

EARNINGS MANAGEMENT AND SHARE MARKET PERFORMANCE: FURTHER EVIDENCE FROM EQUITY CARVE-OUTS

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Abstract

This study examines 326 equity carve-out offerings during 1982-1997. We investigate whether parent firms manage earnings of carve-out firms prior to initial public offering in an attempt to increase earnings and proceed from the issue. We estimate discretionary accruals by using three cross-sectional modifications of Jones (1991). We find that the difference between high and low discretionary accruals is best captured when we estimate discretionary accruals using the performance-matched model. We also examine the one-year, two-year and three-year buy-and-hold abnormal returns (BHAR) of the carve-out firms. There are no significant differences in share returns between the carve-out and the performance-matched firms, but after controlling for the level of discretionary accruals, we find that carve-out firms with high level of discretionary accruals consistently perform poorly one-year to three-years after the offering. We also find significant negative correlation between discretionary accruals estimated by performance matched Jones model and buy and hold abnormal returns. These results are consistent with issuers of the carve-out firm managing the earnings of the carve-out firm upwards to influence initial offer price but we conclude that more investigation is necessary to understand the incentives of the parent firms in doing so.

1. INTRODUCTION

The US SEC has over recent years pinpointed earnings management for the waning credibility of financial statements. This is aggravated by high profile corporate collapses often accompanied by fraudulent accounting practices. The appetite for financial statement issuers to manage earnings may be influenced by job security, self-interest in the presence of compensation schemes or need to achieve target earnings and meet market's expectations. The desire to increase earnings may exacerbate when firms prepare to go public through equity issue and the scarcity of historical accounting information to verify the financial statement numbers only underscores the opportunity for issuers to manage earnings prior to the public offering.

This paper examines whether parents of carve-out firms adopt income-increasing accruals prior to offering in an effort to increase earnings and therefore increase issue price on initial offer. Obviously, a higher issue price will increase expected proceeds to be received by the parent from sale of equity. Powers (2003) examine whether carve-out transactions are driven by efficiency or opportunity to sell over valued subsidiaries. His results support the latter arguing that many parents use the carve-out to trade equity for cash particularly when parent's liquidity is low.

We examine 326 carve-outs during 1982-1997 to investigate whether earnings management is evident in the period prior to carve-out. We utilised three methods to estimate expected and discretionary accruals: a) cross-sectional Jones (1991), b) cross-sectional Jones with lag return on assets (ROA) and c) performance matched Jones model. We find that carve-out firms with high discretionary accruals in the year

of offering experience a drop in long-run share returns, a pattern consistent with earnings management.

The remainder of the paper is organized as follows. The next section discusses the existing literature on earnings management, the motivation of parent firms to do so prior to carve-out and the market reaction to such behaviour. Section 3 outlines the sample and research method used for this study. Section 4 presents the empirical results. Section 5 provides our conclusion.

2. EARNINGS MANAGEMENT, MOTIVATION OF PARENT FIRMS TO MANAGE EARNINGS AND MARKET REACTION TO CARVE-OUT OFFERINGS

Earnings management occurs when financial statement issuers use their discretion to report financial data.¹ This is critical to the price-setting process of firms going public for the first time because publicly available information about the firm at the time of offering is scant. The evidence on whether IPO firms engage in opportunistic earnings management is mixed. Aharony, Lin and Loeb (1993) investigate whether firms manipulate earnings prior to an initial public offering. They suggest that managers have incentives to behave opportunistically in an effort to increase the offer price but provide only a weak support for their earnings manipulation hypothesis. To the extent that evidence of earnings management was detected, it was more pronounced for small firms with higher levels of debt.

¹ Teoh, Welch and Wong (1998a) discuss four ways by which earnings can be managed by financial statement issuers. Firstly, management can choose an accounting method that will affect the timing of when revenues and expenses are recorded. Secondly, there is much discretion on how accounting estimates and principles can be applied. For example, estimation of bad debts or the determination of estimated useful life of an asset. Thirdly, financial statement issuers can exercise judgment on when and how events are recognised as accounting events, which then have to be disclosed in the financial statements. Lastly, management has power over deciding when to acquire and dispose of assets, and when to time sales of non-current assets to recognise gains or losses.

Other studies indicate that firms do manage their earnings prior to listing. For example, Neill, Pourciau and Schaefer (1995) report marginal but significantly positive association between the initial proceeds of a public offering and a selection of accounting methods that result to higher earnings and asset values. Friedlan (1994) finds evidence that IPO issuers use income increasing discretionary accruals prior to the public offering.

Teoh, Wong and Rao (1998) examine the magnitude of accrual in the year of issue and several years after and find that IPO firms on average have positive issue-year abnormal accruals and earnings, and poor long-run earnings and negative abnormal returns. Teoh, Welch and Wong (1998a,b) and Rangan (1998) also find similar results for their sample of IPOs and SEOs.

Collectively, these studies indicate that investors do not see through aggressive accounting practices at the time offering, but once it becomes apparent through subsequent earnings disappointments, the optimism reverses and share return performance of equity offering firms deteriorates. However, Shivakumar (2000) suggests that firms manage earnings in reaction to investors assuming that they do so. He finds evidence of earnings overstatement by issuers, but concludes that investors infer earnings management and unravel its effects at offering announcements. To the extent that the capital market is efficient, if investors can “undo” earnings management, they will make downward adjustments to the value of reported financial data (Healy and Wahlen, 1999).

In this study, we examine whether carve-out firms manage accruals around the year of initial public offering. Teoh, Wong and Rao (1998) discuss why IPO firms continue to manage earnings in the year of IPO.²

Equity carve-outs are unique in that they combine characteristics of both restructuring and financing transactions. A carve-out differs from a spin-off in that the parent firm continues to hold a substantial fraction of equity of the carved-out subsidiary.³ Like any other public equity offering, carve-outs reduce the influence of the parent firm over the carve-out subsidiary and a new security is created.

Despite the increasing importance of carve-outs in raising equity capital, there is relatively little evidence on the incentives of parent firms in carve-out transactions as compared with IPOs and SEOs. While the fundamental rationale behind the equity offerings of IPOs, SEOs and carve-outs may be similar there is a difference in the content of information made available to the public prior to the offering. The information asymmetry between investors and issuer is lowest for SEOs because financial information and other announcements are available to the public, whereas information asymmetry is worst between investors and issuers that go public for the first time due to lack of publicly available information.

While carve-out firms are classified as IPOs, information asymmetry is arguably less severe for a carve-out firm due to some financial information that may be contained in the parent firm's financial statements although in aggregate with other subsidiaries.

² Teoh et al (1998) did not look at pre-issue accruals because they believed that issuers continue to boost earnings thru to first fiscal year after offering (which contains both pre-IPO and post-IPO periods). Examination of pre-issue accruals will result to a substantial decline in their sample size. An earlier version of the paper analyzing pre-issue accruals of a reduced sample of 130 IPOs report similar qualitative results.

At best, some information about performance and the financial affairs of the carve-out subsidiary may be transparent in segment reporting disclosures. Qualitative information and disclosure made by the parent firm may also assist potential investors in making informed decisions regarding the carve-out firm's initial public offering. Given this differential in information content available to the public, this study contributes to the current literature by examining the behaviour of discretionary accruals of carve-out firms in the year of equity offering.

However, most investors rely on the prospectus for information about the carve-out firm rather than the financial statements of the parent firm. Some of the contents of the prospectus may be biased toward information depicting favourable prospects for the carve-out firm. Moreover, APB 20 (Accounting Principles Board) allows firms undertaking an IPO to change accounting principles and make retroactive adjustments in the financial statements provided in the prospectus. This creates strong incentives for issuing firms to report higher earnings in the lead prior to the carve-out date because aggressive accounting practices may be difficult to observe due to lack of pre-listing information.

As in any public offering, issue price is positively correlated with reported earnings of the carve-out firms. Firms with superior earnings performance will have higher issue prices resulting to higher proceeds raised from the capital markets. Hence, the incentive is to manage earnings upward and paint a rosier picture of the firm's financial affairs. We therefore hypothesise that carve-out firms will manage earnings upward by adopting income-increasing accruals in the year before public offering.

³ All firms in our sample show that the parent owns at least 50% of carve-out firm prior to the issue.

To further investigate whether discretionary accruals of carve-out firms are opportunistic, we examine the pre-listing levels of discretionary accruals and determine how this is correlated with post-listing share returns. Teoh, Wong and Rao (1998) argue that if carve-out firms manage earnings prior to the public offering, the manage component of earnings will not reflect long-term favorable prospects. Consequently, the high levels of earnings reported prior to carve-out will not be sustained. When the market is disappointed with the subsequent earnings decline, carve-out firms are penalized with share price decline. We hypothesize that the long-run post-listing return is negatively correlated with discretionary accruals for the sample of carve-out firms.

3. SAMPLE AND RESEARCH METHOD

3.1 Sample

We identify 646 equity carve-outs from SDC platinum database between 1982 and 1997. The final sample resulted to 326 equity carve-outs after dropping 124 firms due to inavailability of share prices in the CRSP database and another 196 firms due to the absence of financial data in the Compustat database. We obtained the prospectuses of our sample firms from the LEXIS NEXIS Academic Research database providing us with some pre-listing financial information and offer characteristics.

3.2 Measures of Earnings Management

Prior research used a number of accounting accrual measures to detect earnings management. These measures include total accruals (Healy, 1985), changes in total accruals (DeAngelo, 1986), and abnormal accruals derived from the Jones model (1991), or some variation of the Jones model (e.g., Defond and Jiambalvo, 1994;

Dechow, Sloan and Sweeney, 1995). The ability of Jones model or Jones-like accrual expectation models to measure the discretionary accruals has been challenged in the literature. Specifically, extant models appear to be biased towards finding earnings management in sample of firms with extreme performance (Dechow *et al*, 1995). Furthermore, Hribar and Collins (2002) find evidence that errors in estimating expected and abnormal discretionary accruals exist when the balance sheet approach is used, and when a firm experience a merger, an acquisition, or discontinue a major operation. These concerns are certainly critical to our research, our sample being non-random and experiencing a major corporate event.

While the Jones model (1991) has its limitations, evidence suggests that no other model is superior in estimating discretionary accruals. Guay, Kothari and Watts (1996) demonstrate that accruals derived from five alternative models reflect considerable imprecision but the Jones or the modified-Jones models still yield abnormal accruals that are significantly different from a random assignment of accruals into normal and abnormal components. Thomas and Zhang (2000) evaluate the ability of six different accrual prediction models to detect earnings management and conclude that Jones (1991) model is the only model that exhibits some predictive ability.

In this paper, we adopt the cross-sectional Jones (1991) model first introduced by Defond and Jiambalvo (1994) to estimate the expected and abnormal components of total accruals. In most initial public offering scenario, the time-series analysis of the Jones model is not feasible due to lack of historical information. Three methods were employed namely: (1) cross-sectional Jones (1991) model, (2) cross-sectional Jones (1991) with lag ROA model, and (3) performance-matched Jones (1991) model.

To employ the cross-sectional Jones (1991) we estimate expected accruals in year of carve-out for all firms in the same two digit SIC code excluding the carve-out firm using the following regression equation:

$$TAC_{it}/TA_{it} = \beta_1 [1/TA_{it}] + \beta_2 [\Delta REV_{it}/TA_{it}] + \beta_3 [PPE_{it}/TA_{it}] + \varepsilon_{it} \quad (1)$$

Where:

TAC_{it} is the total accruals for firm i in year t. Total accruals is defined as net income less cash flow from operating activities

ΔREV_{it} is changes in revenues for firm i in year t less revenues in t-1

PPE_{it} is property, plant and equipment for firm i at the end of year t

TA_{it} is the total assets for firm i at the end of year t.

ε_{it} is the regression residual for firm i in year t

There are on average eight firms in each regression model. Property, plant and equipment and change in revenue are used to control for the non-discretionary component of total accruals. Some changes in accruals could be due to changes in performance and economic conditions and independent of managerial discretion. Plant, property and equipment is used to control for the effects of non-discretionary depreciation expense on reported earnings. All variables are deflated by total assets to reduce heteroscedasticity.⁴

The cross-sectional Jones with lag ROA model is similar to equation (1) except for the inclusion of lag ROA as an explanatory variable. Inclusion of lag ROA is consistent with Dechow et al.'s (1995) concern that accruals estimation using the Jones (1991) model may be flawed when firms experience extreme performance. This is expected of firms undergoing a major corporate event such as carve out sample. For the second accrual estimation model we estimate expected accruals using the following equation:

$$TAC_{it}/TA_{it} = \beta_1 [1/TA_{it}] + \beta_2 [\Delta REV_{it}/TA_{it}] + \beta_3 [PPE_{it}/TA_{it}] + \beta_4 LagROA + \varepsilon_{it} \quad (2)$$

Where:

Lag ROA is net income divided by total assets in t-1.
See equation 1 for definition of other variables

McNichols (2000) suggests that aggregate accrual models that do not consider long-term earnings growth are potentially misspecified and can therefore result in misleading inferences about earnings management. Similarly, Kothari, Leone and Wasley (2002) advocate matching sample firms with control firms to mitigate the impact of performance on the estimation discretionary accruals. For our performance-matched accrual estimation model we follow a matching procedure similar to Loughran and Ritter (1997). For each of our carve-out firm we find a control firm that satisfies the following criteria:

- (a) non-issuing firm,
- (b) same two-digit SIC Code as carve-out firm;
- (c) end-of-year total assets between 80% to 120% of the issuing firm's;
and,
- (d) closest lag ROA to carve-out firm in the year of carve-out.

We run regression equation (1) for the matched firms to calculate discretionary accruals. The performance-matched discretionary accruals are calculated by subtracting the discretionary accruals of the matched firm from that of the carve-out firm. The use of matched firms in our research design enables us to draw inferences with respect to the discretionary behaviour of the carve-out firms.

⁴ Lipe (1986), Rayburn (1986), and Jones (1991) suggest using a scaling factor in the model to reduce heteroscedasticity.

3.3 Measures of share return performance

The long-run share return performance of equity offerings is sensitive to the valuation method and the choice of benchmark used to measure share returns. Loughran and Ritter (2000) suggest that use of market return as a benchmark may cause a test bias towards finding no abnormal return because the benchmark also includes public offering firms. Lyon, Barber and Tsai (1999) recommend the use of buy-and-hold abnormal returns, which without rebalancing, accurately represents investor experience. We compute the buy-and-hold returns and compare the performance of carve-out firms with that of performance-matched firms over a three-year holding period.⁵ In essence, we would like to seek how our estimated discretionary accruals correlate with the carve-out firm's buy-and-hold returns in varying time periods so we can determine whether discretionary accruals provide some evidence of managers exercising their discretion in selecting aggressive accounting policies.

To determine whether discretionary accruals are correlated with the carve-out firm's long-run market performance, we regressed discretionary accruals and some control variables on long-run buy-and-hold returns using the following regression model:

$$BHAR_{it} = \alpha + \beta_1 DISC_{it} + \beta_2 MKTRET + \beta_3 UP + \beta_4 ACAPX_{it} + \beta_5 \Delta NI_{it} + \beta_6 MV + \beta_7 MKBK_{it} + \varepsilon_{it} \quad (3)$$

Where:

$BHAR_{it}$ = buy-and-hold returns m months after the carve-out date and are calculated by compounding the daily returns of the sample firms across the m months holding

⁵ There are two ways to cumulate abnormal returns, namely, 1) cumulative abnormal returns (CAR) and 2) buy-and-hold abnormal returns (BHAR). Both leads to some statistical problems. Cumulating one-period returns over a long time interval induces a positive or negative bias due to measurement errors of the observed returns (Conrad and Kaul, 1993; Barber and Lyon, 1997). The use of BHAR can reduce this bias but it is subjected to severe inference problems in statistical tests (Barber and Lyon 1997; Kothari and Warner 1997).

period adjusted by the compounded daily returns of the performance-matched firms across the m -month holding period

$DISC_{it}$ = discretionary accruals using either a) cross-sectional Jones model, b) cross-sectional Jones model with lag ROA or c) performance matched Jones model

$MKTRET$ = buy-and hold cumulative market index return from the exchange that listed carve-out firm belongs

UP_{it} = carve-out firm's first-day return

$CAPX_{it}$ = growth rate of capital expenditure from year 0 to year t

NI_{it} = change in net income from year 0 to year t scaled by total assets

MV = logarithm of market capitalization of carve-out firm as reported in the prospectus

$MKBK$ = market-to-book ratio reported in the prospectus where market price is equal to issue price

ε_{it} = error term

4. EMPIRICAL RESULTS

Table 1 shows that our carve-out sample is concentrated in certain industries such as business services, industrial machinery, electronic equipment and communications. The number of carve-outs increased during “hot issue” periods (Ritter, 1991) between 1986-1987. The significance of equity carve-outs as a means of capital raising is observed in the last half decade of our sample period, raising more than US\$27 billion.

[Insert Table 1 here]

Panel A of Table 2 provides the descriptive statistics between the carve-out and performance-matched firms. There are no systematic differences between the two samples except for net income, market capitalisation and market-to-book ratio. In Panel B of Table 2, the descriptive statistics of the carve-out sample partitioned at median points of total accruals are reported. The lag ROA variable is the only variable that exhibits significant difference at 1% level in both parametric and non-parametric tests. Firms with high accruals have poor prior year's performance than firms with low accruals.

[Insert Table 2 here]

Panel A of Table 3 reports the discretionary accruals for each of the discretionary accrual estimation model we utilised in this paper. The mean (median) estimated discretionary accruals we derived for the performance-matched Jones model is 4.28% (2.13%) and significantly different from zero at 1% level. The Jones and Jones with lag ROA models does not show significant discretionary accruals at the time of carve-out except for the Jones Model using parametric tests. Panel B shows discretionary accruals partitioned at median points of total discretionary accruals for all estimation models. Firms below (above) the median are classified as a low (high) discretionary accruals firm.

[Insert Table 3 here]

The adjusted buy-and-hold returns (BHAR) for the entire sample are reported in Panel A of Table 4 and the adjusted BHAR for low (high) discretionary accrual firms are shown in Panel B (Panel C).⁶ The results in Panel A are consistent with poor long-run returns of equity offering firms 36 months after the carve-out (Loughran and Ritter, 1997). This finding is more prominent for high accrual firms (Panel C) suggesting that these firms are unable to sustain the same level of performance in pre carve-out period. Consequently, poor long-run returns are observed 36 months after carve-out. This evidence is consistent with earnings management.

[Insert Table 4 here]

Moreover, Figure 1 shows that the mean adjusted BHAR of our carve-out sample adjusted by matched firm performance (PERF) underperform relative to other

⁶ For simplicity, only the BHARs for performance-matched Jones Model are shown.

measures of market returns such as: NYSE/AMEX/Nasdaq Index (ERI) or associated portfolio classed by Center for Research on Share Prices (ERP).

[Insert Figure 1 here]

This result is driven mainly by the poor market performance of firms in the high discretionary accruals group shown in Figure 2. Our results suggest that investors may not be able to see through the aggressive accounting practices by carve-out firms but the investors in subsequent periods adjust their expectations downward after a continuing disappointment on the carve-out firm's earnings performance.

[Insert Figure 2 here]

While findings are supportive of earnings management prior to carve out, we conclude that more investigation is necessary to examine the incentive of parent firms for doing so. Particularly, when the market deciphers earnings management and as a consequence, penalises the firm by a lower share price. This being the case the parent firm stands to loose as much because they typically maintain high levels of ownership of the carve out firm.

5. CONCLUSION

This study examines whether carve-out firms manage their earnings in the lead prior to the equity offering. We estimate discretionary accruals by using three modified models of Jones (1991). These are: a) the cross-sectional Jones (1991) model, b) the cross-sectional Jones (1991) with a lag ROA model and c) the performance-matched Jones (1991) model. We partition the sample into low and high discretionary accruals and examine the buy-and-hold returns of the partitioned sample up to 36 months after the public offering. We find that there are no significant differences in the returns between the sample and performance-matched firms. However, after controlling for the level of discretionary accruals, we find that carve-out firms with high level of discretionary accruals consistently underperform relative to the performance-matched firms. These results are consistent with issuers managing their earnings upward to influence offer price and subsequent after market share prices.

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Table 1
Sample Distribution
326 Equity Carve-out during 1982-1997

Panel A: Number of carve-outs and total proceeds

Year of Listing	No. of Carve-outs	Total Proceeds (U\$m)
1982	2	23,560
1983	17	598,500
1984	8	299,846
1985	6	936,950
1986	23	1,275,609
1987	16	1,138,088
1988	7	636,500
1989	8	1,776,808
1990	8	658,025
1991	20	1,439,065
1992	35	3,414,414
1993	52	6,408,459
1994	38	3,468,255
1995	30	6,221,627
1996	32	7,398,564
1997	24	3,636,272
Total:	326	39,330,741

Panel B: Industry Distribution

SIC	Industry	Frequency
73	Business services	27
35	Industrial machinery/equipment	20
36	Electronic/other electric equipment	19
38	Instruments and related products	18
48	Communications	17
61	Non-depository institutions	17
63	Insurance carriers	16
59	Miscellaneous retail	15
13	Oil and gas extraction	14
28	Chemical and allied products	13
37	Transportation equipment	11
50	Wholesale trade-durable goods	10
33	Primary metal industries	9
49	Electric/gas/sanitary services	7
58	Eating and drinking places	7
20	Food and kindred products	6
51	Wholesale trade-nondurable goods	6
56	Apparel and accessory stores	6
	Others (35 industries)	88
Total		326

Table 2
Descriptive Statistics of the Sample and Matched Firms

The sample consists of 326 equity carve-outs between 1982 to 1997. Performance-matched firms must be a) non-issuing firm b) in the same 2-digit SIC code of the carve-out firm c) within 80% to 120% of the carve-out firm's total assets and d) the closest lag ROA to carve-out firm. Mean (Median) value is reported for each variable. The performance-matched discretionary accrual is coded as high (low) if it is greater (less) than the median performance-matched total accrual. T statistics (Z statistics) are based on paired-sample parametric t test (non-parametric Wilcoxon Signed-rank test). *, **, *** indicate significance at 10%, 5% and 1%, respectively (two-tailed tests).

	Carve-out Firms	Performance- Matched Firms	T Stat (Z Stat)
Panel A: Descriptive statistics (All Firms)			
Total Asset (\$m)	1166 (141)	1436 (114)	0.93 (1.29)
Net Income (\$m)	37 (8)	41 (5)	0.48 (2.75)***
Total Accruals (\$m)	-35 (-2)	-51 (-4)	1.32 (1.23)
Sales revenue (\$m)	1056 (311)	799 (121)	1.19 (0.43)
Net Property, Plant & Equipment (\$m)	642 (144)	415 (36)	0.52 (0.43)
Market Capitalization (\$m)	816 (208)	853 (119)	0.32 (3.02)***
Lag ROA	0.03 (0.05)	0.04 (0.05)	0.85 (0.05)
Debt/Equity Ratio	0.52 (0.21)	0.50 (0.28)	0.22 (0.46)
Market-to-Book Ratio	8.04 (2.52)	2.54 (2.05)	1.50 (3.39)***
Panel B: Descriptive statistics for carve-out firms			
	Low Total Accruals	High Total Accruals	T Stat (Z Stat)
Total Asset (\$m)	1035 (131)	1297 (177)	0.49 (0.78)
Net Income (\$m)	39 (9)	35 (7)	0.25 (0.46)
Sales revenue (\$m)	681 (148)	603 (132)	0.39 (0.97)
Net Property, Plant & Equipment (\$m)	297 (47)	619 (23)	1.38 (0.99)
Market Capitalization (\$m)	689 (191)	947 (263)	0.95 (0.76)
Lag ROA	0.07 (0.07)	-0.01 (0.04)	2.90*** (3.47)***
Debt/Equity Ratio	0.47 (0.18)	0.59 (0.24)	0.96 (0.52)
Market-to-Book Ratio	11.88 (2.52)	4.08 (2.56)	1.09 (0.22)
Underpricing returns	0.08 (0.03)	0.09 (0.03)	0.27 (0.06)

Table 3
A comparison of discretionary accruals using alternative specification of the cross-sectional Jones model

The table is based on 326 carve-outs during 1982-1997. Discretionary accruals are the residuals from the fitted regression obtained in same two digit SIC using the following Jones model: $TAC_{it}/TA_{it} = \beta_1 [1/TA_{it}] + \beta_2 [\Delta REV_{it}/TA_{it}] + \beta_3 [PPE_{it}/TA_{it}] + \varepsilon_{it}$. TAC_{it} is the total accruals for firm i in year t . Total accruals is net income less net cash flow from operating activities. ΔREV_{it} is change in revenues for firm i in year t less revenues in $t-1$, PPE_{it} is gross plant, property and equipment for firm i at the end of year t and TA_{it} is total assets for firm i at the end of year t . Discretionary accrual for Jones model with lag ROA is determined by estimating the cross-sectional discretionary accruals using the Jones model after inclusion of lag ROA as an explanatory variable in the model. To calculate performance-matched discretionary accruals for firm i , we subtract discretionary accruals of the matched firm from discretionary accrual of the carve-out firm. Discretionary accrual is calculated using Jones model. Discretionary accruals is coded as high (low) if it greater (less) than the median discretionary accrual. The t-statistics and z statistics are based on parametric t test and non-parametric Wilcoxon-signed ranks test. ***, **, and * represent 1%, 5% and 10% two-tailed significance level, respectively.

Panel A: Discretionary accruals (n = 326)

Estimation Model	Mean	Median	t-stat	Z stat
Jones Model	0.0157	-0.0023	1.97**	0.59
Jones Model with Lag ROA	0.0322	-0.0055	1.34	0.39
Performance-Matched Jones Model	0.0428	0.0213	4.01***	4.49***

Panel B: Discretionary accruals partitioned to high and low discretionary accruals

	Low DA (n =163)		High DA (n =163)		t-stat	Z stat
	Mean	Median	Mean	Median		
Jones Model	-0.0281	-0.0190	0.0595	0.0334	5.75***	6.90***
Jones Model with Lag ROA	-0.0405	-0.0297	0.1486	0.0767	3.07***	7.81***
Performance-Matched Jones Model	-0.0629	-0.0282	0.1048	0.0346	11.84***	15.61***

Table 4:
Long-run Buy-and-hold abnormal return for equity carve-out firms

The long-run buy-and hold abnormal return 36 months after the carve-out are calculated by compounding the daily returns of the sample firms and performance-matched control firms across the holding period. The table reports the difference in the mean and median buy-and-hold returns of the sample firms and the matched firms for 36 months. The carve-out firm as high (low) if it is greater (less) than the median performance-matched discretionary accrual. ***, **, and * represent 1%, 5% and 10% two-tailed significance level, respectively.

Panel A: BHAR for ALL Firms

Month	N	Mean	Median	t - stat	sign rank	probt	Prob z
1	326	0.0037	0.0076	0.39	975.5	0.70	0.57
2	326	0.0201	0.0327	1.35	2533	0.18	0.13
3	326	0.0180	0.0369	0.95	3161.5	0.34	0.06
4	326	0.0248	0.0128	1.16	2447.5	0.25	0.15
5	326	0.0148	0.0010	0.63	1561.5	0.53	0.36
6	326	0.0205	-0.0010	0.74	1723.5	0.46	0.31
7	326	0.0043	0.0202	0.14	836.5	0.89	0.62
8	326	-0.0093	-0.0059	-0.27	367.5	0.79	0.83
9	325	-0.0069	0.0088	-0.18	610.5	0.86	0.72
10	324	-0.0127	-0.0390	-0.32	-236	0.75	0.89
11	324	-0.0124	-0.0107	-0.28	-212	0.78	0.90
12	324	-0.0152	-0.0295	-0.32	-811	0.75	0.63
13	321	-0.0318	-0.0386	-0.61	-1768.5	0.54	0.29
14	321	-0.0428	-0.0625	-0.73	-1834.5	0.46	0.27
15	319	-0.0422	-0.0847	-0.69	-2323	0.49	0.16
16	319	-0.0430	-0.0499	-0.68	-1441	0.49	0.38
17	317	-0.0528	-0.0549	-0.66	-1222.5	0.51	0.45
18	316	-0.0638	-0.0576	-0.79	-1525	0.43	0.35
19	312	-0.0650	-0.0553	-0.84	-1778	0.40	0.27
20	311	-0.0780	-0.0781	-1.02	-2614	0.31	0.10*
21	306	-0.0537	-0.0565	-0.68	-2354.5	0.50	0.13
22	305	-0.0323	-0.0792	-0.41	-2168.5	0.69	0.16
23	303	-0.0534	-0.1220	-0.60	-2488	0.55	0.10*
24	299	-0.0791	-0.0796	-0.83	-1841	0.41	0.22
25	295	-0.1187	-0.1074	-1.14	-2112	0.25	0.15
26	290	-0.1527	-0.1271	-1.18	-2248.5	0.24	0.12
27	289	-0.1343	-0.1402	-1.00	-2177.5	0.32	0.13
28	287	-0.1871	-0.1374	-1.08	-2281	0.28	0.11
29	281	-0.1360	-0.1428	-1.00	-1820.5	0.32	0.18
30	278	-0.1137	-0.1362	-0.78	-1853.5	0.44	0.17
31	276	-0.1769	-0.1476	-1.04	-2116	0.30	0.11
32	273	-0.1236	-0.1319	-0.76	-1614.5	0.45	0.22
33	271	-0.1408	-0.1233	-0.81	-1116	0.42	0.39
34	267	-0.1293	-0.1370	-0.95	-1796	0.34	0.16
35	264	-0.0868	-0.1157	-0.67	-1593	0.50	0.20
36	264	-0.0865	-0.1766	-0.70	-1739	0.49	0.16

Panel B: BHAR for firms with low discretionary accrual firms

Month	N	Mean	Median	t - stat	sign rank	probt	Prob z
1	163	0.0220	0.0202	1.81	1087.5	0.07**	0.07**
2	163	0.0277	0.0414	1.49	1067.5	0.14	0.06**
3	163	0.0435	0.0647	1.85	1586	0.07**	0.01***
4	163	0.0339	0.0491	1.18	986	0.24	0.10*
5	163	0.0363	0.0209	1.17	971	0.24	0.11
6	163	0.0442	0.0323	1.21	945	0.23	0.12
7	163	0.0292	0.0451	0.67	782	0.50	0.20
8	163	0.0134	0.0103	0.27	637	0.79	0.29
9	162	0.0264	0.0637	0.47	808.5	0.64	0.18
10	161	0.0418	0.0110	0.76	471.5	0.45	0.43
11	161	0.0663	0.0092	1.14	585.5	0.25	0.32
12	161	0.0823	0.0349	1.35	547.5	0.18	0.36
13	159	0.0894	-0.0033	1.39	481	0.17	0.41
14	159	0.0749	0.0038	1.11	371	0.27	0.53
15	159	0.0908	-0.0041	1.33	522	0.18	0.37
16	159	0.0755	0.0262	1.14	588	0.26	0.31
17	159	0.0794	0.0173	1.09	476	0.28	0.41
18	159	0.0736	-0.0062	0.99	331	0.32	0.57
19	156	0.0856	-0.0045	1.09	378	0.28	0.51
20	155	0.0622	-0.0236	0.76	101	0.45	0.86
21	154	0.0808	-0.0239	0.91	156.5	0.36	0.78
22	153	0.1017	0.0048	1.08	369.5	0.28	0.50
23	153	0.1063	-0.0260	1.12	350.5	0.27	0.52
24	151	0.1202	0.0129	1.25	616	0.21	0.25
25	148	0.0916	0.0345	0.98	525	0.33	0.32
26	146	0.0361	-0.0505	0.37	241.5	0.72	0.64
27	145	0.0585	-0.0726	0.60	265.5	0.55	0.60
28	144	0.0464	-0.0091	0.45	251	0.65	0.62
29	141	0.0652	0.0176	0.60	394.5	0.55	0.42
30	140	0.0398	0.0161	0.33	273	0.75	0.57
31	139	0.0248	0.0206	0.19	251	0.85	0.60
32	137	0.0727	0.0631	0.54	372.5	0.59	0.43
33	135	0.1032	0.0466	0.83	528	0.41	0.25
34	135	0.0958	0.0573	0.75	453	0.45	0.32
35	134	0.0982	0.1166	0.72	506.5	0.47	0.26
36	134	0.0670	0.0330	0.46	385.5	0.64	0.39

Panel B: BHAR for firms with high discretionary accruals firms

Month	N	Mean	Median	t - stat	sign rank	probt	Prob z
1	163	-0.0144	-0.0113	-0.99	-565	0.32	0.36
2	163	0.0128	0.0171	0.55	249.5	0.58	0.69
3	163	-0.0075	0.0244	-0.25	88	0.80	0.88
4	163	0.0157	-0.0171	0.49	247	0.62	0.68
5	163	-0.0068	-0.0439	-0.19	-160	0.85	0.79
6	163	-0.0032	-0.0416	-0.08	-65	0.94	0.91
7	163	-0.0206	-0.0309	-0.44	-359	0.66	0.55
8	163	-0.0320	-0.0277	-0.65	-435	0.52	0.47
9	163	-0.0401	-0.0373	-0.75	-474	0.45	0.43
10	163	-0.0666	-0.0901	-1.16	-597	0.25	0.32
11	163	-0.0901	-0.0613	-1.39	-669	0.17	0.27
12	163	-0.1116	-0.0734	-1.56	-922	0.12	0.13
13	162	-0.1508	-0.1279	-1.88	-1346.5	0.06*	0.02**
14	162	-0.1582	-0.1269	-1.68	-1288.5	0.10*	0.03**
15	160	-0.1743	-0.1656	-1.73	-1635	0.08*	0.01***
16	160	-0.1606	-0.1570	-1.52	-1231	0.13	0.04**
17	158	-0.1858	-0.1273	-1.31	-1045.5	0.19	0.07***
18	157	-0.2029	-0.1069	-1.43	-1050.5	0.16	0.07***
19	156	-0.2155	-0.1470	-1.63	-1193	0.10*	0.03**
20	156	-0.2172	-0.1843	-1.70	-1364	0.09*	0.02**
21	152	-0.1900	-0.1780	-1.44	-1284	0.15	0.02**
22	152	-0.1672	-0.2102	-1.30	-1344	0.19	0.01***
23	150	-0.2163	-0.2380	-1.42	-1482.5	0.16	0.01***
24	148	-0.2825	-0.2244	-1.72	-1422	0.09*	0.01***
25	147	-0.3305	-0.2478	-1.79	-1490	0.08	0.00***
26	144	-0.3442	-0.2390	-1.43	-1278	0.15	0.01***
27	144	-0.3285	-0.2419	-1.31	-1306	0.19	0.01***
28	143	-0.4224	-0.2359	-1.28	-1322	0.20	0.01***
29	140	-0.3386	-0.2272	-1.35	-1229	0.18	0.01***
30	138	-0.2695	-0.2701	-1.01	-1120.5	0.31	0.02**
31	137	-0.3815	-0.3216	-1.22	-1172.5	0.23	0.01***
32	136	-0.3214	-0.2804	-1.09	-1037	0.28	0.02**
33	136	-0.3831	-0.2881	-1.19	-975	0.24	0.03**
34	132	-0.3596	-0.3564	-1.49	-1215	0.14	0.01***
35	130	-0.2774	-0.3141	-1.26	-1125.5	0.21	0.01***
36	130	-0.2447	-0.3252	-1.21	-1105.5	0.23	0.01***

Table 5: Regression results

Dependent variable one-year, two-year and three-year BHAR of the carve-out firms adjusted by BHAR of performance matched firms. The long-run buy and hold returns m months after the carve-outs are calculated by compounding the daily returns of the sample firms across the m -month holding period. DISC is discretionary accruals using either a) cross-sectional Jones model, b) cross-sectional Jones model with lag ROA or c) performance matched Jones model. MKTRET is the buy-and hold cumulative market index return from the exchange that listed carve-out firm belongs. Underpricing _{i} is the carve-out firm's first-day return. ΔCAPX_i is the growth rate of the carve out firm's capital expenditure from year 0 to year t . ΔNI_i is the asset scaled change in net income of carve-out firm from year 0 to year i . MV is the logarithm of market capitalization of carve-out firm as reported in the prospectus. MKBK is the market-to-book ratio reported in the first financial statement after carve-out using issue price as market value. ***, **, and * represent 1%, 5% and 10% two-tailed significance level, respectively.

Panel A: Jones Model

	1-year BHAR	2-year BHAR	3-year BHAR
Constant	-0.329 (-2.59)***	-0.655 (-2.80)***	-0.635 (-1.76)
DISC	-0.057 (-0.24)	-0.440 (-1.03)	-0.298 (-0.45)
MKTRET	0.100 (0.35)	0.199 (0.33)	-0.500 (-0.74)
Underpricing	-0.096 (-0.41)	0.471 (1.04)	-0.297 (-0.43)
ΔCAPX_i	0.041 (2.45)**	0.102 (6.88)***	0.047 (3.65)***
ΔNI_i	-0.022 (-4.09)***	-0.026 (-2.48)**	-0.003 (-0.68)
MV	0.058 (2.56)**	0.081 (1.91)*	0.131 (2.02)**
MKBK	0.001 (0.29)	0.002 (0.53)	0.001 (0.22)
Adjusted R ²	0.07	0.18	0.05
F-statistic	4.08***	8.98***	2.62**

Panel B: Jones with Lag ROA model

	1-year BHAR	2-year BHAR	3-year BHAR
Constant	-0.338 (-2.67)***	-0.695 (-2.98)***	-0.679 (-1.90)*
DISC	-0.056 (-0.72)	-0.149 (-1.12)	-0.393 (-2.05)**
MKTRET	0.096 (0.34)	0.230 (0.38)	-0.552 (-0.82)
Underpricing	-0.093 (-0.39)	0.495 (1.09)	-0.278 (-0.40)
ΔCAPX_i	0.044 (2.54)**	0.106 (6.95)***	0.053 (4.05)***
ΔNI_i	-0.022 (-4.09)***	-0.025 (-2.44)**	-0.002 (-0.64)
MV	0.059 (2.63)***	0.086 (2.03)**	0.142 (2.20)**
MKBK	0.001 (0.27)	0.002 (0.51)	0.001 (0.16)
Adjusted R ²	0.07	0.18	0.07
F-statistic	4.15***	9.01***	3.25***

Panel C: Performance-Matched Jones Model

	1-year BHAR	2-year BHAR	3-year BHAR
Constant	-0.326 (-1.78)*	-0.335 (-0.86)	-0.256 (-1.22)
DISC	-0.551 (-2.12)**	-2.233 (-4.21)***	-0.884 (-2.75)***
MKTRET	0.283 (0.69)	0.600 (0.58)	0.363 (0.93)
Underpricing	0.017 (0.05)	0.388 (0.51)	-0.113 (-0.28)
ΔCAPX_i	0.006 (0.25)	0.032 (1.29)	0.005 (0.72)
ΔNI_i	-0.021 (-2.77)***	-0.022 (-1.23)	-0.008 (-3.70)***
MV	0.053 (1.61)	0.026 (0.36)	0.045 (1.20)
MKBK	0.001 (0.27)	0.006 (0.83)	-0.000 (-0.07)
Adjusted R ²	0.03	0.06	0.08
F-statistic	2.33**	3.27***	3.80***

Figure 1: Mean Buy-and-hold abnormal returns of Carve-outs Firms relative to market index

The figure below compares the mean buy-and-hold returns of the carve-outs relative to the market and matched firms. ERI is the excess returns of the carve-outs relative to NYSE/AMEX/Nasdaq Index returns. ERP is the excess returns of the carve-outs relative to associated portfolios classed by CRSP. PERF is the excess returns of the carve-outs relative to a performance-matched firm. The matched firm is in the same 2-digit SIC code in the same year and has the closest lag ROA as the carve-outs.

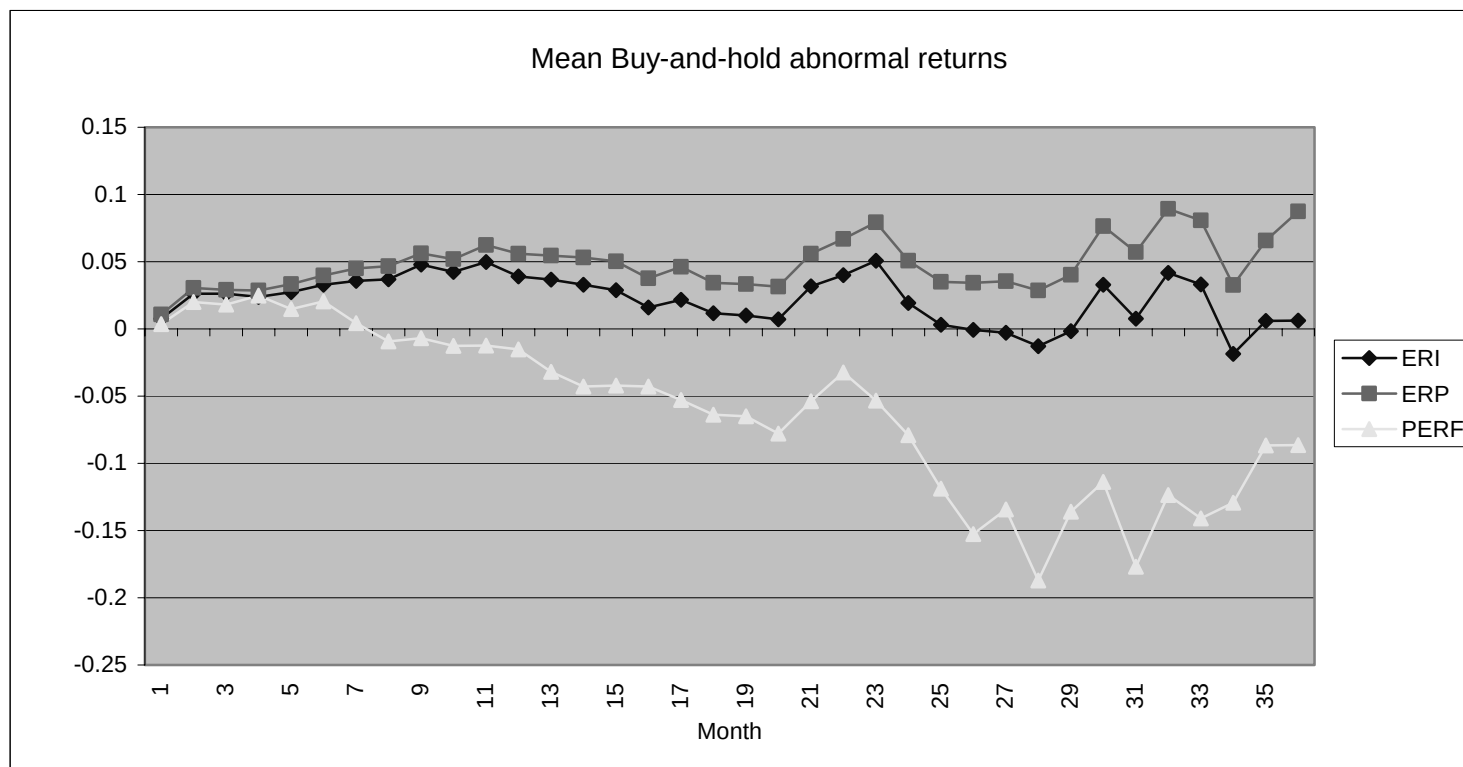


Figure 2:
Mean Buy-and-hold Abnormal Returns of Carve-outs Firms with low or high discretionary accruals

The figure below compares the mean buy-and-hold returns of the carve-outs adjusted by the buy-and-hold returns of the performance-matched firms. The matched firm is in the same 2-digit SIC code in the same year and has the closest lag ROA as the carve-outs. To calculate performance-matched discretionary accruals for firm i , we subtract the Jones model discretionary accrual of performance-matched firm from the Jones model discretionary accrual of carve out firm. The performance-matched discretionary accrual is coded as high (low) if it is greater (less) than the median performance-matched discretionary accrual.

