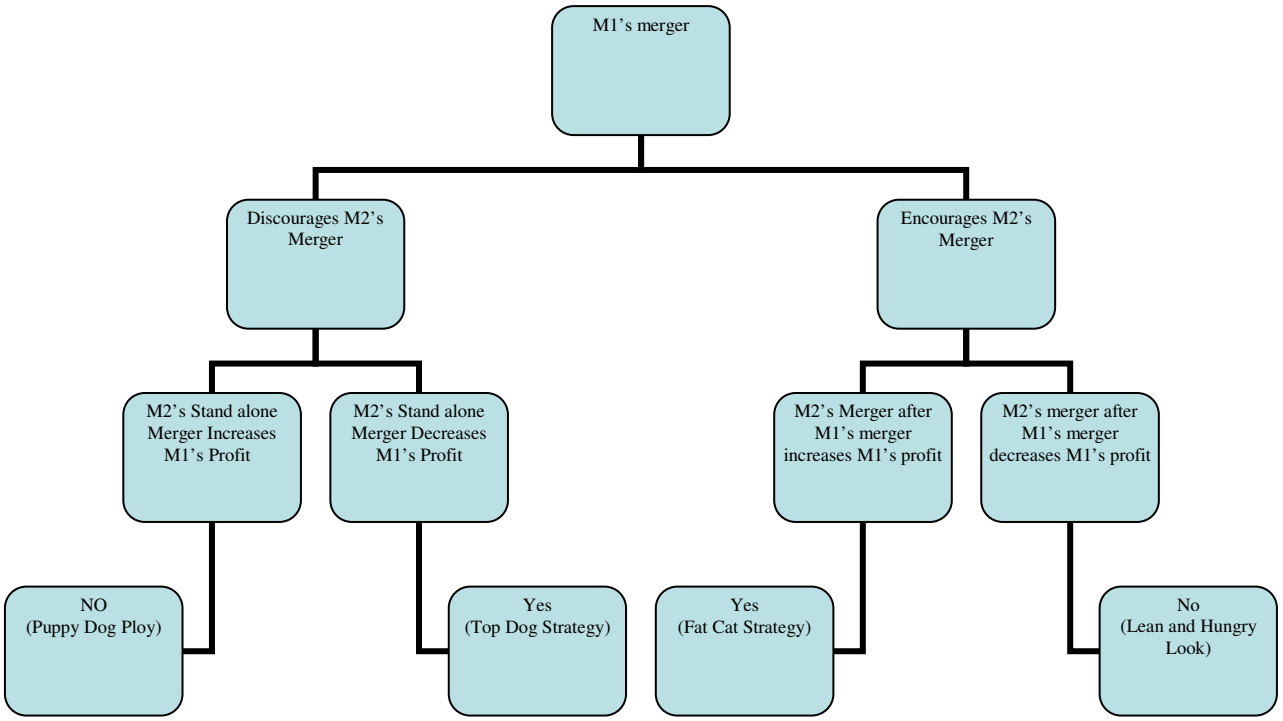
[28] Nilssen and Sorgard's (1998) two stage game does not have simultaneous moves in the second stage. In their second stage, M2 chooses between a high and a low activity level (merger or no merger). Since they use Fudenberg and Tirole' (1985) original framework to illustrate the business strategies they say that M1 plays soft(tough) when it wants M2 to play high (low) in stage 2, i.e., when it wants M2 to merge (not to merge)

Table A1.1 Four Possible outcomes in the Nilssen and Sorgard (1998) Model

M2 \ M1	Merge	Don't Merge
Merge	**1**	**2**
Don't Merge	**3**	**4**

Each of the possible outcomes arises under circumstances that can be described under two scenarios. 1) In the first scenario it is profitable for M2 to merge following a merger by M1 (i.e. M1's merger encourages M2's merger). If M2's subsequent merger has a positive impact on M1's profitability then it is optimal for M1 to merge (Fat Cat Strategy) thereby encouraging M1's merger which is profitable for all firms in the industry. However if M2's subsequent merger has a negative impact on M1's profitability then it is optimal for M1 not to merge (Lean and hungry look) to deter M2's merger. 2) In the second scenario it is not profitable for M2 to merge following a merger by M1 (i.e. M1's merger discourages M2's merger). If M2's stand alone merger has a positive impact on M1's profitability then M1 should not merge (Puppy Dog ploy). But if M2's stand alone merger has a negative impact on M1 then M1 should merge in order to soften M2's reaction (Top Dog strategy). These strategies are summarized in Figure A1.1

Figure A1.1 Nilssen and Sorgard (1998) Sequential Merger Game



A2.Alternative Measures of Competition

A key to the analysis contained in my study lies in the measurement of competitive interactions in an industry. While the Herfindahl-type index is a popular measure market structure it is argued that the relationship between the Herfindahl index and competitive interaction is ambiguous. Lyandres (2006) proposes two alternative measures in his study to capture strategic interactions. His first measure is simply the log number of firms in the industry which as an inverse proxy for competitive interactions. While this measure does not directly capture whether a firm competes in strategic substitutes it is positively correlated with the absolute slope of firm reaction functions. His second measure is a modified version of the CSM estimated in Sundaram, John and John (1996). Sundaram et al's measure can be biased if there are common cost or revenue shocks to firms in an industry. Lyandres (2006) corrects this problem in Sundaram et al's CSM measure and estimates an Adjusted CSM measure, $\overline{CSM}$.

$$\overline{CSM} = Corr\left\{\Delta\overline{\prod}_1 / \Delta\overline{S}_1, \Delta\overline{S}_2\right\} \qquad \textbf{(A2.1)}$$

I use this alternative measure of competitive interactions and re-run my models the results from which are presented in this section.

Table A2.1 Logit Regression predicting the probability of a sequential merger in an industry

The binary dependent variable is equal to 1 when a sequential acquisition bid occurs in an industry and is equal to 0 otherwise. All independent variables except C&i_spread are measured prior to the occurrence of an initial bid in the industry. Demand Shock is the industry median percentage change in sales. Demand_Shock _Sq is the square of Demand Shock. Mb and mb_sd are the industry median Market to Book ratio and the standard deviation of Market to Book ratios within the industry. C&i_spread is the spread between the Commercial and industrial loans and the federal funds rate. Rivalposret_dummy is dummy variable equal to 1 when then value weighted announcement return to a portfolio of rival firms at the time of the initial bid in the industry is positive and equal to 0 otherwise. Csm_l is the Lyandres (2006) adjusted CSM competition measure. Csml_Rivalret is the interaction between rival return dummy and the competition measure. Standard errors are reported in parantheses below the coefficients.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
		SS	**SC**	**Low HHI**	**High HHI**
Rivalposret_dummy	-1.52**	-1.03	-3.32**	-1.85**	-2.20
	(0.64)	(.79)	(1.44)	(0.86)	(1.38)
csm_l	-0.2705				
	(0.88)				
csml_Rivalret	21.24				
	(46.44)				
Demand Shock	3.87	3.54	-0.95	-3.89	38.66
	(6.30)	(9.53)	(12.59)	(8.48)	(43.30)
Demand_Shock _Sq	-1.65	-13.20	37.55	33.17	-169.9
	(19.25)	(30.73)	(37.79)	(30.04)	(217.3)
Profitability Shock	12.71$	7.21	34.02$	8.00	23.87
	(7.07)	(9.07)	(20.61)	(10.44)	(15.38)
mb	-0.00	0.19	-0.40	-0.03	-0.10
	(0.25)	(0.31)	(0.87)	(0.29)	(0.59)
mb_sd	-0.05	-0.00	-0.21	-0.04	0.00
	(0.05)	(0.06)	(0.26)	(0.07)	(0.13)
c&i_spread	-2.20$	-3.03$	-2.53	-2.85$	-1.91
	(1.22)	(1.74)	(2.71)	(1.63)	(2.54)
Constant	2.10	3.25	3.27	3.82	-0.13
	(1.94)	(2.86)	(4.41)	(2.57)	(4.44)
Observations	78	42	36	42	36

Standard errors in parentheses
$ significant at 10%; ** significant at 5%; * significant at 1%

Table A2.2 OLS Regressions of Acquirer's announcement period abnormal returns

The dependent variable is the acquirer's CAR over a three day window surrounding the announcement date of the acquisition. . Rivalposret_dummy is dummy variable equal to 1 when then value weighted announcement return to a portfolio of rival firms at the time of the initial bid in the industry is positive and equal to 0 otherwise. Csm_l is the adjusted competitive strategy measure of Lyandres (2006). Csml_Rivalret is the interaction between rival return and the competition measure. Ib_dum is a dummy identify if the acquirer was the first to make a bid in the industry. Stage is the number of days since an initial bid in an industry. Stage1 is a dummy identifying if the acquirer belongs to the first stage decision maker group. Mb_rel is ratio of the acquirer and target MB ratio. Tender_dum is a dummy if the acquisition was conducted through a tender offer or not. Lognumfirms is log of the number of firms in the industry prior to the initial bid. Standard errors are reported in parantheses below the coefficients.

	(1)	**(2)**
Rivalposret_dummy	0.0085	-0.0001
	(0.0126)	(0.0137)
csm_l	0.0317$	0.0365$
	(0.0196)	(0.0209)
Csml_Rivalret	0.2912	0.3382
	(0.7803)	(0.8135)
ib_dum		-0.0354
		(0.0191)
stage		-0.0000
		(0.0000)
stage1		0.0193
		(0.0262)
mb_rel		-0.0058
		(0.0062)
tender_dum		0.0222
		(0.0156)
lognumfirms		-0.0056
		(0.0076)
Constant	-0.0235*	0.0236
	(0.0083)	(0.0461)
Observations	151	151
R-squared	0.0975	0.0271

Standard errors in parentheses

$ significant at 10%; ** significant at 5%; * significant at 1%

A3. Alternative specification of the OLS regression models of acquirer returns

I address two issues pertaining to the specification of the regression models in Tables 11 and 12. Firstly, inclusion of initial bidders in the OLS regressions may bias the coefficients in the regression model because the announcement returns to the initial bidders and the rival portfolios are measured contemporaneously. Secondly, because hypotheses 3 through 6 imply differential effects of *Stage1*, between sub-groups based on the competitive measure and externality classification, the regression models in Tables 11 and 12 do not directly test this relationship. The principal variable of interest *Stage1*, which is a dummy variable, identifies first stage bidders. In general this variable is expected to have a positive relationship with the acquirer returns. This positive relationship is expected to be primarily driven by acquirers in strategic complements (*H3* and *H4*) and those that experienced positive externalities (*H5* and *H6*). In order to account for these problems in the original regression models, I run alternative specifications and report these results in Table A3.1.

I exclude the initial bidders from the sample of acquirers and run the OLS regression model specified in Equation 10. The results from this regression are reported in column (1) of Table A3.1. The estimates are qualitatively similar to those reported in Table 11. *Stage1* still enters the regression with an insignificant coefficient. The only variable of significance is the equity market to book ratio, *amb,* which as in Table 11 has a significantly negative impact on the acquirer's returns. Based on these results I

conclude that including the initial bidders in the acquirer return regressions does not introduce any significant bias in the coefficient estimates. Thus my original interpretations of the estimates in Table 11 and 12 are unaltered.

In columns (2) and (3) I report the regression estimates of all acquirers but in addition I include two interaction terms, *Stage1* interacted with *csm*, *stage1*csm* and with the value weighted announcement returns to rival portfolios measured at the time of the corresponding initial bid, *stage1*rivalret*. These interaction terms are meant to capture any differential impact of stage1 across the sub-samples based on either the competitive strategy measure or the positive versus negative externality measure. The F-statistic generated by test, reported at the bottom of the table, fails to reject the null hypothesis that *Stage1* has any differential impact on the acquirer returns across the sub-samples.

Table A3.1 OLS Regressions of Acquirer's announcement period abnormal returns

The dependent variable is the acquirer's CAR over a three day window surrounding the announcement date of the acquisition. . *Rivalposret_dummy* is a dummy variable equal to 1 when the value weighted abnormal announcement period return to a portfolio of rival firms at the time of the initial bid in the industry is positive and equal to 0 otherwise. *csm* is the competitive strategy measure of Sundaram, John and John (1996). *dormant* is number of days an industry had no acquisitions. *Stage* is the number of days since an initial bid in an industry. *Stage1* is a dummy identifying if the acquirer belongs to the first stage decision maker group. *mb_rel* is ratio of the acquirer and target MB ratio. *tender_dum* is a dummy if the acquisition was conducted through a tender offer or not. *hhi* is the sales based Herfindahl index measuring industry concentration. *Stage1*csm* is an interaction term between *stage1* and *csm*. *Stage1*rivalret* is an interaction term between *stage1* and the value weighted abnormal announcement period return to a portfolio of rival firms at the time of the corresponding initial bid.

	(1)	**(2)**	**(3)**
dormant	0.0003	0.0000	0.0000
	(0.7170)	(0.2170)	(0.2660)
ib_dum	-	-0.0166	-0.0168
		(0.3730)	(0.3650)
stage1	0.0209	0.0187	0.0178
	(0.2840)	(0.2880)	(0.3120)
csm	-0.0189	-0.0269	-0.0025
	(0.4300)	(0.3290)	(0.8830)
Rivalposret_dummy	0.0065	0.0118	0.0039
	(0.6620)	(0.2780)	(0.7670)
amb	-0.0061$	-0.0046$	-0.0048*
	(0.0460)	(0.0650)	(0.0560)
mb_rel	0.0044	-0.0035	-0.0028
	(0.5490)	(0.5870)	(0.6680)
hhi	0.0182	-0.0875	-0.0829
	(0.8390)	(0.1340)	(0.1570)
Stage1*csm	-	0.0392	-
		(0.2640)	
Stage1*rivalret	-	-	0.3153
			(0.3070)
_cons	-0.0330	-0.0108	-0.0074
	(0.1720)	(0.4300)	(0.5980)
Number of obs	121	221	221
F	0.9700	1.86	1.83
Prob > F	0.4555	0.0602	0.0643
R-squared	0.0662	0.0733	0.0724
Adj R-squared	-0.0018	0.0338	0.0329
F-test		F=1.26	
H0:Stage1*csm=0	-	P>F=0.2637	-
F-test			F=1.05
H0:Stage1*rivalret=0	-	-	P>F=0.3068

$,,** denote significance at the 10%, 5% and 1% levels respectively. P-Values are in parentheses below the coefficients.*

VITA

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Findings and Conclusions: Temporally separated merger decisions within an industry may not necessarily be independent events. The literature on merger waves and casual observation attests to this fact. Fundamental economic shocks and cheaper capital are attributed as causes of this cascading effect in merger activity. See Harford (2004). Devoid of economic shocks will merger attempts by one firm encourage other firms to pursue similar strategies? Further, do firms anticipate rival reactions in making their own merger decisions? The principal idea in this study is that in oligopolistic settings, given that a merger has occurred in an industry, the likelihood that the initial merger will be followed by a sequential merger is conditional on the nature of merger induced externalities and the expected reaction of rival firms. When merger induced externalities are positive, the likelihood of a sequential merger is lower. I refer to this expectation as the '*Accommodation Hypothesis*'.

The findings in this study are partially consistent with the '*Accommodation hypothesis*'. Controlling for the type of competition in the product markets I find that the likelihood of sequential horizontal mergers is inversely related to the externality imposed on rival firms by an initial merger. I do not find evidence consistent with the stylized empirical results of Yan (2006), Carow, Heron and Saxton (2006) and others who find that early movers in merger waves are better off than late movers. The wealth effects for acquiring firms measured as their announcement period abnormal returns are not different between first and second stage acquisitions. These results for acquirer returns are not affected in multivariate settings and hence I conclude that overall the evidence is only partially consistent with strategic competition theory.

ADVISER'S APPROVAL: Ramesh P.Rao