

Gains Trading as an Earnings Management Tool: The Case of Property-Casualty Insurers

Submission to the 2019 Annual Meeting of the American Risk and Insurance Association

Abstract

We investigate the incidence of “gains trading” by property-casualty insurers, in which firms sell invested assets to achieve an earnings benchmark. We identify gains trading behavior in just over 8% of insurer financial statements in our twenty-year sample. Approximately half of this behavior was to avoid reporting losses, while the other half was to show year-over-year earnings growth. The decision to gains trade varies by firm characteristics and financial standing. Gains trading is more likely for firms organized as mutuals, which we conclude is the result of greater agency conflict for mutuals.

1. Introduction

Insurance companies derive profits from three main sources: through the sale of insurance contracts (referred to as “underwriting” gains/losses), receiving income on invested assets (coupon payments, dividends, etc.), and realizing capital gains (or losses) when investments are sold. Both underwriting and investment profits have been studied extensively in the literature, while capital gains have received far less attention. This is somewhat surprising, given the extensive discretion managers have over realizing capital gains/losses and their relative size. The purpose of this study is to fill some of that gap by investigating the use of “cherry picking” by property-casualty (P&C) insurers in the United States.

Cherry picking is defined as the “selling of available-for-sale assets to meet earnings benchmarks (Lee, Petroni, and Shen, 2006)”. We identify P&C insurers with a significantly negative relationship between realized capital gains and pretax operating income (net income before taxes and realized capital gains) as “cherry pickers.” We then examine the relationship between cherry picking behavior and a number of factors, including ownership structure, liquidity, access to external capital, and financial distress. Our study provides evidence of the financial and institutional factors that drive a firm’s decision to cherry pick investment sales.

Lee, Petroni, and Shen (2006, “LPS”) reported that publicly-traded P&C insurers identified as cherry pickers were more likely than non-cherry pickers to meet or exceed an earnings benchmark of prior year net income, but did not explore this finding further. Their study focused primarily on whether or not cherry pickers chose a reporting method that obfuscates their cherry picking activity, finding that they did. We follow the LPS methodology for identifying cherry pickers for both public and private insurers, focusing our study on factors associated with cherry picking behavior rather than attempts to hide cherry picking activity.

While our identification strategy mirrors that of LPS, our hypotheses are more closely aligned to the earnings management literature, such as Beaver, McNichols and Nelson (2003). These authors tested whether or not insurers underestimate loss reserves (reducing the loss expense) in an effort to avoid reporting small net income losses. Instead of using loss reserve adjustments as the earnings management mechanism, however, we use the realization of capital gains.¹ We examine the incidence of cherry picking to firm ownership structure and financial distress, just as

¹ Realized capital gains, while smaller than loss reserve errors, are somewhat comparable in scale. The mean loss reserve error in our dataset is -0.8% of assets, while the mean realized capital gain is 0.4% of assets. We provide more information in Section 4.

Beaver et al. did with loss reserves. Furthermore, we test the effect of liquidity and access to external capital on cherry picking, which was influenced by the findings of Colquitt et al. (1999), Ellul et al. (2015), and Lu et al. (2017), among others.

Using a dataset of insurer statutory financials from 1996 to 2015, we identify approximately 25% of P&C firms as potential cherry pickers, defined as firms with a significantly negative relationship between realized capital gains (RCG) and pretax operating income (PTOI). Specifically, we regress RCG on PTOI for each insurer, labeling the insurer a “cherry picker” if the coefficient on PTOI is significant at the 0.10 level (one-sided). We find that cherry pickers are 19% more likely than non-cherry pickers to report net income just above zero and 17% more likely to report net income just above last year’s net income. We interpret this as evidence of earnings management via realized capital gains. We further find that insurers organized as mutuals are the most likely to cherry pick, while publicly-traded insurers are the least likely. In addition, liquidity and leverage play a large part in the decision to cherry pick—firms with high levels of cash are less likely to cherry pick, while firms with high debt levels are more likely to cherry pick.

Our study contributes to the existing literature in a number of ways. First, we show that managers sell invested assets for reasons other than a response to financial market conditions. This is a manifestation of the incentive conflict between owners and managers, as outlined in Mayers and Smith (1988). Cherry picking is greatest for mutual insurers, who have a lower degree of monitoring and less access to capital than other ownership forms. Second, we identify cherry picking as an additional mechanism for insurers to manage earnings. This extends the insurance literature on earnings management and loss reserving (e.g. Beaver et al., 2003), and gives additional perspective to the banking literature on cherry picking (Dong & Zhang, 2014; Nelson et al., 2003). Third, we show that existing liquidity and access to new capital both affect a firm’s decision to realize capital gains. This provides initial evidence that insurers use invested assets as a source of internal capital, leading to new questions about the optimality of this strategy and whether invested assets are a substitute for external capital.

In the next section, we discuss the literature on cherry picking by insurers and outline the broader literature on management of earnings and capital. In Section 3, we formally introduce our hypotheses and explain our motivations. We describe our data and methodology in Section 4 and report our results in Section 5. In the final section, we review our study, highlight our results, discuss the implications, and suggest future avenues of research that may stem from our study.

2. Related Research

Research focused on insurers using capital gains to manipulate earnings is somewhat limited. LPS (2006) provided a test of realized capital gains as an earnings management tool for publicly-traded insurers. They categorized insurers as “cherry pickers” when there was a significantly negative relationship between RCG and net income before RCG. They reported that cherry pickers were more likely to meet or exceed the prior year’s earnings than non-cherry pickers, and that cherry pickers tended to use a less transparent reporting method.² A similar study by Jordan, Clark, and Smith (1997) found that RCG was negatively related to return on assets, which they interpreted as evidence of income smoothing. In a study of life insurers, Collins et al. (1997) found that RCG increased as firms faced pressure from regulators and that RCG were negatively related to pre-RCG earnings (particularly for mutual life insurers).

Realizing capital gains to manage earnings is a frequent occurrence and one that is important to investors. In a study of 515 earnings management actions over all industries, Nelson et al. (2003) reported that realizing gains and/or losses was the second-most common method of managing revenues (adjusting reserves being the most common). Managers have significant incentives to achieve certain earnings benchmarks—firms who report year-over-year earnings growth tend to be valued higher than other firms (Barth et al., 1999).³ The mechanism used to achieve such growth, however, appears to make a difference. Ahmed and Takeda (1995) concluded that investors valued RCG used for earnings management less than RCG used for other purposes, based on stock returns for publicly traded banks. Dechow and Skinner (2000) offered a comprehensive discussion of the practical, regulatory, and academic implications of earnings management.

Other studies have considered that an insurer’s decision to sell investments may be related to capital, rather than income. Recent literature has focused on insurers’ decision to sell downgraded investments. Ellul et al. (2015) found that insurers who experienced the largest rating downgrades for asset-backed securities during the 2008 financial crisis were more likely to sell securities with

² The goal of the LPS study was to investigate cherry picking as a motivation for the reporting method, so they did not report any tests of earnings management. The authors mentioned that they “find that insurers [they] designate as cherry pickers are significantly more likely, at less than the 1 percent level, to use realized gains to meet or beat the earnings benchmark than insurers not designated as cherry pickers,” but did not provide any more detail.

³ Collins et al. (1997) provided an excellent discussion of the various earnings benchmarks managers might seek, depending on the firm’s ownership structure.

large unrealized capital gains.⁴ Firms with low risk-based capital (RBC) ratios were the most likely to engage in this gains trading in order to mitigate the impact of downgrades. Lu et al. (2017) examined the decision to sell downgraded bonds by life insurers. Similar to Ellul et al., they concluded that RBC requirements were a primary factor driving the decision to sell downgraded bonds, though differences in access to capital did not explain different selling behavior between ownership structures. Earlier studies, such as Ambrose et al. (2008) and Ellul et al. (2011), came to similar conclusions regarding the influence of regulatory capital on the decision to sell downgraded investments.

The majority of papers on RCG decision-making lie outside of the insurance literature, primarily in banking. Seminal work by Scholes et al. (1990) showed that earnings play a part in banks' decision to realize capital gains, as do taxes and capital requirements. In contrast, Carey (1994) found evidence that banks sell investments to smooth earnings, but not to manage capital or tax liabilities. Beatty et al. (1995) determined that investment gains are primarily used to manage earnings and secondarily used to manage capital. More recently, Dong and Zhang (2014) investigated cherry picking behavior by banks prior to the 2008 financial crisis. They found evidence that managers realize capital gains and losses to smooth income and to meet analyst earnings expectations, but not to avoid reporting losses. The literature on earnings management by banks is vast, but Healy and Wahlen (1999) and Beatty and Liao (2014) provided comprehensive reviews.

Earnings management through insurer underwriting results has been studied extensively, given the significant effect of loss reserves in reported underwriting gains/losses and the level of discretion insurers have over reporting them. Loss reserves, particularly for long-tail lines of business, are inherently uncertain before claims are realized. Gaver and Paterson (1999) jointly examined the effect of loss reserving, recognition of gains and losses, and investment transactions, finding that all three were used to achieve satisfactory IRIS ratios before RBC was in widespread use. Beaver et al. (2003) provided evidence that insurers underestimate losses to avoid reporting negative earnings. The authors also showed that this earnings management differs by ownership structure of the firm. In contrast, Grace and Leverty (2012) offered the most

⁴ They refer to selling assets with large unrealized gains as "gains trading," and this term is often used with respect to improving a capital position. This is not the same as cherry picking, though they may appear the same. As it is defined by LPS, cherry picking specifies that managers realize capital gains to achieve a particular earnings benchmark. We use the term somewhat more loosely. In our study, cherry picking refers to selling investments (at either a gain or loss) to offset non-RCG earnings. This has potential effects on both income and capital.

recent evidence on whether or not insurers set loss reserves for purposes of income smoothing and conclude they do not.

The existing literature leaves a number of questions to be answered. First, to what degree does cherry picking RCG play a part in managing earnings? LPS provided some general results that firms achieve earnings by realizing capital gains, but further investigation is warranted. Second, given the differences in monitoring and access to capital over ownership structures, does the incidence of cherry picking differ by ownership structure? Beaver et al. (2003) illustrate the differences in loss reserve manipulation, but other mechanisms are outside the scope of their study. Finally, under what financial conditions do firms cherry pick? Selling invested assets creates liquidity and may be the only option to generate liquidity for constrained or distressed firms. We seek to answer each of these remaining questions in our study.

3. Hypotheses

Earnings management

We expect that the earnings management findings of LPS (2006) with respect to public companies will also apply to mutual firms and private companies. Insurers who achieve a particular earnings benchmark will be more likely to have cherry picked their RCG in order to achieve such a benchmark.

H1: Property-casualty insurers will engage in cherry picking of RCG to achieve earnings benchmarks.

We consider that earnings benchmarks may differ as outlined in Collins et al. (1997) and Dechow and Skinner (2000). Specifically, some firms may manage earnings to avoid net income losses, while others may wish to meet or exceed the prior year's earnings. We examine both benchmarks.

Ownership structure

While the findings of LPS (2006) apply to publicly-traded insurers, we believe cherry picking of RCG will be at least as common for private stock and mutual insurers. While private firms may face less public pressure to meet annual or quarterly earnings benchmarks, managers still have strong incentives to avoid losses and/or generate growth. Mutuals have more limited access to external capital and mutual managers face a lesser degree of monitoring by owners. Thus, we expect that mutuals are more likely to cherry pick than stock companies.

H2a: Mutual insurers are most likely to cherry pick.

H2b: Public insurers are least likely to cherry pick.

Our prediction regarding public insurers is in contrast to the findings of Beaver et al. (2003). We predict the opposite effect because under-reserving is not immediately observable by investors, while RCG are immediately and fully reported on the income statement.

Liquidity

As a corollary to earnings management, insurers may realize capital gains and capture earnings to improve their (liquid) capital position. Both realized and unrealized capital gains have the same effect on policyholder surplus, a common measure of available capital.⁵ The only balance sheet effect of RCG is with respect to liquidity—unrealized gains are not liquid until they are sold for cash. Thus we expect firms with low levels of liquid capital are more likely to realize capital gains to improve their liquidity. This is consistent with the findings of Ellul et al. (2015).

H3: Firms with higher levels of liquid capital are less likely to cherry pick.

Access to external capital

Concurrent with the liquidity hypothesis (H3), realizing capital gains is one way firms may create liquidity. While the “pecking order theory” of Myers and Majluf (1984) states that internal capital is less costly than external capital. Combining this theory with the corporate hedging model of Froot, Scharfstein, and Stein (1993), firms needing capital may sell investments as long as the opportunity cost of the future investment income and capital gains is less than the cost of external capital. This implies that firms are more likely to realize capital gains when external capital is more costly (or unavailable).

H4: Firms with less access to external capital are more likely to cherry pick.

Financial distress

Firms who are financially constrained may be forced to sell invested assets to maintain liquidity or improve capital positions, as in Ellul et al. (2015). The loss reserve literature also shows that distressed firms are more likely to manipulate loss reserves than financially healthy firms (Petroni, 1992). We expect that such constraints will lead firms to cherry pick in order to mitigate their financial distress and reduce the probability of a liquidity crisis.

H5: Firms experiencing financial distress are more likely to cherry pick.

⁵ In calculating Policyholder Surplus in the Capital and Surplus Account, the Change in Policyholder Surplus includes both (Line 22) Net Income (which includes RCG net of capital gains tax) and (Line 23) Change in Net Unrealized Capital Gains or (Losses) Less Capital Gains Tax.

4. Data and Methodology

We begin with a dataset of financials for property-casualty (P&C) insurance companies provided by the National Association of Insurance Commissioners (NAIC), starting in 1996 and ending in 2015. We focus on P&C insurers because they have fewer restrictions on their investment allocations than do life insurers and, due to the relatively short-term nature of their underwriting business, invest in more liquid securities (Nissim, 2010). We drop insurers who are not organized as stock or mutual companies. We then identify public stock insurers by matching the listed parent company from the NAIC financials to firms in the Center for Research in Security Prices (CRSP) database of stock returns.⁶ We also cross-check our public firms against a CRSP pull based on SIC codes (6330 and 6331) and lists of publicly-traded P&C insurers, such as in Fier and Liebenberg (2013). We manually examine a number of firm 10-K filings to ensure a significant portion of their revenue was derived from property-casualty insurance operations. We drop firms who report negative, zero, or missing assets or net premium written. We scale capital values (such as surplus notes and capital changes paid in) by capital and scale income statement and asset/liability values by total assets. We aggregate financials for subsidiary firms to the group level, as the decision to realize capital gains is one made at the highest level of management. Our method to identify cherry picking behavior (following LPS, 2006) includes a separate regression for each firm, so we drop firms who have fewer than five years of observation.

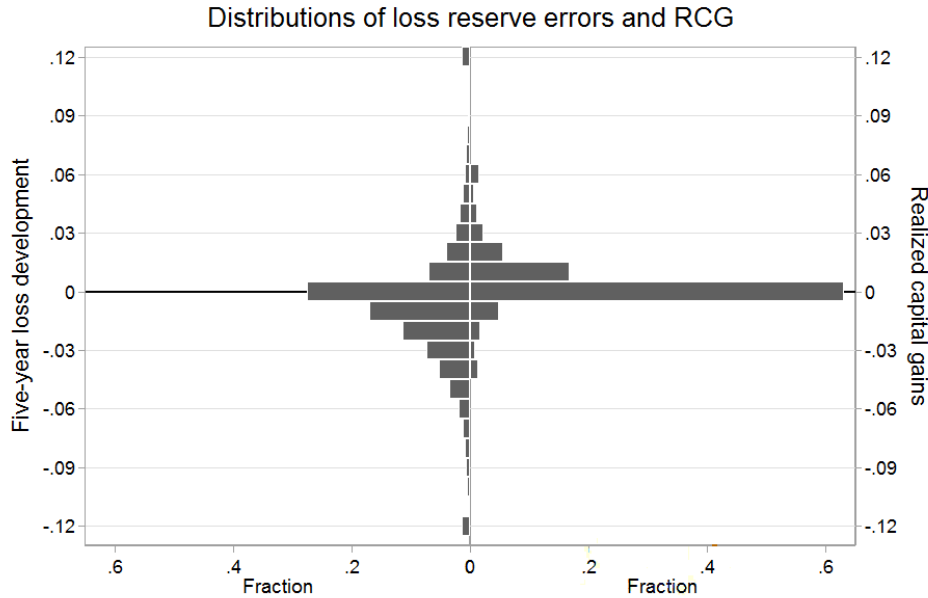
Our final dataset consists of 18,266 firm-year observations. There are 1,361 firms—431 (31.7%) are mutuals, 817 (60.0%) are private stock firms, and 113 (8.3%) are publicly-traded stocks. Firms operate during our twenty-year period of study for a mean (median) of 13.4 (14) years. More than a quarter of firms (28.2%) operate for the full twenty years, while 7.4% of firms operate for our minimum of five years.

To assess the economic significance of cherry picking, it is important to consider the scale. A good basis of comparison is loss reserve errors, which have been the focus of much prior literature. We measure loss reserve errors by the five-year “development” of losses— for accidents occurring in year t , development is the change in loss reserves between year t and year $t + 5$. Loss reserve errors are often larger than capital gains in a given year, but realized capital gains are not insignificant. In our dataset, five-year loss development ranges from -0.12 to 0.12, while realized capital gains range from -0.04 to 0.06 (both scaled by assets and winsorized at the 0.01 level). The mean loss reserve error is -0.008 and the mean realized capital gain is

⁶ We use a fuzzy matching algorithm based on names and manually check each match.

0.004. Ultimately, manipulating loss reserves and realizing capital gains have potential to influence a firm's financials to similar degrees. Figure 1 illustrates the distributions of loss reserve errors and RCG.

Figure 1: Comparison of distributions for loss reserve errors and realized capital gains



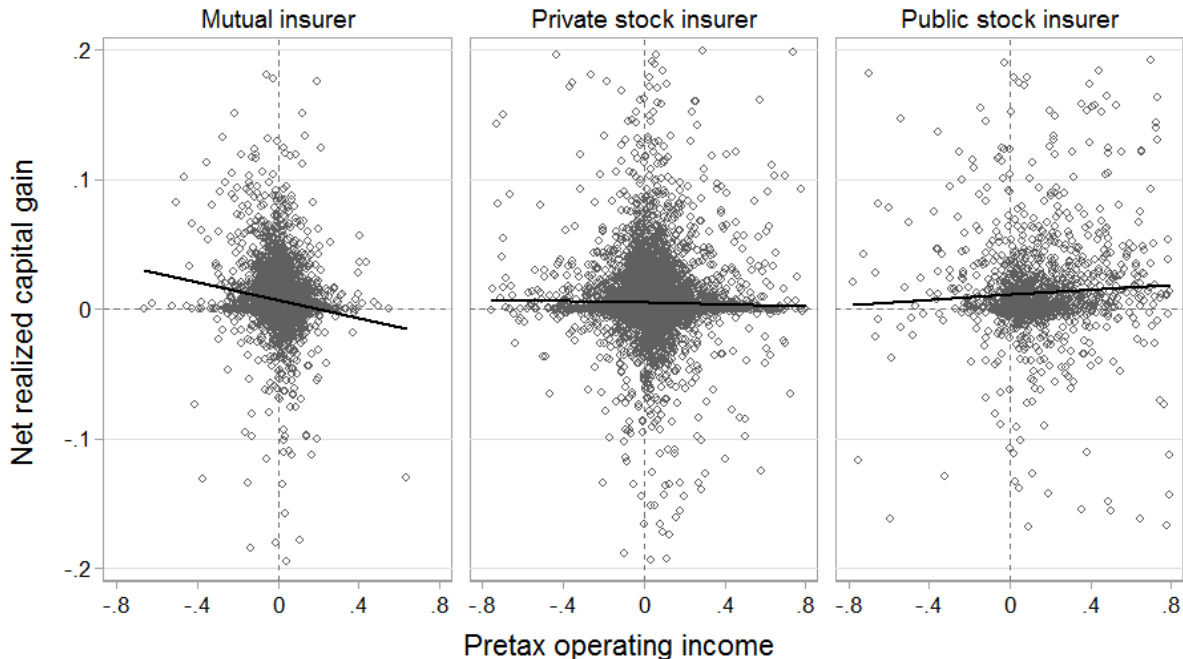
We follow the methodology of LPS (2006) to label cherry pickers as those firms with a significant negative relationship between RCG and net income before RCG. Our measure of net income before RCG is Pretax Operating Income (PTOI), which is equal to net income before taxes, dividends, and RCG. We regress RCG on PTOI, with both values scaled by Total Assets and winsorized at the 0.01 level. Our regression model is outlined in Equation (1) below. We perform this regression separately for each insurer, setting $CHERRY PICK_i = 1$ if β_i is negative and significant at the 0.10 level (one-sided). If the coefficient is not significant, $CHERRY PICK_i = 0$.

$$RCG_{it} = \alpha_i + \beta_i PTOI_{it} + \epsilon_i \quad (1)$$

We identify 287 (21.1%) of our firms as cherry pickers. Of these cherry pickers, 117 (40.8%) are mutuals, 145 (50.5%) are private stock insurers, and 25 (8.7%) are public stock insurers. The rate of cherry picking for mutual insurers is substantially greater than for stock insurers (27.2% of

mutuals cherry pick, compared to 17.8% of private stocks and 22.1% of public stocks). Figure 2 below illustrates the relationship between PTOI and RCG over the three ownership structures.

Figure 2: Relationship between PTOI and RCG, by ownership structure



Gray circles are drawn for each firm-year observation. The thick black line represents the fitted values. Reference lines are drawn at zero.

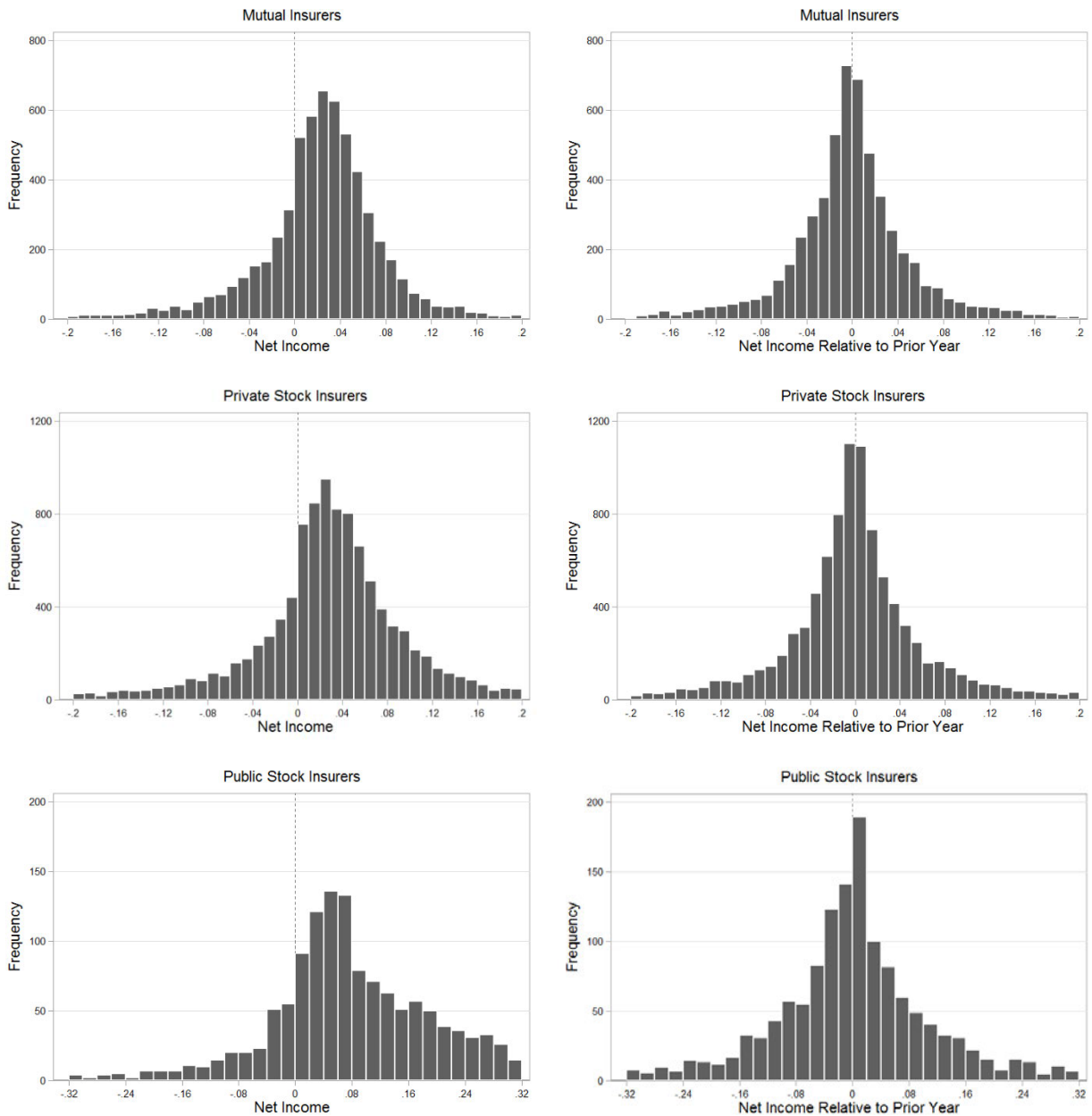
Earnings may be managed to achieve a particular benchmark, but the earnings goal may differ by firm. One goal may be to avoid reporting losses, and Beaver et al. (2003) observed a discontinuity between small reported losses and small reported gains in the distribution of net income. Alternatively, a firm may seek to meet or exceed the prior year's net income, showing year-over-year growth. This benchmark was the focus of LPS, though they did not report specifics of the discontinuity. We consider both benchmarks in our study, evaluating both raw net income (*NI*) and income relative to the prior year (*RELNI*).⁷

We follow the “portfolio method” in setting earnings intervals to evaluate earnings management (Beaver et al., 2003; Degeorge et al., 1999). We specify intervals equal to $2 \times IQR \times N^{-1/3}$ in the distribution of net income for each of the three ownership structures. The interval including and

⁷ Firms also may seek to meet or exceed analyst expectations (Dechow & Skinner, 2000), but this would apply only for those publicly-traded firms who have an analyst following. LPS chose not to investigate firms who seek to achieve analyst expectations, as 25% of the publicly-traded firms in their sample are not followed by any analysts.

immediately above $NI = 0$ represents the firms most likely to have engaged in earnings management, as those are the insurers who most closely avoided reporting negative earnings. Those insurers reporting net income (relative net income) in the interval immediately above zero are designated with an indicator variable $ABOVENI = 1$ ($ABOVERELNI = 1$), with the indicator values equal to zero for all other insurers. The interval immediately below zero is assigned an indicator variable value $BELOWNI = 1$ ($BELOWRELNI = 1$) and zero otherwise. We provide distributions in Figure 3, with distributions of Net Income in the left column, distributions of Relative Net Income in the right column, and ownership structure in each row. The vertical line in each distribution is at zero. The discontinuity in raw net income observed by Beaver et al. (2003) is clear for all ownership forms, but only public firms appear to have a jump in earnings to show year-over-year growth.

Figure 3: Net Income and Net Income Relative to Prior Year, by Ownership Structure



Distributions of Net Income are in the left column and distributions of Relative Net Income are in the right column. Both variables are scaled by total assets. Mutual insurers are in the first row, private stock insurers are in the second row, and public stock insurers are in the third row. The vertical line is set at zero to show the discontinuity from negative earnings to positive earnings, which is consistent with earnings management activity. The distributions above use equal-sized intervals of net income for illustrative purposes. Following the prior literature, the intervals in our analysis are calculated to have an equal number of observations, which mitigates the influence of outliers.

Having calculated our earnings management variables, we conduct a logistic regression of *CHERRY PICK* on variables related to our hypotheses. Testing the ownership structure hypothesis involves indicator variables for *MUTUAL* and *PUBLIC*, with private stocks being the omitted

category. Our indicator variables for earnings management, *ABOVENI* or *ABOVERELNI* test the earnings management hypothesis. We include indicators for the interval immediately below zero (last year's net income), *BELOWNI* and *BELOWRELNI* and test for a significant difference in coefficients between the above and below indicators. We expect managed earnings to be *the result of cherry picking* (*ABOVENI* and *ABOVERELNI*), so we use period t values.

In contrast, the other hypotheses are thought to influence cherry picking behavior *ex ante*, so we use lagged values from year $t - 1$. We test the liquidity hypothesis by including *CASH* (scaled by assets) as a regressor. We examine the financial distress hypothesis by including an indicator variable (*DISTRESS*) for any IRIS ratios outside the normal range as specified by the NAIC IRIS Ratio Guide (2016).⁸ Our variable to test the access to capital hypothesis is *LEVERAGE*, which is equal to total liabilities divided by total assets (Colquitt et al., 1999). All else equal, firms who are more highly levered will have less access to external capital. We are currently in the process of collecting other variables for this test, such as credit ratings.⁹

We include a number of control variables. We include the ratio of capital to assets (*CAPASSRATIO*, surplus divided by total assets) to control for existing capital levels. Internal capital markets may be a substitute for RCG, so we include the number of members in a group (*NUMINGRP*) as a rough proxy. We add controls for firm age (*AGE*) and size (*LOGASSETS*). We also include a fixed effect for each year, as market conditions may have an industry-wide effect on the decision to realize capital gains. We specify robust standard errors.

In constructing our dataset, we noted that financials tended to be significantly different in the last year before a firm leaves the dataset (due to insolvency, acquisition, etc.). Specifically, net premiums written, total assets, and net income (among other variables) were significantly lower in a firm's last year of operation ($p < 0.01$ for total assets and net income, $p < 0.05$ for NPW). Considering these differences, we exclude the last year of observation for firms who exit the dataset before 2015 (our last year of data). Our general regression model is as follows:

⁸ Traditionally, insurance regulators flagged insurers for financial distress if one or more IRIS ratios is outside of the normal ranges. We exclude any IRIS ratios that would be influenced by RCG, including Investment Yield (Ratio 6) and those involving the change in Policyholder Surplus (Ratios 7 and 8). This criterion matches that of Beaver et al. (2003) and Petroni (1992).

⁹ We also are in the process of collecting data to test whether cherry picking differs by the level of monitoring. These variables include including ownership by institutional investors (which may also proxy for access to capital), independent board members, and an indicator variable for CEO and Chairman of the Board being the same individual.

$$\begin{aligned}
& \text{logit}(CHERRY\text{PICK}_{i,t}) \\
& = \alpha + \beta_1 MUTUAL_i + \beta_2 PUBLIC_i + \beta_3 ABOVENI_{i,t} + \beta_4 BELOWNI_{i,t} \\
& + \beta_5 CASH_{i,t-1} + \beta_6 LEVERAGE_{i,t-1} + \beta_7 DISTRESS_{i,t-1} \\
& + \beta_8 NUMINGRP_{i,t} + \beta_9 CAPASSRATIO_{i,t-1} + \beta_{10} AGE_{i,t} \\
& + \beta_{11} LOGASSETS_{i,t}
\end{aligned} \tag{2}$$

The explanatory variables *ABOVENI* and *BELOWNI* are replaced with *ABOVERELNI* and *BELOWRELNI* when we consider year-over-year growth (rather than avoiding losses) as the earnings goal. We provide definitions of these variables and summarize their expected coefficients in Table 1. Because the regression model in Equation (2) is a logit, coefficients are reported as odds ratios, with an odds ratio less than one meaning that cherry picking is less likely and an odds ratio greater than one meaning cherry picking is more likely.

Table 1: Definitions for dependent variable and explanatory variables of interest

| Variable | Definition | Expected Coefficient (Hypothesis) |
|--------------------------|--|------------------------------------|
| <i>CHERRY\text{PICK}</i> | 1 if negative and significant relationship between RCG and Pretax Operating Income, 0 otherwise | Dependent variable |
| <i>MUTUAL</i> | 1 if insurer is organized as a mutual, 0 otherwise | >1 (Ownership) |
| <i>PUBLIC</i> | 1 if insurer is publicly traded on a U.S. exchange, 0 otherwise | <1 (Ownership) |
| <i>ABOVENI</i> | 1 if insurer's net income is in the first interval above and including zero, 0 otherwise | >1 (Earnings Management) |
| <i>ABOVERELNI</i> | 1 if insurer's net income less last year's net income is in the first interval above and including zero, 0 otherwise | >1 (Earnings Management) |
| <i>CASH</i> | Cash as of the end of the prior year, scaled by total assets | <1 (Liquidity) |
| <i>LEVERAGE</i> | Total liabilities divided by total assets as of the end of the prior year | >1 (Access to external capital) |
| <i>DISTRESS</i> | 1 if any IRIS ratios in the prior year were outside of the normal range specified by the NAIC, 0 otherwise | >1 (Financial distress) |

We provide summary statistics for these variables and control variables in Table 2. Approximately 26% of our observations indicate cherry picking. Firms organized as mutuals comprise 34% of the sample, while publicly-traded firms comprise 8.9%. Approximately 5% (7%) of insurer-event

observations report net income in the interval including and just above zero (last year's net income). On average, firms hold approximately 13% of assets in cash, though this is highly skewed with a median of 4.6%. More than 12% of observations report negative cash, which is surprising. We are investigating the implications of this value. Leverage also appears to be skewed, with a mean of 1.0 (liabilities equal to assets) but a median of 0.63. Leverage is less than one for 76% of observations. More than 60% of observations include at least one IRIS ratio outside of the normal ranges, which is likely a function of our broad definition of *DISTRESS*. A Risk-Based Capital (RBC) ratio less than 2.0 (a more conservative and literal definition of distress) indicates that only 0.5% of firms were subject to actual regulatory action.

Table 2: Summary statistics for variables of interest

| | Mean | Median | Min | Max | SD | N |
|--------------------|--------|--------|--------|---------|--------|--------|
| <i>CHERRY PICK</i> | 0.256 | 0.000 | 0.000 | 1.000 | 0.437 | 17,654 |
| <i>MUTUAL</i> | 0.340 | 0.000 | 0.000 | 1.000 | 0.474 | 17,654 |
| <i>PUBLIC</i> | 0.089 | 0.000 | 0.000 | 1.000 | 0.285 | 17,654 |
| <i>ABOVENI</i> | 0.049 | 0.000 | 0.000 | 1.000 | 0.217 | 17,654 |
| <i>ABOVERELNI</i> | 0.067 | 0.000 | 0.000 | 1.000 | 0.249 | 17,654 |
| <i>CASH</i> | 0.133 | 0.046 | -1.326 | 8.986 | 0.248 | 17,654 |
| <i>LEVERAGE</i> | 1.004 | 0.626 | 0.010 | 9.457 | 1.385 | 17,654 |
| <i>DISTRESS</i> | 0.601 | 1.000 | 0.000 | 1.000 | 0.490 | 17,654 |
| <i>NUMINGRP</i> | 1.986 | 1.000 | 1.000 | 48.000 | 3.159 | 17,654 |
| <i>CAPASSRATIO</i> | 0.921 | 0.586 | -8.557 | 24.180 | 1.381 | 17,654 |
| <i>AGE</i> | 56.726 | 38.000 | 0.000 | 263.000 | 49.050 | 17,650 |
| <i>LOGASSETS</i> | 11.095 | 10.888 | 4.378 | 19.401 | 2.362 | 17,654 |

These summary statistics are for our full panel, but fewer observations are included in our regressions due to our use of lagged values for some variables. Summary statistics for the sample included in the regressions are not significantly different.

5. Results

Main results

We report results of our analysis in Table 3. The first column is the logistic regression of *CHERRY PICK* on the variables of interest, using non-negative net income as the earnings benchmark. The second column uses the prior year's net income as the earnings benchmark. Coefficients are converted to odds ratios, so that a coefficient above one indicates more likely to cherry pick and a coefficient below one indicates less likely to cherry pick. Overall, these models

significantly predict the occurrence of cherry picking, with a chi-squared statistic significant at better than the 0.0001 level. The pseudo R-squared statistic is relatively low at 0.033, but this is to be expected given the limited variation in the dependent variable (it is also consistent with the results in Beaver et al., 2003).

Firms who report small positive amounts of net income are more likely to have cherry picked their RCG, as are firms who report net income slightly greater than the prior year. Those with earnings immediately below the benchmark levels are not significantly more likely to have cherry picked. This supports the earnings management hypothesis. Mutuals are the most likely ownership form to engage in cherry picking (50% more likely than private stock firms), while publicly-traded stock firms are least likely (26% less likely than private stock firms). This finding is consistent with our ownership structure hypotheses. Firms with higher levels of cash are less likely to cherry pick, consistent with our expectations regarding liquidity. Using leverage as a proxy for access to external capital, firms who have less access to external capital are more likely to cherry pick. This provides some indication that realizing capital gains and external financing are substitutes. Firms who experience financial distress are slightly less likely to cherry pick, which conflicts with our prediction regarding financial distress. It may be that the potential for greater scrutiny when under financial distress leads firms to be more cautious with respect to cherry picking.

Table 3: Determinants of cherry picking

| Dependent var: <i>CHERRY PICK</i> | (1) | (2) |
|-----------------------------------|---------------------|---------------------|
| <i>ABOVENI_t</i> | 1.191** (0.103) | |
| <i>BELOWNI_t</i> | 0.984 (0.090) | |
| <i>ABOVERELNI_t</i> | | 1.169*** (0.084) |
| <i>BELOWRELNI_t</i> | | 1.083 (0.077) |
| <i>MUTUAL_t</i> | 1.504*** (0.072) | 1.504*** (0.072) |
| <i>PUBLIC_t</i> | 0.741*** (0.059) | 0.734*** (0.058) |
| <i>CASH_{t-1}</i> | 0.614*** (0.108) | 0.615*** (0.108) |
| <i>LEVERAGE_{t-1}</i> | 1.203*** (0.039) | 1.207*** (0.039) |
| <i>DISTRESS_{t-1}</i> | 0.930* (0.040) | 0.941 (0.041) |
| <i>NUMINGRP_t</i> | 1.001 (0.021) | 1.001 (0.021) |
| <i>CAPASSRATIO_{t-1}</i> | 0.728*** (0.032) | 0.726*** (0.032) |
| <i>AGE_t</i> | 1.002*** (0.000) | 1.002*** (0.000) |
| <i>LOGASSETS_t</i> | 1.138*** (0.014) | 1.136*** (0.014) |
| Year FE | Yes | Yes |
| Observations | 16,130 | 16,130 |
| Pseudo R ² | 0.0327 | 0.0328 |
| χ ² | 526.9 | 525.4 |

Robust standard errors are reported in parentheses. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

In addition to this primary result, we investigate the effect of a number of alternative explanatory variables. Our measure of *DISTRESS* is admittedly broad, as it takes a value of one if any subsidiary has an IRIS ratio outside the normal range. As an alternative, we calculate the total number of abnormal IRIS ratios for an insurer and divide by the number of members in the insurance group (*NUMDISTRESS*).¹⁰ This gives a “scaled” distress level, the average number of

¹⁰ If an insurer is not part of a group, the denominator is one.

abnormal IRIS ratios per group member. We also investigate the role of internal capital markets, replacing the rough proxy *NUMINGRP* with *ICMTRANSACT*, equal to reinsurance ceded to affiliates minus reinsurance assumed from affiliates, divided by direct premiums written. We report results using these alternative explanatory variables in Table 4.

Table 4: Determinants of cherry picking (alternative)

| Dependent var: <i>CHERRY PICK</i> | (1) | (2) |
|-----------------------------------|---------------------|---------------------|
| <i>ABOVENI_t</i> | 1.199** (0.103) | |
| <i>BELOWNI_t</i> | 0.996 (0.091) | |
| <i>ABOVERELNI_t</i> | | 1.170** (0.084) |
| <i>BELOWRELNI_t</i> | | 1.078 (0.077) |
| <i>MUTUAL_t</i> | 1.483*** (0.071) | 1.482*** (0.071) |
| <i>PUBLIC_t</i> | 0.733*** (0.058) | 0.728*** (0.058) |
| <i>CASH_{t-1}</i> | 0.627*** (0.110) | 0.628*** (0.110) |
| <i>LEVERAGE_{t-1}</i> | 1.228*** (0.034) | 1.231*** (0.034) |
| <i>NUMDISTRESS_{t-1}</i> | 0.960** (0.017) | 0.964** (0.017) |
| <i>ICMTRANSACT_t</i> | 0.703*** (0.047) | 0.704*** (0.047) |
| <i>CAPASSRATIO_{t-1}</i> | 0.722*** (0.023) | 0.722*** (0.023) |
| <i>AGE_t</i> | 1.002*** (0.000) | 1.002*** (0.000) |
| <i>LOGASSETS_t</i> | 1.133*** (0.014) | 1.131*** (0.014) |
| Year FE | Yes | Yes |
| Observations | 16,130 | 16,130 |
| Pseudo R ² | 0.0344 | 0.0345 |
| X ² | 551.0 | 549.9 |

Robust standard errors are reported in parentheses. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

After including these alternative variables of interest, the coefficients on our initial explanatory variables of interest do not change significantly. The coefficient on *NUMDISTRESS* indicates that cherry picking becomes less likely as the insurer reports IRIS ratios outside of normal ranges. Similar to *DISTRESS* in our primary regression results, this is the opposite effect we predicted, but is consistent with greater regulatory scrutiny. The coefficient on *ICMTRANSACT* implies that internal capital markets are a substitute for cherry picking. Internal capital markets have a net-zero effect on the income statement, but may create balance sheet liquidity for group members who need it.

Is cherry picking necessarily a bad thing? We have conducted some initial tests (not reported) that indicate that cherry picking behavior is detrimental to owners. Return on assets (ROA) is significantly lower for insurers who cherry pick (2.17% versus 1.90%, $p < 0.01$) and the coefficient of variation of ROA is higher for cherry pickers (0.53 versus 0.93, $p < 0.01$). Cherry pickers do appear more likely to pay dividends, with 6.02% of non-cherry pickers paying dividends versus 7.56% of cherry pickers ($p < 0.01$). If we define a “cherry picking event” to be the first year a firm had a combination of positive RCG, negative PTOI, and non-negative Net Income, we can compare results within a firm.¹¹ The mean ROA prior to a cherry picking event is 2.42%, while in the years after a cherry picking event, the mean ROA is 1.07% ($p < 0.01$). The act of cherry picking does appear to slightly reduce the variability of ROA—the coefficient of variation of ROA is 1.05 prior to cherry picking and 0.91 after cherry picking (not significant). We are developing additional tests to fully examine the effect of cherry picking on owners.

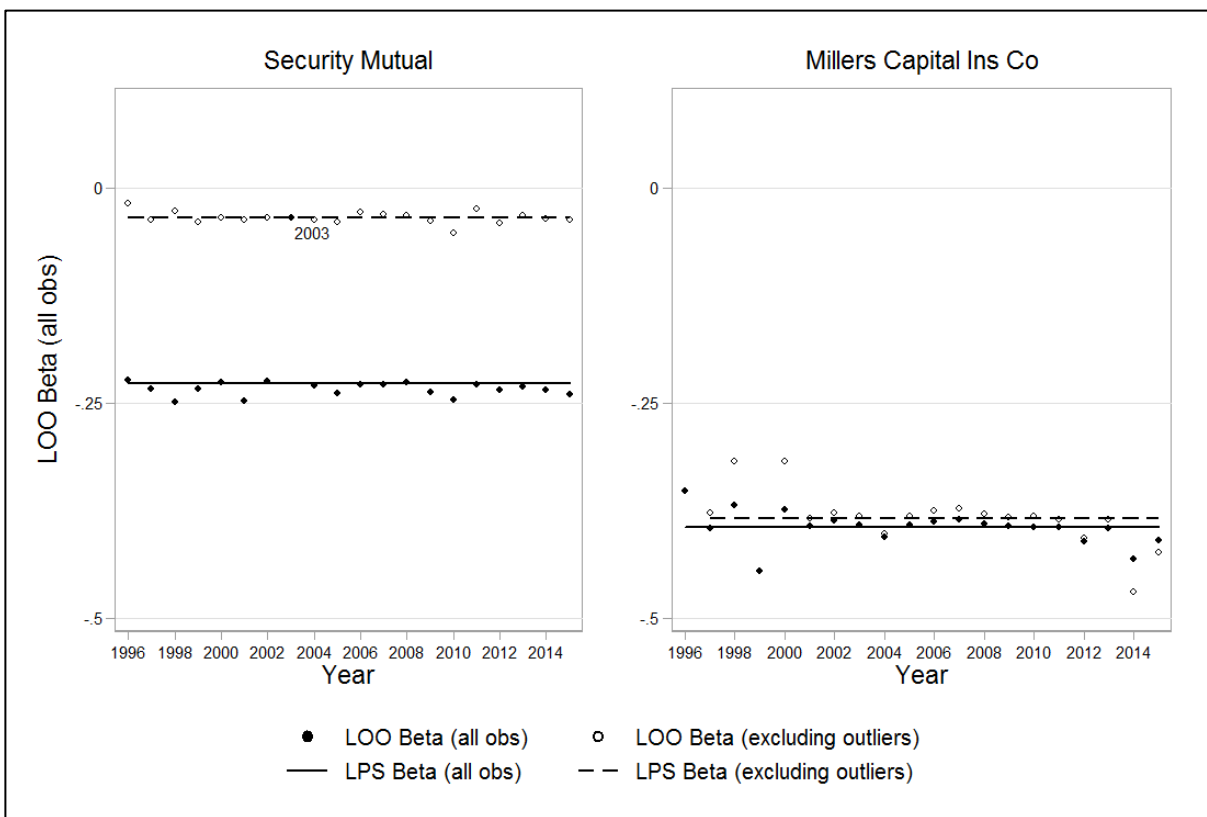
Robustness

Given the relatively small sample size in each firm-specific regression, the LPS method of identifying cherry pickers is susceptible to outliers even when using winsorized values of RCG and PTOI. To address this, we conduct a jackknife estimation of Equation (2), conducting a separate regression for each firm-year observation and leaving out one year of observation in the regression. This results in a separate leave-one-out (LOO) beta for each firm-year observation. If the LOO beta for a particular year is more than two standard deviations from the average LOO beta for that firm, we identify this year as an outlier and exclude it from a second round of LPS (i.e. non-jackknife) regressions. If the beta from the second round of LPS regressions is still significantly negative, we label the firm as a “consistent” cherry picker (*CONSIS_CP* = 1) and use this indicator as an alternative dependent variable.

¹¹ We are also considering this or a similar measure as an alternative dependent variable.

We illustrate this strategy in Figure 4, with the solid line representing the initial estimate of beta using the LPS method and the solid dots representing LOO estimates of beta. For Security Mutual, the 2003 year is an outlier that influences our negative estimate of beta in the original LPS identification (i.e. the LOO beta for 2003 tells us that beta is much less negative when leaving out 2003). For Millers Capital, the years 1996 and 1999 are the largest outliers but do not appear to be significantly different from the initial beta estimate. Once we exclude the outlier years for both firms, we re-estimate beta using the LPS method. The dotted line represents this new estimate of beta. For Security Mutual, there was a significant change in the LPS beta estimate after excluding the 2003 outlier (beta increased from -0.22 to -0.03), while the beta for Millers Capital did not substantially change after excluding 1996 and 1999 (beta increased from -0.39 to -0.38). The updated beta for Security Mutual is no longer significantly negative, but the updated beta for Millers Capital remains significantly negative. Thus, we set $CONSIS_CP = 0$ for Security Mutual and $CONSIS_CP = 1$ for Millers Capital. For illustration, we again re-estimate the LOO betas (excluding outliers from first LOO iteration) to show that the LOO betas changed significantly for Security Mutual but not for Millers Capital, and all LOO betas are now all centered around the updated LPS beta.

Figure 4: LPS beta estimates before and after excluding outliers



In Table 5, we report the results of the logistic regression of *CONSIS_CP* on the variables in Equation (2). The coefficients on the earnings management variables and ownership variables are mostly consistent with our main results. The only exception is that firms reporting earnings just below the prior year's earnings also were likely to cherry pick (though less so than firms showing slight growth). Public companies appear to be even less likely to cherry pick after controlling for outliers. Consistent with our primary results, firms with higher levels of cash are less likely to cherry pick, highly levered firms are more likely to cherry pick, and distressed firms are less likely. This alternative measure of cherry picking as our dependent variable does not result in higher goodness-of-fit statistics.

Table 5: Determinants of cherry picking (robustness)

| Dependent var: <i>CONSIS_CP</i> | (1) | (2) |
|--|---------------------|---------------------|
| <i>ABOVENI</i> | 1.218*** (0.112) | |
| <i>BELOWNI</i> | 0.954 (0.096) | |
| <i>ABOVERELNI</i> | | 1.285*** (0.096) |
| <i>BELOWRELNI</i> | | 1.218*** (0.091) |
| <i>MUTUAL</i> | 1.266*** (0.065) | 1.265*** (0.065) |
| <i>PUBLIC</i> | 0.481*** (0.040) | 0.466*** (0.039) |
| <i>CASH</i> _{<i>t</i>-1} | 0.674* (0.137) | 0.676* (0.137) |
| <i>LEVERAGE</i> _{<i>t</i>-1} | 1.191*** (0.054) | 1.198*** (0.054) |
| <i>DISTRESS</i> _{<i>t</i>-1} | 0.906** (0.042) | 0.926* (0.043) |
| <i>NUMINGRP</i> | 0.968 (0.035) | 0.968 (0.035) |
| <i>CAPASSRATIO</i> _{<i>t</i>-1} | 0.767*** (0.047) | 0.766*** (0.047) |
| <i>AGE</i> | 1.000 (0.001) | 1.000 (0.001) |
| <i>LOGASSETS</i> | 1.201*** (0.016) | 1.199*** (0.016) |
| Year FE | Yes | Yes |
| Observations | 16,130 | 16,130 |
| Pseudo R ² | 0.0340 | 0.0347 |
| χ ² | 496.3 | 503.3 |

Robust standard errors are reported in parentheses. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

We examine a number of other alternative models which are not reported. We create an indicator variable for negative PTOI and positive RCG in the same year, finding consistent results for ownership structure, cash, and leverage. In this model, we exclude the earnings management and distress variables, as firms with negative PTOI are much more likely to have net income close to zero.¹² In an investigation of earnings management by ownership structure, we interact the

¹² We investigated the effect of the non-negative earnings management variable *ABOVE* and included another indicator variable for those firms reporting net income just below zero (*BELOW*). The coefficient on

earnings management indicator variables with ownership structure indicator variables. Our preliminary results indicate that mutuals and private companies are more likely to cherry pick to achieve a year-over-year increase in net income than to avoid reporting negative net income, but we are still evaluating the results of this model. We also re-run the original regressions without excluding the last year of firms who drop out of the sample and results do not significantly differ.

6. Conclusion

Prior studies have shown that managers of property-casualty insurance companies may manipulate loss reserves to achieve a particular earnings benchmark (Beaver et al., 2003). How else might managers achieve that earnings benchmark? One possible method is by “cherry picking”—selling invested assets at a gain, where the gain becomes revenue and increases the firm’s net income. Lee, Petroni, and Shen (2006) found evidence of this behavior for publicly-traded insurers, but focused on how managers might conceal earnings achieved in this way. We extend their study to both public and private firms, focusing on the potential drivers of earnings management as outlined in Beaver et al. (2003) for loss reserves.

We identify insurers who engage in cherry picking as those with a significantly negative relationship between realized capital gains and pretax operating income. We investigate the factors that influence this cherry picking behavior, including ownership structure, liquidity, access to external capital, and financial distress. We hypothesize that mutual insurers, firms with low levels of cash, firms with less access to external capital, and firms who are financially distressed will be more likely to cherry pick.

We find support for our ownership hypothesis—relative to private stock insurers, mutual insurers are more likely to cherry pick and publicly-traded insurers are less likely to cherry pick. Cash holdings are negatively related to the likelihood of cherry picking. Firms who are more highly levered are more likely to cherry pick, which we interpret to mean cherry picking is a substitute for external capital. Distressed firms, contrary to our expectations, are less likely to cherry pick. We suggest that this is because distressed firms are subject to higher levels of regulatory scrutiny. In an alternative model, we find that firms with high internal capital market transactions are less likely to cherry pick. We conduct a number of robustness tests which support our initial findings.

ABOVE was 2.4194 and highly significant, while that for *BELOW* was 0.9740 and not significant. This provides some evidence of earnings management by realizing capital gains, but the selection issue remains. We do not observe the same results when considering net income relative to the prior year’s earnings.

Our results with respect to ownership structure may be driven by two factors. Mutual insurers have fewer ways to access external capital than other firms, so may be forced to cherry pick as a source of available capital. Our findings regarding liquidity and access to external capital are consistent with this theory. We are in the process of collecting other proxies for access to external capital, such as credit ratings. Additionally, managers of mutual insurers are subject to less monitoring by owners of the firm (Mayers & Smith, 1988). This allows for greater opportunities for earnings management by mutual managers than for managers of public or private stocks. The lower likelihood of cherry picking for distressed insurers, and our interpretation of the unexpected result, supports the idea that cherry picking is less likely when monitoring is high.¹³ Our next step is to create additional variables for the level of monitoring and quality of corporate governance to investigate this further.

The results of our study have a number of practical implications for insurance markets. We conclude that higher regulatory scrutiny motivates our finding that firms under even a minimal amount of financial distress are less likely to cherry pick. This is consistent with the finding in LPS that firms wish to hide their cherry picking activity. Consumers who are considering a mutual insurer may wish to glance at the financial statements to see if cherry picking is helping the insurer to remain solvent. Given the initial indication that monitoring may be negatively related to cherry picking, regulators and owners might consider cherry picking to be a signal of agency conflicts, particularly when it is done consistently. Future research on cherry picking using the LPS methodology should account for the influence of outliers, as we did in our robustness tests.

Our study has a number of limitations. First, as in most of the earnings management literature, we are unable to directly observe the intent or expectations of managers. There are certainly firms who achieved small levels of net income that did not do so by managing earnings. The decision to realize capital gains for those firms may have been completely independent of achieving an earnings benchmark. There also may be firms who managed earnings via cherry picking and achieved net income greater than our “small net income” interval, so we consider this potential selection issue to be random. Second, loss reserving is likely a preferable method of managing earnings than realizing capital gains in many cases—losses are a much larger item on the income statement and errors are not detectable for many years. A potential advantage of using realized capital gains to manage earnings is that selling assets is almost completely discretionary (the only

¹³ The findings in Lee et al. (2006), that firms choose a reporting method to conceal cherry picking, also support this.

restriction being that the remaining portfolio must comply with regulations). Setting loss reserves, on the other hand, must be actuarially justified and are subject to regulatory scrutiny.

We believe our study generates new questions about the decision to realize capital gains. Subsequent research may focus on comparing cherry picking to loss reserve manipulation and the conditions under which a firm may engage in each. Given that realizing capital gains and loss reserving have similar effects on net income, other management goals studied in the loss reserving literature (such as net income smoothing and maximizing executive compensation) might also be applied to realized capital gains.

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