

# **Corporate Inversions and Long-Run Performance**

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## **Abstract**

This paper investigates the short-term and long-term stock performance of firms that undergo corporate inversions. The results show that the market response to the initial inversion announcement differs based on the type of inversion. Merger & Acquisition (M&A) and restructuring inversions are perceived positively by the market, but naked inversions do not generate a price response. Furthermore, acquirers in inversion-related M&A transactions generate a price premium that is in excess of what is typically generated by acquirers in non-inversion M&A. In the long-run, firms that invert through naked and M&A inversions do not generate significant excess returns above the S&P 500. In contrast, restructured inverted firms generate significant excess returns of 214.53%. Collectively, however, the results suggest that corporate inversion alone is not an indicator of future stock returns.

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## Table of Contents

Abstract.....	I
Acknowledgements.....	II
List of Tables .....	V
1. Introduction.....	1
2. Background.....	5
2.1 Expected Benefits of Inversion .....	5
2.2 Costs of Inversion.....	6
2.3 The U.S. History of Corporate Inversions .....	7
3. Literature Review.....	10
3.1 Short-term Performance .....	10
3.1.1 Literature Review .....	11
3.1.2 Research Predictions.....	14
3.2 Long-term Performance .....	14
3.2.1 Literature Review .....	15
3.2.2 Research Predictions.....	18
4. Sample and Data .....	19
4.1 Sample.....	19
4.2 Data .....	21
5. Models and Variables .....	21
5.1 Short-term Performance .....	21
4.2 Long-term Performance .....	23
6. Results.....	24

6.1 Descriptive Statistics .....	24
6.2 Short-term Performance .....	26
6.2.1 Excess Returns.....	26
6.2.2 Robustness .....	28
6.3 Long-term Performance .....	29
7. Conclusion .....	32
8. References.....	35

## List of Tables

Table 1. Sample Selection	41
Table 2. Inversion and Control Samples	42
Table 3. Inversion Announcements by Year and Destination	45
Table 4. Descriptive Statistics	46
Table 5. Short-term Excess Returns	48
Table 6. Short-term M&A Excess Returns	49
Table 7. Long-term Excess Returns for Naked Inversions	50
Table 8. Long-term Excess Returns for M&A Inversions	51
Table 9. Long-term Excess Returns for Restructuring Inversions	52

## 1. Introduction

Corporate tax avoidance is a growing concern worldwide. Recent tax scandals, such as the Panama Papers and the Luxembourg Leaks, provide insight into the scope of tax avoidance and the extent to which corporations will go to lower their tax burdens. Corporate inversions, one of many forms of tax avoidance, are becoming increasingly popular in the United States (U.S.). The U.S. Treasury defines a corporate inversion as “a transaction through which the corporate structure of a U.S.-based multinational group is altered so that a new foreign corporation, typically located in a low- or no-tax country, replaces the existing U.S. parent corporation as the parent of the corporate group” (U.S. Treasury, 2002). U.S. policymakers have taken a number of actions to make corporate inversions more difficult, however their actions are ineffective and have unintended consequences, such as increased foreign investment by U.S. firms (Rao, 2015). Despite the recent increase in inversions, little is known about their long-term effects. My research provides evidence on how the market perceives corporate inversions at the initial announcement date and how inverted firms perform in the years following the inversion.

As of 2014, there were over 4,300 publicly traded U.S. companies (The World Bank, 2016). The number of inversions up until 2014, though debatable, can be conservatively estimated at less than 100, approximately 40 of which have occurred since 2013.<sup>1</sup> The literature on tax avoidance generally tries to better understand what is referred to as the “under-sheltering puzzle”, i.e. why most companies choose not to actively

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<sup>1</sup> Compilations of inversion firms have differed on their definition of inversion and their samples. For example, some have classified Garmin and Carnival Corp. as inversions, while others have not. These firms, although they began operations in the U.S., have always been foreign incorporated. Other firms, such as Lyondellbasell Industries N.V., have foreign origins, but over time have increased their shareholder base or business presence in the U.S. Cortes et al. (2014) refer to these firms as Americanizations.

engage in tax avoidance strategies given the low expected costs of doing so (Weisbach, 2002; Desai & Dharmapala, 2009). This appears to be particularly true for corporate inversions. The first possible explanation is that inversions are not well understood by the market, leaving managers with little incentive to invert. Chorvat (2015) argues that the market's failure to price future returns associated with inversion provides support for the conclusion that the inversion decision involves private information known to corporate managers, but not to the market. She argues that this private information is related to intangibles in non-U.S. subsidiaries. An alternative explanation is that inversions are in fact not beneficial and any long-run excess returns can be explained by other non-inversion factors, such as the structure of the underlying inversion transaction. The focus of my study is on the latter explanation of the inversion puzzle.

Inversions can take a number of forms, such as taxable stock transfer, M&A-related, spin-off, asset, financial reorganization, subsidiary IPO, and *ab initio*<sup>2</sup> (Desai and Hines, 2002; Rao, 2015). In the taxable stock transfer form of inversion, a U.S. company engages in a share exchange with its own subsidiary. Following the share exchange, the subsidiary becomes the parent company, and the U.S. company becomes a subsidiary (Marples & Gravelle, 2014). A number of different terms are used in the literature for the taxable stock transfers, including unilateral inversion (Chorvat, 2015), self-inversion (Hicks & James, 2014), naked inversion (Marples and Gravelles, 2015), and single company inversion (Cloyd, Mills, and Weaver, 2003b). An M&A inversion involves the acquisition of a foreign target company by a U.S. company or the acquisition of a U.S.

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<sup>2</sup> *Ab initio* is the Latin term for “from the beginning”. Firms that fall into this category have been foreign incorporated since their inception; however, they are or were associated with a U.S. incorporated firm.

target company by a foreign company, which results in the re-domiciliation of the U.S. company to a foreign jurisdiction (Babkin, et al., 2015). A restructuring inversion involves significant changes in a firm's ownership, business, or assets and can take the form of either a spin-off, a financial reorganization, or a leveraged buy-out (Cortes, et al., 2014).

Prior research provides conflicting evidence on the market's price response to inversion announcements. However, it generally fails to distinguish among the types of inversions. This distinction is important as prior non-inversion literature shows that mergers and acquisitions (M&As) and restructurings provide different types of information to the market. My results show that M&A and restructuring inversion announcements generate positive abnormal returns, while naked inversion announcements do not generate any price response. However, the returns are not significantly different from those earned by control firms that merged or restructured but did not invert.

This paper represents the second long-run event study on corporate inversions. The first, Chorvat (2015), finds that inversions generate significant long-run excess stock returns above the S&P 500 market index and that these returns are higher for corporations that inverted prior to the introduction of Internal Revenue Code (IRC) Section 7874 (s. 7874). Pre s. 7874 inversions generated significant returns of approximately 225% above the market, while post s. 7874 inversions only generated long-run excess returns of 34%. My study differs from Chorvat (2015) in terms of the context in which inversions are examined and the finding of long-run excess returns. While she examines stock returns based on whether the inversion occurred pre- or post-s. 7874, I examine stock returns

based on the type of inversion. I divide inversions into three categories: naked, M&A, and restructuring.

My results show that firms that invert through a naked or M&A inversion do not generate excess returns above the S&P 500 over periods of one and two years, and to December 31, 2015. In fact, M&A inverters underperform by 44% in the long-run (as of December 31, 2015) relative to comparable U.S. firms that acquire overseas targets in non-inversion M&As. In contrast, firms that invert through a restructuring generate significant excess returns of 215% above the S&P 500 as of December 31, 2015.

Collectively, the results suggest that future stock returns differ based on the method through which a firm inverts. However, inversion alone is not an indicator of future stock returns. Any excess returns, whether positive or negative, are likely the result of other non-inversion related factors.

My study contributes to the growing area of accounting literature on corporate inversions in two ways. First, I provide evidence that the market response to inversion announcements differs based on the type of inversion. Previous studies find contradictory evidence on whether the market prices inversion announcements. Second, I answer the call for research on the long-term effects of inversion, as proposed by Hanlon & Hetizman (2010), and address the phenomenon of the “under-sheltering puzzle”.

The remainder of the paper is organized as follows. Section 2 provides background information, including the expected benefits and costs of inversion, and the history of inversions in the U.S. Section 3 reviews the relevant previous and concurrent literature. Section 4 discusses the data and sample collection procedures. Section 5

describes the models and variables. Section 6 presents the results. Finally, section 7 concludes and provides a discussion of the findings and implications.

## **2. Background**

### **2.1 Expected Benefits of Inversion**

Most developed countries today have territorial tax systems. The United States is one of only 6 countries in the world that has a worldwide system (Pomerleau, 2015). Under a territorial system, corporations are subject to taxation on active business income only in the source country (i.e. the country in which the income is earned). A tax liability on foreign earnings is not incurred in the country of residence. Earnings repatriated from foreign subsidiaries through dividends are also not subject to taxation in the country of residence (Matheson, et al., 2013).

Under a worldwide system, corporations are subject to taxation in their country of residence on income earned anywhere in the world. The tax liability in the home country is offset, by a deduction or credit, for taxes paid to foreign source countries on the same income (Matheson, et al., 2013). Some countries, such as the U.S., allow corporations to defer taxation on earnings of foreign subsidiaries until they are repatriated (Matheson, et al., 2013). The unrepatriated foreign earnings are designated as permanently reinvested earnings (PRE) and corporations can defer recognition of a U.S. tax expense (Edwards, et al., 2012).

The U.S. corporate tax rate, at 35%, is currently one of the highest in the world. As a result, a U.S.-owned company may end up paying more in taxes than another identical U.S. company that is foreign owned (Mider & Drucker, 2016). The current U.S. tax system makes U.S. firms less competitive in a global market where their competitors

are only subject to territorial taxation (Seida and Wempe, 2004). Consequently, U.S. firms employ strategies, such as corporate inversions, to minimize their taxes (Jeffers, 2014) (Schmidt, et al., 2015).

Through corporate inversion, U.S. companies relocate their headquarters to foreign jurisdictions, which substantially reduces their tax liabilities. Firms claim that inversion allows them to save U.S. taxes on foreign-sourced earnings (Hanlon & Heitzman, 2010). Seida and Wempe (2004) find that effective tax rates decline from 32.01% to 20.44% post-inversion. This reduction in taxes results in greater after-tax cash flows and is expected to increase shareholder value.

## **2.2 Costs of Inversion**

There are costs associated with corporate inversions, both at the firm and shareholder levels. Since inversion, in general, does not change the operational structure of a firm and usually management remains within the U.S., corporate level costs are indirect. Inverted firms may face reputational and political costs, such as unfavorable press coverage and increased attention from legislators and policymakers (Seida and Wempe, 2002). Inverted corporations are often labelled as “unpatriotic” or “poor corporate citizens”, and thereby potentially face consumer and taxpayer backlash. This can be especially costly for firms that deal directly with consumers (Col and Errunza, 2015). In April of 2014, U.S. pharmaceutical giant, Walgreens, announced that it was considering re-domiciling to Switzerland. In the following months, Walgreens was publicly shamed through protests by advocacy groups (Staggs, 2014), and criticized by politicians, such as Illinois Senator Dick Durbin who called Walgreens’ decision a

“positively un-American tax dodge” (Sweeney, 2015). In August of 2014, Walgreens gave in to the pressure and decided against the inversion.

Inversions may also generate costs at the shareholder level. Post-inversion, many firms choose to relocate their headquarters in tax haven countries, where shareholders have fewer legal rights than in the U.S. For example, Bermuda imposes limitations on legal action against corporate executives and directors (Seida and Wempe, 2002), which makes it more difficult to remove entrenched and inefficient management (Col and Errunza, 2015). Inversion also generates tax costs to shareholders. Generally, incurring taxes on capital gains is an inevitable consequence of holding a company’s shares.<sup>3</sup> However, corporate inversions do not allow shareholders to choose the timing of this tax. Under IRC section 367(a), U.S. shareholders are treated as if they sold their shares and then repurchased them in the new merged entity. The shareholders are therefore liable for capital gains tax on the “sale” at the time of the inversion (Gunn and Lys, 2015).

### **2.3 The U.S. History of Corporate Inversions**

The U.S. Congress has mostly taken a reactive approach to corporate inversions. Wells (2014) even described the inversion experience in the U.S. as a game of “whack-a-mole”: “We enact laws and change regulations to whack the inversion mole in the middle of its head. But soon after, another inversion mole pops up in a slightly different place. We then whack that mole, too. And the game continues — again and again, without resolution. We do not see the futility in this game because we cannot accept that our responses to the corporate inversion phenomenon are wrong.” (Wells, 2014)

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<sup>3</sup> Assuming that the price of the shares increases from the date of purchase.

The first corporate inversion occurred in 1982, more than three decades ago, when Louisiana-based construction company, McDermott Inc., re-domiciled to Panama. McDermott Inc. operated a wholly-owned holding company, McDermott International, in Panama through which it booked its foreign earnings, which had become substantial (Rao, 2014). To avoid tax on the repatriation of the foreign earnings to the U.S., McDermott Inc. chose to relocate its headquarters to Panama. Shareholders of McDermott Inc. exchanged their shares for cash and newly issued shares of McDermott International. Upon completion of the transaction, McDermott International was the parent company and McDermott Inc. was its U.S. subsidiary (Hwang, 2015). The transaction was not taxable to the corporation. In response to this inversion, Congress adopted IRC s. 1248(i) in 1986, under which consideration received in a stock exchange from a controlled foreign corporation (CFC) is taxable to the U.S. corporation (Henry, 2014). A major loophole in s. 1248(i) was that it was not applicable when a company inverted into a subsidiary of a newly formed controlled foreign corporation (CFC) (Hicks & James, 2014).

The second U.S. company to invert was Texas-based consumer-products company Helen of Troy which re-domiciled to Bermuda in 1994. Helen of Troy exploited the loophole in s. 1248(i) by inverting into a newly formed CFC in Bermuda (Hicks & James, 2014). The IRS responded to the Helen of Troy inversion by issuing Treasury Regulations under IRC s. 367(a) in 1996. Unlike s. 1248(i), which targeted inverted corporations, s. 367(a) imposed taxes on the shareholders of inverting corporations. Under s. 367(a) regulations, gains on transfers to a foreign corporation would be taxable

to the shareholders of the inverting U.S. firm if the shareholders owned at least 50% of the new firm after the inversion, while losses would not be deductible (Henry, 2014).

Following the inversions of McDermott and Helen of Troy, a number of other U.S. companies inverted through shares exchanges between the late 1990s and the early 2000s, primarily to Bermuda and the Cayman Islands. Deterring inversions by imposing shareholder level taxes under s. 367(a) proved ineffective as significant stock in inverting firms was often held by tax-exempt institutional investors.

Congress responded to this wave of inversions with s. 7874 of the American Jobs Creation Act in 2004. Under s. 7874(a), an inverted firm is subject to U.S. corporate taxes on certain asset transfers and licenses for a period of 10 years if it meets certain criteria.<sup>4</sup> Under s. 7874(b), if the former shareholders of the U.S. firm own at least 80% of the new inverted firm post-inversion, the inverted firm is treated as a domestic U.S. firm for tax purposes (Rao, 2015).

Inversion activity initially subsided in the U.S. following the introduction of s. 7874, until companies found yet another way to circumvent the law. A new wave of inversions began in the late 2000s and continues to this day. This new generation of inversions differs significantly from past ones. Companies now are inverting to European destinations, such as Switzerland and Ireland.

The method of inversion has also changed significantly post-s. 7874. Prior to s. 7874, U.S. firms inverted through the “naked inversion” method, whereby they would set

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<sup>4</sup> The three criteria are:

- 1) a foreign corporation acquires substantially all of the assets of a domestic corporation
- 2) after the acquisition, former shareholders of the target firm own at least 60% of the foreign firm
- 3) after the acquisition, the firm does not have “substantial business activities” in the foreign jurisdiction (Rao, 2015)

up a subsidiary in the target country and subsequently exchange shares with the subsidiary so that the subsidiary would become the new parent. S. 7874 made inversion under this method exceedingly difficult (Marian, 2015), so U.S. firms started to invert through merger and acquisition. In the M&A form of inversion, a U.S. firm acquires a small foreign firm that is located in a low tax jurisdiction or a U.S. corporation is acquired by a larger foreign corporation in a low tax jurisdiction (Marples & Gravelle, 2014).

Some U.S. companies have inverted, both pre- and post-s. 7874, through non-traditional methods of inversion that involve a corporate restructuring, such as spinoffs and leveraged buyouts. These restructurings result in material changes in the company's business, assets, or ownership (Cortes, et al., 2014).

### **3. Literature Review**

#### **3.1 Short-term Performance**

The empirical literature on corporate inversions provides conflicting evidence of stock market reactions to inversion announcements. There are compelling arguments on whether the market should react positively or negatively. On one hand, inversions may reduce taxes and increase cash flows, thereby increasing shareholder wealth. Hanlon and Slemrod (2009) argue that shareholders want to minimize corporate tax payments and that an aggressive tax strategy makes a company's shares more attractive. This suggests that a positive market reaction should be observed to corporate inversion announcements.

Alternatively, as discussed previously, inversions can generate significant costs at the corporate and shareholder levels, such as political scrutiny, consumer backlash, and tax costs. In addition, tax avoidance activity may lead to uncertainty about the volatility

of the firms' future profits (Shevlin, et al., 2013). This suggests that the market will react negatively, if the costs at the corporate and shareholder level outweigh expected future tax benefits, or that the market will not react at all, if the costs are proportional to expected future tax benefits.

### **3.1.1 Literature Review**

In the early 2000s, a number of studies were conducted on the short-term price reaction to corporate inversion announcements, with mixed results. Using a sample of 19 inversions announced between 1993 and 2002, Desai and Hines (2002) find that the stock price reaction to the initial inversion announcement is positive and that, on average, stock prices rise approximately 1.7% in the five-day window around the announcement date, although they do not assess the statistical significance of the observed returns.

The initial inversion announcement date is generally the date that the board of directors approve the proposed inversion. It is also the date on which the proposed inversion is publicly announced. Following board approval, the proposed inversion transaction must be approved by shareholders, which typically occurs 8 to 12 months later. Using a sample of 19 inversions that were approved between 1994 and 2002, Seida and Wempe (2002; 2003) do not find any evidence of a stock price reaction around the initial announcement date. However, they find statistically significant average Cumulative Abnormal Returns (CARs) of 2.5% over a three-day window centered on the shareholder approval date.

In a follow up study, Cloyd, Mills, and Weaver (2003a) caution against using the shareholder approval date to assess the market reaction as there is little to no uncertainty that shareholders will approve the inversion transaction. Investors would anticipate this

and expected value of the inversion would be impounded into the stock price upon board approval. Cloyd, Mills, and Weaver (2003a) replicate Seida and Wempe (2002)'s study and test the significance of the shareholder approval date CARs for each firm individually. Only four firms have significant positive returns.

These early studies do not distinguish between the different types of inversions and they group all inversions into a single category to assess the market reaction. Cloyd, Mills, & Weaver (2003b) are the first to assess returns for naked and M&A inversions separately, stating that the returns to M&A inversions may be confounded by other non-inversion factors, such as the valuation implications for the merger itself. Their M&A sample consists of only five M&A inversion announcements, all of which were announced prior to s. 7874. Cloyd, Mills, and Weaver (2003b) find two- and five-day CARs of -1.91% and -1.72%, respectively, for the naked sample. Five of the 20 firms have significant negative returns and two have significant positive returns. The average return across the sample are not significant. The two- and five-day CARs to M&A inversion announcements are -4.19% and -0.51%, respectively. Three of the five announcements have significant negative returns. The authors conclude that there is no compelling evidence that the market responds positively to inversion announcements and this suggests that the benefits of inversion are either not obvious to investors or that they are offset by other costs.

Babkin et al. (2015) further classify M&A transactions based on whether the inverting U.S. firm is the acquirer or target firm in the merger transaction. Their sample of inversion announcements ranges from 1983 to 2014, and includes 25 naked and 48 M&A inversions. Of the 48 M&A inversions, 31 are U.S. acquirer and 17 are U.S. target

firms. The mean and median announcement period (t-2, t+3) returns for naked inversions are -2.53% and -0.73%, respectively. M&A inversion announcements generate positive returns. The mean and median returns to U.S. acquirer firms are 4.92% and 1.59%, respectively. The mean and median returns to U.S. target firms are 16.96% and 16.64%, respectively. Finally, the mean and median returns across all announcements, naked and M&A, are 0.77% and 0.52%. Babkin et al. (2015) do not assess the statistical significance of the returns.

Taken together, prior studies suggest that the market reaction to inversion announcements differs based on the structure of the proposed inversion and is also influenced by other factors related to the said structure. To the best of my knowledge, prior inversion literature has not assessed the market response for restructuring inversion announcements separately. My research addresses this gap in the literature.

The literature on restructurings suggests that the market reacts positively to restructuring announcements. Eckbo and Thornburn (2008) provide a comprehensive review of prior literature on corporate restructurings and abnormal returns based on a review of 19 studies of 2,052 corporate spinoffs announced between 1962 and 2000; and 4 studies on leveraged buyouts (LBOs) conducted between 1984 and 2007. They find that corporate spinoffs, generally, are a source of value creation. This value creation is driven by a number of factors, including increased corporate focus and corporate governance, and reduced negative synergies, resulting from the elimination of unrelated divisions. Spinoff announcements generate positive price reactions of 1.7% to 5.6%. Announcements of LBOs are also received positively by the market. Value creation in LBOs is driven by increases in operating efficiencies, such as improved managerial

investment decisions, mitigation of agency problems, and lower taxes. LBO announcements generate two-day CARs of 16 to 17%.

### **3.1.2 Research Predictions**

Consistent with prior literature, I predict that the short-term market response to the initial inversion announcement will differ based on the type of inversion. Naked inversion announcements will not generate a price response. M&A inversion announcements will generate a positive price response. Finally, restructuring inversion announcements will generate a positive price response. I also examine whether returns to inversion M&As and restructurings are in excess of returns typically generated by non-inversion M&As and restructurings. If returns are truly driven by the underlying transaction and not inversion, then the returns generated by inversion announcements should not be in excess of returns generated by similar types of announcements that are not inversion related. Stated formally, my first three predictions are:

**Prediction 1:** Announcements of naked inversions will not generate a price response

**Prediction 2:** Announcements of M&A inversions will generate a positive price response, but not in excess of that generated by non-inversion M&A announcements.

**Prediction 3:** Announcements of restructuring inversions will generate a positive price response, but not in excess of that generated by non-inversion restructurings.

### **3.2 Long-term Performance**

The empirical literature on the long-term performance of inverted firms is sparse. The inconclusive evidence in prior studies of a short-term market reaction suggests the need to study the effects of inversion in the long-term. Assuming market efficiency, the long-term effects of inversion should be priced around the initial announcement date.

However, given the significant costs and uncertainty of corporate inversions, there is the risk that expected future tax benefits will not be realized. As a result, actual firm performance may differ from ex-ante expectations (Lusch, et al., 2016).

### **3.2.1 Literature Review**

Cloyd, Mills, and Weaver (2003) are the first to investigate stock returns in the period following the inversion announcement. They examine one, two, and six month post-inversion announcement returns for 20 single company inversions announced between 1982 and 2002, and find average returns of -0.02%, 4.40%, and 4.07%, respectively. Only about half of the firms have positive returns in each window. The returns are not statistically significant.

In a concurrent study, Lusch et al. (2016) examine excess buy-and-hold returns for 10 pre-s. 7874 naked inverters over one-, two-, three-, five, and 10-year periods. The results suggest that inverters do not generate excess returns relative to their non-inverted competitors. Lusch et al. (2016) also assess long-term performance using accounting-based financial measures and find that inverters have lower pretax and after-tax earnings performance relative to their non-inverted competitors.

A recent report from Bloomberg analyzes the performance of 14 firms that have inverted through M&A between 2010 and 2013 (Sutherland, 2014). The median excess return to the sample is 14.60% above the MSCI World Index. Examining the performance of each firm individually, however, shows that only 8 of the 14 firms outperform the market. At least half of the M&A inversions in the sample are announced in either 2013 or 2014, and thus the analysis of these firms uses less than one year of data. Furthermore, at the time of the analysis the inversion deal for four of the firms was

still pending and two of those deals were eventually cancelled. The report does not assess the statistical significance of the returns.

A 2014 report from Reuters examines the long-term returns of 52 U.S. companies that inverted through naked and M&A inversions between 1983 and 2014. Results show that many inverted companies have not produced above-average long-term returns for investors (Drawbaugh, 2014). Of the 52 companies, 19 earn returns above the S&P 500, 19 underperform the S&P 500, 10 are acquired by other firms, three go bankrupt, and one reincorporates back in the U.S.<sup>5</sup> Companies in the oilfield and engineering sectors have the poorest performance; not only do they underperform relative to the S&P, but also relative to sector matched indices. Similar to the Bloomberg report, the significance of the returns is not assessed.

Chorvat (2015) studies post-inversion announcement returns for firms that inverted pre- and post-s. 7874. She finds that firms that inverted prior to s. 7874 generate five-year excess returns of 61.71% above the S&P 500 and long-run returns of 224.70% as of March 1, 2013. Firms that inverted post-s. 7874 generate excess returns of 34.26% as of March 1, 2015. The returns for both pre- and post-s. 7874 inversions are significant. Her sample includes 21 pre-s. 7874 announcements and 21 post-s. 7874 announcements. Chorvat (2015), however, does not assess performance separately for naked and M&A inversions.

Overall, except for Chorvat (2015), prior studies suggest that inversions do not generate long-run excess returns. To explain this lack of results, some have argued that

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<sup>5</sup> Xoma returned to the U.S. in 2010.

corporate inversion is not an indicator of performance. For example, Drawbaugh (2014) states, “inversions, on their own, despite largely providing the tax savings that companies seek, are no guarantee of superior returns for investors”. Others believe that in pursuing a corporate inversion, companies make poor strategic decisions, and subsequently suffer from operational inefficiencies. Companies may base their inversion decision solely on tax benefits rather than on economic fundamentals (Winegarden, 2016). Likewise, they might pursue merger targets that are not a good strategic fit when inverting through M&A (Friedman, 2014).

To the best of my knowledge, there has been no attempt made to determine whether the observed differences in results could be driven by the underlying structure of the inversion transaction. Yet, just like for short-term returns, it is possible that inverted firms do not generate long-run returns in excess of what is generated by similar non-inverted firms. Any observed excess returns, supposedly from inversion, are likely the result of other, non-inversion related factors, such as M&A or corporate restructuring. If this assumption holds, then firms that invert through M&A and restructuring will have returns consistent with returns documented in the M&A and restructuring literature.

There is extensive M&A literature that shows firms perform poorly in the years following an M&A.<sup>6</sup> Agrawal et al. (1992) examine the performance of mergers by U.S. listed firms from 1955-1987 and find that M&A firms earn significantly negative excess returns of 10% for up to five years post-merger. Loughran and Vijh (1997) look at 947 acquisitions between 1970 and 1989 and also find that stock mergers earn negative excess returns of 25% in the five years following the merger. A number of other studies

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<sup>6</sup> For a review of the literature, see Agrawal & Jaffe (2000)

also provide similar evidence (Conn et al., 2005; Laamanen and Keil, 2008; Ma et al., 2009).

In contrast, prior studies suggest that firms have positive long-run performance following a restructuring.<sup>7</sup> Kirchmaier (2003) examines the long-term stock performance of 41 spinoffs that occurred between 1989 and 1999 and finds excess returns of 17.30% in the 780 trading days following the spinoff announcement. McConnell and Ovtchinnikov (2004) study post-spinoff performance for 311 firms between 1965 and 2000 and find significant excess returns of 26.32% in the 36 months following the spinoff. Patel et al. (2012) examine the stock performance of spinoff firms for the period 1995 through 2011. They find that spinoff firms outperform the S&P 500 for 12 months following the date on which the spinoff was completed.

Prior literature also provides evidence of positive excess returns to firms backed by private equity firms. Mian & Rosenfeld (1993), using a sample of 48 reverse LBOs between 1983 and 1988, find three-year excess returns of 24.73%. Drathen and Faleiro (2007) analyze 86 LBO-backed IPOs between 1990 and 2006, and find five-year excess returns of 22.15%. Antonsson and Palmer (2012) find excess returns of 26.19% for a sample of 17 reverse LBO between 1981 and 2007.

### **3.2.2 Research Predictions**

If inversion is not an indicator of future performance and the returns to inverted firms are comparable to those of similar non-inverted firms, then long-run performance will differ among the types of inversions. Naked inversions will not generate long-run

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<sup>7</sup> For a comprehensive review of the literature, including market response and long-run performance, see (Bowman, et al., 1999), (Brauer, 2006), and (Lee & Madhavan, 2010).

excess returns. M&A inversions will generate negative excess returns. Restructuring inversions will generate positive excess returns. Furthermore, the returns to all firms will not differ significantly from returns to matched non-inverted firms. My next three predictions are as follows:

**Prediction 4:** Firms that invert through a naked inversion will not generate excess long-term returns above the S&P 500 or above comparable firms that do not invert.

**Prediction 5:** Firms that invert through M&A will generate excess long-term returns below the S&P 500. However, the returns will be similar to other firms that undergo M&A for non-inversion reasons.

**Prediction 6:** Firms that invert through a restructuring will generate excess long-term returns above the S&P 500. However, the returns will be similar to other non-inversion restructured firms.

## 4. Sample and Data

### 4.1 Sample

To enter the sample, a firm must announce a proposed inversion. Sample firms are first identified from prior studies cited above. To make sure more recent inversions are included in the sample, I then use Bloomberg's "Tracking Tax Runaways" list, and data compiled by the Congressional Research Service<sup>8</sup>. Data was last retrieved in August of 2015. The initial sample consists of 100 inversions. All inversions are then cross-referenced with U.S. Securities and Exchange Commission (SEC) filings obtained from

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<sup>8</sup> <http://www.bloomberg.com/infographics/2014-09-18/tax-runaways-tracking-inversions.html>  
<http://democrats.waysandmeans.house.gov/press-release/new-crs-data-47-corporate-inversions-last-decade-2>

EDGAR to confirm the announcement date and whether the proposed transaction was completed. Firms that cancelled the proposed inversion, inversions that are still pending, and firms that are not listed are removed from the sample, leaving a total of 80 inversions announcements. An additional 24 firms are removed because they have less than 24 months of stock price data following the inversion announcement or they are traded in over-the-counter (OTC) markets. The final sample consists of 56 firms.

Sample inversion transactions are then classified as either naked, M&A, or restructuring. Consistent with Marples and Gravelle (2015), a naked inversion is a share exchange between a U.S. Corporation and its foreign subsidiary that results in the foreign subsidiary becoming the parent corporation. It generally does not involve any changes in the firm's operations, structure, or ownership make up. Consistent with Babkin et al. (2015), an M&A inversion occurs when a U.S. corporation incorporates in a foreign jurisdiction through a merger with a foreign corporation. Last, consistent with Cortes et al. (2014), the foreign incorporation of a spinoff or leveraged buyout is classified as a restructuring inversion. A restructuring transaction results in a substantial change in the firm's ownership, business, or assets (Cortes, et al., 2014). SEC filings retrieved from EDGAR are used to classify the sample inversion transactions based on these definitions. I compare my classifications to that of Desai and Hines (2002); Rao (2015); and Chorvat (2015) to validate my interpretations. The final sample consists of 19 naked, 24 M&A, and 12 restructuring inversions. The sample selection procedure is summarized in Table 1.

(Insert Table 1 here)

Next, I select a control firm for each sample inversion firm. Controls firms are selected from COMPUSTAT for naked inversions, Thomson SDC Platinum for M&A inversions, and Bloomberg for restructuring inversions. All sample firms are matched based on year, industry, and total revenues. For the naked sample, I can only identify a control firm for long-term stock performance because control firms do not have an event date on which short-term performance is assessed. Target and acquiring M&A inverters are matched with non-inverting targets or acquirers, respectively. Restructuring firms are matched with non-inverting restructured firms based on the type of restructuring transaction, i.e. spinoff or leverage buyout. A list of sample and matched firms is presented in Table 2.

(Insert Table 2 here)

## **4.2 Data**

Data to compute descriptive statistics is collected from COMPUSTAT. Short-term event study data is obtained from CRSP. Stock price data for long-term stock returns is collected primarily from Yahoo Finance, which provides the adjusted closing price. Yahoo Finance does not include historical returns for delisted firms, including those firms that were acquired. Adjusted prices for these firms are calculated using Thomson Reuters Datastream. Stock price data is also calculated from Datastream for foreign acquirers and targets in the M&A control sample.

## **5. Models and Variables**

### **5.1 Short-term Performance**

To test the market response to the initial inversion announcement, I compute cumulative average abnormal returns (CAARs), as defined by Mackinlay (1997) over

one-, three-, and five- day event windows.<sup>9</sup> This approach is consistent with Cloyd et al. (2003).

Abnormal return is computed as:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \quad (1)$$

Where:

- $R_{i,t}$  = The actual return to sample firm  $i$  at time  $t$ , i.e. the day of the initial inversion announcement
- $E(R_{i,t})$  = The expected return to sample firm  $i$  at time  $t$ , i.e. the day of the initial inversion announcement calculated from the market model

The market model is defined as:

$$E(R_{i,t}) = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (2)$$

Where:

- $E(R_{i,t})$  = The expected return to firm sample firm  $i$  at time  $t$ , i.e. the day of the initial inversion announcement
- $r_{m,t}$  = The return on the market at time  $t$ , i.e. the day of the initial inversion announcement

The estimation period ranges from 220 days to 60 days prior to the announcement date.<sup>10</sup>

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<sup>9</sup> The event date is the initial inversion announcement date (i.e. the date of board approval). As discussed by Cloyd, Mills, and Weaver (2003a), using the shareholder approval date is problematic because by that date information about the inversion is already known to the market and has already been impounded into the stock price. There is little to no uncertainty that the shareholders will approve the transaction and hence the market is unlikely to react.

<sup>10</sup> There is no uniformly accepted estimation period in event studies. As discussed by Sorokina, Booth, and Thornton (2013), prior studies use various estimation periods, ranging from 100 days to 500 days. In my analysis, I also use alternative estimation periods, i.e. 150, 200, and 250 days (not reported). However, the results do not change.

The average abnormal return (AAR) is calculated as the simple cross-sectional average of the returns in the sample. Cumulative average abnormal returns (CAARs) is the sum of the AAR over the specified windows. The significance is tested using a standard two-tailed t-test.

#### **4.2 Long-term Performance**

To assess the long-run performance of inversion transactions, I use the same approach as Chorvat (2015). I measure abnormal returns as the observed ex-post return on the security minus the return on a benchmark index. Following the approach of Ritter (1991) and Barber & Lyon (1997), I estimate the abnormal return as the cumulative average return to a buy and hold portfolio of the firms in my sample. Returns are defined as the change between the opening stock price on the day prior to the inversion announcement and the closing price one- and two-years post-inversion announcement and to December 31, 2015.

Unlike prior event-study literature, which generally calculates the buy-and-hold return as the geometric holding period return, following Chorvat (2015), I calculate the buy-and-hold return as the arithmetic holding period return. The geometric return mimics the return obtained by a day trader who purchases a security at the opening of each trading day and sells it as the market closes each day (Smith, 2008). In contrast, the arithmetic holding period return mimics the long-run returns that would have been earned by an investor who purchased and held the stock (Chorvat, 2015). Returns are adjusted for stock splits and dividends, and defined as:

$$Returns = \frac{(Price_{t+1} - Price_t)}{Price_t} \quad (3)$$

Following Chovart (2015), I estimate the abnormal returns using the market model, and use the S&P 500 as the benchmark. Buy and hold abnormal returns are defined as:

$$BHAR_{it} = AR_{it} - AR_{Index,t} \quad (4)$$

Where:

$BHAR_{it}$	=	The buy-and-hold abnormal return for firm $i$ at time $t$
$AR_{it}$	=	The actual return to the firm $i$ at time $t$
$AR_{Index,t}$	=	The return on the market index at time $t$

The average buy and hold abnormal return (ABHAR) is then calculated as the compounded equally weighted return on a portfolio of all securities in the sample:

$$ABHAR_t = \frac{1}{n} \sum_{i=1}^n BHAR_{it} \quad (5)$$

The significance of ABHAR is calculated using a bootstrapped skewness-adjusted  $t$  statistic as defined by Lyon, et al. (1999).

## 6. Results

### 6.1 Descriptive Statistics

Table 3 displays announcement years and destinations for sample firms. Bermuda and Cayman Islands are the most common destinations between 1999 and 2002. Most of these inversions are naked inversions. No inversions are announced in 2004 or 2005. This is consistent with a reduction in inversions in the immediate period following s. 7874. Post-s. 7874, the most common destinations are Ireland and the United Kingdom. Most of these inversions are through M&A.

(Insert Table 3 here)

Table 4 presents mean and median values for market-to-book ratio (MB), leverage, return on assets (ROA), earnings per share (EPS), effective tax rate (ETR), cash effective tax rate (CETR) and the fraction of foreign pretax income to total pretax income, for each of the three inversion subsamples and for matched control samples. For the naked and M&A samples, all variables are calculated for the year prior to the inversion announcement. Most of the restructuring firms were private at the time of the inversion announcement and thus data is not available for the pre-inversion period. For this group, all variables are calculated for the first year the firm is listed. Significance of difference in means and medians is tested using a t-test and a Mann-Whitney U test, respectively. Significance levels are two-tailed.

Panel A reports descriptive statistics for the naked inversion and control firms. Inversion firms are not significantly different from control firms in terms of MB ratios, leverage, ROA, EPS, ETR, and CETR. Inversion firms have, on average, higher MB ratios (16.96%), ROA (1.03%), EPS (24.27%), and CETR (2.13%), but lower leverage (-2.98%) and ETR (-0.57%). Inversion firms have significantly higher mean and median foreign earnings of 36.57% and 33.30%, respectively ( $p < 0.10$ ). This is consistent with the incentive to invert. Inversions allow companies to save U.S. taxes on foreign-sourced earnings.

Descriptive statistics for the M&A sample are presented in Panel B. Inverting acquirers are similar to non-inverting acquirers on all measures except leverage. Inverting acquirers are, on average, 8% more leveraged than matched non-inverting acquirers ( $p < 0.05$ ). Inverting targets differ from non-inverting targets only on ETR ( $p < 0.05$ ). The average ETR for inverting and non-inverting targets are 14.04% and 42.66%,

respectively. The lower ETR of inverting target firms is consistent with U.S. acquirers inverting to lower their tax burdens.

Panel C reports descriptive statistics for the restructuring sample. Inverted firms have lower MB ratios and CETR, but higher ETR, EPS, ROA, and leverage. However, the difference between the inversion and control samples are not significant.

(Insert Table 4 here)

## **6.2 Short-term Performance**

### **6.2.1 Excess Returns**

Table 5 reports CAARs calculated over one-, three-, and five-day windows for sample and control firms. Outliers in the data are detected using the Tukey (1977) method. Observations that fall outside of 1.5 times the interquartile range (IQR) are removed in calculating returns.<sup>11</sup>

Panel A of Table 5 shows CAARs for the naked sample. Two firms are removed due to insufficient data. The results show a negative, but insignificant price response. The one-, three-, and five-day CAARs are -0.65%, -1.07%, and -1.47%, respectively. The results support my prediction that announcements of naked inversions do not generate a market response. The lack of excess returns on the initial announcement date is also consistent with Seida and Wempe (2002).

Panel B displays CAARs for acquiring and target firms around M&A announcements for both inversion and non-inversion firms. Five transactions are further removed from this analysis: one with insufficient data, one merger of equals, and three

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<sup>11</sup> Sample returns do not differ if outliers are not removed.

partial mergers. Ten target firms are excluded from the sample because they are either privately held or are not CRSP-listed.

Acquirers in inversion-related M&As generate significant positive excess returns, while acquirers in non-inversion M&As do not. The one-, three-, and five-day returns to inverting acquirers in excess of the returns to non-inverting acquirers are 1.74% (not significant), 2.98% (not significant), and 4.06% ( $p < 0.10$ ), respectively. In contrast, both inversion and non-inversion target firms in M&As generate significant positive abnormal returns. The returns to inversion target firms over one-, three-, and five-day windows are 13.98%, 16.59%, and 17.45%, respectively. Non-inversion target firms generate returns of 12.87%, 15.14%, and 16.28%. All returns are significant at the 0.01 level. The difference in returns between inversion and non-inversion target firms is not significant.

The results provide partial support for my prediction that announcement returns do not differ between inversion and non-inversion M&As. Babkin et al. (2015) also find evidence of excess returns to inverting acquirers of 3.70%, however they do not test for statistical significance. Excess returns to inverting acquirers over non-inverting acquirers are likely the result of investors' expectations of reduced future taxes post-inversion.

Panel C displays CAARs to restructuring inversion announcements. Six firms are removed from the sample because there is no indication at the time of the initial announcement that the transaction is an inversion. One-, three-, and five-day CAARs for sample firms are 10.54% ( $p < 0.01$ ), 9.15% ( $p < 0.05$ ), and 12.21% ( $p < 0.05$ ), respectively. One-, three-, and five-day CAARs for control firms are 10.51% ( $p < 0.01$ ), 11.84% ( $p < 0.01$ ), and 11.30% ( $p < 0.01$ ). The difference in returns between inverted and non-inverted firms is not significant. The finding of positive excess returns is

consistent with Eckbo and Thornburn (2008). The findings are also consistent with my prediction that corporate inversions do not generate excess returns above similar non-inversion transactions.<sup>12</sup>

(Insert Table 5 here)

### **6.2.2 Robustness**

Table 6 provides additional analysis of returns to M&A announcements. For this analysis, I use a larger sample of M&A inversion announcements, including those that were subsequently cancelled. Consistent with Babkin et al. (2015), I classify the transaction based on whether the U.S. firm is the acquirer or the target in the transaction. Marples and Gravelle (2015) suggest that there are two types of M&A inversions: “a U.S. corporation acquired by a larger foreign corporation” or “a smaller foreign corporation acquired by a U.S. Corporation”. An example of the former is UK based Enco’s acquisition of U.S. firm Pride International. To the best of my knowledge, no prior study has assessed returns for both acquirer and target firms based on this distinction.

Panel A displays returns for transactions where a U.S. firm acquires a foreign firm. The results show that U.S. inverting acquirers generate significant excess returns above non-inverting acquirers. The one-, three-, and five-day returns to inverting acquirers in excess of returns non-inverting acquirers are 3.09% ( $p < 0.10$ ), 3.77% ( $p < 0.05$ ), and 2.75% (not significant). Target firms generate similar returns regardless of whether the M&A is inversion-related.

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<sup>12</sup> Returns are also calculated using a market adjusted model (not reported). The returns are similar and results are not affected.

Panel B displays returns for transactions where a foreign firm acquires a U.S. firm. Many of the foreign acquiring firms in Panel B are previously inverted U.S. firms that subsequently acquire a U.S. target. The one-, three-, and five-day returns to inverting foreign acquirers in excess returns to non-inverting acquirers are 4.17% ( $p < 0.10$ ), 4.26% (not significant), and 4.16% (not significant). The returns to inverting and non-inverting U.S. targets are not statistically different.

Difference in returns is also assessed for inverting firms between the two types of M&A inversions (not shown). The returns to U.S. acquirers are not statistically different from the returns to foreign acquirers. Results are similar for foreign and U.S. targets.

Overall, the results are consistent with Babkin et al. (2015), who find excess returns to inverting acquirers of 3.70%, and excess returns to inverting targets of only 0.28%. One explanation is that the excess returns to inverting acquirers relative to non-inverting acquirers represents the expected inversion benefit. Expected future tax benefits from inversions are impounded into the stock price around the announcement date.

(Insert Table 6 here)

### **6.3 Long-term Performance**

Table 7 provides the results of excess returns to naked inversion firms. Outliers in the data are detected using the Tukey (1997) method. Observations that fall outside of 1.5 times the interquartile range (IQR) are removed in calculating returns.<sup>13</sup> Column 1 displays excess returns relative to the S&P 500. The results show that naked inversions generate excess returns of 8.09% and 21.29% over the one- and two-year periods

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<sup>13</sup> The following returns to December 31, 2015 are removed: Mcdermott (-1282.28%), Helen of Troy (1994.07%), Everest Re (698.67%), and Arch Capital (1209.54%).

following the inversion announcement. Excess returns as of December 31, 2015 are 31.78%. The returns are not statistically significant. Column 2 of Table 7 displays excess returns relative to control firms. The one- and two-year returns are -4.04% and 1.00%, respectively. Excess returns as of December 31, 2015 are -48.12%. The returns are not statistically significant.

Overall, consistent with my prediction, the results provide evidence that naked inversions do not generate significant excess returns in the long-run above the S&P 500 or above size and industry matched non-inverted firms. This is consistent with the argument that inversion alone is not an indicator of future returns.

(Insert Table 7 here)

Excess returns for M&A inversions are reported in Table 8. Outliers are also removed using the Tukey (1977) method.<sup>14</sup> Column 1 displays excess returns relative to the S&P 500. The one- and two- year excess returns are 13.46% and 29.73%, respectively. Long-run excess returns as of December 31, 2015 are -15.16%. The returns are not statistically significant. Column 2 of Table 8 displays excess returns relative to control firms. The one- and two- year excess returns are 3.70% and 7.60%, respectively. The returns are not statistically significant. Long-run excess returns as of December 31, 2015 are -44.37% ( $p < 0.10$ ).

Overall, consistent with my prediction, the results suggest that M&A inversions do not generate significant excess returns above the S&P in the long-run. Inversion-motivated M&A firms generate negative long-run returns relative to firms that merge for

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<sup>14</sup> Returns to December 31, 2015 for Alkermes (396.07%) are removed. All returns for Valeant are removed.

non-inversion reasons. These results are consistent with prior literature that suggests that in pursuing inversions, companies make poor strategic decisions, such as merging with a target firm that is not a good strategic fit (Friedman, 2014).

(Insert Table 8 here)

Excess returns from restructuring inversions are presented in Table 9. Outliers are removed using the Tukey (1977) method.<sup>15</sup> Column 1 of Panel A displays excess returns relative to the S&P 500. The one- and two-year excess returns are 22.96% (not significant) and 85.08% ( $p < 0.05$ ). Excess returns as of December 31, 2015 are 214.53% ( $p < 0.10$ ). Excess returns relative to control firms are presented in column 2 of Table 8. The one- and two-year, and December 31 excess returns are -20.08%, 21.86%, and 17.27%, respectively. The returns are not statistically significant.

The results provide strong evidence that firms inverting through a restructuring generate significantly large excess returns relative to the market, which is consistent with prior literature and my prediction. However, also consistent with my prediction, there is no evidence that inversion leads to excess returns compared to similar firms that do not invert.

(Insert Table 9 here)

Taken together, my results suggest that inversion alone is not an indicator of future stock performance. Rather, future returns depend on the structure of the underlying transaction.

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<sup>15</sup> The following returns are removed: Altisource (1 year = 290.08%; 5 year = 1045.79%) and Core Labs (December 31, 2015 = 3654.79%)

## 7. Conclusion

This study investigates the market reaction to the announcement of an inversion and assesses the long-run stock performance of inverted firms among three inversion types: naked, M&A-related, and restructuring. Short-term performance is assessed relative to similar non-inverted firms for M&A and restructuring inversions. Long-run performance is assessed relative to the S&P 500 market index and relative to similar non-inverted firms.

My short-term event study results show that the market perceives inversion announcements differently based on type of inversion. M&A and restructuring announcements are perceived positively, while naked announcements do not generate a price response. Only M&A acquirers generate returns in excess of that of the control sample. The excess returns to inverting acquirers over non-inverting acquirers in M&A transactions suggests the presence of incremental expected benefits from the inversion that are being impounded into stock price. Distinguishing between transactions where a foreign corporation acquires a US target and transactions where a US corporation acquires a foreign target shows similar results for both types of transactions. These results are consistent with Babkin et al. (2015).

My long-run event-study results also show that returns differ based on the type of inversion. Naked and M&A inversions do not generate long-run excess returns relative to the market or to comparable non-inverted firms. In fact, M&A inverters significantly underperform relative to comparable firms. Finally, I find evidence that restructuring inversions outperform the market. However, the returns to these firms are not in excess of returns to comparable non-inverted firms.

My study provides some insight to the “under-sheltering puzzle” of why only a small number of U.S. companies have inverted. My results provide support for the argument that inversion alone is not an indicator of excess future returns. On the contrary, in the case of M&As, inversions destroy shareholder value. Inversions generate significant costs and it is unclear whether post-inversion benefits offset or exceed those costs. Given the number of other less costly tax minimization strategies that firms can employ, corporate inversions may be a last resort.

My study has a number of limitations. First, the results of my study may be affected by self-selection. Sample firms choose inversion and may share common characteristics. Second, as discussed by Lusch et al. (2016), the inversion sample only includes firms that actually inverted. There is the possibility that other firms, which have privately discussed inverting, are included in the control samples. Third, as discussed by Rao (2015), the sample includes only those firms that are generally considered to be inverters by prior studies and credible media sources. The sample does not describe all firms that have expatriated from the U.S. Finally, there may be overlap between my inversion classifications. For instance, some M&A transactions also meet the criteria for a restructuring.

While my study provides insight into the future stock performance of firms that invert, little is known about other long-term effects. There are still many unanswered questions, such as whether firms face changes in their business activities or operations post-inversion, either voluntarily or due to shifts in the business environment. There is also uncertainty about how inverted firms perform relative to non-inverted firms on performance measures other than stock price. Finally, as suggested by Chorvat (2015)

and Babkin et al. (2015), it is unclear whether there are private costs or benefits from inversion, at the either the shareholder or the corporate level, that are not known to the market. These are some of the questions that future research can explore.

## 8. References

- Agrawal, A. & Jaffe, J. F., 2000. The post-merger performance puzzle. In: *Advances in Mergers and Acquisitions Volume 1*. s.l.:Emerald Group Publishing Limited, pp. 7-41.
- Agrawal, A., Jaffe, J. F. & Mandelker, G. N., 1992. The Post-Merger Performance of Acquiring Firms: A Re-Examination of an Anomaly. *The Journal of Finance*, 47(4), pp. 1605-1621.
- Antonsson, J. & Palmér, M., 2012. From Greed to Good? - A Study on the Long-Run Stock Performance of Reverse Leveraged Buyouts on the American Stock Exchanges. *Master Thesis, School of Economics and Management, Lund University*.
- Babkin, A., Glover, B. & Levine, O., 2015. Are Corporate Inversions Good for Shareholders?. Available at SSRN: <http://ssrn.com/abstract=2700987>, 7 December .
- Barber, B. M. & Lyon, J. D., 1997. Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. *Journal of Financial Economics*, Volume 43, pp. 341-372.
- Bloomberg, 2015. *Tracking Tax Runaways*. [Online] Available at: <http://www.bloomberg.com/infographics/2014-09-18/tax-runaways-tracking-inversions.html>
- Bowman, E. H., Singh, H., Useem, M. & Bhadury, R., 1999. When Does Restructuring Improve Economic Performance?. *California Management Review*, 41(2), pp. 33-54.
- Brauer, M., 2006. What Have We Acquired and What Should we Acquire in Divestiture Research? A Review and Research Agenda. *Journal of Management*, 32(6), pp. 751-785.
- Chorvat, E., 2015. Expectations and Expatriations: A Long-Run Event Study. *U of Chicago Public Law Working Paper No. 445*, 7 August.
- Cloyd, C. B., Mills, L. F. & Weaver, C. D., 2003. Firm Valuation Effects of the Expatriation of U.S. Corporations to Tax Haven Countries. *Journal of the American Taxation Association*, October, Volume 23, pp. 87-109.
- Cloyd, C. B., Mills, L. & Weaver, C. D., 2003. Market Nonreaction to Inversions. *Tax Notes*, 13 January.p. 259.

- Col, B. & Errunza, V. R., 2015. Havenly Acquisitions. *Pace University and McGill University. Working Paper.*
- Congressional Research Service, 2014. *New CRS Data: 47 Corporate Inversions in Last Decade.* [Online]  
Available at: <http://democrats.waysandmeans.house.gov/press-release/new-crs-data-47-corporate-inversions-last-decade-2>
- Conn, R. C. L., Cosh, A., Guest, P. M. & Hughes, A., 2005. The Impact on UK Acquirers of Domestic, Cross-Border, Public and Private Acquisitions. *Journal of Business Finance and Accounting*, 32(5), pp. 815-870.
- Cortes, F., Gomes, A. & Gopalan, R., 2014. Corporate Inversions and Americanizations: A Case of Having the Cake and Eating it Too?. *SSRN Working Paper.*
- Desai, D. A. & Dharmapala, D., 2009. Corporate Tax Avoidance and Firm Value. *THE Review of Economics and Statistics*, 91(3), pp. 537-546.
- Desai, M. A. & Hines, J. R., 2002. Expectations and Expatriations: Tracing the Causes and Consequences of Corporate Inversions. *National Tax Journal*, September, 55(3), pp. 409-440.
- Drathen, C. v. & Faleiro, F., 2007. The Performance of Leveraged Buyout-Backed Initial Public Offerings in the UK. *London Business School, Working Paper.*
- Drawbaugh, K., 2014. When companies fee U.S. tax system, investors often don't reap big returns. *Reuters*, 18 August.
- Eckbo, B. E. & Thorburn, K. S., 2007. Chapter 16 - Corporate Restructuring: Breakups and LBOs. In: B. E. Eckbo, ed. *Handbook of Empirical Corporate Finance, Volume 2.* Amsterdam, The Netherlands: Elsevier B.V, pp. 430-493.
- Edwards, A., Kravet, T. & Wilson, R., 2012. Permanently Reinvested Earnings and the Profitability of Foreign Cash Acquisitions. *Rotman School of Management Working Paper No. 1983292.*
- Friedman, A. H., 2014. *Corporate Inversions: A Primer*, Washington, D.C.: The Washington Update.

- Gunn, R. N. & Lys, T. Z., 2015. The Paradoxical Impact of Corporate Inversions on US Tax Revenue. *Kellogg School of Management - Working Paper*.
- Hanlon, M. & Heitzman, S., 2010. A review of tax research. *Journal of Accounting and Economics*, 50(2-3), pp. 127-178.
- Hanlon, M. & Slemrod, J., 2009. What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement. *Journal of Public Economics*, 93(1-2), pp. 126-141.
- Henry, M., 2014. *Mergers of Equals. Getting Caught in the S 7874 Corporate Inversion Web - Change the Rules or Change the Game*, New York City, New York: Tax Quarry.
- Hicks, H. & James, O., 2014. Select Corporate Migration and Combination Considerations in an Ever Changing Environment. *International Tax Journal*, 40(3), pp. 25-42.
- Hwang, C., 2015. The New Corporate Migration: Tax Diversion through Inversion. *Brooklyn Law Review*, 80(3), pp. 807-1218.
- Jeffers, A. E., 2014. Corporate Inversions: How Corporations Are Using These Practices To Legally Avoid U.S. Taxes. *Insights to a Changing World Journal*, 2014(3), pp. 98-115.
- Kirchmaier, T., 2003. *The performance effects of European demergers*, London, UK: Centre for Economic Performance, London School of Economics and Political Science.
- Laamanen, T. & Keil, T., 2008. Performance of Serial Acquirers: Toward an Acquisition Program Perspective. *Strategic Management Journal*, 29(6), pp. 663-672.
- Lee, D. & Madhavan, R., 2010. Divestiture and Firm Performance: A Meta-Analysis. *Journal of Management*, 36(6), pp. 1345-1371.
- Loughran, T. & Vijh, A. M., 1997. Do Long-Term Shareholders Benefit From Corporate Acquisitions?. *The Journal of Finance*, 52(5), pp. 1765-1790.
- Lusch, S., Seida, J. & Watson, L., 2016. The Long-Run Costs and Benefits of Corporate Inversions. *University of Notre Dame, Working Paper*.

- Lyon, J. D., Barber, B. M. & Tsai, C.-L., 1999. Improved Methods for Tests of Long-Run Abnormal Stock Returns. *Journal of Finance*, 54(1), pp. 165-201.
- MacKinlay, C. A., 1997. Event Studies in Economics and Finance. *Journal of Economic Literature*, 35(1), pp. 13-39.
- Ma, Q., Whidbee, D. A. & Zhang, A. W., 2011. Value, valuation, and the long-run performance of merged firms. *Journal of Corporate Finance*, 17(1), pp. 1-17.
- Marian, O., 2015. Home-Country effects of corporate inversions. *Washington Law Review*, 90(1), pp. 1-73.
- Marples, D. J. & Gravelle, J. G., 2014. Corporate Expatriation, Inversions, and Mergers: Tax Issues. *Congressional Research Service*, 25 September.
- Matheson, T., Perry, V. & Veung, C., 2013. Territorial vs. Worldwide Corporate Taxation: Implications for Developing Countries. *IMF Working Paper*, 13(205).
- McConnell, J. J. & Ovtchinnikov, A. V., 2004. Predictability of Long-term Spinoff Returns. *Journal of Investment Management*, 2(3), pp. 35-44.
- Mian, S. & Rosenfeld, J., 1993. Takeover Activity and the Long-Run Performance of Reverse Leveraged Buyouts. *Financial Management*, 22(4), pp. 46-57.
- Mider, Z. & Drucker, J., 2016. *How U.S. Companies Buy Tax Breaks*. [Online] Available at: <http://www.bloomberg.com/quicktake/tax-inversion>
- Patel, P. N. et al., 2012. *Do Spin-Offs Create or Destroy Value?*, s.l.: Credit Suisse.
- Pomerleau, K., 2015. *Tax Foundation*. [Online] Available at: <http://taxfoundation.org/blog/worldwide-taxation-very-rare>
- Rao, N. S., 2015. Corporate Inversions and Economic Performance. *National Tax Journal - Forthcoming*.
- Ritter, J. R., 1991. The Long-Run Performance of Initial Public Offerings. *Journal of Finance*, 46(1), pp. 3-27.

- Schmidt, P. M., Bates, J. D. & Paravano, J. H., 2015. Why Tax Inversions Continue to Be an Effective Global Tax Planning Strategy. *Journal of Taxation of Investments*, 32(2), pp. 3-9.
- Seida, J. A. & Wempe, W. F., 2002. Market Reaction to Corporate Inversion Transactions. *Tax Notes*, 25 November.p. 1098.
- Seida, J. A. & Wempe, W. F., 2003. The Market's Reaction or Nonreaction to Corporate Inversions. *Tax Notes*, 17 February.p. 1146.
- Seida, J. A. & Wempe, W. F., 2004. Effective Tax Rate Changes and Earnings Stripping Following Corporate Inversion. *National Tax Journal*, 57(4), pp. 805-828.
- Shevlin, T. J., Urcan, O. & Vasvari, F., 2013. *Corporate Tax Avoidance and Public Debt Costs*. s.l., s.n.
- Smith, Z., 2008. An empirical investigation of initial public offering (IPO) price performance. *Walden University, Ph.D. Dissertation*, p. 42.
- Sorokina, N., Booth, D. E. & John H. Thornton, J., 2013. Robust Methods in Event Studies: Empirical Evidence and Theoretical Implications. *Journal of Data Sciences*, 11(1), pp. 575-606.
- Staggs, D., 2014. Activist Pressure Keeps Walgreen's HQ—And Nearly \$4 Billion in Taxes—In U.S.. *In These Times*, 1 October.
- Sutherland, B., 2014. Investors Cheer, U.S. Jeers at Tax-Driven Deals: Real M&A. *Bloomberg*, 17 2014.
- Sweeney, B., 2015. 'There's a new sheriff in town': Pessina begins transformation at Walgreens. *Crain's Chicago Business*, 9 April.
- The World Bank, 2016. *Listed Domestic Companies, Total*. [Online]  
Available at:  
[http://data.worldbank.org/indicator/CM.MKT.LDOM.NO?order=wbapi\\_data\\_value\\_2014+wbapi\\_data\\_value+wbapi\\_data\\_value-last&sort=desc](http://data.worldbank.org/indicator/CM.MKT.LDOM.NO?order=wbapi_data_value_2014+wbapi_data_value+wbapi_data_value-last&sort=desc)  
[Accessed 10 March 2016].

Tukey, J. W., 1977. *Exploratory Data Analysis*. 1st Edition ed. s.l.:Addison-Wesley Publishing Company.

U.S. Treasury, 2002. *Corporate Inversion Transactions: Tax Policy Implications*, s.l.: Office of Tax Policy.

Weisbach, D. A., 2002. Ten Truths about Tax Shelters. *Tax Law Review*, 55(2), pp. 215-253.

Wells, B., 2014. Corporate Inversions and Whack-a-Mole Tax Policy. *Tax Notes*, 23 June, Volume 143, pp. 1429-1434.

Winegarden, W., 2016. *Corporate Inversions Are the Symptoms; Poor Tax Policies Are the Disease*, San Francisco, CA: Pacific Research Institute.

**Table 1: Sample Selection**

This table summarizes the sample selection procedure.

	<u>Naked</u>	<u>M&amp;A</u>	<u>Restructuring</u>	<u>Total</u>
Initial Sample	34	48	18	100
Remove:				
Unlisted	2	2	1	5
OTC-traded	3	1		
Cancelled	3	11		14
Pending		1		1
Less than 24-months Stock Price Data	6	9	5	24
Total	20	24	12	56

**Table 2: Inversion and Control Samples**

This table presents the final samples of inverted and control firms.

**Panel A: Naked Inversions**

<b>Destination</b>	<b>A-Date</b>	<b>Sample Firm</b>	<b>Control Firm</b>
Panama	Oct 28, 1982	Mcdermott Intl	Aerojet Rocketdyne
Bermuda	Dec 30, 1993	Helen Of Troy	Key Tronic
Cayman Islands	Feb 08, 1996	Triton Energy	Penn West Petroleum
Cayman Islands	Jun 01, 1997	Santa Fe International	Pioneer Natural Resources
Cayman Islands	Feb 11, 1998	Fruit Of The Loom	Mohawk Industries
Bermuda	Nov 24, 1998	Xoma	Neogen
Cayman Islands	Mar 15, 1999	Transocean	Apache
Bermuda	Sep 17, 1999	Everest Re	Mercury General
Bermuda	Sep 23, 1999	White Mountains	Kansas City Life Ins
Bermuda	Jan 18, 2000	Arch Capital	National Western Life
Bermuda	Nov 29, 2000	Foster Wheeler	Jacobs Engineering
Bermuda	Jun 11, 2001	Cooper Industries	Advanced Micro Devices
Bermuda	Oct 16, 2001	Ingersoll-Rand	Emc Corp
Bermuda	Jan 02, 2002	Nabors Industries	Precision Drilling
Cayman Islands	Jan 31, 2002	Noble	Chesapeake Energy
Bermuda	Apr 05, 2002	Weatherford	Cnooc
Canada	Jun 29, 2009	Tim Hortons	Cracker Barrel Old Ctry Stor
United Kingdom	Nov 09, 2009	EnSCO	Freeport-Mcmoran
United Kingdom	Jan 13, 2012	Aon	Marsh & McLennan
United Kingdom	Feb 28, 2012	Rowan	Quicksilver Resources

**Table 2 (continued)**

**Panel B: M&A Inversions**

<b>Destination</b>	<b>A-Date</b>	<b>Sample Firms</b>		<b>Control Firms</b>	
		<b>Acquirer</b>	<b>Target</b>	<b>Acquirer</b>	<b>Target</b>
Bermuda	Mar 17, 1997	Tyco	ADT	Exxon	Mobil
Bermuda	Feb 09, 1999	XL Cap	Nac Re	Markel	Terra Nova
Bermuda	Dec 19, 1999	Trenwick	LaSalle	Metlife	Soince RE
Bermuda	Mar 14, 2007	Argonaut	PXRE	American Finl Grp	Marketform
Canada	Jun 21, 2010	Biovail	Valeant	Abbott Labs	STARLIMS Tech.
Ireland	May 09, 2011	Alkermes	Elan	Alere	Axis-Shield
Ireland	Sep 19, 2011	Jazz	Azur	Gilead Sciences	YM BioSciences
Australia	Sep 26, 2011	Tronox	Exxaro	Newmont Mining	Paladin Energy
Switzerland	Mar 28, 2012	Pentair	Tyco	Molycorp	Neo Material Tech
Israel	Apr 16, 2012	Stratasys	Objet	Cisco Systems	NDS
Ireland	May 21, 2012	Eaton	Cooper	GE	Industrea
Bermuda	Jul 30, 2012	Tower Group	Canopus	Arthur Gallagher	Insurance Dialogue
United Kingdom	Feb 05, 2013	Liberty Global	Virgin Media	Global Eagle Ent.	Adv. Inflight Alliance
Ireland	May 10, 2013	Actavis	Warner Chil.	Stryker	Trauson Holdings
Ireland	Jul 29, 2013	Perrigo	Elan	OPKO Health	Prolor Biotech
Ireland	Nov 05, 2013	Endo Health	Paladin	Clovis Oncology	EOS SpA
Ireland	Mar 19, 2014	Horizon Pharma	Vidara	Emergent Bio	Cangene
Ireland	Jun 16, 2014	Medtronic	Covidien	Danaher	Nobel Biocare
Switzerland	Jun 18, 2014	TE Conn.	Measurement Spec.	Cirrus Logic	Wolfson Microelec.
Bermuda	Jun 25, 2014	C&J Energy	Nabors	TransAtlantic Pet.	Stream Oil & Gas
Netherlands	Jul 14, 2014	Mylan	Abbot	AmerisourceBerg	Profarma
United Kingdom	Oct 13, 2014	Steris	Synergy	Archer Daniels	Alfred C Toepfer Intl
Netherlands	Oct 27, 2014	Wright Medical	Tornier	BioMarin Pharma	Prosensa Holding BV
Canada	Aug 26, 2014	Burger King	Tim Hortons	Universal Health	Cygnat Health Care

**Table 2 (continued)****Panel C: Restructuring Inversions**

<b>Type</b>	<b>Destination</b>	<b>A-Date</b>	<b>List-Date</b>	<b>Sample Firm</b>	<b>Control Firm</b>
LBO	Singapore	May 07, 1990	Mar 18, 1994	Flextronics	Lexmark
LBO	Netherlands	Dec 09, 1993	Sep 21, 1995	Core Labs	The Hackett Group
Sub Spin-Off	Bermuda	Jan 07, 1996	Aug 15, 2005	Loral Space	Live Nation Ent.
Sub IPO	Netherlands	Dec 17, 1996	Mar 27, 1997	Chicago B&I	Schuff International
LBO	Cayman Islands	Jan 26, 2000	Dec 11, 2002	Seagate	Synnex
LBO	Cayman Islands	Apr 10, 2002	Dec 16, 2004	Herbalife	VCA Inc
LBO	Hong Kong	Jan 29, 2003	Dec 15, 2011	Michael Kors	Gordman Stores
LBO	Netherlands	Jan 09, 2006	Mar 11, 2010	Sensata	Sciqwest
LBO	Bermuda	Sep 06, 2006	May 26, 2011	Freescale Semi.	Inphi Corp
Recapitalization	Luxembourg	Jul 05, 2007	Jun 16, 2011	Samsonite	Sally Beauty Holdings
Sub Spin-Off	Luxembourg	Dec 19, 2008	Aug 06, 2009	Altisource	Core Logic
Bankruptcy	United Kingdom	Jul 26, 2009	Nov 17, 2011	Delphi Auto	Douglas Dynamics

**Table 3: Inversion Announcements by Year and Destination**

This table classifies inversion announcements by year and destination country.

	1982	1990	1993	1996	1997	1998	1999	2000	2001	2002	2003	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total	
Australia																	1				1	
Bermuda			1	1	1	1	4	2	2	2		1	1					1		1	18	
Canada															1	1					1	3
Cayman Islands				1	1	1	1	1		2												7
Hong Kong											1											1
Ireland																	2	1	3	2		8
Israel																		1				1
Luxembourg													1	1								2
Netherlands			1	1								1									2	5
Panama	1																					1
Singapore		1																				1
Switzerland																		1		1		2
United Kingdom															2			2	1	1		6
<b>Total</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>8</b>	<b>56</b>	

**Table 4: Descriptive Statistics**

This table reports descriptive statistics for the inversion and control samples. Significance of difference in mean and median are tested using a t-test and a Mann-Whitney U test, respectively. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent confidence levels, respectively. Significance levels are based on two-tailed tests.

**Panel A: Naked Inversions**

<u>Variable<sup>(1)</sup></u>	<b>Sample</b>		<b>Control</b>		<b>Difference</b>	
	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>
MB	2.4136	1.8817	2.2440	1.8935	0.1696	-0.0118
Leverage	0.1963	0.1922	0.2260	0.1947	-0.0298	-0.0025
ROA	0.0508	0.0668	0.0405	0.0589	0.0103	0.0079
EPS	2.4259	2.2644	2.1832	1.5807	0.2427	0.6837
ETR	0.2805	0.2841	0.2862	0.3011	-0.0057	-0.0170
CETR	0.1386	0.1527	0.1174	0.0355	0.0213	0.1173
% Foreign Earnings	0.5762	0.4485	0.2105	0.1155	*0.3657	*0.3330

**Panel B: M&A Inversions**

<u>Acquirer Variable<sup>(1)</sup></u>	<b>Sample</b>		<b>Control</b>		<b>Difference</b>	
	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>
MB	2.9355	2.7278	3.0661	1.3109	-0.1306	1.4169
Leverage	0.2500	0.2374	0.1700	0.2537	**0.0801	-0.0163
ROA	-0.0040	0.0281	0.0180	0.1959	-0.0220	-0.1679
EPS	0.7655	1.1146	1.5600	0.4236	-0.7646	0.6910
ETR	0.2074	0.2232	0.2338	0.0091	-0.0264	0.2141
CETR	0.1227	0.1590	0.1998	0.0576	-0.0772	0.1014
% Foreign Earnings	0.5158	0.4651	1.3109	1.3109	-0.7951	-0.8458

<u>Target Variable<sup>(1)</sup></u>	<b>Sample</b>		<b>Control</b>		<b>Difference</b>	<b>Acquirer</b>
	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>
MB	2.2788	2.2186	3.1802	1.8466	-0.9015	0.3721
Leverage	0.2574	0.1700	0.2287	0.0840	0.0288	0.0860
ROA	0.0435	0.0684	-0.0408	-0.0133	0.0843	0.0817
EPS	0.9217	1.5617	0.0358	-0.0945	0.8859	1.6563
ETR	0.1404	0.1583	0.4266	0.4431	** -0.2863	* -0.2848
CETR	0.0577	0.0295	0.2050	0.2657	-0.1473	-0.2362
% Foreign Earnings	0.6683	0.7231	0.3711	0.4276	0.2972	0.2955

**Table 4 (continued)****Panel C: Restructuring Inversions**

<u>Variable<sup>(1)</sup></u>	<u>Sample</u>		<u>Control</u>		<u>Difference</u>	
	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>
MB	2.9422	3.0645	3.7531	3.2829	-0.8109	-0.2184
Leverage	0.3757	0.2002	0.2960	0.1706	0.0797	0.0296
ROA	0.1037	0.0512	0.0186	0.0255	0.0851	0.0257
EPS	0.6054	0.5306	0.0946	0.2732	0.5109	0.2574
ETR	0.1490	0.1996	0.1074	0.2443	0.0417	-0.0447
CETR	0.0740	0.0571	0.1966	0.2356	-0.1225	-0.1785

(1) Variable definitions:

Market to Book Ratio (MB)	=	$\frac{\text{(Fiscal Year Closing Price * Common Shares Outstanding)}}{\text{Common Equity}}$
Leverage	=	$\frac{\text{(Long-term Debt + Debt in Current Liabilities)}}{\text{Total Assets}}$
Return on Assets (ROA)	=	$\frac{\text{Net Income}}{\text{Total Assets}}$
Earnings Per Share (EPS)	=	$\frac{\text{Net Income}}{\text{Common Shares Outstanding}}$
Effective Tax Rate (ETR)	=	$\frac{\text{Income Tax Expense}}{\text{Pretax Income}}$
Cash Effective Tax Rate (CETR)	=	$\frac{\text{Income Taxes Paid}}{\text{Pretax Income}}$
% Foreign Earnings	=	$\frac{\text{Pretax Foreign Income}}{\text{Total Pretax Income}}$

**Table 5: Short-term Excess Returns**

This table presents the Cumulative Average Abnormal Returns (CAAR) to the initial inversion announcement over one-, two-, and five-day windows centered on the announcement date.

Returns are calculated using the market model:

$$E(R_{i,t}) = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$$

T-statistics are used to determine significance levels. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent confidence levels, respectively. Significance levels are based on two-tailed tests.

	<b>Predicted Sign</b>	<b>(0,0)</b>	<b>(-1,1)</b>	<b>(-2,2)</b>
<b>Panel A - Naked</b>				
All (18)	Not significant	-0.51	-1.12	-1.78
<b>Panel B: M&amp;A</b>				
Acquirer- Sample (19)	+	***1.42	***3.48	***4.85
Acquirer- Control (19)	+	-0.32	0.50	0.79
Excess	Not significant	1.74	2.98	*4.06
Target- Sample (13)	+	***13.98	***16.59	***17.45
Target- Control (9)	+	**12.87	**15.14	***16.28
Excess	Not significant	1.11	1.45	1.18
<b>Panel C: Restructuring</b>				
Sample (6)	+	***10.54	**9.15	**12.21
Control (6)	+	***10.51	***11.84	***11.30
Excess	Not significant	0.03	-2.69	0.91

**Table 6: Short-term M&A Excess Returns**

This table presents the Cumulative Average Abnormal Returns (CAAR) for M&A inversion announcements. M&A inversions are divided based on whether the U.S. firm is the acquirer or target in the M&A transaction.

Returns are calculated using the market model:

$$E(R_{i,t}) = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$$

T-statistics are used to determine significance levels. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent confidence levels, respectively. Significance levels are based on two-tailed tests.

**Panel A: Announcement of U.S. Corporations Acquiring Foreign Corporations**

	U.S. Acquirer				Foreign Target			
	(0,0)	(-1,1)	(-2,2)	(n)	(0,0)	(-1,1)	(-2,2)	(n)
Inversion	**3.18	**4.37	**4.10	28	***16.27	***16.88	***20.11	14
Match	0.09	0.61	1.35	27	***18.64	***19.22	***18.20	14
Excess	*3.09	**3.77	2.75		-2.37	-2.34	1.91	

**Panel B: Announcements of Foreign Corporations Acquiring U.S. Corporations**

	Foreign Acquirer				U.S. Target			
	(0,0)	(-1,1)	(-2,2)	(n)	(0,0)	(-1,1)	(-2,2)	(n)
Inversion	***4.20	***4.68	***4.09	8	***18.56	***19.53	***21.21	9
Match	0.03	0.42	-0.07	7	***18.48	***20.49	***22.26	8
Excess	*4.17	4.26	4.16		0.08	-0.96	-1.05	

**Table 7: Long-term Excess Returns for Naked Inversions**

This table examines the long-run excess returns generated by firms that inverted through the naked method. Returns are reported for 1-, and 2- year periods following the initial inversion announcement and as of December 31, 2015. Column (1) displays excess returns to inverted firms relative to the S&P 500. Column (2) displays excess returns to inverted firms relative to matched control firms.

Returns are calculated using buy-and-hold abnormal returns (BHAR):

$$BHAR_{it} = AR_{it} - AR_{Index,t}$$

Significance levels are determined using bootstrapped t-statistics. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent confidence levels, respectively. Significance levels are based on two-tailed tests. Standard errors are shown in parentheses.

Sample Firm	<u>(1) Benchmark: S&amp;P 500</u>				<u>(2) Benchmark: Control Firms</u>			
	Predicted Sign	1 Year	2 Year	Dec 31, 2015	Predicted Sign	1 Year	2 Year	Dec 31, 2015
McDermott		0.0647	0.0115			-0.3710	-0.2582	
Helen of Troy		0.1122	0.0344			-0.1605	0.0186	
Triton Energy <sup>1</sup>		-0.3612	-1.0181			-1.0912	-1.6881	
Santa Fe Intl		-0.2561	-0.8651			0.1217	-0.1559	
Fruit of the Loom		-0.6438	-1.3372	-2.0299		-1.0679	-1.2201	-8.4193
Xoma Corp.		-0.3607	1.6501	-1.6972		-0.2997	1.4916	-2.8360
Transocean		0.5690	1.0513	-1.0705		-0.2508	0.2098	-3.6063
Everest Re		0.5509	1.2745	6.9867		0.5516	0.9154	4.7328
White Mtn		0.4501	1.6122	4.2913		0.5507	1.6962	3.6813
Arch Capital		0.0944	0.8760			-0.5045	0.3672	9.4988
Foster Wheeler <sup>1</sup>		0.3242	-0.3244			-0.3093	-1.0137	
Cooper <sup>1</sup>		0.3365	0.2860			1.0260	1.0727	
Ingersoll-Rand		0.0897	0.5803	2.4660		0.6997	0.6020	1.4138
Nabors		0.3314	0.3067	-1.2170		-0.0307	-0.4778	-1.0661
Noble Corp		0.3284	0.1966	-0.8202		-0.0505	-0.9655	-0.7676
Weatherford		0.0641	-0.0960	-1.0704		-0.0320	-0.9579	-7.1973
Tim Hortons		0.0907	0.1907			-0.6558	-0.6626	
EnSCO		-0.0472	0.0016	-1.4720		-0.3856	-0.1062	-1.1910
AON Plc		0.1019	0.3420	0.4903		-0.0534	-0.2766	-0.4533
Rowan		-0.2204	-0.5160	-1.0431		0.4539	-0.0887	-0.0449
<b>Average</b>	Not significant	0.0809 (0.0721)	0.2129 (0.1793)	0.3178 (0.7613)	Not significant	-0.0404 (0.1165)	0.0100 (0.1920)	-0.4812 (1.2604)

<sup>1</sup>Returns as of December 31, 2015 returns are not computed for these firms because they were acquired.

**Table 8: Long-Run Excess Returns for M&A Inversions**

This table examines the long-run excess returns generated by firms that inverted through the M&A method. Returns are reported for 1- and 2-year periods following the initial inversion announcement and as of December 31, 2015. Column (1) displays excess returns to inverted firms relative to the S&P 500. Column (2) displays excess returns to inverted firms relative to matched control firms.

Returns are calculated using buy-and-hold abnormal returns (BHAR):

$$BHAR_{it} = AR_{it} - AR_{Index,t}$$

Significance levels are determined using bootstrapped t-statistics. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent confidence levels, respectively. Significance levels based on two-tailed tests. Standard errors are shown in parentheses.

Sample Firm	<u>(1) Benchmark: S&amp;P 500</u>				<u>(2) Benchmark: Control Firms</u>			
	Predicted Sign	1 Year	2 Year	Dec 31, 2015	Predicted Sign	1 Year	2 Year	Dec 31, 2015
Tyco		0.5169	0.9111	-1.0121		0.3400	0.6169	
XL Capital		-0.4102	0.2489	-0.6406		-0.2600	0.1580	
Trenwick		0.5337	-0.0011	-1.4383		0.5775	-0.1490	-2.6686
Argonaut		-0.5750	-0.8005	-0.7556		-0.3611	-0.6873	-2.8571
Alkermes		0.2438	0.8560			0.7133	1.2018	
Jazz		0.0837	0.6954	1.5964		-0.7596	-1.0364	-0.0898
Tronox		-0.1347	-0.3520	-1.5874		-0.0024	-0.0871	-0.9374
Pentair		0.0455	0.4159	-0.3082		0.7957	1.2246	0.6910
Stratasys		0.8950	1.3648	-0.8391		0.7677	1.2340	-1.3576
Eaton		0.3682	0.3623	-0.2149		0.0656	0.0618	-0.8412
Tower Group <sup>1</sup>		-0.0435	-1.1897			-0.3151	-1.5224	
Liberty Global		-0.0143	0.0170	-0.1731		0.0838	-0.0811	-0.0458
Actavis		0.6818	1.5241	1.6692		0.3708	0.9510	1.0641
Perrigo		-0.0051	0.2097	-0.1224		-0.6051	-0.6884	-1.0186
Endo Health		0.4354	0.1970	0.2467		0.4029	0.6236	0.4982
Horizon Pharma		0.4399		0.3845		0.2800	-0.6036	-0.3977
Medtronic		0.4257		0.5921		0.1917		0.3275
TE Conn.		0.0441		0.0030		-0.4465		-0.2557
C&J Energy		-0.6518		-0.8977		0.0131		-0.0547
Mylan		0.3271		0.0214		-0.4664		-0.6261
Steris		0.1518		0.2884		0.0354		0.4263
Wright Medical		-0.2297		-0.0154		-0.3418		-0.2067
Burger King		-0.0323		0.0206		-0.2288		-0.0799
<b>Average</b>	-	0.1346 (0.0764)	0.2973 (0.1885)	-0.1516 (0.1804)	Not significant	0.0370 (0.0890)	0.0760 (0.2075)	*-0.4437 (0.2210)

<sup>1</sup>Returns as of December 31, 2015 returns are not computed for these firms because they were acquired.

**Table 9: Long-Run Excess Returns for Restructuring Inversions**

This table examines the long-run excess returns generated by firms that inverted through a restructuring. Returns are reported for 1- and 2-year periods following the initial listing date and as of December 31, 2015. Column (1) displays excess returns to inverted firms relative to the S&P 500. Column (2) displays excess returns to inverted firms relative to matched control firms.

Returns are calculated using buy-and-hold abnormal returns (BHAR):

$$BHAR_{it} = AR_{it} - AR_{Index,t}$$

Significance levels are determined using bootstrapped t-statistics. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent confidence levels, respectively. Significance levels are based on two-tailed tests. Standard errors are shown in parentheses.

Company	<u>(1) Benchmark: S&amp;P 500</u>				<u>(2) Benchmark: Control Firms</u>			
	Predicted Sign	1 Year	2 Year	Dec 31, 2015	Predicted Sign	1 Year	2 Year	Dec 31, 2015
Loral Space		-0.0802	0.2294	-0.2281		-1.1115	-0.1946	-1.4926
Chicago B&I		-0.4617	-1.0113	7.3037		-1.2433	-0.7608	1.3398
Altisource			3.3385	1.9229				0.8301
Flextronics		-0.1554	0.9593	1.8458		-0.3233	0.5233	-0.6870
Core Labs		0.1549	1.3488			0.1549	0.6940	
Seagate		0.4973	0.1881	2.0595		-0.0162	0.0595	
Herbalife		1.0595	1.5775	6.8112		-0.0377	-0.0919	0.1723
Sensata		0.6282	0.5460	0.7128		0.5492	0.1067	0.6557
Michael Kors		0.9777	1.9763	0.0304		0.3631	1.4007	0.6463
Freescale Semi.		-0.4529	-0.3693	0.4511		-0.1797	0.0971	-0.2776
Samsonite		-0.0880	0.1639	0.1980		-0.5433	-0.3068	-0.3912
Delphi Auto		0.4463	1.2626	2.4910		0.1026	0.8780	0.9314
<b>Average</b>	+	0.2296 (0.1560)	**0.8508 (0.3317)	*2.1453 (0.7337)	Not Significant	-0.2078 (0.1614)	0.2186 (0.1747)	0.1727 (0.2610)