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WHAT DRIVES MERGER WAVES?
A STUDY OF THE SEVEN HISTORICAL MERGER WAVES IN THE U.S.

by

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SUBMITTED TO SCRIPPS COLLEGE IN PARTIAL FULFILLMENT OF THE DEGREE OF BACHELOR OF ARTS

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ABSTRACT

Historically, merger and acquisition (or M&A) activity has occurred in cyclical patterns, forming what are known as “merger waves.” To date, there have been a total of seven waves. Though it is widely acknowledged that merger waves exist, there is no consensus on what drives these waves. Through both qualitative and quantitative analysis, this paper aims to determine the causes of merger waves and looks at those causes through two different lenses: the neoclassical view, which states that economic shocks cause merger waves, and the behavioral view, which states that increases in merger activity are due to managerial behavior and decisions. By analyzing the economic, political, and technological landscapes as well as valuation and interest rate data during periods of intense merger activity, I conclude that neoclassical theories are stronger in explaining the first three waves, whereas behavioral theories are stronger in explaining the last three waves.

ACKNOWLEDGEMENTS

First and foremost, I would like to take this opportunity to thank both of my readers, Professor Van Horn and Professor Batta, as well as Professor Pedace, for their guidance and support throughout this process. I would also like to thank my parents for their endless love and encouragement.

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INTRODUCTION

Mergers and acquisitions (M&As) are part of "the market for corporate control" and take place when one firm, the "acquirer", takes over another firm, the "target". Companies merge in order to achieve "synergy", the concept that the combined value of two companies would be greater than the sum of the separate, individual companies due to the enhanced cost efficiencies of the new business. By merging, the two companies combine resources and therefore have a better chance of controlling the market and dominating their industry or industries. Over the years, corporate mergers have occurred in waves, with periods of intense merger activity followed by few transactions in the takeover market. For my thesis, I will explore what causes these merger waves. More specifically, I will be looking at merger waves in the United States, focusing on how these causes can affect the size of the merger wave, the type of mergers that take place during that wave (horizontal, vertical, or conglomerate mergers), and the industry or industries in which the mergers take place.

Mergers and acquisitions represent one of the most crucial activities in corporate finance and have become an essential tool for corporate growth and development. In 2017, the M&A market experienced $3.7 trillion in transaction volume, becoming the fifth most active year on record (Cristerna, 2018). M&A's possess many benefits that increase profits and shareholder value through various strategies. These strategies include economies of scale produced by increasing market share, the diversification of product and market risks, capitalizing on the expanded use of an existing distribution network through the acquisition of new product capabilities, and more (Tamosiuniene, 2009). There is currently debate around the causes of merger waves. However, the existing literature tends to side with one of two theories: The behavioral theory, which is the belief that merger waves are correlated

with high stock market valuations and that they result from the timing of managers' market overvaluations of their firms (Harford, 2005), and the neoclassical theory, which argues that merger waves are the result of industry shocks.

I examine data on historical merger waves and use these two different frameworks in order to identify patterns and determine what actually drives merger waves. Since we are in the midst of a merger wave, the new data could possibly help to identify a new pattern and clarify the causes of these waves. Furthermore, because each merger wave is unique and clusters by factors such as time, type, and industry, it will be valuable to further understand what specific types of causes can lead to different types of merger waves. More specifically, I look at whether these waves are caused by firms combining across different economies in order to gain efficiency and capture bigger market shares, or if they are a result of managers trying to increase profitability in the short run. By analyzing historical merger waves and the economic, political, and technological changes going on during those time periods, we can gain a better understanding of what drives merger waves in different economies or industries over time.

LITERATURE REVIEW

Considerable research has been conducted on the causes of M&As and it is widely acknowledged that merger waves exist. However, there is little research dedicated to explaining merger waves. No consensus currently exists as to what actually drives these waves. The existing literature tends to use one of two frameworks to analyze merger waves: Neoclassical and behavioral. Within those two frameworks are different theories which

explain the causes of merger waves. In this literature review, I will be explaining both of the frameworks and their underlying theories, as well as providing evidence from existing literature that supports these theories.

1. The Neoclassical View

The neoclassical view seeks rational explanations for the causes of merger waves and assumes the separation of ownership and control, which means that the shareholders of a company (the owners) have no direct control over management's decision making. This view also assumes that managers act to maximize shareholder value and/or capital market efficiency. This framework stems from the empirical observation that changes in the economy, which could be technical or regulatory, cause industries to consolidate in waves (Mitchell & Mulherin, 1996). There are two main theories of the neoclassical framework: The Industry Shock Theory and the Q-Theory of Mergers.

a. Industry Shock Theory: Theoretical Contributions

The industry shock theory posits that merger waves result from shocks to an industry's economic, technological, or regulatory environment (Harford, 2005). In economics, a "shock" is defined as an unexpected or unpredictable event that affects an economy, either positively or negatively. For example, shocks could be the development of a new technology, a new fiscal or monetary policy, or even a new law being put into action. Mitchell & Mulherin (1996) support this theory by finding interindustry restructurings and takeovers are directly related to economic shocks in those industries. They isolated industry shocks that drove merger activity during the fourth merger wave in the 1980's, and studied industry-level patterns in takeover and restructuring activity during that time, hypothesizing

that corporate takeovers are often the least cost means for an industry's structure to respond to economic shocks.

Maksimovic & Phillips (2001) state that firms adjust in size until the marginal benefit is equal to the marginal cost of production; as output prices increase, more productive firms experience a larger gain in value from the assets that they control. As a result, these firms find it optimal to acquire plants from less productive firms in the industry even when that involves an increase in the costs of management (Maksimovic & Phillips, 2001). Similarly, they also find that a positive shock in an industry increases the opportunity cost of operating as an inefficient producer in that same industry. Industry shocks alter the value of assets and create incentives to transfer those assets to more productive uses. Maksimovic & Phillips's empirical results indicate that assets are more likely to be sold when: (1) the economy is undergoing positive demand shocks, (2) when the assets are less productive than their industry benchmarks, (3) when the selling firm has more productive divisions in other industries, and (4) when the selling division is less productive (Maksimovic & Phillips, 2001). When there is a positive demand shock, productive firms seek to acquire the assets of less productive firms, whose lack of productivity in comparison with its peers is exacerbated by the positive industry shock.

Gort (1969) states that mergers occur when two actions are satisfied: 1) a non-owners' estimated value of an asset must be higher than that of some owner of that asset, and 2) the buyers' investor surplus, which Gort defines as the difference between the investor's estimated value of the asset and its actual market price, must be greater than that investor's surplus for any other asset that they can buy. Therefore, according to Gort, economic disturbances "alter the structure of expectations" (Gort, 1969) and create

discrepancies in the valuations needed to produce mergers because they alter the expectations of individuals, rendering the future less predictable and leading to an increase in the variance in valuations. This variance in valuations is not a result of asymmetric information, but instead a result of differing opinions on how an economic disturbance will affect the value of a company. Since valuations are merely estimates and investors rely on past records to predict future performance, when an economic shock occurs the past becomes less effective in predicting the future and the range of estimates increases. This leads to more variation and uncertainty in valuations. Using this framework, Gort claims that changes in technology and fluctuations in stock prices lead to more M&A activity. When an industry experiences a change in technology, this leads to new products or new processes of production. Because demand for new products and production costs are now difficult to predict from past performance, the variance in investors' valuations increase and the frequency of mergers also increase. When a company experiences a rapid change in its share price, this new share price leads to increased variability in valuations. According to Gort, positive and negative changes both increase valuation dispersion, but affect merger activity in opposite ways: A price increase leads to a decrease in merger activity because acquirers are less likely to buy overvalued companies, whereas a price decrease leads to an increase in merger activity for the opposite reason.

Empirical Support

In support of the industry shock theory, Kleinert and Klodt (2002) examine the causes of the five original merger waves in the 20th century. The first merger wave, which occurred from 1897 to 1904, was caused by the industrial revolution and then ended with the enforcement of the Sherman Act and Clayton Act. The act prevented the monopolization of

industries and impeded horizontal merger activities, which is the merging of companies in the same industry. In response to the new laws controlling horizontal mergers, a second wave occurred from 1920 to 1929 and was dominated by vertical mergers (the merging of companies involved at different stages of the supply chain process, ie: a car company merging with a tire production company) and conglomerate mergers (the merging of companies in completely unrelated industries).

The third wave lasted from 1965-1975 and was caused by the strive for economies of scale via mass production in consumer goods industries, by acquiring firms in other markets (aka: conglomerate mergers), and by the diversification of products. The fourth wave, which lasted from 1984-1988, was less distinct in the US than in Europe because Europe was preparing for the completion of the Single Market. As a result, firms tried to convert "national champions" into international or European ones. In order to do so, firms aimed to achieve synergies by merging production activities with related technologies, leading the merger waves to be in technology-intensive industries. Lastly, Kleinert and Klodt (2002) claim that the fifth wave, which started in 1995 and was still ongoing at the time of the paper's publication, was driven by globalization and deregulation because they observed that the most active industries in that wave were 1) those where a globalized market was of importance and 2) where deregulation and liberalization significantly impacted competition intensity.

b. Q-Theory of Mergers: Theoretical Contributions

The Q-ratio is used to determine if a company is over or under valued and equals the total market value of a company divided by its total asset value, or the total asset

replacement cost (Investopedia, 2003). The Q-theory of mergers draws from the Q-theory of investment, which states that a firm's investment rate should rise with its Q-ratio. A company has a "low Q" if the Q-ratio is between 0 and 1. A low Q means that the replacement cost of assets is greater than the value of the stock, so therefore the company is undervalued. Conversely, if a company has a Q-ratio that is greater than 1, it is considered to have a "high Q" and is overvalued.

Tobin's Q theory suggests that the Q-ratio is a driving factor behind the investment decisions of companies (Tobin, 1969). Companies with a high Q tend to be well managed, can generate a return on capital that exceeds the cost of capital, and should invest in more assets in order to maximize their shareholders' value (Tobin, 1969). Therefore, high Q companies tend to buy low Q companies, which pose as attractive investment opportunities. Jovanovic and Rousseau (2002) expand on Tobin's Q-theory and argue that high Q firms tend to buy low Q firms because total takeover returns, or the combined values of the merging firms, are larger if the target has a low Q and the acquirer has a high Q. In that light, the Q-theory of mergers states that merger waves are a result of the effective reallocation of assets that occurs when poorly managed companies (those with a low Q), are acquired by better managed companies (companies with a high Q). Markets with widely differing Q ratios lead to increased M&A activity and more mergers waves occur in those markets.

Dong et al (2006) investigate the motivators for takeovers by considering empirical relationships between the market valuations of firms and a set of takeover characteristics. The authors test two different theories of takeovers: the misvaluation hypothesis, which is behavioral rather than neoclassical, and the Q hypothesis of takeovers. The misvaluation

states that market inefficiencies have important effects on takeover activity. Bidders with high valuations try to profit by buying undervalued targets with cash, or by paying equity for targets that may be overvalued but still have a lesser value than the bidder. The Q hypothesis of takeovers, on the other hand, focuses on how acquisitions redeploy assets and asserts that takeovers reallocate the target's assets to different uses. These uses can generate higher or lower payoffs, depending on the business opportunities of the bidder and target firms, as well as the quality of their management. According to this hypothesis, Q is an indicator of the degree to which a firm can create shareholder value from their invested resources. High quality bidders (high Q firms) improve bad targets (low Q firms) more than bad bidders improve good targets. Dong et al (2006) establish that the evidence for the Q hypothesis is stronger pre-1990, whereas the evidence for the misevaluation hypothesis is stronger post-1990. This suggests that the Q hypothesis may be better in explaining merger waves that occurred before 1990.

Empirical Support

In their paper, Jovanovic and Rousseau (2002) pooled approximately 118,000 observations from 1971-2000. They looked at Q, the market to book ratio of each acquiring company, and q, the average market to book value of "disappearing" firms, or the acquired firms. They examine the effect Q would have on X, a company's direct investment in capital, and how Q-q would affect Y, the acquisitions of the bundled capital. Their results suggest that while the effect of Q on X was significant, the effect of Q-q, or the difference in Q values between the acquirer and the target, had a significant impact on Y with nearly three times that of Q on X. In addition, they also found that wider Q dispersions between

acquiring and target companies correlated with increased merger activity, therefore proving that widely differing Q ratios lead to merger waves.

To test both the misevaluation and Q hypotheses, Dong et al (2006) used the ratio of a firm's price-to-book value of equity (or P/B) as a proxy for Q, and a firm's price-to-residual income (or P/V) as well as their P/B for the misevaluation hypothesis. Since P/B and P/V provide complementary information about the misevaluation hypothesis, Dong et al (2006) performed both univariate and multivariate tests. The authors studied approximately 1,000 successful and 800 unsuccessful acquisitions bids, then divided the ratios into bidder P/B and P/V and target P/B and P/V. They found that bidder valuation ratios, on average, were higher than those of their targets. From their sample of 2,916 firms for which they could calculate P/B, the average P/B was 4.405 for acquirers and 1.159 for targets—extremely statistically significant results. The bidder versus target findings are consistent with the Q hypothesis. The Q hypothesis predicts that the total gains are generated by acquisitions with "bad" targets (lower Q) and "good" bidders (higher Q) than by ones involving good targets and bad bidders. Therefore, a higher bidder valuation and lower target valuation are associated with high bidder and target returns, which also confirms Jovanovic and Rousseau's (2002) findings that wider dispersions in Q between the target and bidding companies lead to increased merger activity.

2. The Behavioral View

Whereas the neoclassical view assumed that managers always strive to maximize shareholder value and capital market efficiency, the behavioral view relaxes those assumptions and proposes that there may be managerial motivation to engage in merger

activity (Gugler et al, 2006). The behavioral view is supported by observations that stock market valuations are positively correlated with aggregated merger and industry merger activity. What separates the behavioral view from the neoclassical view is that managerial behavior, rather than economic shocks, is what drives merger waves. Next, I discuss the three main theories that make up the behavioral framework.

a. Market Timing Theory: Theoretical Contributions

According to the market timing theory, merger waves are driven by overvalued markets that have valuation dispersion, and managers try to time these markets by using their overvalued shares to acquire lesser valued companies and gain their real assets (Lorenzen, 2015). The term "market timing" refers to financing decisions that are intended to capitalize on temporary mispricings in the market, usually by issuing overvalued securities and purchasing undervalued ones[1]. This is very similar to the misvaluation hypothesis that we discussed earlier. Market timing reveals that while managers may have a long-term view, they also consider short-term profitability and success, and therefore may cater to short-term mispricing to further this objective (Baker et al., 2004).

Shleifer and Vishny (2003) present a model of M&As based on stock market misvaluations of the combining firms. They theorize that transactions are driven by the stock market valuations of merging firms and argue that financial markets are inefficient, causing markets to incorrectly value companies during certain periods (Schleifer and Vishny, 2003). They assume that management of both the acquiring and target companies are rational and

[1] Baker, M., Ruback, R.S., Wurgler, J., 2004. Behavioral Corporate Finance: A Survey (Working Paper No. 10863). National Bureau of Economic Research. https://doi.org/10.3386/w10863

fully informed about their company and industry, therefore they can recognize situations when their company and other companies in the industry are incorrectly valued. Overall, Schleifer and Vishny (2003) conclude that managers engage in M&A activity to protect shareholders from long term wealth loss and exploit their temporarily overvalued stock to acquire lesser companies. However, because their stock price is overvalued, the shareholders of the acquiring company suffer a short-term loss from the decrease in value post-merger but ultimately experience a long-term gain from the company's acquisition of assets.

Rhodes-Kropf et al (2005) explore the effects of misvaluation on merger activity, which is similar to the market timing theory. They focus on the market-to-book value of equity ratios of companies, or M/B, and decompose it into three parts using the formula M/B = M/V x B/V, V representing the value of a company. The three parts are firm-specific error, time-series error, and long-run value to book. Acquirers with high firm-specific error use stock to buy targets with relatively low firm-specific error at times when both firms benefit from positive time-series selection error, or when both firms are overvalued in the market. Additionally, merger intensity is highly positively correlated with short-run deviations in valuation from long-run trends and that low long-run value-to-book (V/B) firms buy high long run V/B targets when they control for firm-specific and time-series sector error. Therefore, they claim that while it is generally true that higher M/B firms acquire lower M/B firms, much of this is driven by short-run deviations in firm and sector level fundamentals.

They conclude that high short-run value but low long-run value firms may buy high long-run value firms in order to substantiate the market's beliefs and protect shareholders from long term wealth loss, which agrees with the market timing theory. Though the neoclassical Q theory suggests that successful transactions have large differences in M/B

between the bidder and target, Rhodes-Kropf et al (2005) claim that failed transactions actually have *larger* differences that completed transactions, while successful deals display higher levels of misvaluation. Even in industries that have experienced an economic shock, most acquirers in that industry come from the highest misvaluation quintile. Therefore, even though economic shocks could be fundamental drives of merger activity, Rhodes-Kropf et al believe that misvaluation affects how these shocks are spread throughout the economy. Misvaluation affects the method of payment used to conduct transactions, as well as who buys whom.

Empirical Support

Schleifer and Vishny's (2003) model suggests that, since managers act on high valuations in order to protect shareholders, the more highly valued acquirer would only make a cash bid if the target was undervalued even at the bid price, ie: $P < q$, or the price is less that the cost of capital. According to the authors, this is most likely to happen with undervalued targets who experience low returns prior to being acquired. Adrade et al (2001) supports them, finding that in 66% of mergers between 1973 and 1998, the value of the acquiring company was greater than that of the target company.

Because the Market Timing theory suggests that managers act in the best interests of shareholders, their model also suggests bidder returns from cash acquisitions should be positive in the long run. Loughran and Vijh (1997) found that tender offers result in positive abnormal bidder returns of 43% in the five years following the merger. Rau and Vermaelen (1998) studied a larger sample of 316 tender offers between 1980-1991 and found that acquirers in their study experienced positive long-run returns of 8.5% in the three years following the merger, which supports Schleifer and Rhodes-Kropf et al's findings.

Additional evidence comes from Rhodes-Kropf et al, who looked at 4,025 mergers and found that the average log(M/B) of acquirers was 0.83 and the average log(M/B) of targets was 0.69. They also found that the average long-run V/B of acquirers was 0.39, compared to 0.58 for the targets. This evidence therefore supports their claims that high M/B firms buy low M/B firms and that firms with low long-run value tend to buy firms with high long-run value.

b. Agency Cost Theory: Theoretical Contributions

Agency costs are costs that arise because of core problems such as conflicts of interest between management and shareholders of a company. Shareholders want management to run the company in a way that maximizes shareholder value, but management might make decisions that maximize their personal wealth and power. Unlike the market timing theory which assumes that managers of a company act in the interest of their shareholders, the agency cost theory of M&As states that merger activity results from managers acquiring firms for their own self-interests and motivations such as profit maximization and job security (Cummings and Xie, 2008). There are multiple reasons why M&As could benefit managers. Cummings and Xie (2008) believe managers may intentionally acquire companies that require their personal skills, which would make it harder for shareholders to replace them. Managers may also be motivated to engage in non-value enhancing mergers in order to increase the size of their firm and their compensations. Jensen (1986) adds to this, stating that growth of a company increases the amount of resources under its control, therefore increasing managers' power and compensation. Additionally, the fact that firms tend to reward middle managers through promotions rather

than bonuses leads to a managerial bias towards growth through acquisitions, because growing the company adds more positions and creates more opportunities for promotion (Jensen, 1986). Therefore, M&As are motivated by managerial self-interest, and they are unlikely to generate operating or financial synergies and valuations could decrease post-merger.

In a later paper, Jensen (2005) explains that managers who act out of self-interest only focus on short-term gains for their companies. Being a CEO, CFO, or manager of a company with an overvalued stock is dangerous because a company cannot produce performance that is required to justify that stock price, except by pure luck. The market expects an overvalued company to keep outperforming in order to sustain their high valuation. But since that is impossible, managers start to make decisions that destroy long-run value of the company but generate the market's expected performance in the short-run. Despite knowing that they are unable to meet their market-projected growth, managers pursue mergers that are potentially destructive to the company's long-term value, postponing the problem until they have left the company.

Empirical Support

In their study, Moeller et al (2005) provide evidence on the magnitude of the agency costs of overvalued equity. They looked at 4,136 acquisitions from 1998 to 2001, 87 of which were "large loss" deals that experienced significant losses post-merger. The aggregate wealth loss associated with the large loss deals was $397 billion, while the other 4,049 acquisitions made a total gain of $157 billion. The acquiring firms lost a total of $240 billion in comparison to a loss of $4.2 billion in all of the 1980's. The authors also note that though the large loss deals represented only 2.1% of acquisitions from 1998 to 2001, they accounted

for 43.4% of the money spend on acquisitions during that period. In addition, the losses to bidders were offset by the gains to sellers for a net synergy gain of $11.5 billion in the 1980's. However, from 1998-2001, the losses to acquirers exceeded gains to the target firms, resulting in a net synergy loss of $134 billion.

Jensen (2005) also presents the case of Nortel, a real-life illustration of the agency cost theory which shows that management was destroying value through the company's acquisitions. Between 1997 and 2001 Nortel was under the leadership of its new CEO, John Roth. During this time, Nortel acquired 19 companies at a price of more than $33 billion and paid for many of these acquisitions with Nortel stock, which increased dramatically during that same period. When Nortel's stock price collapsed, most of these acquisitions had to be written off as losses (Jensen. 2005). Nortel's effort to transform itself clearly damaged the company and its shareholders. At the end of 2001, the company was valued at $24 billion and its share price fell by more than 90% from its peak in September 2000. Nortel's share price was also 44% lower than it was on October 1, 1997, when Roth took over as CEO. Jensen (2005) estimates that the agency cost of overvalued equity for Nortel, or the total loss experienced by shareholders, was $44.5 billion. But, Nortel's decline did not stop there—the price drop suffered by Nortel didn't just involve the elimination of its overvaluation, but it also involved a significant destruction of its core value, mainly through acquisitions and overinvestment (Jensen, 2005).

c. Managerial Discretion Theory: Theoretical Contributions

The third and final of the behavioral theories is the managerial discretion theory, or the managerial theory. This theory is similar to the agency cost theory and its assumption that

managers act in their own self-interest, but it states that managers pursue to grow their firms through mergers either because their incomes are tied to growth or because they get "psychic income" from managing a large firm (Gugler et al., 2012). Psychic income is defined as the nonmonetary or nonmaterial satisfactions one gets from an occupation or economic activity, such as the feeling of being powerful or important (Financial Times Lexicon).

According to Gugler et al. (2012), merger waves occur during stock market booms because optimism in the market allows growth-seeking managers to undertake more wealth-destroying mergers than under normal conditions. These managers pursue growth through M&A activity even though it may not be in the best interest of their shareholders, and it is shown that report weak or negative effects of mergers on the profitability and sales of companies (Gugler et al., 2012). Under the behavioral view, the common "shock" that causes a merger wave is the increase in optimism in the market, which leads to a stock market boom.

The past two behavioral theories hypothesized that merger waves are caused by managers' reactions to overvalued *stock* prices, which only accounts for mergers financed through stock. As a solution, Gugler et al. (2012) offers the managerial theory, which covers different financing options. It states that firms that are not overvalued may still undergo mergers when optimism in finance markets is high, choosing to finance the merger with cash or issue debt. Therefore, when optimism in equity markets increases, the market's constraint weakens on managers who wish to grow their companies through mergers that destroy shareholder wealth. As a result, more mergers take place and a merger wave occurs.

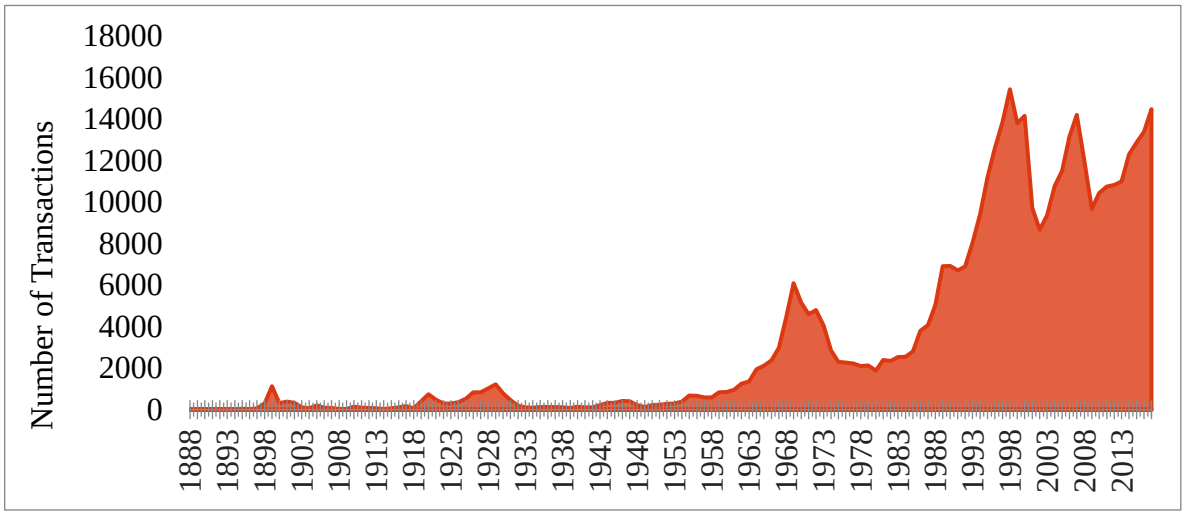
Conclusion

In summary, the extant literature does not reach a consensus. The research on M&As is extensive, but there is little research on the actual causes of merger waves. Also, much of the literature is older and refers to the 20th century merger waves. As we are now in the midst of a merger wave, new data could possibly help identify a new pattern and clarify the causes of the current waves. My contribution to the existing literature will be to isolate the cause of merger waves, whether it agrees with the aforementioned theories or not.

DATA AND RESULTS

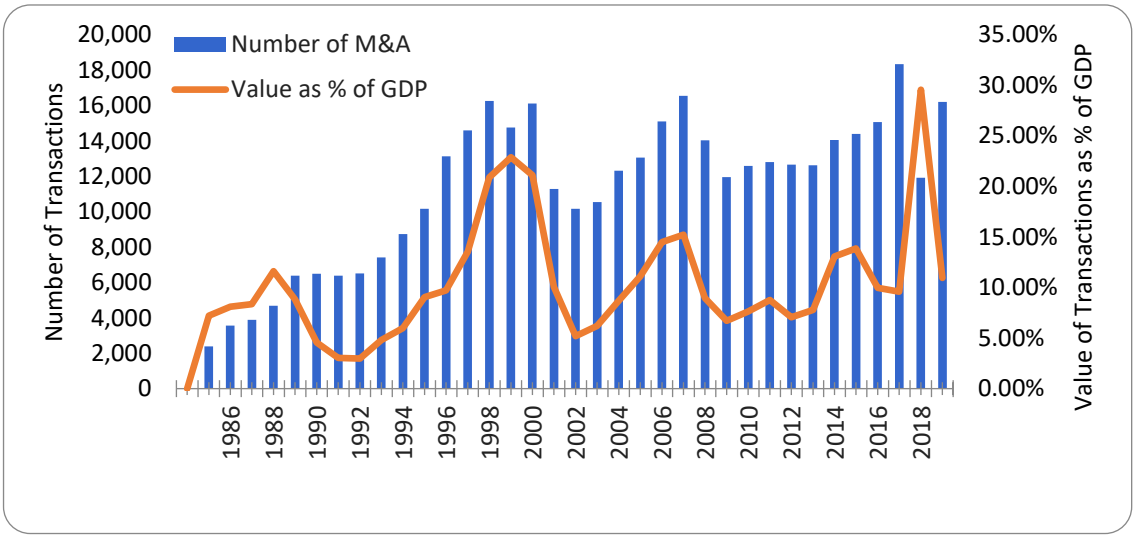
If one considers the total number of M&A transactions that have occurred throughout history, they would find that M&A activity is highly cyclical and occurs in waves. As shown in Figure 1, a total of six completed merger waves have occurred since the 1880's and we are currently in the midst of a seventh wave. Figure 2 focuses on the last four merger waves, showing the number of M&A transactions in North America since 1980 compared to the total value of M&A transactions by year compared to GDP for that year.

Figure 1- Merger waves in the US from 1851-2017 (estimated)



Source: *Thomson Financial, Institute for Mergers, Acquisitions and Alliances*

Figure 2- Total M&A in North America vs. Value of transactions as a percent of GDP



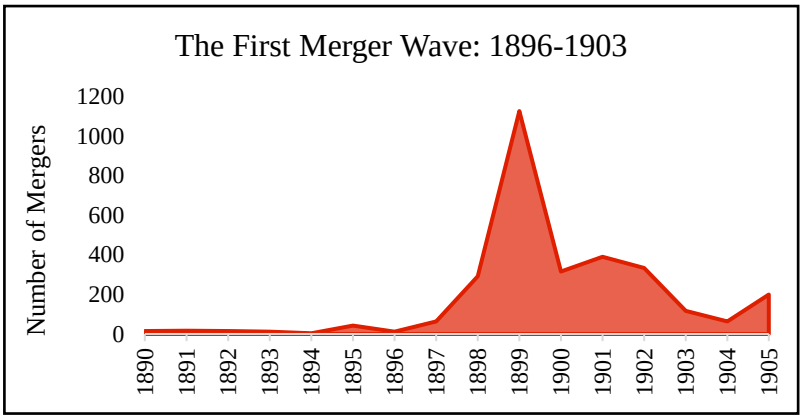
Source: *Thomson Financial, Institute for Mergers, Acquisitions and Alliances*

In order to explain this cyclical pattern in M&A activity and relate it to neoclassical theories, I first look at each individual wave and the shocks that occurred in the corresponding time period (regulatory and political changes, technological advances, and

economic shocks). Then, I analyze the last three waves by looking at valuations and interest rates during those periods in order to relate it to behavioral theories. As previously mentioned, there is no consensus on the exact cause of these waves, but the literature tends to side with either the neoclassical view or the behavioral view. Through my combination of analyses, I hope to provide my own explanation on the causes of these waves.

I. A Neoclassical Analysis, by Wave

The First Wave: 1896-1903



The first merger wave came to be known as the "great merger movement" and was comprised of mostly horizontal mergers that consolidated the manufacturing industry. At this time in history, the US had just come out of The Panic of 1893 and was experiencing a period of economic prosperity. In addition, the US was going through a period of industrialization and reform which created opportunities in the manufacturing industry though technological innovation. The invention of the steam engine led to the creation of a well-developed national railroad network which allowed the US to exploit high scale economies and removed many of the physical constraints on businesses, allowing them to expand their distribution channels all over the US (Keinert and Klodt, 2002; Banerjee &

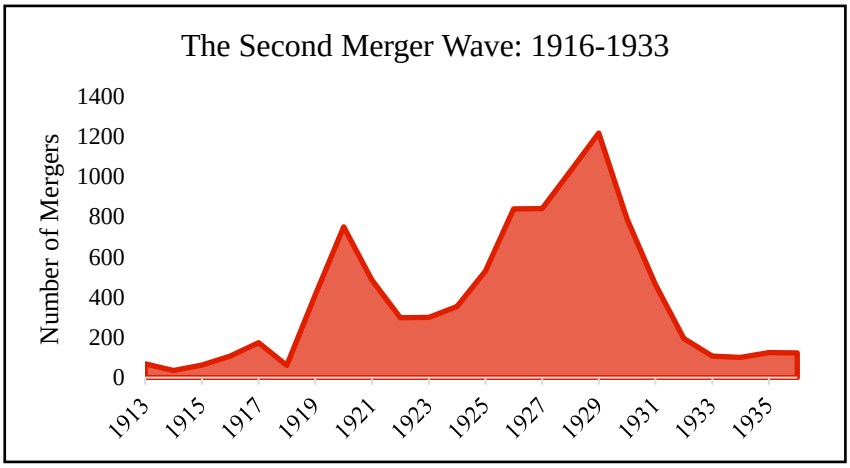
Eckard, 1998). Also around this time, the New York Stock Exchange (NYSE) was experiencing its largest trading volumes to date due to revolutionary technological developments such as the telephone, which reduced trading time from 15 minutes to 6 seconds (Reference for Business). This increase in trading volume reflected the rise of large corporations and industry wide trusts, reaching a high of 3 million shares in 1901. As a result, stock prices during this period were a reasonable reflection of a firm's performance and could therefore provide information on the future prospects of the firm, including potential mergers (Banerjee & Eckard, 1998).

In 1890, Congress passed the Sherman Antitrust Act, which outlawed monopolistic business practices in the US. However, in 1895, the supreme court decision in the E.C. Knight case placed the mergers of manufacturing firms outside the reach of the act and therefore outside the jurisdiction of Federal regulation. Therefore, there were no legal barriers to mergers which led to an increase in merger activity during this time (Banerjee & Eckard, 1998). In addition, antitrust enforcement reached an all-time low during the Mckinley Presidency from 1897-1901. This lack of restraint allowed firms to consolidate into industrial trusts with market shares so large that they exceeded 80% in many cases (Banerjee & Eckard, 1998). According to O'Brien (1988), this merger wave was a temporary acceleration in the growth of firm size and industrial concentration. O'Brien (1988) also claims that this wave was motivated by horizontal concentration in order to suppress price competition.

In 1904, the Supreme Court overturned the previous E.C. Knight ruling in the Northern Securities case and nullified a merger between two railroad companies, citing concern that the resulting market dominance would negatively affect competition. Mergers

for all monopolies were now under Federal Law (Banerjee & Eckard, 1998). This change in regulation, as well as the stock market crash of 1904, caused a slowdown in M&A activity and ended the first merger wave.

The Second Wave: 1916-1933



The second merger wave was mainly comprised of oligopolistic mergers in the banking sector. According to White (1985), this merger movement was one of the most important developments in banking. During this period, many regulatory changes were occurring. In 1913, the Federal Reserve Bank was established. In 1914, World War I broke out and America became a global lender, replacing London as the center of the financial world. Then, in November of 1918, the National Bank Consolidation act was passed and established a formal procedure for the consolidation of national banks. Prior to the act, if two national banks wanted to merge one had to be liquidated while the other purchased its assets and assumed its liabilities (White, 1985). After this act was passed, merging was more flexible; rather than having to fully liquidate, two national banks could consolidate under either's charter, they just had to specify the amount of capital, surplus, and undivided profits

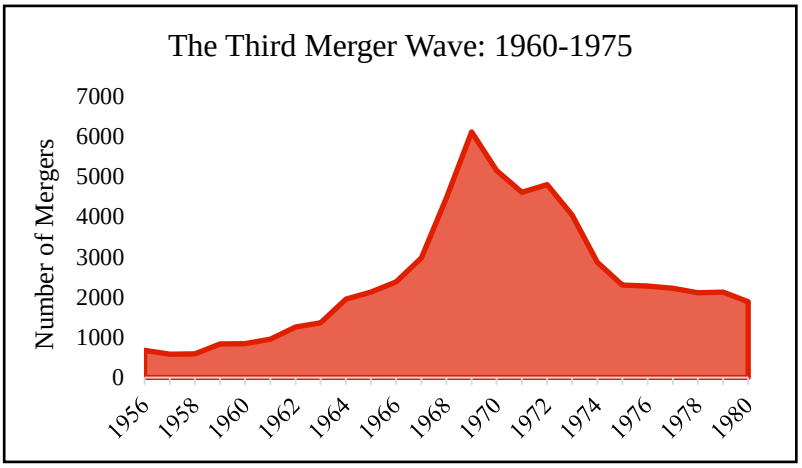
in the new merged organization and which assets would be eliminated, if any. This act only applied to mergers between two national banks and a national bank wanting to merge with a state bank still had to go through the old procedures. As a result, leading national banks started abandoning their national charters to merge with state banks, which prompted the creation of the McFadden Act of 1927. This act allowed a national bank to consolidate with a state bank under the new rules, encouraging more mergers in the banking industry (White, 1985).

Additionally, in response to the Sherman Act of 1980 which banned the formation of monopolies through horizontal mergers, the Clayton Act in 1914 encouraged vertical mergers and the formation of oligopolies (Owen, 2006). This act served as a catalyst for the second merger wave, which could be seen in the banking industry. According to White (1985), banks during this time period needed bigger loans in order to continue serving their industrial customers, a group that was increasing rapidly. Since loans were capped at 10% of a company's capital, banks turned to mergers as a quick way of increasing their capital in order to increase their loan sizes. Once earnings from commercial loans started to decline, these banks had to seek new ways to maintain and increase their income and moved into the trust and investment banking businesses through vertical mergers, which allowed them to quickly acquire the expertise and reputation necessary for success.

After the end of WWI, the Wilson administration put "unconventional handcuffs" on the banking sector by establishing the World War Foreign Debts Commission Act in 1922, which insisted that all debtor countries pay back their war loans to America (Investopedia). This caused a slowdown in world trade and created hostility toward American goods. Then in September of 1929, the stock market crashed on what is infamously known as Black

Tuesday and the world economy was knocked out, leading to the Great Depression in October. The Fed could not contain the crash and refused to stop the Depression. All banks suffered as a consequence, therefore ending the second merger wave.

The Third Merger Wave: 1960-1975

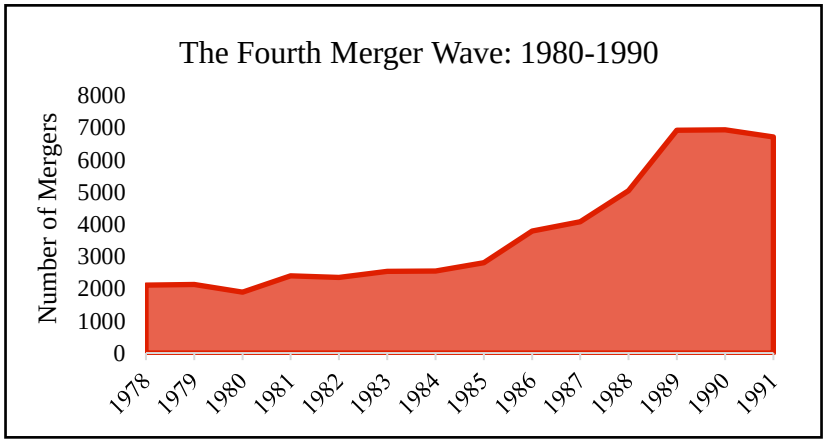


The third merger wave is often characterized as a wave of conglomerate mergers. After World War II ended in 1945, the US emerged from the war as the world's richest and most militarily powerful country. The overall economy grew 37% during the 1950s and by the end of the decade, the average family had 30% more purchasing power than in the beginning. The US stock market rose significantly (Owen, 2006). As a result of this new economic prosperity, profitable companies found themselves with large cash flows. Because they didn't want to pay out this extra money to shareholders via dividends, they instead turned to the market for corporate control and reinvested the money back into their businesses by acquiring other companies. However, as these firms sought to expand, they also faced tougher antitrust enforcement from the government. In 1950, the Celler-Kefauver Act was passed, which strengthened the anti-merger provisions of the Clayton Act and

addressed loopholes. Now, the government was scrutinizing horizontal and vertical mergers and companies that wanted to expand found their only option was to form conglomerates (Gaughan, 2017).

As Owen (2006) notes, the number of conglomerate firms increased from 8.3% of Fortune 500 firms in 1959 to 18.7% in 1969. Conglomerate mergers offer a means of diversification for companies—for example, General Electric is a conglomerate and has a number of businesses under its name such as healthcare, transportation, and energy. This diversification serves as a method for companies to reduce cash flow volatility through reducing exposure to industry specific risks (Nouwen, 2011). Therefore, during this time many companies paid for their acquisitions using stock and opted for conglomerate mergers so they could expand into new markets and areas and reduce risk. This third wave ended with the 1973 oil crisis, when the members of the Organization of Arab Petroleum Exporting Countries targeted the US, amongst other countries, by proclaiming an oil embargo and severely increasing the price of oil per barrel. As a result of this crisis, there was a sharp increase in inflation and a worldwide economic downturn, halting all merger activity.

The Fourth Wave: 1980-1990

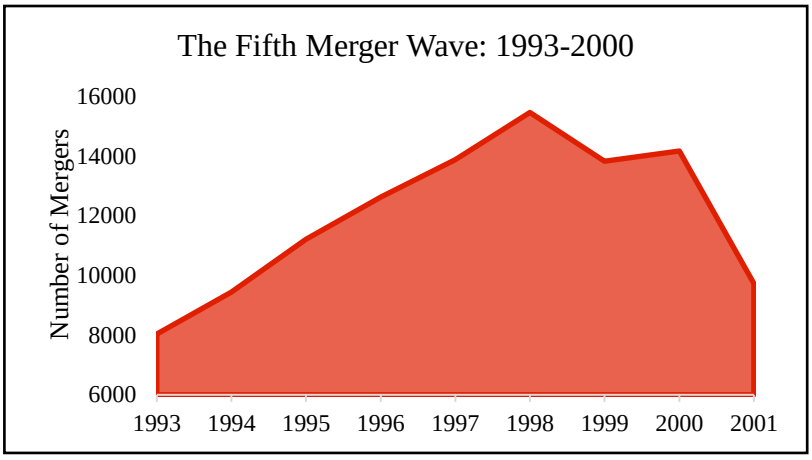


During the 1980's people started to see economic reforms as burdensome to economic growth, and US financial sector resultantly experienced a lot of deregulation. At this same time, there were a lot of innovative compensation schemes being established for top executives (Santomero, 2003). These schemes included a significant increase in the use of stock options as compensation, which was supposed to improve management's incentives to increase shareholder value. Many people argue that such compensation schemes placed more emphasis on short term rather than long term performance and could have also possibly led to managerial greed and mergers that would solely increase management's compensation. In order to increase valuations, more innovative compensation programs were also put into place in order to encourage executives to take greater risks and engage in more creative accounting in order to improve their reported earnings and drive their bottom line. Management started to promote an aggressive corporate culture and no one held these companies in check.

Due to this aggressive corporate culture, most of the bids in the fourth merger wave were hostile, meaning that they did not have the approval of the target company's management (Nouwen, 2011) and that companies relied on aggressive and innovative financial and legal techniques to acquire target companies and secure voting control (Cheffins, 2015). This new wave was also characterized by "bust-up takeovers", or takeovers where large fractions of the target company's assets were sold post-acquisition. According to Goldstein (2000), some believe that hostile takeovers served as a form of corporate governance because the threat of takeover would exert pressure on corporate managers to act in the interest of shareholders. Financial market pressure should motivate poorly performing management to do better, as well as function to discipline and replace

inefficient managers. While companies used cash and stock to finance M&As in the previous waves, mergers in the fourth wave were leveraged buyouts (LBOs) and were heavily financed by debt (Nouwen, 2011). Therefore, the fourth merger wave was comprised of hostile takeovers because poor managerial incentive schemes combined with equally ineffective corporate governance mechanisms allowed corporate mismanagement to flourish throughout 1970-1980 (Owen, 2006). However, this wave came to an end due to the early 1980's recession and a slowdown of the debt market, which dried up financing for these mergers.

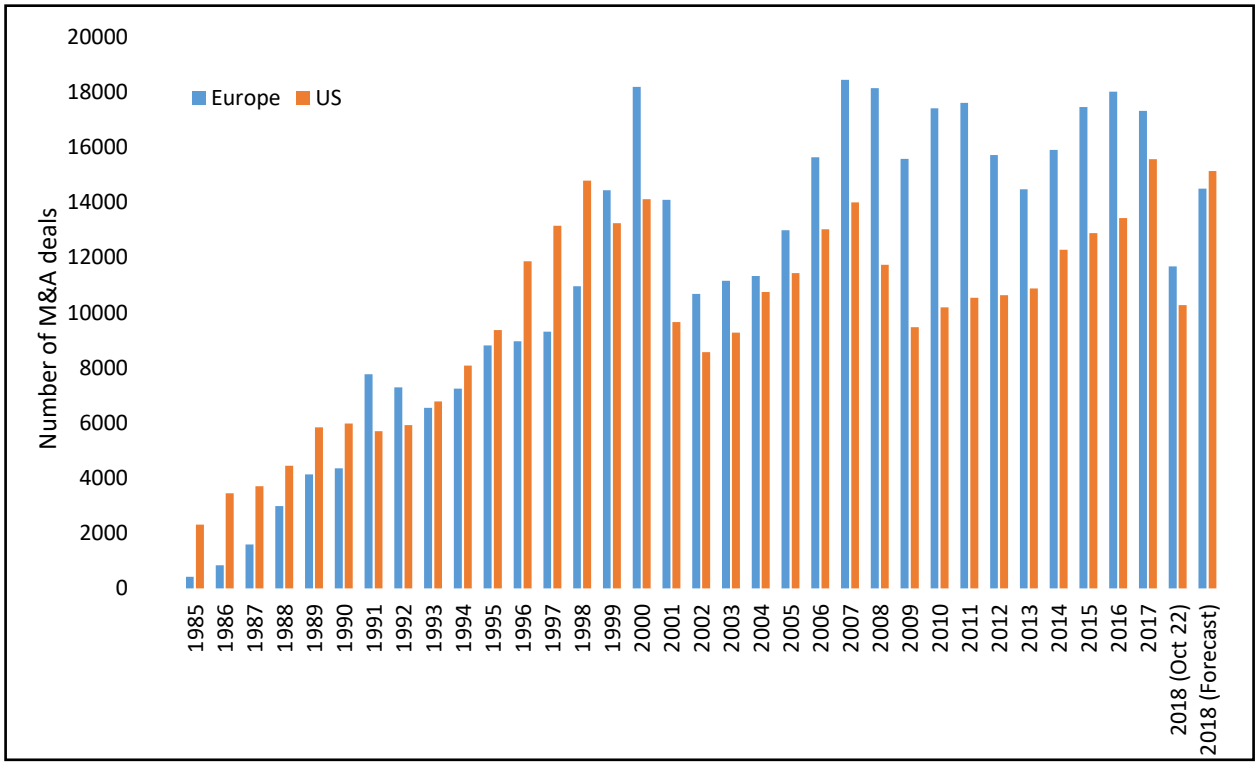
The Fifth Wave: 1993-2000



The 1990's were seen as a decade of great economic prosperity. After the 1990-1991 recession, financial markets were booming and the globalization process accelerated (Nouwen, 2011). In order to keep up with economic growth and increasing global demand, U.S. companies targeted companies abroad and the number of cross-border acquisitions increased significantly. This wave was less distinct in the US than in Europe, which is shown by its small size in Figure 1. Also, Figure 3 shows that the number of M&A transactions in Europe far surpassed those in the US in 1999 and 2000, even reaching one of

its highest peaks in 2000. During this time, Europe was preparing for the creation of the Single Market, which allowed all countries involved to trade with each other without restrictions or tariffs. In response, countries tried to convert their strongest firms into international competitors, merging their production activities with related technologies and causing M&A activity to take place in technology intensive industries (Kleinert & Klodt, 2002).

Figure 3- Number of M&A Transactions in Europe vs. US

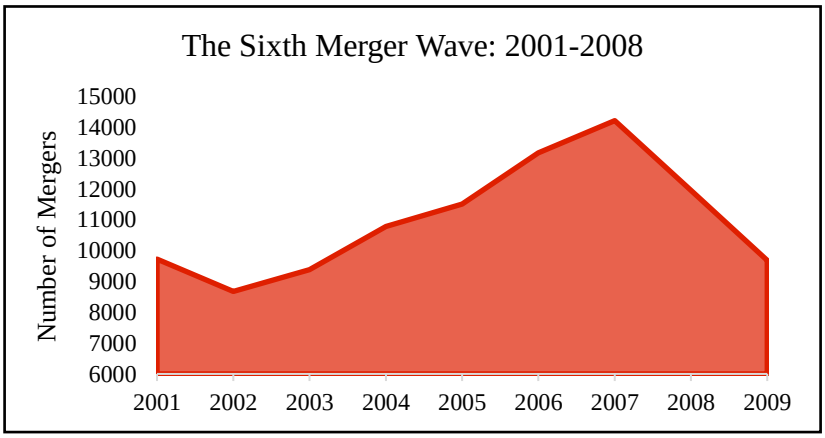


Source: *Thomson Financial, Institute for Mergers, Acquisitions and Alliances*

According the Nouwen (2011), the fifth wave began as a result of technological innovations such as information technology, as well as a refocus of companies on their core competencies in order to gain competitive advantage. US corporations wanted to participate

in the globalization of the economy, which led to the creation of "mega" deals—such as Exxon and Mobil and Citibank and Travelers—that were unthinkable before this wave. Gaughan (2001) claims that the fifth wave trended towards consolidating mergers where leading firms acquired competitors across the nation in order to build dominant companies. According to Gaughan, most of these mergers were in the banking and telecommunications industry, spurred on by significant changes in the regulatory environment at the time. In 2000, the dot com bubble burst and the stock market fell tremendously, losing 10% of its value within a few weeks. This marked the end of the fifth wave.

The Sixth Wave: 2001-2008

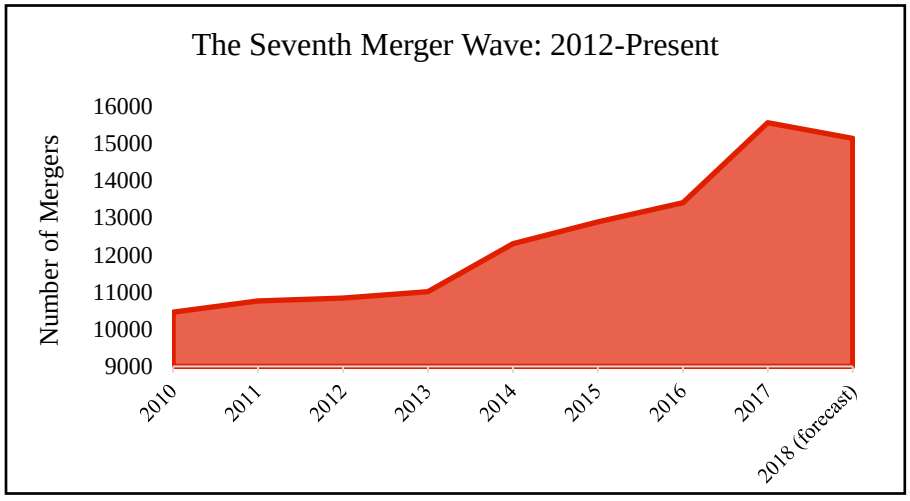


The sixth merger wave began after the 2001 recession. At this time, economic growth was resurfacing and there was an increase in liquidity into the market due to the stimulus from the Federal Reserve which kept interest rates low in order to stimulate the economy. Low interest rates also contributed to the rise of private equity funds as levered acquisitions became cheaper and the stock market was booming, leading to large amounts of available capital and an extremely favorable environment for M&As (Cordeiro, 2014). Alexandridis et al (2012), believe that behavioral theories which state that mergers happen

when overvalued firms seek to acquire less overvalued assets are unlikely to explain what drove the sixth wave. They claim that stock prices during this wave were not overvalued and were based on sound fundamentals rather than over-optimistic expectations. To support their claim, they provide data that valuations were lower in 2003-2007 than they were during the 1990's wave (Alexandridis et al, 2012). Therefore, it is most likely that the sixth wave was mainly the result of the availability of abundant liquidity at the time. In contrast, Cordeiro (2014) believes that the high liquidity and cheap capital generated distortions and target companies ended up being overvalued due to enormous speculation and a lack of detected risks from directing a large volume of resources towards "bad" assets.

However, both authors agree on the economic downturns that ended the wave. In late 2007, investors and corporate managers started becoming skeptical of Mortgage Backed Securities (MBSs) and credit markets. Then in 2008, credit dried up and financing became scarce, leading the world into recession and bringing M&A activity to a halt (Alexandridis et al, 2012; Corderio, 2014).

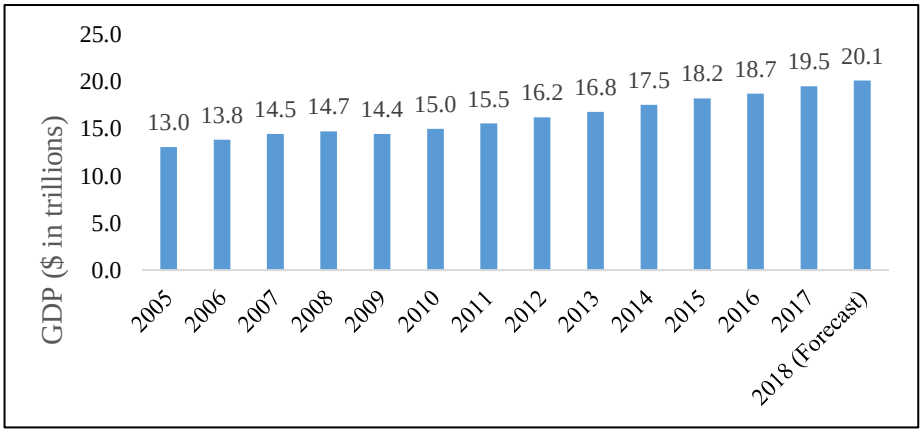
The Seventh Wave: 2010-Present



The seventh wave is the most current merger wave. Since coming out of the Great Recession in 2009, the US economy has been growing. Interest rates are low but starting to increase once again, stock prices are at historic highs, and the unemployment rate is at a 49-year low of 3.7%, with job openings exceeding the number of unemployed Americans by more than 650,000 (Morath, 2018). As seen in Figure 4, GDP has climbed $5.1 trillion dollars since 2009, and is expected to increase another $0.6 trillion by the end of 2018. Figure 5 shows that corporate profits are currently at an all-time high due in part to tax cuts (Grocer, 2018), indicating that firms have more money to spend and re-invest in their businesses.

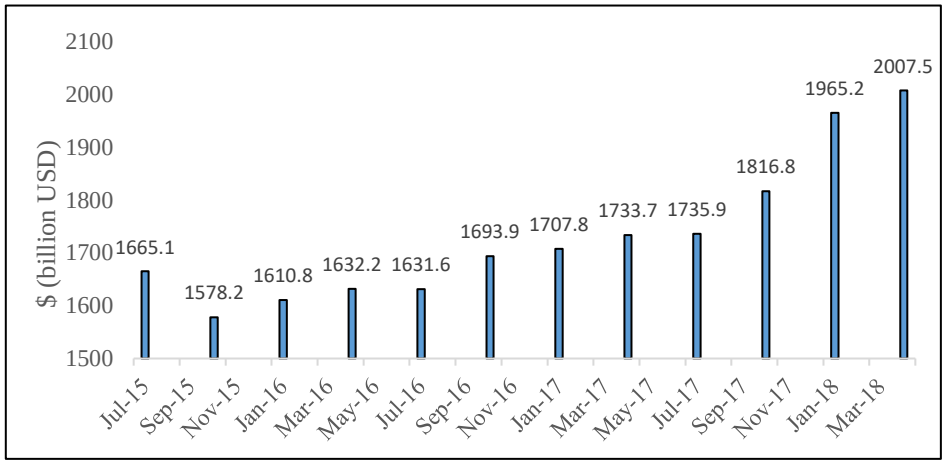
In its 2018 M&A trends report, Deloitte states that corporations now have more spending firepower; companies say that their cash levels have increased and that M&A remains the number one intended use of those funds (Deloitte, 2018). Technology acquisition is the number one driver of M&A pursuits this year and managers are showing a strong bias towards vertical integration, especially in life sciences, health care, technology, and financial services.

Figure 4- US GDP from 2000-2018 (estimated)



Source: U.S. Bureau of Economic Analysis, Real Gross Domestic Product [GDPC1], retrieved from FRED, Federal Reserve Bank of St. Louis;

Figure 5- US Quarterly Corporate Profits, since Q3 2015



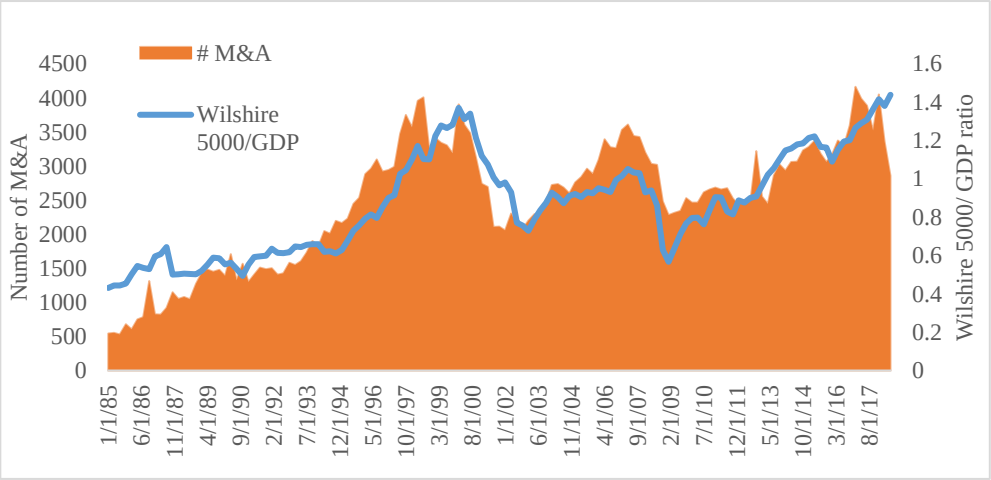
Source: TradingEconomics.com, US Bureau of Economic Analysis

According to the New York Times, fears of Silicon Valley's growing ambitions helped to drive a record run of M&A activity, with more than $2.5 trillion in mergers announced during the first half of 2018 (Grocer, 2018). In addition, four of the ten biggest deals during this period were made in part to fend off competition from the largest technology companies as the value of acquisitions announced during the first half of 2018 increased 61% from the same time in 2017 (Grocer, 2018). Companies are turning to M&As in order to capture a greater market share and change their business models in order to battle companies such as Netflix, Amazon, and other tech companies who are currently trying to enter new industries. Along the same lines, a number of larger deals have been in the media and healthcare industries—industries that are having to battle tech's encroachment upon their territories. Large media firms are now having to compete with companies like Netflix by owning both their content *and* the platform on which it is provided, and healthcare companies must respond to companies like Amazon who are trying to enter the healthcare business.

II. A Behavioral Analysis, by Wave

A common theme that underlies all behavioral theories is that merger waves are driven by managerial behavior and decisions rather than economic shocks. Another driver of these theories is that market valuations are positively correlated with merger activity. However, valuation data, such as a company's stock price, is unavailable for the older merger waves. Therefore, I will only consider the valuations of mergers within the last three waves. The Buffet Indicator, Warren Buffet's favorite market valuation tool, is calculated by dividing the total market capitalization (aka market cap) of the S&P 500 by US Gross GDP. A company's market cap is defined as its number of shares outstanding multiplied by its stock price. According to Buffet, the higher this ratio, the more overvalued the market currently is. Figure 6 contains the Wilshire 5000 to GDP ratio as compared to quarterly M&A volumes over time for the last three merger waves. The Wilshire 5000 to GDP ratio is identical to The Buffet Indicator, but uses the total market cap of the Wilshire 5000 index in the numerator rather than the S&P 500.

Figure 6- Wilshire 5000 to GDP ratio vs. M&A Volume, Quarterly

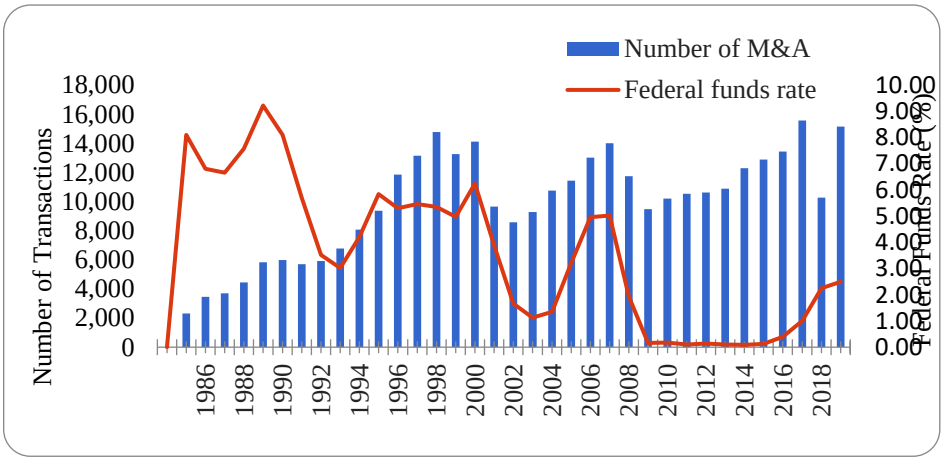


Sources: Federal Reserve Bank of St. Louis: Wilshire 5000 Full Cap Price Index; Federal Reserve Bank of St. Louis: US Gross Domestic Product, Thomson Financial, Institute for Mergers, Acquisitions and Alliances

I chose to use the Wilshire 5000 index because it includes all US stocks with readily available pricing, covering a wider variety of companies in different industries with different market caps than other stock indices. As shown in Figure 6, the Wilshire 5000/GDP ratio and M&A volume are positively correlated; as the ratio increases, so does M&A activity. This suggests that high market valuations drive mergers and acquisitions. As stated in the Market Timing Theory, if market valuations are high, managers are more likely to use their companies' inflated stock prices to acquire the real assets of lower-priced companies.

Interest rates also have an impact on valuations, driving merger waves. According to Warren Buffet, the higher the interest rate, the greater the downward pull on financial valuations. This is because the rates of return that investors need from any kind of investment are directly tied to the risk-free rate that they can earn from government securities. If the government rate rises, the prices of all other investments must adjust downward to a level that brings their expected rates of return into line.

Figure 7- Federal Funds Rate vs. Number of M&A transactions in the US



Source: Federal Reserve Bank of St. Louis: Effective Federal Funds Rate; Thomson Financial, Institute for Mergers, Acquisitions and Alliances (IMAA) analysis.

Conversely, if interest rates fall, the decrease pushes the prices of all other investments upward. When perceived valuations are high, even if those valuations may be rational, managers might choose to take advantage of their highly valued shares and engage in merger activity. Therefore, if we assume that high valuations encourage more M&A activity, we can conclude that as interest rates decrease, the number of M&A transactions increase. This is shown in Figure 7, which compares the number of M&A transactions in the US with the federal funds rate. When the federal funds rate is high, M&A activity is low. Additionally, Figure 7 shows that low federal funds rates occur at the same time as the start of each of the last three merger waves, indicating that low interest rates are positively correlated with an increase in merger activity.

Values of Companies Pre and Post Merger

Though high valuations and interest rates indicate that merger waves are driven by managerial reactions to good market conditions, they do not tell us about the motives behind managers' decisions to engage in M&A activity. In order to gain insight into this, I consider the major M&A transactions that have taken place during the past three merger waves. By "major," I mean the most publicized mergers at the time with transaction values above $20 billion. More specifically, I was interested in examining the effect that the transaction had on the total value of the company. I considered the market caps of acquiring companies in each wave one month pre and post-combination to see if the merger had a positive or negative effect on the company's total market cap. If the value of a company declined post-merger, then this could suggest that the merger was driven by managerial greed such as increasing firm size to increase one's compensation, regardless of the effect the merger would have on shareholders.

On the other hand, if the value of the company increased, then this could confirm that managers engage in mergers to maximize shareholder wealth. Tables 1-3 below present data on the "biggest", or highest value, completed M&A transactions that have occurred in the US during the last three merger waves. More specifically, it shows the percent change in the market caps of the acquiring companies pre and post-merger. In these mergers, either the acquiring company was from the US, the target company was from the US, or both were from the US. As stated before, valuation data is difficult to find before these waves, which removes them from consideration.

Table 1— The Fifth Wave (1993-2000)

Acquirer	Target	Year merged	Mkt cap pre	Mkt cap post	% Change
Worldcom	MCI Communications	1997	NA	NA	NA
Exxon	Mobil	1998	174.95	267.08	53%
Citicorp	Travelers Group	1998	7.48	4.87	-35%
Bell Atlantic	GTE	1998	76.93	119.22	55%
BP	Amoco	1998	81.64	79.84	-2%
Vodafone Group	Mannesmann	1999	44.8	163.15	264%
Pfizer	Warner Lambert	1999	167.67	285.48	70%
SBC Communications	Ameritech Corp	1999	96.40	99.96	4%
Vodafone group	Airtouch communications	1999	33.98	37.37	10%

Note: Market cap is in Billions, taken one month pre and post-merger

Table 2—The Sixth Wave (2001-2008)

Acquirer	Target	Year merged	Mkt cap pre	Mkt cap post	% Change
America Online Inc	Time Warner	2000	224.00	20.00	-91%
Comcast Corp	AT&T Broadband & Internet Svcs	2001	35.01	41.12	17%
Pfizer Inc	Pharmacia Corp	2002	176.48	262.81	49%
JPMorgan Chase & Co	Bank One Corp,Chicago,IL	2004	140.82	139.19	-1%
AT&T Inc	BellSouth Corp	2006	100.68	99.53	-1%
InBev NV	Anheuser-Busch Cos Inc	2008	205.66	165.88	-19%
Pfizer Inc	Wyeth	2009	110.82	146.78	32%
Glaxo Wellcome	SmithKline Beecham Plc.		169.93	158.64	-7%

Table 3—The Seventh Wave (2009-Current)

Acquirer	Target	Year merged	Mkt cap pre	Mkt cap post	% Change
Verizon Communications Inc	Verizon Wireless Inc	2013	144.280	134.880	-7%
T-Mobile US	Metro PCS	2013	4	14.77	269%
Berkshire Hathaway	Heinz	2013	273.49	290	6%
Softbank	Sprint	2013	35.55	44.79	26%
Heinz	Kraft	2015	43.21	97.48	126%
Actavis PLC	Allergan Inc	2015	76.39	115.95	52%
Fortis	ITC Holdings	2016	8.7	12.7	46%
IMS Health Holdings	Quintiles Transnational Holdings	2016	9.07	18.7	106%
TransCanada	Columbia Pipeline Group	2016	29.1	37.03	27%
Johnson Controls	Tyco International	2016	26.9	38.08	42%
Microsoft	Linkedin	2016	470.18	484.05	3%
Baxalta	Shire	2016	36.86	55.85	52%
Anheuser-Busch InBev	SAB Miller	2016	205.66	165.88	-19%
Charter Communications Inc	Time Warner Cable Inc	2016	20.81	22.66	9%
Sherwin Williams	Valspar	2017	31.17	32.79	5%
Northstar Asset Management Group	Northstar Realty Finance & Colony Capital	2017	1.7	8	371%
Abbott Laboratories	St Jude Medical	2017	56.57	74.11	31%
The Dow Chemical Co	DuPont	2017	78.67	167.55	113%
Dell	EMC Corp	2017	13.65	16.06	18%
Century Link	Level 3 Communications	2017	14.93	13.13	-12%
Great Plain's Energy	Westar Energy	2018	7.55	15.1	100%
Marriott International	Starwood Group	2018	45.6	44.95	-1%
AT&T	Time warner	2018	198.35	227.01	14%
Marathon Petroleum corp	Andeavor	2018	37.11	48	29%
Keurig Green Mountain	Dr. Pepper Snapple Group	2018	21.67	33.15	53%

As shown in Table 1 and 3, the majority of the acquiring companies in the fifth and seventh waves experienced an increase in value post-merger. However, as shown in Table 2, the majority of acquiring companies in the sixth wave experienced a decrease in value post-merger, which could indicate that mergers in that wave were driven by managerial greed. Considering the macroeconomic events during the sixth wave, the US had just emerged

from the 2001 recession. Interest rates were low and there was excess money in the market due to the stimulus from the Federal Reserve. Finding themselves with a sudden abundance of liquidity, managers at this time could have participated in mergers solely to increase their compensation or power, rather than maximize shareholder value. This greed could also be a result of the corporate climate at the time, which is reflected in the use of risky investment vehicles such as the Mortgage-Backed Security—the faulty asset-backed security that was a major contributor to the 2008 recession.

In contrast, the economic environments during the fifth and seventh wave are similar, which could explain why values of acquiring companies increased post-merger during those waves. In both the fifth and seventh wave, the US economy was expanding, and companies are looking to expand in order to stay competitive. For example, companies during the fifth wave merged in order to counteract the increasing globalization, while companies during the seventh wave are currently merging in order to counteract tech giants such as Amazon and Netflix. Additionally, both waves were spurred by technological innovations—the development of information technology in the fifth wave and the threat and expansion of Silicon Valley in the seventh wave. In order to build dominant and competitive companies, managers must have a long term view when making M&A decisions. Therefore, it is more likely that managers approached M&A transactions in these two waves with the intention to build the company and increase its value post-merger rather than increasing their own returns.

III. Results

After examining the economic environments during the seven merger waves, it seems as if the first three merger waves were caused as a result of macroeconomic shocks, whereas the last three waves were driven by managers' responses to high market valuations. For the fourth wave, it appears it was a result of managerial self-interest, reflected in aggressive corporate culture and the hostile takeovers during the period. However, since valuation data is not available for mergers during that time frame, I am unable to empirically test my conclusion.

Each of the first three waves acted as responses to economic changes during wave preceding it: The first merger wave consisted of horizontal mergers in the manufacturing industry and was spurred by technological inventions from the industrial revolution as well as a changing regulatory environment, including a loophole in the Sherman Antitrust Act. The second wave was a response to the regulations of the first wave that banned horizontal mergers and was mainly comprised of oligopolistic mergers. Lastly, with the government cracking down on both vertical and horizontal mergers, the third wave therefore consisted of conglomerate mergers. In contrast, market valuations were high and interest rates were low during the last three merger waves which could have caused managers to engage in merger activity in order to increase firm size and maximize either shareholder wealth or their own returns. Therefore, this is evidence that neoclassical theories may best explain the causes of the first three merger waves while behavioral theories best explain the last three merger waves.

CONCLUSION

In order to determine what drives merger waves, I explored the neoclassical and behavioral theories by analyzing a multitude of economic shocks and trends that occurred during each merger wave. To find data that aligned with neoclassical theories, I analyzed previous economic, political, technological, and regulatory changes that were occurring during each time period to see if those changes acted as shocks that caused an increase in merger activity. For the behavioral theory, I focused on market valuations and interest rates in relation to M&A activity in order to determine if the market was overvalued in times of heavy merger activity. Finally, for the last three waves, I looked at the total market capitalization of acquiring firms pre and post-merger during to see if the merger had created or destroyed value for the firms, which could yield insight into managerial motives for participating in mergers.

Ultimately, I concluded that neoclassical theories are better for explaining the first three waves while behavioral theories are better for the last three waves. So, while industry shocks and economic changes may have caused the first three waves, the last three waves were driven by high market valuations and managers' decisions to use their company's overvalued stock to acquire companies and expand their businesses. Interestingly, it seems as if the sixth wave was driven by managerial greed—which is shown in Table 2 by an overall loss in value post-merger—while the fifth and seventh waves appear to be driven by managers' efforts to maximize shareholder value. The fourth wave, however, was a wave consisting of hostile takeovers during a time of increased deregulation and use of stock-based compensation. Therefore, I hypothesize that managerial behavior was the cause of this

wave, but I am unable to test my hypothesis since valuations during that period were unavailable to me, given the resources I had access to.

My findings on what drives merger waves is important because there is a lack of literature surrounding the topic and no consensus currently exists. While there are discussions on M&As themselves and the motivation behind mergers, there is very little research on the cyclical pattern of merger activity and the actual fundamental causes of merger waves. Since we are currently in the midst of the seventh wave, which is a wave that has lasted for eight years, we need to be cautious. As my macroeconomic research shows, all previous waves ended in an economic crisis or recession. When there is a negative shock to the economy, consumer confidence decreases, which consequently decreases market valuation. Based on my research, when valuations start to decrease so does M&A activity, bringing the merger wave to an end.

One major limitation to my research was the lack of valuation data for companies before 1990. Since many companies that merged were not public before that time, it was not possible to find data on stock price or the number of shares outstanding, and therefore I was unable to calculate their market caps. There was also limited data on mergers during the fifth and sixth wave, which limited the extent to which I could study the values of companies pre and post-merger. As seen in tables 1 and 2, I only had nine mergers to sample for both of those waves, which is not a representative sample. Additionally, since I only studied the biggest M&A transactions in each wave, the data is not representative of all mergers that took place during the period

If I had more time and resources to create an optimal study for this topic, I would create aggregate indicators of both the neoclassical and behavioral theories (ie: indicators for

the Q-theory, agency cost theory, market timing theory, etc). By looking at the sum of each indicator during each wave, we would be able to better understand the drivers behind each wave and whether they side with the neoclassical theory or behavioral theory. I also would look for more commonly used measures of elevated market sentiment (investors' attitudes towards the market) at the aggregate level (all industries combined). With these measures, I would analyze the extent to which they explain the volume of transactions in a given year, and whether those transactions weigh more heavily in years of merger waves. Lastly, I would use past data to predict where we are in the latest merger wave given our current economic state. By doing so, we could predict if we are now at the top of the merger wave, or on the downside, which could signal that we are close to another economic contradiction.

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