

# The Impact of Macroeconomic Surprises on Mergers & Acquisitions for Real Estate Investment Trusts

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## Abstract

This paper examines the impact of various macroeconomic and real estate specific surprises on M&A transactions involving Real Estate Investment Trusts. The 2008 financial crisis drastically affected merger & acquisition activity, especially within the real estate market. The number of M&A transactions involving Real Estate Investment Trusts was very volatile during this period of economic turmoil and it appeared that several economic factors contributed to changing patterns in M&A activity. Our study uses time series data to draw a connection between REIT-related M&A activity and quantifiable factors. From our results we find there to be a relationship between the macroeconomic environment and REIT-related M&A activity.

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*JEL Classifications:* G10; G14; G34

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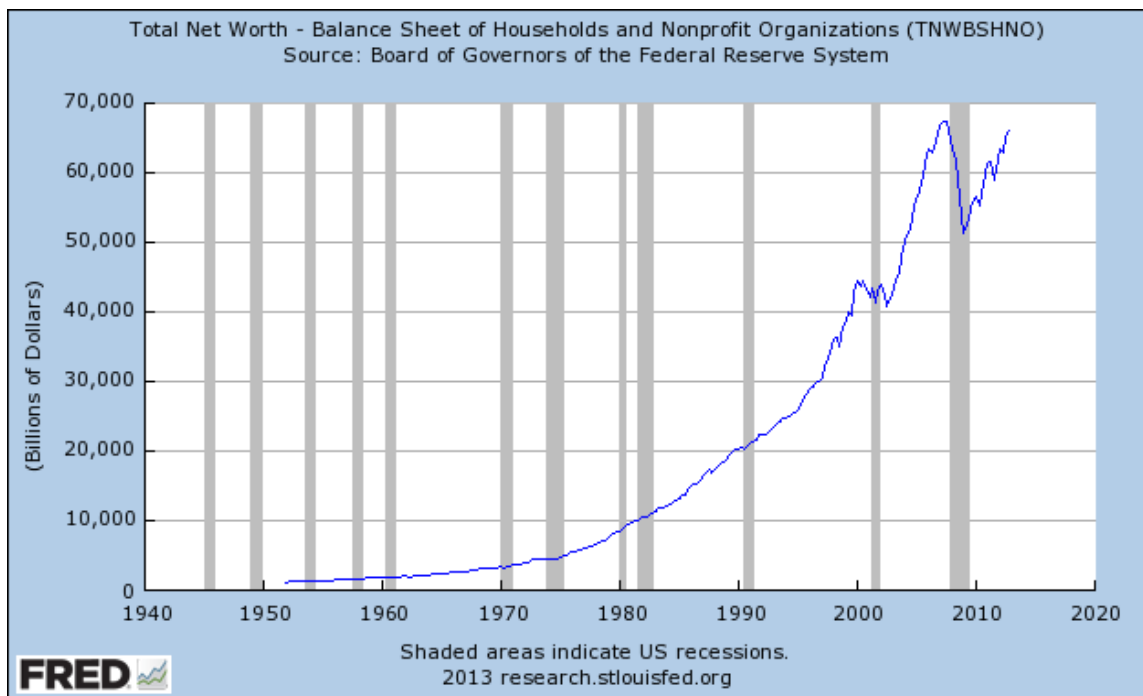
## **I. Introduction**

Corporate finance points out that there is a complex connection between various elements of the economic environment and corporate decision-making. This study explores the unique interconnectedness of relevant economic and financial conditions with mergers and acquisitions (“M&A”) specifically for deals involving a real estate investment trust (“REIT”). Previous literature in this field fails to properly address this idea and tends to focus more on shareholder wealth surrounding the announcement of an M&A transaction, rather than the economic environment that may have induced or predicated that transaction. Therein lies our research question: What is the impact of macroeconomic surprises and real estate specific surprises on REIT-related M&A activity in terms of quantity of transactions? This is an empirical study that uses time-series data to draw a causal link between the volume of REIT-related M&A activity to quantifiable factors of the macro economy and real estate market.

The 2008 Subprime Mortgage Crisis plagues the minds of all investors from the smallest household to the largest institutional investors and money managers. The pervasive and global impact of the housing, and subsequent, financial crisis that started in the United States and spread throughout the world has had drastic effects on the economy, corporations, and individuals. As represented by Graph 1, we saw Total Net Worth of Households and Charity Organizations drop from an all-time high (at the time) of roughly \$67.413 trillion in 2007Q3 to \$51.408 trillion in 2009Q1, a drop of over 20% in a little over a year (FRED). American households struggled to make mortgage payments and subsequently, millions were forced into foreclosure and banks repossessed their homes. This weighed in heavily on the balance sheets of hundreds of banks and mortgage lenders that went bankrupt. Those financial institutions that survived had to accept a massive government bailout to strengthen their balance sheet and avoid

bankruptcy. Credit markets froze, households stopped spending, stock markets crashed erasing trillions of dollars of wealth and real GDP in the United States dropped from \$13.326 trillion in 2007Q4 to \$12.701 trillion in 2009Q2 (FRED). These figures give you a general understanding of the depth of the crisis and the overwhelming shocks to the financial industry and economy that the U.S. experienced in 2008-2009.

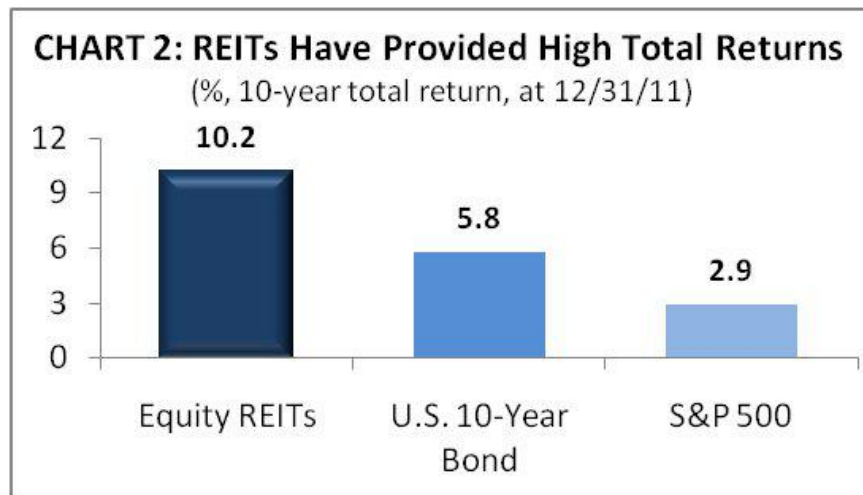
**Graph 1. Total Net Worth: Households and Nonprofit Organizations (FRED)**



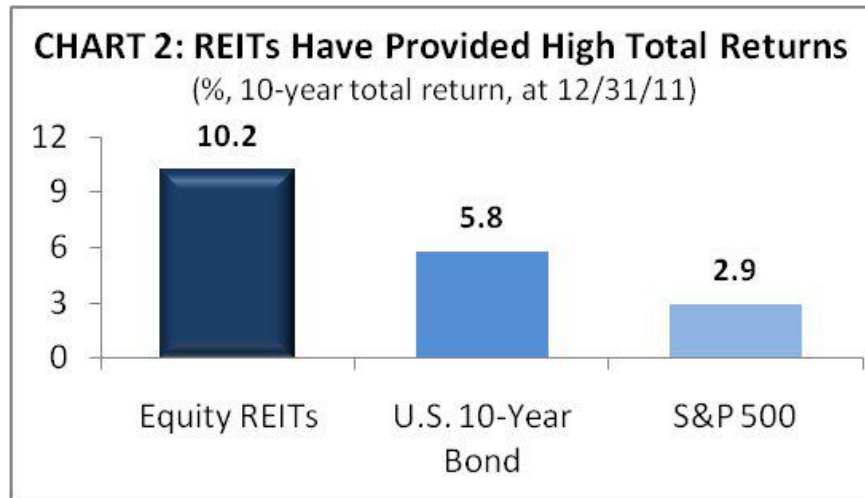
“In the current macroeconomic environment characterized by a high degree of uncertainty, modest growth, and low interest rates, investors are finding Real Estate Investment Trusts attractive because of the trusts’ relatively high dividend yields, relatively stable and predictable lease-based cash flows, and access to capital at favorable terms” (Seeking Alpha, 2012). Refer to Graph 2 and Graph 3. Investors who purchase shares of a REIT earn dividends, derived from rental income and capital gains from sales of properties (real estate appreciation), and capital gains from stock appreciation once sold. REITs operate similarly to mutual funds in that they allow investors to pool their money together to invest in large-scale, income producing

real estate assets through the purchase and sale of liquid securities. Commercial real estate, the underlying asset in a REIT, is a highly unique asset class that attracts long-term investors because of relatively stable, predictable future cash flows and large potential upside with a limited downside (limited to value of initial investment). Commercial real estate is a property that is used solely for business purposes, including, but not limited to, office, residential/multi-family, retail, hotels, industrial and medical sectors. Although each sector must take different aspects of the real estate market into consideration, in a broad sense, they operate in a similar fashion. Some investors also view real estate as an inflation hedge because the value of a building will appreciate as inflation rises. REITs offer investors superior liquidity and a well-diversified portfolio of real estate properties without the financial risks associated with real estate acquisitions.

**Graph 2. REIT Dividend Yields (Seeking Alpha)**



### Graph 3. REIT Total Returns (Seeking Alpha)



REITs were formed in 1960 after Congress passed The Real Estate Investment Trust Act of 1960, in which a new tax code exempted REITs from corporate tax in the same manner as regulated investment companies if they followed certain regulations. The primary regulations to qualify as a REIT, a type of pass-through corporation, under U.S. tax rules are that they must pay dividends of at least 90% of taxable income, have at least 75% of total assets invested in real estate and cannot have more than 50% of its shares held by 5 or fewer individuals. This is of particular importance to REITs because the federal government only taxes undistributed income, while the distributed earnings of the company are taxed to the shareholders as ordinary income. Therefore, because of the regulation mandating that having at least 90% of REIT earnings must be distributed as dividends, REITs only pay corporate taxes on a fraction of their earnings. Before this law was passed, investing in real estate assets was limited to very wealthy individuals and institutions. This legislation made income-producing real estate available to the small-scale investor through the purchase of equity as with any other security.



The objective of this study is to take a closer look at mergers and acquisitions that occur within the REIT space. As explained earlier, the real estate industry is particularly interesting because of the uniqueness of real estate assets and the role they take within the market. Beyond just real estate assets, REITs are valuable pass-through corporations that give investors access to income producing real estate that wasn't possible for the average investor before. The motivation for this study is drawn from the differences in the observed number of transactions surrounding the financial crisis in 2008, i.e. 39 transactions occurred in 2006 compared to 0 in 2009 for REITs included in the NAREIT Index<sup>1</sup> (REITWatch, 2013). This difference is illustrated in Table 1 along with A.1 and A.2 in the Appendix. This list of transactions is included for illustrative purposes to demonstrate the casual observation that there are a high number of transactions in some years whereas there are none in others. The focus will be on the macroeconomic factors and general economic conditions that affect the number of transactions that occur in any given quarter and determining what has the largest impact on REIT M&A. While this data only includes publicly traded U.S. REITs, this example is intended to be a microcosm that illustrates the potential impact that the macro-economy and real estate market can have on M&A transactions over time.

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<sup>1</sup>NAREIT: National Association of Real Estate Investment Trusts. Data includes 172 publicly traded U.S. REITS

**Table 1. U.S. REIT Merger and Acquisition Activity (REITwatch, 2013)**

<i>Year</i>	<i>Number of Transactions</i>
2004	6
2005	9
2006	39
2007	18
2008	4
2009	0
2010	3
2011	3
2012	4

Attempts to explain why mergers and acquisitions occur in the REIT industry tend to focus primarily on the internal factors that impact M&A decisions and the apparent absence of hostile takeovers. The majority of studies try to prove the inefficient management theory which states that firms with superior management look to acquire firms with unexploited resources so that they can cut costs and increase revenues (Womack, 2010). The methodology utilized for these types of studies is an event study that quantifies firm returns before and after the announcement of a merger or acquisition. If the data supports the idea that the target is underperforming before the announcement and then the combined firm experiences positive abnormal returns, they state that the results lend itself to the inefficient management hypothesis. Conversely, we intend to quantify aspects of the macroeconomic environment that influence M&A activity. In recent times, the financial crisis has had drastic effects on the real estate industry due to property value shocks and tightening of the credit markets. Michael Reid, a principal at Herald Square Properties and former COO of SL Green, notes that although there may be numerous motives for M&A activity within the REIT space, the 3 most common in his experience are a desire to purchase the real estate owned by the target company, to incorporate

and utilize the target firm's operating platform and management team, and ultimately to increase earnings<sup>2</sup>. Many of these decisions are made in consideration with the state of the macro economy along with the real estate market and quantifying how these factors can affect number of transactions lies at the core of our study.

There remains a gap in the literature that fails to address what market factors in the economy affect M&A activity involving REITs. We intend to focus solely on macroeconomic and industry specific factors that influence the number of M&A transactions. There are many factors to consider when looking at which economic indicators impact the market for M&A activity and identifying the factors most pertinent to the real estate sector. This study focuses on surprises in real GDP growth, inflation, consumer sentiment, mortgage rates, fed funds rate and REIT returns while also including Policy Dummies for 1986 and 1994. An explanation as to why we choose these variables is outlined in the Empirical Specification section. Throughout history, the macroeconomic environment has influenced corporate decisions and there tends to be a direct correlation with the business cycle (Becketti, 1986). Since REIT M&A can only be tracked back to 1960, we must be careful to differentiate between causation and correlation, and how this might limit the robustness of our results.

Furthermore, as mentioned above, literature in the REIT M&A space focuses on supporting the inefficient management hypothesis by utilizing an empirical methodology that quantifies the underperformance of target returns prior to the announcement and then showing positive combined firm performance post announcement. If this were in fact the case for the next wave of M&A activity, we would witness a large amount of M&A deal flow in the post financial

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<sup>2</sup>Herald Square Properties is a fully integrated investment & operating company focused on the Midtown Manhattan Office Market. SL Green Realty Corp is a NYSE listed REIT

crisis period. This makes sense intuitively because in the post financial crisis period, when property shocks and a rise in delinquencies plagued REIT returns, REIT underperformance would be/is quite prevalent and thus points toward a higher frequency of REIT M&A. However, this is not the case in the post-crisis era as only 10 transactions occurred between 2008-2011 (REITwatch, 2013). This activity is shown in the appendix. With this in mind, we hone in on the primary question that we intend to address: How have various macroeconomic factors along with real estate specific factors influenced the volume of M&A transactions observed in the REIT industry? With macro-economic conditions changing drastically during the financial crisis, we are predicting that the large fluctuation in M&A activity can be in part attributed to these changing conditions. The goal of our study is to determine which conditions play the largest role. We examine a 30-year timeframe so as to not limit our study to solely the economic crisis of 2008, but to also incorporate other economic shocks over the last 30 years.

The structure of the paper is outlined as followed: Section II provides a detailed overview of the previous literature within REIT M&A; Section III describes the theoretical framework used; Section IV discusses the empirical specification; Section V presents the relevant data used to study the factors that influence M&A activity; Section VI details the regression results; and Section VII is the conclusion.

## **II. Literature Review**

The purpose of the literature review is to discuss previous research conducted and to place our study within the relevant literature on our topic. We focus on two areas of importance: first,

starting with REITs in general and moving towards REIT M&A specifically; second, macroeconomic impact on general M&A.

## **II.1 REIT M&A**

In economic and finance literature, the motivation for merger and acquisition transactions has been heavily studied and different theories have evolved. The goal of a majority of research in the REIT M&A space has dealt with M&A motives by quantifying firm returns with an event study framework. Campbell et al. (2009) examined a sample of 114 REIT merger announcements from 1994-2001 where the sample included mergers in which the acquiror was a publicly traded Equity REIT and the target was either public or private. They measured abnormal shareholder returns over 1, 3, and 5-year periods. The results from the study were that the 60-month BHAR for the combined portfolio of merging firms was -9.9% and is statistically significant (Campbell, Giambona, and Sirmans, 2009).

In the framework of their study, Campbell et al. (2009) found it difficult to prepare an accurate study that mitigated the affects of outside factors as they solely wanted to compare returns based on merging firms and non-merging ones. Since this was an industry study, it does not use a broader market index and is free from modeling problems that can accrue when the sample firms are affected in an asymmetric manner by various pricing factors. Additionally, only reference firms in the same industry as event firms were matched together to eliminate bias of potential inaccuracies that could have arisen from comparing across industries. Our framework includes deals across the various real estate industries, or property types. The issues with comparing across industries that were presented indicated that it is important to consider deal

trends not only on an aggregate scale but also to potentially separate by property type through the implementation of dummy variables.

In an effort to perform a more in depth analysis of real estate mergers and shareholder performance following the announcement of the merger, Womack (2010) established new evidence to distinguish why mergers occur in the real estate industry by quantifying the combined firm return for nearly three decades of real estate mergers. Womack (2010) postulated that the three dominant M&A theories are the empire-building hypothesis, the over-valued information signal hypothesis, and the inefficient management hypothesis. Within the REIT M&A space, a majority of the studies focused on the inefficient management hypothesis as the motive for M&A transactions and use the almost complete absence of hostile takeovers as the motivation for the study (Womack, 2010). “Findings from this study [were] consistent with the notion that real estate mergers occur because firms with superior management acquire other firms that possess unexploited opportunities to cut costs and increase earnings, the inefficient management hypothesis” (Womack, 2010). By utilizing four different models, market model, raw, net of market, and bid-ask average, and seven different event windows, Womack (2010) concluded the data supported the inefficient management hypothesis and highlighted that real estate mergers are generally wealth creating events in that shareholders at least break even but can also experience modest gains. The results were consistent with the inefficient management hypothesis in that superior management was able to realize greater abnormal returns, i.e. cut costs and increased revenues. The validity and effect of this theory on reasons driving M&A activity will be brought into question as the effects of macro and market factors are weighed in our analysis.

Eichholtz and Kok (2008) examined the presence of the inefficient management hypothesis during a recent takeover wave (1999-2004) using the complete global universe of listed property companies. The methodology used to study this hypothesis first looked at the relative underperformance of REIT targets prior to the announcement and then measured the target returns post merger announcement to confirm the inefficient management hypothesis. Their results were consistent with the inefficient management hypothesis and cited long-term underperformance as the driver for M&A activity for REITs (Eichholtz and Kok, 2007).

Ratcliffe and Dimovski (2012) took a different approach to studying M&A in the market of REITs by conducting a meta-analysis of 15 REIT studies to draw conclusions on the factors influencing the returns by targets and bidders. Consistent with other industry studies, targets enjoyed the majority of the gains in a merger. This study shed light on the conclusion in Andrade et al. (2001) that “there are two main catalysts for M&A activity, mergers occur in waves and second, within each wave, there is a strong clustering by industry” (Ratcliffe and Dimovski, 2012). This has strong implications on the focus of our study in that the global financial crisis could be considered an industrial shock that causes the next wave of REIT M&A due to the impact it had on property values and mortgage markets. Looking at structural changes in the overall economy and within the real estate industry, potential market factors could facilitate REIT M&A.

## **II.2 Macroeconomic influences on M&A**

As it pertains to our study, a different set of literature has focused on macro factors that influenced M&A activity but these studies focused on general M&A, not industry specific, and few concentrated their study within the United States. H. Richard Nakamura (2002) focused on

selected macroeconomic factors and financial variables, and their influence on the pattern of M&A observed in Japan. Nakamura (2002) concluded that he cannot not confidently say that macro factors explain the pattern of M&A in Japan due to the relatively short time period studied. However, he noted that there seems to be a correlation between economic business cycles and waves of M&A. Nakamura's study built off the work previously done by Ali-Yrkko (2002), which focused on the history of Finnish M&A. Although Ali-Yrkko did not define the effects as causal, he takes a three-step approach to addressing why M&A occurs. Based on his results, Ali-Yrkko suggested that M&A decisions can be seen from a top down flow, where macro level factors caused shocks on the industrial level, to which managers on a micro level reacted and made decisions whether or not to engage in M&A activity (Nakamura, 2002).

Additionally, some studies focused on foreign direct investment by looking at the growth in international production via cross-border mergers and acquisitions and the role of macroeconomic influences on that activity. Li et al. (2003) studied the firm specific characteristics that affect market timing in China and emphasized the importance of controlling for environmental and situational factors. In the context of our study, this implies that macroeconomic fluctuations impacted acquisition decisions, and acquisition timing in particular. Building off the conclusions of Li et al., Uddin et al. (2011) looked at the macroeconomic influence on cross-border M&A in the U.K.. Uddin and Boateng followed a similar methodology to that of which this study is proposing by regressing the number of deals flowing into and out of the U.K. against real GDP, interest rate, exchange rate, money supply, share price index, and inflation. Uddin et al. found that GDP, exchange rate, interest rate and share prices had a significant impact on the level of outward UK cross-border M&A, and GDP, money supply, and



share price had a statistically significant impact on the level of U.K. cross-border M&A inflows (Uddin and Boateng, 2011).

Shifting focusing onto the U.S., Mitchell and Mulherin (1996) extensively studied the issue of merger waves and their causes by looking at 51 industries during the 1980s. They assumed that the structure of any industry, “including the number and size of firms, is a function of a number of factors such as technology, government policies, and supply and demand conditions.” Any major changes, or shocks, to these factors would cause a shift in that industry that would incite a merger wave. Mitchell and Mulherin postulated that when a firm looked to expand as a result of a shock, they tended to do so externally through takeovers, the least-cost method.

Harford (2005) used the transaction value for all mergers from 1981 to 2004 from the Securities Data Corporation (SDC) to measure merger activity. He suggested that mergers are procyclical because firms were less financially constrained during economic peaks and thus had more (or possibly cheaper) sources of capital. This would imply that we would see more activity during peaks of the business cycle than during troughs. Dittmar and Dittmar (2008), used a similar method and found that GDP growth is significant and positively correlated with mergers. Finding that economic growth (GDP) represents positive stimulus for excess cash flows and thus merger activity.

Furthermore, Harford (2005) built on the work of Mitchell and Mulherin (1996) by modifying the neoclassical theory to include a necessary condition of capital liquidity to accompany these industry shocks. He postulated and confirmed through his empirical study that industrial shocks, whether they be technological, economics or regulatory, caused merger and acquisition activity to cluster in time within an industry. However, not all shocks propagated

merger waves, a sufficient level of capital liquidity must be present to initiate an industry merger wave.

Chan, Hendershott and Sanders (1990) demonstrated, using a multi-factor model, that the excess returns to REITs observed using a simple CAPM framework evaporated when this multifactor approach is utilized. They identified three key factors that drove both the equity market and REIT returns: changes in risk term structures and unexpected inflation. Over macro factors such as forward industrial production and expected inflation have a lesser impact or switch between a positive and negative influence. They also found that impacts of macro factors on real estate returns were consistently lower than impacts on general stock returns.

For the purpose of this study, we intend to focus more on the external factors that influence M&A activity for the real estate industry. After a thorough analysis of previous literature, we determined that testing motive hypotheses for M&A activity within the REIT space by looking at firm specific factors and quantifying the target, bidder or combined returns limits the robustness of our results. By focusing on the market factors, we can more confidently state what drives M&A transactions. Given the 2008 & 2009 shocks in property values and mortgage markets, we will investigate mergers occurring for reasons potentially unique relative to other waves of M&A activity. Our goal is to apply some of the techniques and methodology from the macro literature to study how the macroeconomic environment affects purely the aggregate quantity of REIT-related M&A in the United States. REITs have become prominent players in the acquisition of commercial real estate and we believe that REITs act as a good proxy to represent the real estate sector as a whole. The importance of our study lies in the fact that studies on the macro effect on M&A have never focused on the REIT industry nor used such an extensive list of potential factors.

### **III. Theoretical Framework**

#### **III.1 Merger Wave Theory**

Merger waves occur within industries and in the aggregate when multiple industries are experiencing merger waves. Numerous studies have shown that there is no consensus on the cause of these merger waves, but there are two leading theories: neoclassical, and behavioral & agency. We are applying this theory uniquely as it is the first application for REITs (Harford, 2005).

#### **III.2 Neoclassical Theories**

Mergers occur mainly as a result of external shocks, either in the form of economic, technological, financial, regulatory, or political shocks (Harford, 1999, 2005) and are made to sustain or create competitive advantages (Jensen, 1988). Mergers are primarily motivated by such shocks and are expected to lead to profit optimization and shareholder value creation; assuming managers are aligned with shareholders' interests (Martynova and Renneboog, 2008). Under these assumptions, combined firms should be able to operate more efficiently than the individual standalone entities through the realization of synergies (Anderson, Medla, Rottke and Schiereck, 2012).

Any shocks to the structure of an industry would cause a shift in that industry that would incite a merger wave. When a firm looks to expand as a result of a shock, they tend to do so externally through takeovers, the least-cost method.

#### **III.3 Behavioral and Agency Theories**

The foundation of this set of theories lies within the classic motives of incentives, agency costs, or information signaling (Womack, 2012).

- *Empire building*: managers have incentives to expand the corporation beyond its optimal size, which increases the manager's power through resource acquisition. It is also associated with increases in manager's compensation" (Jensen, 1986). Therefore, by increasing the size of the firm, managers are increasing their own compensation. This would then imply that managers are inclined by selfish, value-destroying motives, not market conditions.
- *Over-valued information signal*: The fundamental assumption is that "financial markets are inefficient, so some firms are valued incorrectly. In contrast, managers are completely rational, understand stock market inefficiencies, and take advantage of them, in part through merger decisions. Mergers in this model are a form of arbitrage by rational managers operating in inefficient markets." (Womack, 2012, pg. 449)
- *Inefficient management*: Firms with unexploited financial opportunities are natural candidates for acquisition by other firms with better management, which in turn aims to improve the target's management and performance. Furthermore, greater macroeconomic conditions would impact the frequency of mergers occurring when a firm was previously underperforming and therefore, is more likely to be acquired by superior management. This is conditional on managers operating in a fashion consistent with the inefficient management hypothesis (Womack, 2012, pg. 450).

### **III.4 Arbitrage Pricing Theory**

The expected return of an asset can be modeled as a linear function of various macro-economic factors or theoretical market indices. Within this model, sensitivity to changes in various factors is represented by a factor-specific beta coefficient. Based on the idea that an asset's returns can be predicted using the relationship between that same asset and many common risk factors. The

primary assumptions of APT are that a factor model can describe security returns, there are sufficient securities to diversify away idiosyncratic risk, and well-functioning security markets do not allow for the persistence of arbitrage opportunities (Geweke and Zhou, 1996).

#### IV. Empirical Specification

Our study focuses on two macro-regressions that include a comprehensive list of variables with accompanying data as summarized in Table 2. Later in this section, we address why we are choosing to include the variables in this list and also the reasoning behind variables we do not plan to include.

**Table 2. Variables**

<i>Variable</i>	<i>Category</i>	<i>Source</i>	<i>Notes</i>
Real GDP Growth (%)	Macro-economy, Surprise	FRED	Seasonally Adjusted Annual Rate
Inflation Rate (%)	Macro-economy, Surprise	FRED	Seas. Adj., % change of CPI for All Urban Cons.
U. Of Michigan: Consumer Sentiment (Index)	Macro-economy, Surprise	FRED	Not Seasonally Adjusted
Federal Funds Effective Rate (%)	Macro-economy, Surprise	FRED	
30-Year Conventional Mortgage Rate (%)	Real Estate specific, Surprise	FRED	Not Seasonally Adjusted
FTSE NAREIT U.S. R.E Index Series Returns (%)	Real Estate specific, Surprise	NAREIT	
Tax Reform Act (1986) Policy Dummy	Regulatory/policy	-	
"Look-Through" Provision (1994) Policy Dummy	Regulatory/policy	-	
Number of Transactions (acquiror as REIT)	Dependent	SDC	
Number of Transactions (target as REIT)	Dependent	SDC	

\*FRED: Federal Reserve Bank of St. Louis, Economic Data

We focus on “surprises” in levels of variables as opposed to general levels. A surprise is essentially a predicted value minus the observed historical value for the data points. The methodology for obtaining predicted values for the regressors is outlined later in this section. Rather than studying trends in levels of these variables, we find that our results are more robust by focusing on surprises. A surprise can technically be either positive or negative and we believe that this opens up a whole new way to view what drives M&A activity. For example,

one may think that activity will spike in strong economic times as good capital markets conditions allow for attainable financing for transactions as firms aim to expand their portfolios. On the contrary, in weak economic times, some firms may face a cash flow problem and may want to consolidate with other firms to gain higher liquidity and a generally healthier financial situation. Furthermore, by viewing the results of both positive and negative surprises, we are able to see the effects of how unexpected changes in levels (both negative and positive) of variables affect transaction activity for the two types of regressions.

Within the economic environment, we use the University of Michigan consumer sentiment index to represent current consumer sentiment about the state of the economy. Initially, we intended to incorporate future market sentiment as measured by the VIX Index, along with CDS spreads to encompass different aspects of debt markets, however this data is not available for the duration of the timeframe for M&A transactions and was unable to be incorporated.

For industry specific variables, the two included are the 30-year conventional mortgage rate along with a REIT return index. The 30-year conventional mortgage rate encompasses contract interest rates on fixed-rate mortgages for commercial and residential real estate. The REIT return index includes only public REITs, but it will serve as a sufficient proxy for general REIT returns. Within the industry specific variables, we initially looked at total construction spending, delinquency on commercial real estate loans/leases, and a commercial real estate price index, however these are not being included due to restrictions in gathering the data for a long enough time frame. While several variables were unable to be included due to data restrictions, each of the variables we did include serve to represent an aspect of the macro-economy or real estate market that could affect M&A activity. We include the federal funds rate as a proxy for

changes in monetary policy by the Federal Reserve. Historically, the Federal Reserve has lowered the federal funds rate during recessions and slower economic times. Theoretically, a lower rate will stimulate the economy by making money cheaper and easing credit markets. Real estate owners are affected by the federal funds rate as the rate at which banks can lend each other money will affect the rate that banks loan individuals money. Finally, we include two controls for significant changes in regulations and policies within the real estate industry that we believe will affect activity.

To explain the process of selecting and constructing the dummy variable controls for regulation and policy changes, we have investigated a number of significant changes that have occurred within our timeline and they potentially impact our study. We include dummy variables for the policy actions enacted in 1986 and 1994 that will represent the aggregate of the more recent policy changes because they all deal with ways REITs can improve income generation and maintain their status as a REIT. These policies are summarized below:

#### Regulation & Policy Changes

##### *The Tax Reform Act of 1986 (1986)*

- Includes REIT simplification changes to take effect, including one that for the first time allows REITs to be internally advised and managed.
- Reduced potential for real estate investment to generate tax shelter opportunities
  - Limited deductibility of interest, lengthened depreciation period, and restricted use of “passive losses” essentially meant that real estate investment needed to be more income-oriented.

##### *Five or Fewer “look-through” provision (1994)*

- Provision that makes it easier for pension plans to invest in REITs. Mutual funds and pension funds were no longer considered to be a single investor but rather a collection of each individual investor that comprises that fund.

These policy changes are included because they all deal with ways REITs can improve income generation and maintain their status as a REIT. Accounting for the policy changes in 1986 and 1994 would be, essentially, a control for merger waves. In recent literature, there has been some focus on the apparent clustering of industries during waves of M&A activity. If these variables are deemed to be statistically significant, we could confirm the results of previous studies while also increasing the potential significance of our macroeconomic choice variables.

We would also like to point out that we considered using a third dummy variable to encompass the REIT Simplification Act of 1997 along with the REIT Modernization Act of 1999. These two policy changes involve ways to improve income generation without jeopardizing their status as a REIT. We ultimately decided to not include this final dummy variable as these policy changes occurred shortly after the 1994 policies that we account for and we don't want to limit the robustness of our results by including too many variables.

We run two separate regressions that utilize two different data sets so as to see the similarities and differences of the chosen variables on M&A transactions when the acquiring firm is a REIT and on the contrary, when the target firm is a REIT. Given that these two different types of transactions may differ in nature and motive for the acquiring and target firms, we believe we can reach more meaningful conclusions by splitting up the regressions. Furthermore, REITs and other types of firms may have different financial structures that are affected by the state of the economy, as represented by the variables we use, and may act



differently as an acquiror or target depending on their financial health. The two regression along with the variables are outlined below:

1. Uses data set where the acquiror is a REIT and the target can be any type of firm
2. Uses the data set where the target is a REIT and the acquiror can be any type of firm
  - Dependent variable: number of transactions
  - Independent variables: Real GDP growth (surprise), Inflation rate (surprise), University of Michigan Consumer Sentiment Index (surprise), 30-year Conventional Mortgage Rate (surprise), Federal Funds Effective Rate (surprise), REIT Return Index (surprise), and regulatory/policy dummies (1986 & 1994)

### Model

We run an Ordinary Least Squares regression for the model outlined below. Data for the consumer sentiment index is only available up through 2012Q2 so we have chosen to end the timeframe there. Additionally, with the 1 period ahead forecasts, we use 1983Q1 as the first predictor and therefore our effective timeframe is 1983Q2 – 2012Q2.

$$V (\# \text{ OF TRANSACTIONS}) = X (\text{MACRO-ECONOMY SURPRISES}) + Y (\text{REAL ESTATE SPECIFIC SURPRISES}) + Z (\text{REGULATORY/POLICY})$$

- X: Real GDP growth, inflation rate, consumer sentiment index, fed funds rate
- Y: 30-year mortgage rate, REIT return index
- Z: 1986 policy dummy, 1994 policy dummy

$$V_t = \beta_0 + \beta_1 GDPSURPRISE_t + \beta_2 INFLATIONSURPRISE_t + \beta_3 SENTIMENTSURPRISE_t + \beta_4 FEDFUNDSURPRISE_t + \beta_5 MORTGAGESURPRISE_t + \beta_6 REITRETURNSURPRISE_t + \beta_7 DUMMY1986_t + \beta_8 DUMMY1994_t + \varepsilon_t$$

To measure surprises for certain variables, we utilize an Autoregressive Integrated Moving Average (ARIMA) model, which is a generalized version of an Auto Regressive Moving Average Model (ARMA). Since we do not integrate several time series, which is common in an

ARIMA model, we simply specify that we only use one time series. We fit this model to time series data for real GDP growth, inflation, consumer sentiment, fed funds rate, 30-year mortgage rate, and REIT return index, to forecast future points in the series. We use a 1-quarter lag period as predictions generally become more inaccurate with further lag periods. Additionally, we use two auto-regressive terms as is common in ARIMA models of similar nature. The basic equation for the one-step ahead forecast is as follows:  $Y_{\tau+1} = X_{\tau}\beta$ , where one of the columns of  $X$  is  $Y_{\tau}$ . Furthermore, the timing of a surprise is as follows: Surprise in  $t = (\text{Predicted value as of } t-1) - (\text{Observed value in } t)$  where the predicted values are determined from the ARIMA model specified above. From here, we take the difference of the predicted points and the observed historical data to measure surprises. With this method, we are able to encompass both positive and negative surprises, which as previously mentioned is advantageous. In forming the ARIMA model along with the OLS model, we choose to not address seasonality for time constraint reasons, however it would be interesting to pursue in the future. Looking at the graph of M&A transactions located in the Appendix, there do not appear to be any seasonal effects present. Additionally, A.4 tracks the surprises for each of the regressors and while the plots are somewhat “noisy”, you can view the patterns in surprises for the regressors.

Our preliminary predictions for how the various independent variables will affect the dependent variable (number of transactions) are found below in Table 3. At first glance we predict Real GDP growth, consumer sentiment index, the REIT return index, the 1986 policy dummy, and the 1994 policy dummy to interact positively with the dependent variable meaning that increases in these variables and policies going into effect will increase the number of transactions. The reason surprises might move transaction numbers is that they add new information. A positive GDP surprise implies that the economy is doing better than expected

and this should lead to an increased number of transactions because there is “a tendency for mergers to increase rapidly as the economy expands and to slow as the economy contracts (Beckett, 1986, pg. 13). Further, consumer sentiment index generally aligns with the health of the economy and it seems plausible that the consumer sentiment index will interact similarly as consumers are generally confident and positive during strong economic times.

We believe that the REIT return index will interact differently depending on whether or not the acquiror or target is a REIT. When the target is a REIT and REIT returns are decreasing, we believe there could be more of an appeal for firms to acquire these REITs because when they “are trading at distressed levels amid a continuing credit crunch, experts say the stage is set for merger-and-acquisition plays, with stronger companies taking over weaker rivals” (Pruitt 1). These distressed share prices, which are in part a reflection of REIT return, can be attractive acquisition targets for firms who believe that they are undervalued. On the other hand, when the acquiror is a REIT, positive REIT returns will lead to stronger cash flow and potential to finance acquisitions.

At first glance, the two policy dummies should interact positively with M&A transaction numbers. The first policy denotes that real estate investments will become more income-oriented and this could theoretically spark potential buyers’ interest if they need to acquire other firms or REITs to increase profitability if they are performing well. The 1994 policy allows for more investment potential in REITs and could lead to more M&A activity from both the acquiror and target perspective.

As mentioned in the introduction, many have proposed that REIT investments can be utilized as a hedge against inflation. There are several academic papers that arrive at different conclusions regarding real estate investment’s effectiveness as an inflation hedge, however it is

interesting to note that Chan, Hendershott, and Sanders (1990) conclude that REIT returns and inflation are negatively correlated. While it appears difficult to predict how inflation will affect real estate investment along with M&A transactions involving REITs due to conflicting literature results, we predict that the effect will be opposite that of REIT returns due to the conclusion of the Chan, Hendershott and Sanders literature. Therefore, we predict a negative relationship when the acquiror is a REIT and a positive relationship when the target is a REIT. For the fed funds rate, we predict a negative relationship with M&A transaction volume because, as mentioned earlier in this section, the rate is often lowered in times of economic distress to ease credit markets. While slower economic times could theoretically signify decreased M&A activity, we believe that the appeal of “cheaper” money in credit markets will be very enticing for real estate firms looking to consolidate or acquire other firms alike. We believe this effect will be stronger for the regression where the acquiror is a REIT because they will be particularly enticed by eased credit markets when financing transactions because of their cash flow dependent nature. Similarly, we predict a negative relationship with the 30-year fixed mortgage rate. Higher mortgage rates lead to lower cash flow for these firms engaging in M&A activity and may not be able to access suitable financing for transactions that are required to pay high mortgage rates.

**Table 3. Predicted Coefficient Signs for Variables**

<i>Variable</i>	<i>Category</i>	<i>Prediction</i>
Real GDP growth	Macro-economy, surprise	+
Inflation rate	Macro-economy, surprise	-/+
Consumer sentiment index	Macro-economy, surprise	+
Fed funds rate	Macro-economy, surprise	-
30-year mortgage rate	Real estate specific, surprise	-
REIT return index	Real estate specific, surprise	+/-
1986 policy dummy	Regulatory/policy	+
1994 policy dummy	Regulatory/policy	+

*\*Prediction: Increase in variable leads to predicted change in M&A volume*

## V. Data

In gathering a set of merger & acquisition transactions to use as a primary set of data, we have been constantly developing this set of data to include a sufficient number of deals across a broad time frame. We initially utilized the Zephyr M&A database along with REITwatch to gather past deal information, however we were presented with an insufficient number of transactions and faced a degrees of freedom problem. We ultimately used SDC Platinum and have secured a list of M&A deals spanning from 1983-2013. Furthermore, to increase the number of data points, we have divided deal activity quarterly. Given that the SDC output for historical transactions was an undivided list, we manually sorted the data into quarters to maximize data points. Since there are such a large number of transactions, this was a tedious process from which we were able to gather summary statistics, which are located later in this section. Consideration was given to separating transactions into monthly data, however there would be several data months with 0 transactions and led us to believe that quarterly data was more ideal. For analytical purposes, this wide data set is much more acceptable in terms of creating meaningful regressions and being able to draw thoughtful conclusions from the results.

As mentioned in the Empirical Specification section, we are running two regressions – one where the target firm must be a REIT and the acquiror can be a variety of different types of organizations, and vice versa. At quick glance, some different types of organizations that are involved in transactions with REITs include commercial banks, real estate management firms, private equity firms, shopping centers, hotels, brokerage firms, office buildings, shopping centers, hospitals, and casinos. In an attempt to keep the data set clean, we do not include subsidiaries or joint ventures and search solely with the criteria that the target and acquiror must be public or private.

In running the search for deals on SDC Platinum, we are very specific in conducting the search and a summary table of the search criteria is located below in Table 4. Defining these search criteria was extensive and one of the more tedious aspects of the data gathering process.

**Table 4. SDC Search Criteria**

<i>Search Criteria</i>
1983-Present (limit of SDC database)
U.S. Target and Acquiror
REIT as Acquiror (regression 1) ; REIT as Target (regression 2)
Completed transaction
% of Shares Owned after transaction: 50%-100%
Target: public, private
Acquiror: public, private
Deal Form: Acquisition of stock, majority interest, assets or certain assets; merger; buyback

Specific consideration is given to the overarching goal of our study to focus on trends in industry consolidation within real estate along with patterns in REITs and other investment vehicles in building their portfolios and asset base through acquisitions and similar transactions with other firms. We only include completed deals to eliminate the potential complication of dealing with announced deals that fell through, along with only including deals where both the target *and* acquiror are U.S. based so as to mitigate the effects of the global economy.

In terms of the types of deals we wanted to include, we filtered the search to only include transactions in which the acquiror acquired at least 50% of the target's assets. This allowed us to eliminate minority interest transactions, which are viewed as less indicative of pure M&A activity. Perhaps the most specific part of the search criteria involved determining which types of M&A transactions to include given that there are several variations of transactions outside of cut-and-dry mergers or acquisitions. Initially, we considered including all types of transactions that fell under the M&A umbrella, but researched the various types of transactions to ultimately not include a few types. The options to include are acquisition of stock (most common

acquisition), acquisition of assets, acquisition of certain assets, merger, acquisition of majority interest, buyback, recapitalization, and exchange offer. The obvious types of transactions to include are mergers, acquisitions of stock, and acquisitions of assets & certain assets. An acquisition of stock implies that the acquiror buys the stock of the legal entity that owns the target's assets whereas the acquisition of assets encompasses the acquiror owning each individual asset of the company, which is very relevant for real estate given that REITs may physically own buildings and certain real estate. To continue down the list of transactions, acquisitions of majority interest are simply acquisitions of stock where greater than 50%, but less than 100%, of stock is acquired. A buyback consists of a company buying back its equity securities or securities convertible into equity, either on the open market, through privately negotiated transactions, or through a tender offer. We include these types of transactions because they represent a strategy used by companies to increase profits by reinvesting in themselves when they believe their shares are undervalued. This strategy is similar to other firms that acquire targets because they believe the target's shares are undervalued. The same general motivation applies and we believe that buybacks fit within the scope of transaction types we want to include. While we believe that buybacks were accurately included in the dataset, one shortcoming of the SDC output is that it does not allow you to specifically identify buyback transactions.

The types of transactions that are not included are recapitalizations and exchange offers. Recapitalizations are deals in which a company undergoes a shareholders leveraged recapitalization by issuing a special one-time dividend to allow shareholders to retain an equity interest in the company. These types of deals aim to reorganize a company's capital structure by changing amounts of debt and equity financing and do not encompass the type of M&A activity

that is relevant to our study. Finally, an exchange offer occurs when a company offers to exchange new securities for its equity securities outstanding, securities convertible into equity, or non-convertible debt securities. It also includes deals in which an existing loan is replaced with a new facility during a debt restructuring. While one arm of exchange offers includes companies placing bids on target companies using securities as consideration, relevant M&A activity to us, they also more commonly include equity and debt reorganization within a firm which is not relevant to us. Therefore, since we are unable to split the transactions labeled as exchange offers into a subsector, these transactions have been eliminated from the data set.

The SDC data output along with summary statistics for the two regressions is outlined in the tables below:

**Table 5. SDC Data Output**

<i>SDC Data Output</i>
Transaction complete date
Target/acquiror name
Target/acquiror short business description
Target/acquiror SIC code
Target/acquiror industry sector
Target/acquiror U.S. state
% of shares acquired
% of shares owned after transaction
Value of transaction (enterprise value + premium bidder pays)
Enterprise value

**Table 6. Summary statistics**

<i>Summary Statistics</i>	Acquiror as REIT	Target as REIT
Number of Quarters	121	121
Total Deals	2,619	347
Mean No. Deals Per Quarter	21.60	2.87
Median No. Deals Per Quarter	15	2
Standard Deviation	25.80	2.50
Variance	667.80	6.25
Maximum	151	11
Minimum	0	0



We note that there is much larger transaction volume for the data set with the acquiror as a REIT, which could impact our results. There is a large spike in the data for the acquiror as a REIT from 1994-1998, which we address in the results section. Furthermore, there do not appear to be any unusual spikes in the data for the data set where the target is a REIT.

In addition to gathering data on M&A deals, we have secured data for several of the macroeconomic variables we intend to include. A majority of the data comes from the Federal Reserve Bank of St. Louis and is readily available. The main goal is to include one variable to encompass different aspects of the three main categories of variables. For example, GDP and unemployment rate are both representative of trends in the business cycle and only one metric is needed to represent this. Additionally, variables that represent the same aspects of the economy will often exhibit multicollinearity when running regressions and it will be important to pay attention to this as much as possible.

## VI. Results

In running the two regressions we use the following abbreviations for the regressors in STATA as outlined below in Table 7.

**Table 7. STATA Abbreviations**

<i>STATA Abbreviations</i>	
Real GDP growth	GDP
Real GDP growth surprises	GDPsurprise
Inflation rate	Inflation
Inflation rate surprises	Inflationsurprise
Consumer sentiment	Sentiment
Consumer sentiment surprises	Sentimentsurprise
Fed funds rate	Fedfunds
Fed funds rate surprises	Fedfundssurprise
30-year mortgage rate	Mortgage
30-year mortgage rate surprises	Mortgagesurprise
REIT return index	REITreturn
REIT return index surprises	REITreturnsurprise
Tax reform act (1986) policy dummy	Dummy1986
"Look through" provision (1994) policy dummy	Dummy1994
# of transactions (acquiror as REIT)	MAacquirorREIT
# of transactions (target as REIT)	MAtargetREIT

Presented below are the results for the regressions using surprises for the regressors. Following the table is a discussion of the significant variables and how the results aligned with our predictions.

**Table 8. Acquiror as REIT, Target as REIT regressed on surprises**

Number of transactions	<i>Acquiror as REIT</i>	<i>Target as REIT</i>
GDP surprise	-0.143 (3.854)	0.201 (0.357)
Inflation surprise	0.990 (4.381)	0.914** (.405)
Consumer sentiment surprise	0.447 (0.471)	0.024 (0.044)
Fed funds rate surprise	2.640 (5.775)	-0.332 (0.535)
30-year mortgage rate surprise	-2.301 (5.963)	-0.235 (0.552)
REIT return surprise	-1.138* (0.670)	-0.074 (0.062)
1986 dummy	3.005 (7.815)	-0.187 (0.723)
1994 dummy	27.955*** (4.691)	3.293*** (0.434)
_cons	0.620 (6.770)	0.976 (0.627)
R-squared	0.308	0.400
Adjusted R-squared	0.257	0.354
N	117	117

\*  $p < 0.1$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

From the results provided above, regression 1 yields two significant variables: REIT returns surprise at the 10% level and the 1994 policy dummy at the 1% level. For the second regression, inflation surprise is significant at the 5% level and the 1994 policy dummy is significant at the 1% level. R-squared and adjusted R-squared are fairly high for both regressions and the F statistic is 0 for both. It is interesting to note that the coefficients were different signs for GDP surprise, fed funds rate surprise, and 1986 policy dummy. Our initial predictions were fairly accurate, but differed for GDP surprises for acquiror as REIT, inflation surprise for acquiror as REIT, fed funds rate surprise for acquiror as REIT, REIT return surprise for acquiror as REIT, and 1994 dummy for target as REIT.

It is interesting to note that there are very few significant variables for these two regressions and that inflation surprise is significant for regression 2, but not regression 1. This result aligns with several pieces of literature cited in the empirical specification section that concludes real estate investments are a valuable hedge against inflation. Therefore, it makes sense that firms would seek to acquire REITs and their assets. The 1994 policy dummy is likely significant with a high positive coefficient because of the large spike in transaction activity from 1994-1999. We checked the data to see if there was perhaps double-counting for firms that acquired separate assets, but under the same parent corporation. There appears to be no extra listings in the data and the spikes in transaction activity are accurately presented. The coefficients for the 1994 policy align with our prediction of a positive relationship. Given that this look-through provision allowed for more potential investment in REITs, this allowed REITs to have more capital to finance potential M&A activity.

We would also like to note that the coefficients are generally larger in magnitude for regression 1 and this may likely be attributed to the much larger number of transactions for data set 1 as opposed to data set 2. In an attempt to relate the results to the merger wave theory that is outlined in the theoretical framework section, we looked at the raw surprises data and tried to find trends. Our thought process was that after several quarters of all positive or all negative surprises for certain variables, we would see a spike or a decline in deal activity as compared to quarters shortly before and after. With a focus given on the variables deemed significant in the results, we did not find any sort of consistent trend.

Moving on, we decided to run the same regressions but used level data for the regressors as opposed to surprises and the results are presented below in Table 9. Even though our main

goal is to focus on surprises, we choose to include this second set of regressions in case there are any large discrepancies that could be insightful.

**Table 9. Acquiror as REIT, Target as REIT regressed on levels**

Number of transactions	<i>Acquiror as REIT</i>	<i>Target as REIT</i>
GDP	8.142** (3.466)	0.450 (.362)
Inflation	-6.945* (4.041)	0.036 (0.422)
Consumer sentiment	0.401* (0.241)	0.046* (0.025)
Fed funds rate	7.710*** (1.757)	0.215 (0.184)
30-year mortgage rate	-14.667*** (2.955)	-0.553* (0.309)
REIT return	-0.800 (0.617)	-0.011 (0.065)
1986 dummy	-22.641** (10.165)	-1.238 (1.063)
1994 dummy	4.796 (7.670)	2.187*** (0.802)
_cons	83.760*** (28.260)	1.650 (2.954)
R-squared	0.495	0.438
Adjusted R-squared	0.457	0.397
N	117	117

\*  $p < 0.1$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

For the first regression, GDP is significant at the 5% level, inflation at the 10% level, consumer sentiment at the 10% level, fed funds rate at the 1% level, 30-year mortgage rate at the 1% level, and the 1986 dummy at the 5% level. For the second regression, consumer sentiment is significant at the 10% level, 30-year mortgage rate at the 10% level and the 1994 dummy at the 1% level. The observation that sticks out the most is that the 1994 policy dummy was the most significant variable for both sets of regressions and aligned with our prediction. Furthermore, it is clear that interest rates such as the 30-year mortgage rate plays a significant role in changing M&A activity. The R-squared and adjusted R-squared measures are both higher than the

respective regressions using surprises and the F-statistic is also 0. We next take a look at how the coefficient signs relate for the corresponding variables for the two sets of regressions. While the signs mostly aligned for the regressions with surprises compared to levels, they were different for GDP, inflation, and the 1986 policy dummy for the acquiror as a REIT regression. For the target as a REIT regression, the only discrepancy was with the fed funds rate. There are several more significant variables when measuring the regressors with levels as opposed to surprises. It is interesting to note that R-squared and adjusted R-squared are higher for regression 1 using levels, which is the opposite of surprises. Given that the R-squared measures are relatively high for both sets of regressions, we believe that several of the regressors are related and so we decided to look at correlation matrices for the regressors presented as surprises and as levels shown in Tables 10 and 11.

**Table 10. Correlation matrix for surprises**

	GDP	Inflation	Sentiment	Fed funds rate	Mortgage rate	REIT return
GDP	1.00	0.23	0.26	0.20	0.22	0.14
Inflation	0.23	1.00	0.02	0.30	0.16	0.24
Sentiment	0.26	0.02	1.00	0.31	0.07	0.33
Fed funds rate	0.20	0.30	0.31	1.00	0.45	0.02
Mortgage rate	0.22	0.16	0.07	0.45	1.00	-0.08
REIT return	0.14	0.24	0.33	0.02	-0.08	1.00

**Table 11. Correlation matrix for levels**

	GDP	Inflation	Sentiment	Fed funds rate	Mortgage rate	REIT return
GDP	1.00	0.25	0.51	0.35	0.38	0.19
Inflation	0.25	1.00	0.11	0.36	0.30	0.17
Sentiment	0.51	0.11	1.00	0.52	0.37	0.08
Fed funds rate	0.35	0.36	0.52	1.00	0.90	-0.08
Mortgage rate	0.38	0.30	0.37	0.90	1.00	-0.05
REIT return	0.19	0.17	0.08	-0.08	-0.05	1.00

At first glance, we notice a high correlation between the mortgage and fed funds rate. While other variables have semi-high correlations, such as GDP and consumer sentiment, the relationships are not too strong. One potential option was to re-run the regressions by eliminating one variable at a time to eliminate some of this collinearity, however we ultimately decided that it was not significant enough to merit this new model.

To slightly alter our model, we considered the idea of scaling the dependent variable by dividing the number of deals per quarter by the total number of REITs. This would have been valuable to see if there were trends in the number of REITs over time as related to the number of deals. However, many of the firms listed in the data set are private REITs and there is no measure on the exact number of REITs over time. From REITWatch we can track the number of publicly traded REITs, but ultimately decided against using this scale as the trend in numbers of publicly-traded REITs may not mirror the trend for private ones. Ultimately, we are somewhat surprised that we did not yield more significant variables, but are still able to make meaningful insight in the conclusion section.

## **VII. Conclusion**

Real Estate Investment Trusts are valuable pass through entities that allow the common investor access to real estate returns without going through the financial burden of purchasing highly illiquid, yet durable, real estate properties. REITs have a similar corporate structure to mutual funds in that they allow investors to pool together resources to acquire commercial real estate properties without taking on the massive financial liability or having to worry about managing and operating the building. REITs offer investors superior liquidity and a well-diversified portfolio of real estate properties without the financial risks associated with real estate

acquisitions. Public REITs trade on major exchanges and investors who purchase shares of a REIT earn income from dividend payments, derived from leasing activity and property appreciation after sale, and stock appreciation. After their formation in 1960, REITs have become popular investment vehicles and act a good proxy for the real estate industry as a whole because of their accessibility and their active involvement in the commercial real estate industry. Commercial real estate, the underlying asset, is highly influenced by the state of the general macro economy and tends to be procyclical in its nature (Beckett, 1986). Furthermore, macro conditions can affect corporate decision-making. After a thorough review of the literature, we have determined that there is a lack of studies that focused on the economic environment that may have induced or predicated merger and acquisition activity. Through the framework of this study, we conduct a more in depth analysis of the connection between the macro economy and REIT-related M&A.

Neoclassical theories of merger waves attempt to explain why M&A transactions tend to cluster in time within an industry by citing that industry shocks, either in the form of economic, technological, financial, regulatory, or political shocks, cause an industry to restructure through M&A transactions (Harford, 2005). This study focuses primarily on economic shocks while controlling for major policy changes. For the purpose of this study, we define economic shocks as an economic “surprise, wherein we took the difference between the predicted level and the observed level for real GDP growth rate, Inflation, the University of Michigan Consumer Sentiment Index, 30-year Conventional Mortgage Rate and a REIT return Index. We regressed these factors on the aggregate level of M&A when the target was a REIT and when the acquiror was a REIT. By focusing on surprises, we incorporate the industry shock theory that leads us to



believe that industry shocks can lead to merger waves. We will make some casual inferences below.

After reviewing the regression results, we were surprised that the regressions did not yield more significant variables. While several of these macro-economic factors may have an impact on decision making for REIT M&A, our results only indicate that the 1994 look through provision was substantial in affecting M&A activity. The large spikes in transaction activity begin in 1995 and last until the late 1990s. This implies that mutual funds, traditionally large investors in REITs, potentially had a large and positive impact on activity. The high coefficient for the regression with the acquiror as a REIT highlights the importance of cash flow and adequate financing for M&A activity for REITs. Furthermore, we note the 1-year or so lag period between the policy coming into affect and the upward wave of M&A activity. This leads us to believe that timing might be a factor that contributed to the results we have. Corporate decision making along with M&A transactions involve long and drawn out processes and perhaps are slower to react to economic and real estate changes than on a quarter-by-quarter basis. In this case, as mentioned in the results section, several quarters of positive or negative surprises for the regressors did not lead to any significant increases or decreases in transaction volume. As shown in the results, the model using levels for the regressors yielded several significant variables, which indicates that macro-economic and external real-estate factors do in fact affect M&A transaction activity. This leads us to believe that corporate decision makers within the real estate market are less likely to consider unexpected movements in macro-economic and real estate specific factors and transaction activity is more reflective of levels in these factors as opposed to surprises. Additionally, although we feel that the ARIMA model was the best option, it may not clearly reflect an actual surprise. For example, barring new legislation,

in the U.S. a series of automatic spending cuts will drastically impact the level of GDP. The ARIMA model would most likely lead to an interpretation of a GDP surprise for that quarter when, in fact, this drop is anticipated and not a surprise at the time. However, after significant research on how to measure surprises, the ARIMA model ultimately proved to be the most appropriate for the purposes of our study, but it is important to note that anomalies such as the GDP example could be realities and are important to consider for future research.

While our initial motivation was sparked by public REIT M&A activity, which exhibited clearly volatile transaction numbers surrounding the 2008 economic crisis, our data set from SDC does not appear to indicate the same trends. The idea of an economic shock as demonstrated by the 2008 crisis and general economic surprises supplemented with the merger wave theory have not aligned with our findings in this study. Much of the M&A theory detailed in previous sections focuses on internal motives for M&A activity and in this case those might outweigh the external factors that we highlight in our study. Specifically in the real estate market, strong cash flows and accessibility to financing in capital markets is absolutely crucial for an M&A transaction to succeed, more so when the acquiring firm is a REIT based on our results. The general state of these markets as compared to unexpected shocks seem to be more of a driving factor in affecting transaction volume.

Corporate decision-making regarding M&A activity is driven by a combination of internal and external factors. While it has proved difficult to quantify some of this internal motivation, it would be interesting in the future to see how these motives compare to the external factors we highlight in our study. Additionally, in consideration with the lag period noted between the 1994 policy coming into effect and the large spike in activity, it would be insightful to further study lag periods of M&A activity in response to external factors. The real estate

M&A market is often volatile and unpredictable and dissecting and quantifying the key drivers has provided us with meaningful insight as discussed above.

With access to more information and data, future studies should look to address differences in the geographic dispersion of the firms and could potentially delve into different property types. Due to a lack of time and complete information, we are unable to fully explore these topics. It could be the case that some regions and property types are more affected by changes in the macro and industry specific environment or that there may be confounding effects that limited our results. Ultimately, our study has started to address the connection between M&A activity and quantifiable factors of the macro economy and industry for REITs that hasn't been studied as of this point. Future inquires could lead to more meaningful results that could impact corporate decision-making processes.

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## Appendix

### A.1. U.S. REIT Merger and Acquisition Activity, 2004-2006 (REITwatch, 2012)

**U.S. REIT Merger and Acquisition Activity**  
Enterprise Value in Millions of Dollars  
(2004 - 2012)

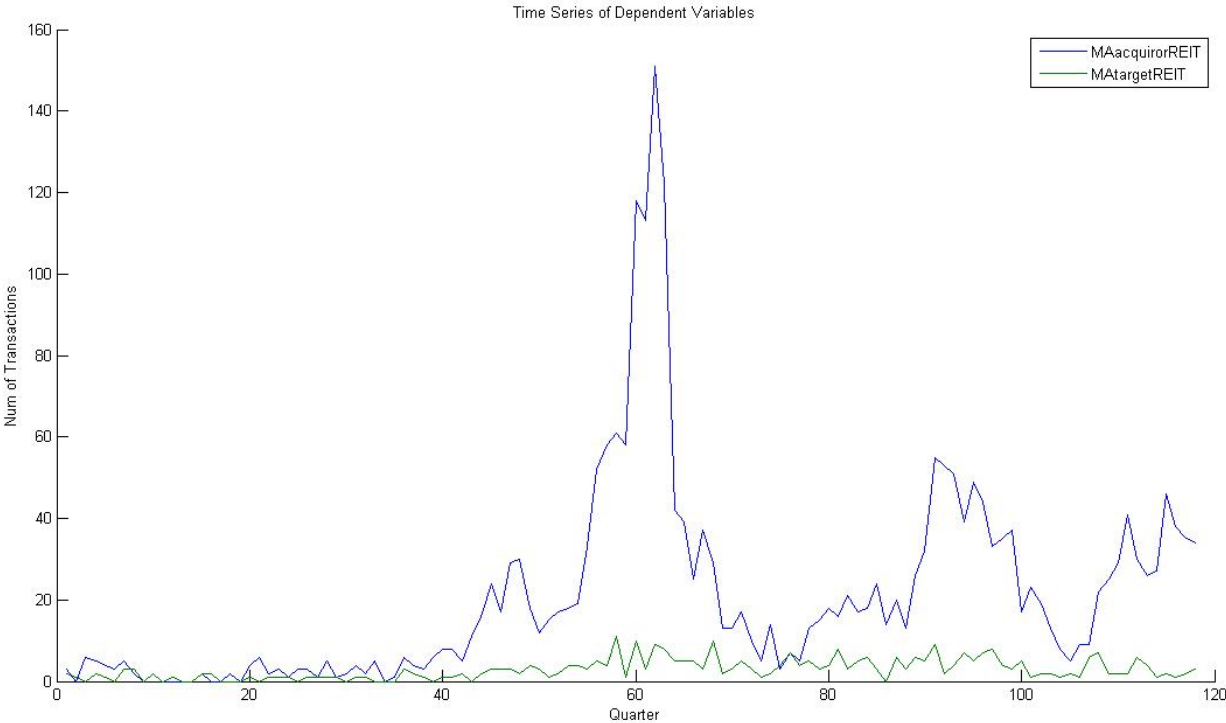
Year	Acquirer	Target	Acquirer Type	Enterprise Value	Announced	Completed	Status
2004	Ventas, Inc.	ElderTrust	Public REIT	191	19-Nov-03	5-Feb-04	Closed
	Arlan Realty Partners, LLC	Great Lakes REIT	Private Real Estate Company	252	21-Jan-04	27-Apr-04	Closed
	ProLogis/Eaton Vance Corporation	KeyStone Property Trust	Public REIT/Investment Advisor	729	3-May-04	4-Aug-04	Closed
	Simon Property Group	Chelsea Property Group	Public REIT	3,000	21-Jun-04	14-Oct-04	Closed
	General Growth Properties, Inc.	The Rouse Company	Public REIT	7,000	19-Aug-04	12-Nov-04	Closed
	PL Retail LLC (Kimco Realty & DRA Advisors)	Price Legacy Corporation	Public REIT/Investment Advisor	3,500	24-Aug-04	21-Dec-04	Closed
	Total Public to Public				14,420	98%	
	Total Public to Private				252	2%	
	<b>Total</b>				<b>14,672</b>		
	2005	Camden Property Trust	Summit Property Group	Public REIT	1,100	24-Oct-04	28-Feb-05
iStar Financial, Inc.		Falcon Financial Investment Trust	Public REIT	120	20-Jan-05	2-Mar-05	Closed
Colonial Properties Trust		Comestore Realty Income Trust	Public REIT	566	25-Oct-04	1-Apr-05	Closed
Centro Properties Limited		Kramont Realty Trust	Australian LPT	120			Closed
The Lightstone Group		Prime Group Realty Trust	Private Real Estate Company	1,500	17-Feb-05	1-Jul-05	Closed
ProLogis		Cadellus Development Corporation	Public REIT	3,819	6-Jun-05	15-Sep-05	Closed
DRA Advisors LLC		CRT Properties, Inc.	Investment Advisor	800	17-Jun-05		Closed
ING Clarion		Gables Residential Trust	Private Equity Joint Venture	4,900	7-Jun-05	30-Sep-05	Closed
DRA Advisors LLC		Capital Automotive REIT	Investment Advisor	1,800	2-Sep-05	16-Dec-05	Closed
Total Public to Public				5,725	39%		
Total Public to Private				9,090	61%		
<b>Total</b>				<b>14,815</b>			
2006	Brandywine Realty Trust	Prentiss Properties Trust	Public REIT	1,921	3-Oct-05	4-Jan-06	Closed
	CDP Capital-Financing Inc.	Crimt Mae Inc.	Investment Advisor/Pension Fund	1,700		19-Jan-06	Closed
	Morgan Stanley Property Fund	AMLI Residential Properties	Investment Advisor/Brokerage Firm	2,100	23-Oct-05	7-Feb-06	Closed
	Duke Realty Corporation	The Mark Winkler Company	Public REIT	855	2-Mar-06	4-Mar-06	Closed
	CallEast Industrial Investors	CenterPoint Properties Trust	Real Estate Operating Partnership	2,436	7-Dec-05	8-Mar-06	Closed
	Morgan Stanley Real Estate and Onex Real Estate	Town and Country Trust	Private Real Estate Joint Venture	1,500	19-Dec-05	31-Mar-06	Closed
	Kimco Realty Corporation	Atlantic Realty Trust	Public REIT	83	1-Dec-05	31-Mar-06	Closed
	Host Marriott Corporation	Stanwood Hotels and Resorts	Public REIT	4,040	14-Nov-05	7-Apr-06	Closed
	GE Real Estate, Inc. & Triac Properties	Arden Realty Trust	Public non-REIT and REIT	3,032	21-Dec-05	2-May-06	Closed
	Blackstone Group LP	MedStar Hospitality Corporation	Private Equity Firm	2,600	20-Feb-06	2-May-06	Closed
	LBA Realty LLC	Bedford Property Investors	Private Real Estate Company	432	10-Feb-06	5-Jun-06	Closed
	Spirit Finance Corporation	Sun Capital Partners, Inc. (ShopKo Stores)	Public REIT	815	10-May-06	2-Jun-06	Closed
	Mack-Cali Realty Corporation	Gale Real Estate Services Corp.	Public REIT	545	16-Feb-06	5-Jun-06	Closed
	Blackstone Group LP	CarAmerica Realty Corp.	Private Equity Firm	5,600	6-Mar-06	13-Jul-06	Closed
	Archstone-Smith	Deutsche WohnAnlage GmbH	Public REIT	649	29-Jun-06	31-Jul-06	Closed
	Public Storage Inc.	Shurgard Storage Centers Inc.	Public REIT	3,200	7-Mar-06	23-Aug-06	Closed
	Westmont Hospitality and Cadim Inc. (Braveheart Holdi	Boytin Lodging Company	JV - Public Pension Fund	417	22-May-06	21-Sep-06	Closed
	Accredited Home Lenders Holding Co.	Aames Investment Corporation	Mortgage Banking Firm	340	14-Sep-06	1-Oct-06	Closed
	Brookfield Properties Corporation	Triac Canada, Inc.	Real Estate Operating Company	2,670	5-Jun-06	5-Oct-06	Closed
	Blackstone Group LP and Brookfield Properties Co.	Triac Properties, Inc.	JV - Private Equity Firm & REOC	6,500	5-Jun-06	5-Oct-06	Closed
	Health Care Property Investors	CNL Retirement Properties	Public REIT	5,300	2-May-06	6-Oct-06	Closed
	Centro Watt	Heritage Property Investment Trust Inc.	JV - Australian LPT & Private Equity Firm	3,200	9-Jul-06	19-Oct-06	Closed
	Kimco Realty Corporation	Pan Pacific Retail Properties	Public REIT	4,000	10-Jul-06	31-Oct-06	Closed
	Morguard Corporation	Sizeler Property Investors, Inc.	Canadian REIT	324	7-Aug-06	10-Nov-06	Closed
	Morgan Stanley	Glenborough Realty Trust, Inc.	Brokerage Firm	1,900	21-Aug-06	29-Nov-06	Closed
	Health Care REIT	Windrose Medical Properties Trust	Public REIT	877	13-Sep-06	20-Dec-06	Closed
	KoPPER LLC	Amen/Vest Properties	Real Estate Operating Partnership	273	18-Jul-06	29-Dec-06	Closed
	Lexington Corporate Properties	Newkirk Realty Trust, Inc.	Public REIT	1,080	25-Jul-06	3-Jan-07	Closed
	SL Green Realty Corp.	Reckson Associates Realty Corp.	Public REIT	6,000	3-Aug-06	25-Jan-07	Closed
	Morgan Stanley	Saxon Capital	Brokerage Firm	706	8-Aug-06	4-Dec-06	Closed
	Babcock & Brown Real Estate Investments	BNP Residential Properties Inc.	Investment Advisor/Brokerage Firm	786	31-Aug-06	28-Feb-07	Closed
	Hospitality Properties Trust	TravelCenters of America Inc.	Public REIT	1,900	1-Sep-06	31-Jan-07	Closed
	Geo Group	CentraCare Properties Trust	Correctional Facility Operator	428	19-Sep-06	24-Jan-07	Closed
	Crown Castle International Corporation	Global Signal Inc.	Public Tower Company	4,000	16-Oct-06	12-Jan-07	Closed
	Developers Diversified Realty Corp.	Inland Retail Real Estate Trust, Inc.	Public REIT	6,200	23-Oct-06	27-Feb-07	Closed
	Reccord Realty Trust	Government Properties Trust, Inc.	Australian LPT	223	24-Oct-06	13-Apr-07	Closed
	GE Capital Solutions	Trustwell Properties, Inc.	Financial Lending Company	3,000	30-Oct-06	27-Feb-07	Closed
	JP Morgan-Special Situation Property Fund	Columbia Equity Trust	Pension Trust Fund	502	6-Nov-06	1-Mar-07	Closed
	National HealthCare Corporation	National Health Realty	Health Care Provider (Public Company)	266	21-Dec-06	31-Oct-07	Closed
	Total Public to Public				47,182	57%	
	Total Public to Private				35,200	43%	
	<b>Total</b>				<b>82,381</b>		

## A.2. U.S. REIT Merger and Acquisition Activity, 2007-2011 (REITwatch, 2012)

Year	Acquirer	Target	Acquirer Type	Enterprise Value	Announced	Completed	Status	
2007	Ventas, Inc.	Sunrise Senior Living REIT	Public REIT	1,036	14-Jan-07	26-Apr-07	Closed	
	Simon Property Group; Farallon Capital Management	Mills Corporation	Public REIT; Investment Advisor	1,350	17-Jan-07	3-Apr-07	Closed	
	Morgan Stanley	CNL Hotels & Resorts Inc.	Brokerage Firm	6,702	19-Jan-07	12-Apr-07	Closed	
	Brookfield Asset Management Inc.	Longview Fibre	Asset Management Firm	2,150	5-Feb-07	20-Apr-07	Closed	
	Blackstone Group	Equity Office Properties Trust	Private Equity Firm	39,000	7-Feb-07	9-Feb-07	Closed	
	Credit-Based Asset Servicing and Securitization LLC (C	Fieldstone Investment Corporation	Mortgage Banking Firm	259	16-Feb-07	17-Jul-07	Closed	
	Centro Properties Group	New Plan Excel Realty Trust, Inc.	Australian LPT	6,200	27-Feb-07	20-Apr-07	Closed	
	Macquarie Bank Limited, Kaupthing Bank hf, et al.	Spirit Finance Corporation	Investment Advisor/Brokerage Firm	3,500	13-Mar-07	1-Aug-07	Closed	
	Inland American Real Estate Trust Inc.	Winstan Hotels, Inc.	Asset Management Firm	460	3-Apr-07	2-Jul-07	Closed	
	Apollo Investment Corporation	Inkeepers USA Trust	Closed-End Investment Company	1,500	16-Apr-07	29-Jun-07	Closed	
	JER Partners	Highland Hospitality	Private Equity Firm	2,000	24-Apr-07	28-Jul-07	Closed	
	AP AIMCAP Holdings LLC	Eagle Hospitality Properties Trust, Inc.	Closed-End Investment Company	319	27-Apr-07	15-Aug-07	Closed	
	Morgan Stanley	Creacent Real Estate Equity	Brokerage Firm	6,500	23-May-07	3-Aug-07	Closed	
	Tahman Speyer/ Lehman Brothers	Archstone-Smith	Real Estate Company/ Brokerage Firm	22,200	29-May-07	5-Oct-07	Closed	
	Whitehall Street Global Real Estate, LP	Equity Inns, Inc.	Investment Advisor/Brokerage Firm	2,200	21-Jun-07	25-Oct-07	Closed	
	Sentinel Omaha LLC	America First Apartment Investors	Real Estate Advisory Firm	532	25-Jun-07	18-Sep-07	Closed	
	Liberty Property Trust	Republic Property Trust	Public REIT	850	24-Jul-07	4-Oct-07	Closed	
	Granary Capital Corp/New York	American Financial Realty Trust	Public REIT	1,094	5-Nov-07	1-Apr-08	Closed	
	Total Public to Public				10,530	11%		
	Total Public to Private				87,321	89%		
	Total				97,851			
	2008	American Campus Communities	GMH Communities Trust	Public REIT	1,400	12-Feb-08	11-Jun-08	Closed
		Hypo Real Estate Bank AG	Quadra Realty Trust	Brokerage Firm	179	29-Jan-08	14-Mar-08	Closed
		Boston Properties	Macklowe Properties (New York Office Port)	Public REIT	3,950	24-May-08	10-Jun-08	Closed
		American Land Lease	Green Courte Real Estate Partners	Private Equity Firm	113	10-Dec-08	16-Mar-09	Closed
Total Public to Public				5,350	95%			
Total Public to Private				292	5%			
Total				5,642				
2009	No Deals							
2010	Brookfield Asset Management Inc.	Crytal River Capital, Inc.	Asset Management Firm	14	24-Feb-10	30-Jul-10	Closed	
	Tiptree Financial Partners, LP	Care Investment Trust, Inc.	Real Estate Advisory Firm	97	16-Mar-10	13-Aug-10	Closed	
	HCP, Inc.	HCR ManorCare, Inc.	Public REIT	6,080	14-Dec-10	8-Apr-11	Closed	
Total Public to Public				6,080	98%			
Total Public to Private				111	2%			
Total				6,191				
2011	AMB Property Corp.	ProLogis	Public REIT	16,517	31-Jan-11	3-Jun-11	Closed	
	Ventas, Inc.	Nationwide Health Properties, Inc.	Public REIT	7,010	26-Feb-11	1-Jul-11	Closed	
	Ventas, Inc.	Copdell Spencer, Inc.	Public REIT	635	27-Dec-11	2-Apr-12	Closed	
Total Public to Public				24,162	100%			
Total Public to Private					0%			
Total				24,162				
<b>Industry Totals: 2004-2012</b>								
Total Public to Public				113,449	46%			
Total Public to Private				132,266	54%			
Total				245,715				



### A.3 M&A Activity



# A.4 Time Series of Surprises

