



Long-term event study of timber real estate investment trust conversions



Xiaorui Piao, Bin Mei ^{*}, Weiyi Zhang

Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA 30602, USA

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ABSTRACT

The long-term financial performance of four timber real estate investment trust (REIT) conversions in the United States is evaluated by an event study with one-, two-, and three-year event windows. Three types of benchmarks are used in gauging the abnormal returns. The first benchmark is a portfolio of firms that are closest in size and book-to-market ratio to the timber REITs, the second is a portfolio of pre-conversion timber firms, and the third is an equal-weighted timber exchange traded fund (ETF) comprised of selected forest firms. Four approaches are used to calculate abnormal returns. Buy-and-hold abnormal returns and cumulative abnormal returns measure the preliminary abnormal returns, zero-investment portfolio approach with rolling regression evaluates the market-based risk premiums, and panel data analyses capture the relative advantages of REITs over their competitors within the timber industry. On average, annualized abnormal returns of 0.5% and 8.9% are identified before and after the REIT conversions. There is no difference between variances of pre- and post-event annualized abnormal returns. Therefore, structural changes have added values to the timber firms in the long run.

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1. Introduction

Real estate investment trust (REIT) is a widely-used corporate structure in the United States in owning and managing various kinds of investment properties such as offices, apartments, hotels, industrial properties, and retail properties (Pagliari et al., 2005). Among many considerations, tax efficiency and liquidity are two major ones. REITs are pass-through entities that pay no income taxes at the corporate level. Instead, corporate income is distributed to the owners and income taxes are only levied at the individual level. In addition, securitized real estate equities can be traded in shares and thus partially eliminate the entry barrier of timberland investment. For a publicly-traded REIT, liquidity is more improved for the fact that stocks of real estate equities are listed and transacted in well-structured stock exchanges, just like any other financial securities. Currently, more than 200 REITs are publicly traded in the US (Mendell et al., 2008).

In the timber sector, there were five publicly traded timber REITs: Plum Creek (PCL), Rayonier (RYN), Potlatch (PCH), Weyerhaeuser (WY), and Catchmark (CTT). Among them, PCL pioneered the conversion in June 1998, followed by RYN in August 2003, PCH in September 2005, and WY in December 2009. CTT went through initial public offering in December 2013 with 280,000 acres of timberland valued at \$310

million.¹ In February 2016, WY acquired PCL with the new WY owning 13 million acres of industrial grade timberland in the US. PCL used to own and manage approximately 7.8 million acres of timberlands, produce a line of softwood lumber products, extract mineral, and receive royalties from coal bed methane, natural gas and oil production. RYN owns or leases approximately 2.3 million acres of timberlands in the US and New Zealand. RYN also has business segments in real estate, performance fiber, and logs trading. PCH owns about 1.42 million acres of land, and manufactures and sells lumber, panels and particleboard. In addition to US timberlands, WY leases another 14 million acres in Canada, manufactures wood and cellulose fiber products, and manages real estate.

Vertically integrated forest products firms, mostly structured as C-Corporations (C-Corps) and Master Limited Partnerships² (MLPs) are predecessors of timber REITs. Pressured by return-driven Wall Street investors and increasing competitions in the timber industry, a separate in business segments took place in the past two decades. Four timber firms converted to REITs, whereas the rest gradually stepped out of timberland management or sold out their timberland holdings (Hood et al., 2015). Such industry-wide segregation probably contributes to a higher level of economic efficiency and better performance of stock returns.

¹ CTT was previously recognized as Wells Timberland REIT. It is not included in the analysis due to data limitation.

² Master Limited Partnerships (MLP) are also pass-through entities. However, they have limitations in attracting institutional investors. Today, more than 70% of common equities of public timber REITs are controlled by institutional investors except for CTT, which has 20%.

^{*} Corresponding author.

E-mail addresses: piaoxr@uga.edu (X. Piao), bmei@uga.edu (B. Mei), wyzhang@uga.edu (W. Zhang).

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There are sound reasons behind these timber REIT conversions. One is double taxation under the C-Corp structure. C-Corp timber firms are considered separate legal entities from their shareholders. Hence, C-Corps pay taxes on their earnings, just as individuals do. However, when timber firms pay out dividends, those payments incur income tax liabilities for shareholders again. That is, one-dollar income is taxed twice before it is finally realized by shareholders. Income of timber REITs, on the contrary, is taxed only once at the shareholder's level. Therefore, after-tax gains are improved for timber REIT investors. Another reason for the conversions is the undervaluation of timberland assets by the market. Substantial timberland ownership changes occurred over the last two decades, when timber REITs and timberland investment management organizations (TIMOs) acquired timberlands from vertically-integrated forest products firms and private timberland owners (Binkley, 2007). Under the generally accepted accounting principles that are adopted in the US, assets are recognized by their book values. This value recognition principle puts timber firms in a disadvantageous position because most timberland assets were acquired a long time ago with few subsequent transactions. As such, the book values of timberlands are way below their fair market values. Being converted to public REITs and focused solely on timberland management, more market information is incorporated and mispricing of timberlands is alleviated. Lastly, public timber REITs offer more liquidity and transparency than their counterparts, private-equity timberland assets. TIMOs typically have minimum investment criteria that are prohibitive to retail investors and require a commitment of 10–15 years, whereas shares of public timber REITs are more easily traded. In addition, financial information of TIMOs is not disclosed to the general public, whereas public timber REITs are subject to Securities and Exchange Commission filings and routinely covered by Wall Street analysts.

The structural changes being broadly recognized, a few studies have investigated their impacts on the financial performance (Mei and Sun, 2008; Mendell et al., 2008; Sun, 2013). However, these studies are short-term analyses in nature. The long-term financial performance of publicly-traded timber REITs after conversions has not been inspected yet. This study aims to fill the knowledge gap by applying a long-term event study on timber REIT conversions with a null hypothesis being that there are no long-term abnormal returns after the conversions.

2. Literature review

In finance, event studies have been prolific on a series of corporate topics such as mergers and acquisitions, earnings announcements, dividend payments, initial public offerings, seasoned equity offerings, share repurchases, proxy fights, stock splits, spinoffs, and so on. A brief review of the literature can be found in Fama (1998). Methodologies of long-term event studies evolve over decades. The measurement of abnormal returns is of great importance and leads to various ways in selecting benchmarks such as market return proxy, individual firms, and stock portfolios, all of which demonstrate certain merits and are chosen based on the purpose of a specific study (Abadie and Gardeazabal, 2003; Barber and Lyon, 1997; Fama, 1998).

Cumulative abnormal returns (CARs) are first used in short-term event studies and demonstrate conclusive favorable statistical properties over other methods (Fama, 1998). However, there remains an ongoing dispute between buy-and-hold abnormal returns (BHARs) and CARs in long-term event studies (Barber and Lyon, 1997; Fama, 1998). Hence, recent long-term event studies have adopted both for the sake of robustness. Fama (1998) argues the vulnerability of gauging long-term abnormal returns due to incorrectly measuring risks (i.e., the bad-model problem) so alternative asset pricing models should be used. Another approach that addresses abnormal returns is known as the zero-investment portfolio approach, in which an investor holds long positions in the target firms and short positions in benchmark firms (e.g., Eberhart et al., 2004; Ikenberry and Ramnath, 2002). Then, the return-risk relation of the portfolio across the stock market is

explained by the Fama-French three-factor model (Fama and French, 1993) and the intercept from the regression is interpreted as a measure of abnormal returns. Rolling regression analyses are often used to further examine the stability of abnormal returns over time. Regarding idiosyncratic risks, the incentives of an event may be endogenously incorporated by the firm. This fact leads to additional analyses on the underlying causal effects and mechanisms of long-term financial performance. Hence, a panel data analysis can be used to deal with the endogeneity issues and reveal causal effects after controlling for other key financial variables (Donald and Lang, 2007).

In the forest products industry, Cascio (2006) identifies nine major mergers and acquisitions during 1995–2002 that involve 15 publicly-traded, integrated forest firms, and finds a significant 15% abnormal return or a net creation of \$4.7 billion of market value attributable to the merger and acquisition announcements. Mei and Sun (2008) compile a more complete database consisting of 70 mergers and acquisitions in the forest products industry from 1990 to 2004, evaluate their impact on the financial performance of forest firms, and find significant gains for the target firms. Sun and Zhang (2011) investigate the impact of vast industrial timberland sales over 1997–2007 and conclude that these sales create values for forest products firms involved without changing much on the systematic risk. Sun et al. (2013) examine both abnormal returns and volatility of public timber firms induced by timberland ownership changes over 1997–2010 and find mixed results.

Looking at timber REITs specifically, Mendell et al. (2008) examine the market response in the short term and find significant abnormal returns. They conclude that investors are in favor of the REIT conversions. Sun (2013) assesses the joint distribution between daily returns of public timber REITs and two market indices and asserts that each firm, except for PCL, has smaller volatility of tail dependence after the conversion. Sun et al. (2013) find positive abnormal returns as well as increased volatility related to the REIT conversions.

Long-term event studies in the forest industry have been scarce. The only one is by Cascio (2006), who applies the calendar-time portfolio approach to estimate the long-run performance of forest firms after mergers and acquisitions. Insignificant three-year average abnormal returns of –5% and –11% are identified compared to benchmark portfolios based on size and risk, respectively. However, as aforementioned, results of long-term event studies largely depend on the selection of benchmarks. A common way to address it is to examine the robustness of the results to different measures (Eberhart et al., 2004).

3. Methodologies

Event study, introduced by Fama et al. (1969), is a common method to evaluate the responses of stock returns to new information. A key assumption underlying event studies is the market efficiency, which dictates that market reaction to new information should be both rapid and lasting. Short-term event studies test the quickness of the market, whereas long-term event studies test the lasting effect. Regardless, an event study starts by defining an event window, during which actual returns and benchmark returns are compared and the differences are recognized as abnormal returns. Both pre- and post-event abnormal returns should be computed to detect the influence of certain event. To examine the short-term anomaly, CARs are computed by summing up abnormal returns over the event window. Then, a *t*-test is conducted to test the null hypothesis of no cumulative abnormal returns. Different event windows may lead to different findings, so timing is crucial in a short-term event study (MacKinlay, 1997).

The long-term abnormal returns are not easy to detect because of investors' financial tactics, more uncertainties over a longer period, and bad-model problems (Andrade et al., 2001; Fama, 1998). The lengthy stock holding period makes it difficult to determine whether a 15% annual abnormal return, for example, is statistically larger than zero. Biases in test statistics introduced by the CAR method force researchers to seek new methods for long-term event analyses. This study uses

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