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Empire-Building Incentives and the Effectiveness of Accrual Investment

Donglin Li[1]
Department of Finance, San Francisco State University
1600 Holloway Ave., San Francisco, CA 94132
donglin@sfsu.edu

ABSTRACT

Accruals are measures of firm investment. Their negative association with firm profitability in future years is stronger when managers have greater incentives for empire building, i.e., for those firms with higher free cash flow, lower leverage, or overvalued equity. Moreover, the negative association is primarily driven by the sample of positive discretionary investment firms and is stronger for fourth quarter accruals, where distorted investment is more likely to occur. Collectively, evidence indicates that the accrual-earnings relationship might be affected by agency costs.

JEL Classifications: *G3, M4*

Keywords: *agency costs; capital investment; accruals; financial statement analysis; empire building*

I. INTRODUCTION

In his influential paper, Sloan (1996) shows that high (low) accruals predict lower (higher) future profits and stock returns.[2] While this well-known accrual anomaly has continued to intrigue financial economists after a decade, a recent work by Fairfield et al. (2003a) puts more pieces into the accrual puzzle by revealing that growth in the book value of long-term operating assets, or "long-term asset accruals" in a more comprehensive accrual definition, has an equally strong negative association with future profits and stock returns.

In explaining their findings, Fairfield et al. (2003a) argue that working capital accruals and long-term asset accruals are both proxies for firm growth. They conjecture that the negative implications of these accruals for future profitability may be related to conservative accounting or diminishing marginal returns on investments. Richardson et al. (2005) posit that the measurement of long-term asset accruals and working capital accruals entails more subjectivity and less reliability than the measurement of other items, such as cash flows or liability changes. They, thus, suggest that measurement error, be it from innate accounting attributes or earnings manipulation, accounts for the negative association between accruals/long-term asset accruals and future profitability.

In this paper, I provide another potential explanation. In the accounting literature, accruals are traditionally viewed as an attribute of earnings management or earnings discretion (Xie, 2001; Chan et al., 2004). However, they are also a measure of firm investment in current working capital.[1] In the corporate finance literature, long-term asset accruals have been shown as a valid measure of capital investment (Hsiao and Li, 2013). I link firm investment in accruals/long-term asset accruals to agency theory (Jensen, 1986; Jensen 2005) and document evidence that the empire-building agency cost (over-investment) may partially explain the negative association between accruals/long-term asset accruals and future profitability.[3]

Specifically, I find that the negative association is stronger when firms have greater investment discretion, i.e., for those firms with higher free cash flow and lower leverage. The association is also stronger following equity overvaluation that may prompt management to over-invest in property, plant, equipment, and perhaps other working capital. Applying a parsimonious model to decompose investment into a non-discretionary component and a discretionary component, I find that the negative association is primarily driven by the positive discretionary investment sample, where over-investment is more likely to occur. In the negative discretionary investment sample, there does not appear to be a negative association. Lastly, the negative association seems stronger for accruals and long-term asset accruals generated in the fourth fiscal quarter, when management are often in a position to either spend the money or "waste" the budget.[4] Collectively, evidence shows that agency costs could potentially affect the accrual-earnings relationship.

In this study, I do not attempt to distinguish behaviors between accruals and long-term asset accruals. Long-term asset accruals may be viewed as long-term investment, and accruals may be viewed as short-term investment. I put them side-by-side to highlight the common attributes between them.

My work is also related to Titman et al. (2004), who find that the negative association between capital investment and stock returns is affected by free cash flow and leverage. However, they do not study accruals or long-term accruals. Nor do they

examine the association between accruals and firm profitability. The negative relationship between accruals and future stock returns does not necessarily imply market inefficiency or agency problems. Even in an efficient market, accruals/investment could negatively co-vary with future stock returns if, in anticipation of lower future discount rates, firms endogenously increase investment (Lamont, 1997; Zhang et al., 2008) or if accruals/investment are accompanied by risk exposure changes in equity (Anderson and Garcia-Feijoo, 2006). I believe my evidence, which illuminates the ways in which agency costs affect firm fundamentals, helps distinguish between competing explanations for accruals/investment-related anomalies. To the extent that firm fundamentals have deteriorated following distorted investments, my evidence reveals that the underlying cause may be related to agency issues rather than endogeneity or omitted risk factors.

My study contributes to the literature of agency theory in corporate finance and that of accrual anomaly in accounting. First and foremost, this is the first study that provides direct evidence on agency costs and overvalued equity mediating the association between accruals/long-term asset accruals and firm performance. Results suggest that empire-building incentives appear to be an important agency issue because they distort firm investment. Second, I show that the negative association between accruals and firm profitability exists primarily in the sample of positive discretionary accruals and is much less detectable in firms with negative discretionary accruals. Since accrual unreliability and the associated measurement errors are not limited to the former sample, they are unlikely to be the *sole* cause of the lower persistence of accruals. More interestingly, my evidence mirrors the fact that accrual anomaly is largely driven by the sample of positive accruals but is scant in the sample of negative accruals. This suggests that the accrual anomaly likely results from investors' irrational expectations of firm fundamentals and is less likely from missing risk factors. My evidence, thus, may shed light on the underlying cause of the accrual anomaly.

It should be noted that I make no claims that agency cost is the only underlying cause of the accruals-future profitability relationship; in fact, an over-investment explanation could even be nested within a broader theory of diminishing marginal returns on investments. Moreover, the explanations of agency cost, measurement error, and earnings management may reinforce each other if managers with empire-building incentives misrepresent accounting numbers to portray overly-optimistic investment opportunities (e.g., Beneish, Lee, and Nichols, 2012). If asset accruals entail more subjectivity and measurement error than liability accruals, they could be easier targets for earnings management. Future studies may explore these possibilities.

In Section II, I summarize relevant literature and I present hypotheses. In Section III, the sample is discussesed and a negative association between accruals, long-term asset accruals, and future profitability is established. Section IV presents my empirical results. The conclusion is provided in Section V.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

A. Literature Review

In the literature on financial statement analysis, it has long been documented that various accounting items can be strong predictors of future earnings. Among a plethora

of accounting items, investment in long-term operating assets, i.e., long-term asset accruals, represents one importance piece of information. Surprisingly, few studies have addressed their implications for future profitability. One exception is Abarbanell and Bushee (1997) who examine the implications of several fundamental signals, including a measure of industry-adjusted growth in capital expenditures, for future profitability. Fairfield et al. (2003a) find that two components of the annual changes in net operating assets—accruals and long-term operating accruals—are equally strong negative predictors of future profitability and stock returns. They hypothesize that the accrual anomaly documented by Sloan (1996) is a growth effect caused by diminishing returns on investment or conservative accounting. Zhang (2007) and Kothari et al. (2005) suggest that accrual anomaly may be related to firm investment. On the other hand, Richardson et al. (2005) point out that different reliabilities associated with various operating accruals should result in different implications for future profitability. In other words, when future profitability is regressed on current profitability and various accruals, accruals and long-term asset accruals should have negative coefficients because these accruals, unlike the cash components of earnings, are often estimated with error.

In corporate finance, there is much empirical evidence which suggests that free cash flow can exacerbate firm over-investment (e.g., Blanchard et al., 1994), whereas debt can mitigate over-investment (e.g., Harvey et al., 2001). Jensen (2005) suggests that overvalued equity may bring various agency costs to a firm, including excessive investing activities. Callen et al. (1996) suggest that firms are more likely to incur excessive capital expenditures in the fourth quarter when managers are in a position to either spend the money or "waste" the budget for the fiscal year. Brown and Pinello (2007) argue that firms engage in less earnings management in the fourth fiscal quarter than in other quarters. I rely on these findings to develop my hypotheses.

B. Hypothesis Development

I first establish that the negative association between accruals/long-term asset accruals and future profitability is robust and not purely a result of conservative accounting. Although this is not the focus of this paper, establishing such a relationship is necessary to provide support for the hypotheses that follow. Penman (2001, p. 561) argues that conservative accounting could make the profitability of new investment appear relatively less profitable in earlier years and more profitable in later years. For example, the use of accelerated depreciation methods for reporting purposes may overstate the depreciation in earlier years after capital investments. If conservative accounting is the dominant force underlying the accruals-earnings relationship, the temporarily dampened profitability will reverse sometime in the future. Consequently, accruals/long-term asset accruals may be a positive portent for long-term future profitability. This leads to my first hypothesis, stated as an alternative to reversal in profitability:

H1: The negative association between accruals/long-term asset accruals and future profitability does not reverse in longer periods.

Evidence consistent with hypothesis H1 would call for an economic explanation for the accruals-future profitability association.

While even optimal investment might lead to lower profitability because of diminishing marginal returns on investments, sub-optimal investment can further erode profitability. The separation of management and ownership creates the potential for management to engage in sub-optimal activities including empire-building behavior. Managers of firms with high free cash flow can act opportunistically, indulging in "value-destroying activities" and "overinvest[ing] and misus[ing] the funds" (Jensen, 1986). Excessive free cash flow enables managers to invest in projects of negative net present values (NPV) after exhausting positive NPV projects (Blanchard et al., 1994; Richardson, 2006). On the other hand, when firms have a cash shortfall, the possibility of over-investment is mitigated because these firms are forced to raise funds through external markets, which provide a monitoring role. If wanton over-investment further reduces future profitability, ceteris paribus, I would expect to observe a more negative association between investment (accruals and long-term asset accruals) and future profitability for firms with high free cash flow.[5]

Leverage could potentially mitigate the problem of over-investment. Leverage restricts the use of internal funds generated in a firm by forcing managers to use cash flow to meet contractual financial obligations (Jensen, 1986; Stulz, 1990). Empire-building incentives for managers may be constrained by the legal rights of creditors to reorganize or even liquidate a firm in case of default. The debt market also provides management discipline. Thus, the negative association between accruals/long-term asset accruals and future profitability could reasonably be expected to be weaker in firms with high leverage. However, debt itself cannot ensure managers to invest optimally (e.g., Lyandres and Zhdanov, 2003). High leverage also brings potential costs, e.g., bankruptcy costs. Thus, I expect the effects of leverage are of second order and are weaker than those of free cash flow. This leads to the next hypothesis, stated in alternative forms:

H2a: The negative association between accruals/long-term asset accruals and future profitability is stronger in firms with higher free cash flow, ceteris paribus.

H2b: The negative association between accruals/long-term asset accruals and future profitability is weaker in firms with higher leverage, ceteris paribus.

Overvalued equity may be more susceptible to excessive investment. A large body of recent research articulates the agency theory of overvalued equity and its implications for corporate investment decisions (e.g., Jensen, 2005; Baker et al., 2003; Dong et al., 2006). The agency theory of overvalued equity makes several predictions about corporate investment-financing decisions, which are quite distinct from the behavior predicted under the accrual reliability or conservative accounting hypotheses. Specifically, it predicts that overvalued firms are more likely to (i) excessively tap the equity market and use overvalued equity as currency to pay for mergers and acquisitions; and (ii) overinvest in property, plant, and equipment (i.e., long-term asset accruals) and other working capital (i.e., accruals). Thus, overvalued equity may aggravate the over-investment issue. This theory leads to the following hypothesis, stated in an alternative form:

H3: The negative association between accruals/ long-term asset accruals and future profitability is stronger in firms with overvalued equity.

If over-investment can partially explain the negative association between accruals/long-term asset accruals and future profitability, I would also expect to observe a stronger result in a sample where over-investment is more likely to occur. On the other hand, the negative association should weaken—or even disappear—in a sample with little trace of over-investment. From this assumption, I then construct a parsimonious model of discretionary investment, defined as investment not warranted by investment opportunities, and examine whether the negative association is stronger in the positive discretionary investment sample than in the negative discretionary investment sample. Since over-investment is more likely to exist in the former group, where the detriment in firm value will manifest in lower future profitability, I expect to see a stronger negative association in that group. Note that other theories such as accrual reliability make no such predictions.

H4: The negative association between accruals/ long-term asset accruals and future profitability is stronger in the sample of positive discretionary investment than in the sample of negative discretionary investment.

It is well known that firm investments made in the fourth fiscal quarter may be less efficient than those made in early quarters. Callen et al. (1996) suggest that managers have incentives to over-invest in the last fiscal quarter when they are often in a position to either burn the money, or lose the last opportunity to deplete the spending budget. These opportunistic expenditures likely lead to lower investment efficiency. I, thus, expect a stronger negative association for accruals/long-term asset accruals in the fourth quarter.

H5: The negative association between accruals/long-term asset accruals and future profitability is stronger for accruals/long-term asset accruals in the fourth quarter than those in other quarters.

III. SAMPLE

My sample includes all US public firms that are covered both by the Compustat Industrial, Full Coverage, and Research files. For most tests, I use annual Compustat data. Financial firms (SIC codes 6000 - 6999) are excluded because their investing, operating, and financing activities may be not clearly demarcated. The full sample consists of 144,336 firm-year observations representing 16,119 firms from 1962 to 2009 to be included in my least restrictive test.[6] The number of observations in any particular test will vary depending on requirements of the test.

Table 1 reports some descriptive statistics for the key variables.[7] In Panel A, long-term asset accruals (LTAA) have an upper quintile of 9.4% and a lower quintile of -1.9%, suggesting that firms both invest and divest. Accruals (ACC) tend to be negative, with a mean of -0.041 and a median of -0.036, largely due to depreciation expenses. Firms, on average, are profitable with mean returns on assets (ROA) of 2.3% and median ROA of 7.1%.

Panel B shows the correlation matrix. Long-term asset accruals and accruals are both positively correlated with current year ROA with Spearman correlation coefficients of 0.266 and 0.272. This is because profitable firms tend to invest more; in

Table 1
Descriptive statistics and correlation matrix

Panel A: Descriptive statistics

	Mean	Std Dev	25%	Median	75%
LTAA	0.051	0.202	-0.019	0.022	0.094
ACC	-0.041	0.156	-0.089	-0.036	0.018
ROA	0.023	0.198	-0.026	0.071	0.136
ROA_{t+1}	0.022	0.199	-0.028	0.070	0.135
FROA	0.034	0.174	0.000	0.074	0.130
FCF	-0.059	0.474	-0.012	0.055	0.097
L	0.279	0.308	0.058	0.222	0.390
VP	0.858	0.761	0.361	0.643	1.096

Panel B: Correlation matrix - Pearson (above diagonal) and Spearman (below diagonal)

	LTAA	ACC	ROA	ROA_{t+1}	FROA	FCF	L	VP
LTAA		0.125	0.158	0.074	0.041	0.109	-0.069	-0.173
		(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
ACC	0.174		0.301	0.164	0.101	0.063	-0.103	-0.046
	(<.0001)		(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
ROA	0.266	0.272		0.791	0.643	0.658	0.034	0.049
	(<.0001)	(<.0001)		(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
ROA_{t+1}	0.148	0.158	0.785		0.731	0.558	0.065	0.075
	(<.0001)	(<.0001)	(<.0001)		(<.0001)	(<.0001)	(<.0001)	(<.0001)
FROA	0.081	0.086	0.584	0.685		0.497	0.105	0.107
	(<.0001)	(<.0001)	(<.0001)	(<.0001)		(<.0001)	(<.0001)	(<.0001)
FCF	0.249	0.022	0.621	0.496	0.396		0.018	0.067
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)		(<.0001)	(<.0001)
L	-0.090	-0.119	-0.049	-0.007	0.046	-0.106		0.179
	(<.0001)	(<.0001)	(<.0001)	(0.020)	(<.0001)	(<.0001)		(<.0001)
VP	-0.200	-0.048	-0.008	0.033	0.082	-0.024	0.215	
	(<.0001)	(<.0001)	(0.012)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	

The sample consists of 144,336 firm-year observations representing 16,119 firms from 1962 to 2009. Below reported correlations, p-values are shown in parentheses.

Variable definitions:

ROA: Return on total assets, measured as operating income (data178) deflated by the average of total assets (data6) at the beginning and end of a fiscal year.

ROA: Return on total assets in year t+1, i.e., the next year.

FROA: The average return on total assets (ROA) from year t+2 to t+5.

LTAA: Long-term asset accruals, measured as change in long-term assets (data6-data4) deflated by average total assets (data6).

ACC: Accruals as defined in Sloan (1996): (Δdata 4 - Δdata 1) - (Δdata5 - Δdata34 - Δdata71) - data14, deflated by average total assets (data6).

FCF: Free cash flow, measured as operating income before depreciation (data13) - interest (data15) - tax (data16) - preferred dividends (data19) - common dividends (data21), deflated by average total assets.

FCF is measured with a one-year lag, i.e., in year t-1. In robustness tests, growth in cash (data1) is applied as a conservative measure of free cash flow.

L: Leverage. The sum of short-term and long-term debts over total assets: (data34+data9)/ data6. It is measured with a one-year lag, i.e., in year t-1.

VP: A measure of equity overvaluation. It is calculated as the ratio of the intrinsic value of equity over the market value of equity (data 25 * data 199). The intrinsic value is estimated as , where , r (=12%) is cost of equity, (=0.62) is the abnormal earnings persistence parameter from the Ohlson (1995) framework, BV is the book value of common equity (data 60), d is annual dividends (data 21), and X is operating income after depreciation (data 178). Lower VP ratios indicate higher likelihood of equity valuation. In related tests, observations with negative VP ratios are omitted. The VP ratio is measured with a one-year lag, i.e., in year t-1.

addition, accruals are a component of current ROA, so there is a mechanical relationship. Accruals and long-term asset accruals are also positively correlated with one-year-ahead ROA and the next 4 years' average ROA (hereafter FROA). However, these correlations do not control for current ROA. I show in later sections that the associations become negative after controlling for current ROA. Free cash flow (FCF) is negatively correlated with leverage (L) with a Spearman correlation coefficient of -0.106 because firms that have a large amount of cash generated internally can afford to borrow less. Also, as expected, accruals and long-term asset accruals are positively correlated with lagged free cash flow (FCF) and negatively correlated with leverage (L) and the intrinsic-value-to-price ratio (VP). For instance, the Spearman correlation coefficients show that long-term asset accruals have correlations of 0.249 with lagged free cash flow, -0.090 with lagged leverage, and -0.200 with lagged VP ratio. These correlations are all significant at the 0.01% level. The above results provide preliminary evidence supporting the idea that free cash flow and overvalued equity may prompt firms to over-invest, while leverage may mitigate this issue.

IV. EMPIRICAL TESTS AND RESULTS

A. Test of H1

To test whether long-term asset accruals and accruals depress short-term profitability but improve long-term profitability, I apply the following regression:

$$ROA_{t+n} = \alpha + \beta_1 ROA_t + \beta_2 INV_t + \varepsilon_{t+n} \quad (1)$$

where n runs from one to ten years ahead, ROA is operating income scaled by the average of total assets at the beginning and end of the fiscal year. INV stands for firm investment (long-term asset accruals or accruals). I run the regression for each year and report the time-series average of coefficients. T-statistics are based on the time-series standard deviation of estimated coefficients.

Panel A of Table 2 reports regression results, applying long-term asset accruals (LTAA) as the investment measure. The coefficient on current ROA is significantly positive, ranging from 0.818 for one-year-ahead ROA to 0.395 for ten-year-ahead ROA. As n increases, the coefficient on current ROA gets smaller, indicating stronger mean reversion of profitability over longer periods. The magnitudes of ROA persistence are similar to those reported in previous studies. For one-year-ahead ROA, the coefficient on long-term asset accruals (LTAA) is negative in all 47 annual

regressions with an average of -0.043. The time-series-based t-statistics is -10.27. The coefficient on LTAA remains significantly negative out to ten years ahead, and never turns positive.[8] This result is inconsistent with the conservative accounting effect that predicts that, at some point, the coefficient should turn positive. Thus, conservative accounting is unlikely to be the dominant cause for the negative association.

In Panel B of Table 2, I use accruals (ACC) as a measure of investment and obtain a similarly negative coefficient for the following ten years' ROA. For one-year-ahead ROA, the coefficient on accruals is negative in 98% of annual regressions with an average of -0.101. The time-series-based t-statistic is -12.04. The coefficient is significantly negative out to ten years ahead and never turns positive. The coefficient on accruals is generally bigger in magnitude than the coefficient on long-term asset accruals (LTAA); this is because LTAA is positively skewed, while ACC is more symmetrically distributed, and hence, less affected by extreme values.

Overall, the results in Table 2 support H1 and confirm the robustness of a negative association between accruals/long-term asset accruals and future profitability. They are also consistent with related research in Richardson et al. (2006), who suggest that the negative association is inconsistent with any effects from conservative accounting. In a related study, Abarbanell and Bushee (1997) also find evidence that the association between capital expenditure and future earnings does not eventually reverse. Thus, a plethora of evidence calls for an economic explanation for the negative association.

Table 2
Implications of long-term asset accruals and accruals for future profitability

	Panel A:					Panel B:				
	$ROA_{t+n} = \alpha + \beta_1 ROA_t + \beta_2 LTAA_t + \varepsilon_{t+n}$					$ROA_{t+n} = \alpha + \beta_1 ROA_t + \beta_2 ACC_t + \varepsilon_{t+n}$				
n year ahead	α	β_1	β_2	t(β_2)	%Years $\beta_2 < 0$	α	β_1	β_2	t(β_2)	%Years $\beta_2 < 0$
1	0.007	0.818	-0.043	(-10.27)	93%	0.000	0.832	-0.101	(-12.04)	98%
2	0.012	0.690	-0.048	(-9.45)	91%	0.005	0.703	-0.122	(-11.05)	93%
3	0.016	0.611	-0.048	(-7.27)	93%	0.009	0.624	-0.123	(-11.18)	91%
4	0.019	0.559	-0.053	(-6.40)	90%	0.012	0.570	-0.119	(-11.13)	95%
5	0.022	0.521	-0.052	(-5.33)	90%	0.015	0.530	-0.121	(-13.01)	98%
6	0.025	0.488	-0.047	(-5.66)	88%	0.018	0.498	-0.115	(-12.58)	100%
7	0.027	0.460	-0.043	(-6.23)	85%	0.021	0.469	-0.115	(-9.37)	95%
8	0.029	0.430	-0.040	(-5.59)	87%	0.023	0.439	-0.108	(-10.01)	95%
9	0.030	0.405	-0.039	(-5.62)	86%	0.025	0.413	-0.116	(-9.09)	95%
10	0.031	0.395	-0.037	(-4.24)	72%	0.026	0.402	-0.090	(-6.74)	92%

Coefficients reported in the table are the time-series means of annual regression estimates. T-statistics are based on the time-series standard deviation of estimated coefficients. Variable definitions:

ROA: Return on total assets, measured as operating income (data178) deflated by the average of total assets (data6) at the beginning and end of a fiscal year.

LTAA: Long-term asset accruals, measured as the change in long-term assets (data6-data4) deflated by average total assets (data6).

ACC: Accruals as defined in Sloan (1996): (Δdata 4 - Δdata 1)- (Δdata5 – Δdata34 – Δdata71) – data14, deflated by average total assets (data6).

B. Tests of H2 and H3

In this subsection, I test whether the negative association between accruals/long-term asset accruals and future profitability is mediated by agency cost factors such as free cash flow, leverage, and overvalued equity. Jensen (1986) defines free cash flow as the portion of cash flow that remains after all positive NPV projects are taken. I follow the literature in corporate finance, e.g., Gul and Tsui (1998), and define free cash flow (FCF) as operating income before depreciation minus interests, taxes, and preferred and common dividends, scaled by total assets. I measure leverage (L) as total debt divided by total assets, following Lang et al. (1996). To measure equity overvaluation, I follow Richardson (2006) and construct a ratio of the intrinsic value of equity over the market value of equity (VP). The intrinsic value is estimated based on firm book value, earnings, and dividends from the Ohlson (1995) framework. More specifically, intrinsic value is estimated as $(1-\alpha r)BV+\alpha(1+r)X-\alpha rd$, where $\alpha=\varpi/(1+r-\varpi)$, r is the cost of equity (=12%), ϖ is the abnormal earnings persistence parameter (=0.62, based on estimate in Dechow et al.1999), BV is the book value of common equity, d refers to annual dividends, and X is operating income after depreciation. A lower VP ratio indicates a higher likelihood of equity valuation; in related tests, observations with a negative VP ratio are omitted. Following the literature, I measure FCF, L and the VP ratio with a one-year lag.

For each year, I sort the whole sample into five portfolios based on levels of free cash flow, leverage, or VP ratio in the year prior to investment. Within each portfolio, I then repeat regression (1). To investigate the long-term implications of accruals/long-term asset accruals, I also measure the dependent variable as the average return on assets from two to five years ahead (FROA):

$$FROA=\alpha+\beta_1 ROA_t+\beta_2 INV_t+\varepsilon \quad (2)$$

Panels A and B of Table 3 present the time-series means of annual regression coefficients. T-statistics are based on the times-series standard deviation of estimated coefficients. Across both regressions of one-year-ahead ROA (Model 1) and subsequent four-year average ROA (Model 2), the coefficients on long-term asset accruals (LTAA) or accruals (ACC) are almost always negative. More importantly, the coefficients generally increase in magnitude (i.e., become more negative) as the level of free cash flow rises, the level of leverage decreases, or the level of equity overvaluation increases. For example, in tests of Model 1, the coefficients on LTAA increase in magnitude from 0.010 in the lowest FCF group to -0.060 in the highest FCF group, decrease from -0.020 in the lowest leverage group to -0.001 in the highest leverage group, and decrease from -0.032 in the lowest VP ratio group to -0.025 in the highest VP ratio group (a low ratio indicates a high likelihood of overvaluation). The differences in coefficients across different levels of agency cost factors, "High-Low," are -0.070, 0.019, and 0.007 (t = -8.90, 2.14 and 0.93), respectively. The lack of significance in the VP ratio test may be explained by the fact that high prices in firms with low VP ratios not only indicate overvalued equity, but also anticipate high profitability in the next year. Thus, the agency cost effect from over-valued equity may be countered by the profit anticipation effect. In Model 2, all differences are statistically

Table 3
Implications of agency costs for the association between long-term asset accruals/accruals and future profitability

		Model 1 $ROA_{t+1} = \alpha + \beta_1 ROA_t + \beta_2 INV_t + \varepsilon_{t+1}$					Model 2 $FROA = \alpha + \beta_1 ROA_t + \beta_2 INV_t + \varepsilon$				
		α	β_1	β_2	t(β_2)	%Years $\beta_2 < 0$	α	β_1	β_2	t(β_2)	%Years $\beta_2 < 0$
Panel A: INV=LTAA, Mean Estimates											
Free Cash Flow (FCF)	Low	-0.033	0.707	0.010	(1.22)	43%	-0.039	0.486	-0.003	(-0.32)	54%
	2	0.004	0.739	-0.033	(-5.93)	84%	0.017	0.510	-0.045	(-4.93)	83%
	3	0.017	0.749	-0.037	(-8.59)	89%	0.039	0.490	-0.044	(-6.96)	93%
	4	0.020	0.762	-0.054	(-10.82)	98%	0.043	0.495	-0.058	(-8.84)	98%
	High	0.016	0.752	-0.060	(-10.25)	95%	0.035	0.475	-0.051	(-7.20)	98%
	High-Low	0.049	0.045	-0.070	(-8.90)	89%	0.074	-0.012	-0.047	(-5.47)	80%
Leverage (L)	Low	-0.011	0.818	-0.020	(-2.54)	63%	0.001	0.625	-0.035	(-2.73)	0.001
	2	0.009	0.783	-0.040	(-4.90)	77%	0.028	0.559	-0.053	(-5.45)	0.028
	3	0.014	0.758	-0.031	(-4.35)	77%	0.032	0.540	-0.042	(-6.11)	0.032
	4	0.016	0.734	-0.027	(-3.95)	74%	0.033	0.496	-0.021	(-3.07)	0.033
	High	0.010	0.729	-0.001	(-0.15)	56%	0.027	0.474	-0.002	(-0.21)	0.027
	High-Low	0.021	-0.089	0.019	(2.14)	35%	0.026	-0.151	0.033	(2.10)	0.026
VP ratio	Low	-0.006	0.814	-0.032	(-5.20)	81%	0.001	0.601	-0.037	(-4.08)	79%
	2	0.010	0.804	-0.048	(-7.59)	88%	0.025	0.565	-0.051	(-6.67)	85%
	3	0.014	0.789	-0.048	(-9.29)	88%	0.034	0.539	-0.045	(-6.62)	92%
	4	0.015	0.768	-0.033	(-4.76)	74%	0.035	0.518	-0.027	(-4.93)	82%
	High	0.011	0.740	-0.025	(-4.14)	69%	0.028	0.515	-0.014	(-1.78)	69%
	High-Low	0.017	-0.074	0.007	(0.93)	55%	0.027	-0.086	0.023	(2.25)	46%
Panel B: INV=ACC, Mean Estimates											
Free Cash Flow (FCF)	Low	-0.032	0.722	-0.060	(-6.87)	82%	-0.040	0.502	-0.069	(-7.67)	90%
	2	0.000	0.760	-0.077	(-10.81)	98%	0.013	0.527	-0.077	(-6.32)	90%
	3	0.011	0.774	-0.079	(-9.02)	91%	0.032	0.517	-0.082	(-6.40)	85%
	4	0.011	0.789	-0.091	(-8.47)	91%	0.033	0.530	-0.116	(-9.55)	90%
	High	0.001	0.785	-0.121	(-11.33)	95%	0.019	0.517	-0.147	(-13.54)	98%
	High-Low	0.034	0.063	-0.061	(-5.37)	84%	0.059	0.015	-0.078	(-6.44)	85%
Leverage (L)	Low	-0.009	0.812	-0.084	(-7.83)	84%	-0.010	0.627	-0.112	(-7.13)	88%
	2	-0.001	0.808	-0.116	(-10.99)	93%	0.018	0.571	-0.107	(-8.44)	88%
	3	0.006	0.786	-0.107	(-13.51)	98%	0.025	0.556	-0.084	(-5.93)	85%
	4	0.009	0.769	-0.082	(-8.39)	89%	0.030	0.500	-0.081	(-6.49)	85%
	High	0.004	0.761	-0.053	(-7.03)	82%	0.026	0.492	-0.053	(-4.02)	73%
	High-Low	0.012	-0.051	0.031	(2.39)	34%	0.036	-0.135	0.060	(2.68)	33%
VP ratio	Low	-0.013	0.839	-0.145	(-13.79)	100%	-0.008	0.627	-0.153	(-8.95)	90%
	2	0.001	0.828	-0.126	(-10.97)	98%	0.015	0.594	-0.154	(-10.23)	97%
	3	0.008	0.802	-0.080	(-7.53)	86%	0.026	0.557	-0.099	(-7.66)	92%
	4	0.011	0.778	-0.059	(-6.30)	86%	0.031	0.528	-0.061	(-4.90)	85%
	High	0.008	0.750	-0.056	(-6.17)	81%	0.025	0.527	-0.054	(-5.24)	87%
	High-Low	0.021	-0.089	0.089	(6.08)	17%	0.033	-0.100	0.099	(5.11)	18%

Table 3 (continued)

		Model 1 $ROA_{t+1} = \alpha + \beta_1 ROA_t + \beta_2 INV_t + \varepsilon_{t+1}$				Model 2 $FROA = \alpha + \beta_1 ROA_t + \beta_2 INV_t + \varepsilon$			
		α	β_1	β_2	p-value β_2	α	β_1	β_2	p-value β_2
Panel C: INV=LTAA, Median Estimates									
Free Cash Flow (FCF)	Low	-0.043	0.720	0.005	{0.451}	-0.030	0.506	-0.012	{0.755}
	2	0.002	0.748	-0.026	{0.000}	0.018	0.501	-0.039	{0.000}
	3	0.015	0.734	-0.038	{0.000}	0.035	0.495	-0.038	{0.000}
	4	0.021	0.760	-0.055	{0.000}	0.040	0.502	-0.052	{0.000}
	High	0.015	0.758	-0.063	{0.000}	0.027	0.468	-0.039	{0.000}
	High-Low	0.046	0.042	-0.070	{0.000}	0.051	-0.036	-0.039	{0.000}
Leverage (L)	Low	-0.013	0.823	-0.026	{0.126}	0.007	0.645	-0.050	{0.006}
	2	0.003	0.793	-0.048	{0.001}	0.016	0.584	-0.044	{0.000}
	3	0.012	0.773	-0.033	{0.001}	0.025	0.548	-0.050	{0.000}
	4	0.017	0.723	-0.030	{0.002}	0.027	0.555	-0.037	{0.000}
	High	0.008	0.762	-0.003	{0.542}	0.019	0.543	-0.031	{0.000}
	High-Low	0.023	-0.068	0.016	{0.066}	0.014	-0.098	0.013	{0.068}
VP ratio	Low	-0.009	0.809	-0.027	{0.000}	-0.013	0.590	-0.034	{0.000}
	2	0.008	0.802	-0.042	{0.000}	0.020	0.559	-0.046	{0.000}
	3	0.013	0.788	-0.053	{0.000}	0.032	0.534	-0.043	{0.000}
	4	0.012	0.770	-0.032	{0.003}	0.034	0.491	-0.027	{0.000}
	High	0.010	0.742	-0.028	{0.020}	0.027	0.505	-0.013	{0.024}
	High-Low	0.019	-0.055	-0.009	{0.644}	0.030	-0.110	0.005	{0.074}
Panel D: INV=ACC, Median Estimates									
Free Cash Flow (FCF)	Low	-0.046	0.739	-0.064	{0.000}	-0.031	0.534	-0.062	{0.000}
	2	-0.002	0.767	-0.076	{0.000}	0.010	0.518	-0.076	{0.000}
	3	0.009	0.753	-0.095	{0.000}	0.024	0.517	-0.086	{0.000}
	4	0.010	0.804	-0.085	{0.000}	0.030	0.517	-0.122	{0.000}
	High	-0.003	0.786	-0.131	{0.000}	0.012	0.523	-0.137	{0.000}
	High-Low	0.030	0.054	-0.063	{0.000}	0.041	-0.008	-0.079	{0.000}
Leverage (L)	Low	-0.016	0.819	-0.087	{0.000}	-0.025	0.625	-0.104	{0.000}
	2	-0.007	0.820	-0.114	{0.000}	0.007	0.586	-0.107	{0.000}
	3	0.004	0.810	-0.110	{0.000}	0.022	0.496	-0.098	{0.000}
	4	0.003	0.767	-0.075	{0.000}	0.031	0.478	-0.083	{0.000}
	High	-0.001	0.769	-0.047	{0.000}	0.018	0.459	-0.057	{0.006}
	High-Low	0.011	-0.058	0.049	{0.049}	0.039	-0.140	0.067	{0.038}
VP ratio	Low	-0.017	0.838	-0.146	{0.000}	-0.018	0.617	-0.154	{0.000}
	2	-0.003	0.834	-0.121	{0.000}	0.012	0.585	-0.135	{0.000}
	3	0.006	0.805	-0.078	{0.000}	0.024	0.558	-0.075	{0.000}
	4	0.009	0.790	-0.055	{0.000}	0.030	0.507	-0.057	{0.000}
	High	0.007	0.762	-0.061	{0.000}	0.021	0.500	-0.043	{0.000}
	High-Low	0.020	-0.085	0.088	{0.000}	0.031	-0.097	0.083	{0.000}

This table reports results from regressions in five portfolios ranked by levels of free cash flow (FCF), leverage (L) or VP ratio, all measured with a one-year lag. Reported coefficients are based on time-series means (Panels A & B) or medians (Panels C & D). T-statistics are based on the time-series standard deviation of coefficient estimates. P-values reported in { } are based on the Wilcoxon rank sum two-sided test. "High-Low" in Panels C &D are medians of coefficient differences, not differences of median estimates. See Table 1 for variable definitions

significant. In each test, I also report the proportion of sample years in which the coefficients on LTAA in firms with high agency cost variables are more negative than those in firms with low agency cost variables. The results are consistent with my predictions in H2 and H3.

The coefficients on accruals (ACC) also move in predicted directions. They increase in magnitude from -0.060 to -0.121 in Model 1, and from -0.069 to -0.147 in Model 2 as the free cash flow level increases. As leverage ratio increases, the coefficients decline from -0.084 to -0.053 in Model 1, and from -0.112 to -0.053 in Model 2. As VP ratio increases, the coefficients decrease from -0.145 to -0.056 in Model 1, and from -0.153 to -0.054 in Model 2.

Panels C and D of Table 3 present time-series medians of annual regression coefficients. P-values for median coefficient differences are based on Wilcoxon rank sum tests. Results are qualitatively similar to those reported in Panels A and B.

In un-tabulated tests, I apply growth in cash holdings as another proxy for free cash flow. I also measure leverage by total liability over the sum of total liability and equity capitalization. The results are robust to using these alternative measures. To test whether my results are sensitive to different time-periods, I repeat my tests in the following sub-periods: 1962 to1977, 1978 to 1993, and 1994 to 2009. The results (untabulated) are qualitatively similar in each sub-period.

Overall, the results in Table 3 are generally consistent with H2 and H3: while free cash flow and overvalued equity can exacerbate the negative association between accruals/long-term asset accruals and future profitability, leverage can mitigate the effect.

C. Test of H4

H4 is the hypothesis that the negative association between accruals/ long-term asset accruals and future profitability is stronger in the sample of positive discretionary investment than in the sample of negative discretionary investment. This is because over-investment is more likely to occur in the former group than in the latter. To test H4, I repeat regression (1) in both groups. Table 4 reports the test results.

In Panel A, I measure investment through long-term asset accruals (LTAA). Discretionary investment is the estimated residual from an investment prediction model with explanatory variables of Tobin's Q, return on assets, and past sales growth. In the sample of positive discretionary LTAA, coefficients on LTAA across all regressions are significantly negative. In striking contrast, no coefficient on LTAA (except for the one-year-ahead test) is significantly negative in the sample of negative discretionary LTAA. In fact, coefficients in this sample are significantly *positive* in the eight-, nine-, and ten-year-ahead tests.[9] The lack of negative association between LTAA and future profitability in this group may be due to the lower likelihood of over-investment. Across all tests, the coefficients on LTAA in the positive discretionary LTAA sample are much lower than corresponding ones in the negative discretionary LTAA sample.

In Panel B, a similar pattern can be observed. The coefficients on accruals (ACC) are all significantly negative in the positive discretionary accruals sample. In contrast, in the negative discretionary accruals sample, except for the one- and two-year-ahead tests, no coefficient is significantly negative. In some tests, the coefficients are even significantly positive. Across all tests, the coefficients on ACC in the positive

discretionary accruals sample are much lower than those in the negative discretionary accruals sample.

In summary, results in both panels support H4 that the negative association between accruals/long-term asst accruals and future profitability is mostly driven by discretionary over-investment. The evidence, however, is inconsistent with explanations from accrual reliability or earnings management.

Table 4
Different implications of positive and negative long-term asset accruals/accruals for future profitability

n year ahead	α	β_1	β_2	t (β_2)	%Years $\beta_2 < 0$	α	β_1	β_2	t (β_2)	%Years $\beta_2 < 0$
Panel A: $ROA_{t+n} = \alpha + \beta_1 ROA_t + \beta_2 LTAA_t + \varepsilon_{t+n}$										
	Discretionary LTAA >0					Discretionary LTAA <0				
1	0.007	0.819	-0.030	(-5.66)	82%	0.012	0.823	-0.025	(-2.08)	68%
2	0.015	0.687	-0.037	(-7.03)	86%	0.019	0.705	-0.019	(-1.26)	61%
3	0.020	0.613	-0.042	(-6.88)	88%	0.024	0.624	-0.005	(-0.27)	51%
4	0.025	0.555	-0.047	(-5.44)	86%	0.026	0.576	-0.023	(-1.60)	55%
5	0.027	0.517	-0.045	(-3.90)	78%	0.029	0.535	-0.024	(-1.68)	61%
6	0.030	0.481	-0.042	(-4.31)	85%	0.031	0.502	0.005	(0.35)	58%
7	0.034	0.450	-0.042	(-4.91)	77%	0.034	0.468	0.023	(1.76)	38%
8	0.035	0.430	-0.047	(-4.63)	79%	0.037	0.430	0.039	(2.24)	37%
9	0.036	0.413	-0.048	(-4.55)	81%	0.038	0.405	0.046	(3.68)	27%
10	0.035	0.409	-0.043	(-4.12)	75%	0.036	0.404	0.027	(2.43)	33%
Panel B: $ROA_{t+n} = \alpha + \beta_1 ROA_t + \beta_2 ACC_t + \varepsilon_{t+n}$										
	Discretionary ACC>0					Discretionary ACC<0				
1	0.003	0.844	-0.126	(-10.34)	95%	0.009	0.813	-0.057	(-5.04)	80%
2	0.010	0.721	-0.179	(-11.44)	95%	0.020	0.681	-0.045	(-2.63)	68%
3	0.015	0.632	-0.181	(-12.46)	98%	0.027	0.608	-0.015	(-0.83)	51%
4	0.019	0.575	-0.191	(-11.97)	98%	0.033	0.548	0.009	(0.59)	45%
5	0.021	0.534	-0.181	(-10.21)	100%	0.034	0.507	-0.008	(-0.35)	49%
6	0.024	0.507	-0.181	(-11.34)	100%	0.037	0.479	0.003	(0.13)	40%
7	0.028	0.469	-0.181	(-11.15)	100%	0.039	0.460	0.013	(0.60)	38%
8	0.029	0.443	-0.190	(-10.94)	100%	0.046	0.425	0.072	(3.48)	32%
9	0.031	0.422	-0.196	(-10.19)	100%	0.047	0.395	0.059	(2.15)	38%
10	0.031	0.416	-0.174	(-7.30)	89%	0.044	0.399	0.073	(3.99)	25%

Reported coefficients are based on the time-series means of annual regression estimates. T-statistics are based on the time-series standard deviation of estimated coefficients. Discretionary LTAA and Discretionary ACC are residuals from a model of discretionary investments that includes Tobin's Q, firm profitability, and past sales growth as explanatory variables. For definitions of other variables, see Table 1.

D. Test of H5

In this subsection, I test whether the negative association between accruals/long-term asset accruals and future profitability is stronger for accruals/long-term asset accruals made in the fourth quarter than in other quarters. The following regression is applied for each fiscal quarter:

$$ROA_{q+4} = \alpha + \beta_1 ROA_q + \beta_2 INV_q + \varepsilon \quad (3)$$

Table 5
Implications of fourth-quarter long-term asset accruals/accruals for future profitability

Fiscal Quarter	Panel A $ROA_{q+4} = \alpha + \beta_1 ROA_q + \beta_2 LTAA_q + \varepsilon$					Panel B $ROA_{q+4} = \alpha + \beta_1 ROA_q + \beta_2 ACC_q + \varepsilon$				
	α	β_1	β_2	t (β_2)	%Years $\beta_2 < 0$	α	β_1	β_2	t (β_2)	%Years $\beta_2 < 0$
	All Sample					All Sample				
1	-0.002	0.687	-0.017	(-2.37)	58%	-0.002	0.701	-0.044	(-6.24)	88%
2	-0.002	0.656	-0.027	(-3.30)	75%	-0.004	0.674	-0.069	(-12.08)	100%
3	-0.003	0.614	-0.039	(-4.74)	92%	-0.004	0.618	-0.076	(-7.51)	88%
4	-0.009	0.607	-0.068	(-6.90)	83%	-0.012	0.601	-0.060	(-7.15)	92%
4-1			-0.050	(-4.92)	76%			-0.016	(-1.75)	68%
			-0.053	{0.000}				-0.017	{0.073}	
4-2			-0.040	(-3.30)	72%			0.008	(1.15)	40%
			-0.047	{0.003}				0.012	{0.378}	
4-3			-0.027	(-2.56)	64%			0.016	(1.33)	44%
			-0.031	{0.023}				0.007	{0.309}	
	LTAA>0					ACC>0				
1	-0.002	0.723	-0.017	(-2.35)	71%	-0.001	0.746	-0.069	(-6.09)	96%
2	-0.003	0.711	-0.022	(-2.90)	83%	-0.004	0.747	-0.065	(-5.65)	92%
3	-0.004	0.710	-0.026	(-3.47)	71%	-0.006	0.727	-0.061	(-4.00)	75%
4	-0.008	0.706	-0.063	(-4.53)	92%	-0.010	0.661	-0.110	(-5.45)	92%
4-1			-0.045	(-3.31)	76%			-0.040	(-1.82)	60%
			-0.039	{0.004}				-0.029	{0.072}	
4-2			-0.040	(-2.63)	64%			-0.045	(-1.95)	64%
			-0.027	{0.029}				-0.049	{0.068}	
4-3			-0.037	(-2.83)	72%			-0.049	(-2.02)	64%
			-0.029	{0.008}				-0.064	{0.055}	
	LTAA<0					ACC<0				
1	-0.002	0.660	0.016	(0.61)	38%	-0.002	0.659	-0.012	(-0.91)	63%
2	-0.004	0.602	-0.039	(-1.51)	71%	-0.004	0.640	-0.058	(-5.19)	79%
3	-0.005	0.538	-0.085	(-3.45)	75%	-0.004	0.579	-0.064	(-4.58)	79%
4	-0.013	0.535	-0.060	(-2.12)	71%	-0.011	0.578	-0.027	(-2.21)	71%
4-1			-0.077	(-2.48)	72%			-0.014	(-0.94)	64%
			-0.078	{0.010}				-0.020	{0.349}	
4-2			-0.021	(-0.78)	56%			0.030	(1.73)	52%
			-0.056	{0.162}				-0.001	{0.284}	
4-3			0.025	(0.75)	44%			0.037	(2.02)	36%
			0.022	{0.471}				0.051	{0.025}	

In this table, one-year-ahead quarterly ROA is regressed on current ROA and long-term asset accruals/accruals. Reported coefficients are based on the time-series means of annual regression estimates from 1977 to 2009. "4-1" reports mean and median differences in coefficients before long-term asset accruals/accruals. T-statistics in parentheses are based on the time-series standard deviation of estimated coefficients. P-values from the Wilcoxon rank sum two-sided test are reported in braces { }.

Variable definitions:

ROA： Quarterly return on total assets, measured as quarterly earnings (data8) deflated by the average of total assets (data44) at the beginning and end of a fiscal quarter.

LTAA: Quarterly long-term asset accruals, measured as the change in long-term assets (data44 - data40) deflated by average total assets (data44).

ACC：Quarterly accruals, measured as (Δdata 40 - Δdata 36) - (Δdata49 - Δdata45 - Δdata47) - data5, deflated by average total assets (data44).

Results are presented in Table 5. In Panel A, the negative coefficients on long-term asset accruals (LTAA) increase in magnitude from -0.017 (t = -2.37) in the first quarter to -0.068 (t = -7.28) in the fourth quarter. In the positive LTAA sample, where over-investment is more likely, the fourth-quarter coefficient on LTAA (-0.063) is much more negative than those in other quarters (-0.017 to -0.026). The differences are significant at the 0.05 level based on t-tests of the means and Wilcoxon rank sum tests of the medians. In contrast, the fourth-quarter coefficient on LTAA in the negative LTAA sample is not the most negative.

In Panel B, the fourth-quarter coefficient on accruals (ACC) is comparable to the second- and third-quarter coefficients but is significantly more negative than the first-quarter coefficient at the 0.10 level. In the positive ACC sample, where over-investment is more likely, the coefficient on fourth-quarter ACC (-0.110) is more negative than those in other quarters (-0.061 to -0.069) in the positive ACC sample. The difference is significant at both the 0.05 level and the 0.10 level. In the negative ACC sample, where over-investment is less likely, I do not observe this pattern. Overall, the empirical results support H5.

E. Discussions on Other Factors: Diminishing Marginal Returns on Investment, Earnings Management, and Accrual Reliability

Besides agency costs, there are other factors that may mediate the negative association between accruals/long-term asset accruals and future profitability. Fairfield et al. (2003a) speculate that diminishing marginal returns on investment could contribute to this. Firms that have been enjoying extremely high profitability will draw more competition, which drives down the gap between current profitability and the market average profitability. New capital investments in these firms are, thus, unlikely to sustain the current level of return on investment. The explanation from diminishing marginal returns on investment seems plausible. It should be noted that the over-investment explanation could even be nested within the diminishing marginal returns on investment, because agency costs could affect investment magnitude. Nonetheless, to find out whether agency costs still mediate the association even after controlling for investment magnitude, I double-sort the sample for each year into 5x5 portfolios based on the levels of current ROA and investment intensity (long-term asset accruals or accruals). Within each of the 25 portfolios, I further sort observations into quintiles based on levels of lagged free cash flow, leverage, or over-valued equity. Within each quintile, I then test the association between accruals/long-term asset accruals and future profitability. This procedure makes sure that each quintile has similar distributions of investment magnitude and current ROA; thus, any difference in the association across quintiles cannot be attributed to diminishing marginal returns on investment. Note that this procedure is biased against finding any mediating effects from agency costs. Untabulated results show that there is still a significant difference in the association across different levels of agency cost factors, as predicted by H2 and H3. This evidence suggests that agency costs may still mediate the negative association beyond the influence from diminishing marginal returns on investment.

Accrual reliability provides another plausible explanation. Richardson et al. (2005) argue that investment would create accruals, and these accruals are unreliable measures of future economic benefits. They claim that the estimation error in accruals

causes the negative association described above. If this is the reason, investments in intangible assets that less reliably measure future economic benefits should be more negatively associated with future earnings and returns. However, in untabulated tests I find that investment in intangibles (data33) is less negatively correlated with future profitability than investment in tangible assets, such as PPE. On the other hand, Moon (2001) documents evidence that managers are unlikely to over-invest in intangibles; thus, the paucity of over-investment in intangibles may account for this difference. I have also shown that the negative association exists primarily in the sample of positive discretionary investment but not in the sample of negative discretionary investment. Since accrual unreliability and the associated measurement errors are not limited to the former sample, they are unlikely to be the *sole* cause of the negative association.

Another potential factor that might explain the negative association between accruals/long-term asset accruals and future profitability is earnings management. Xie (2001) finds that the accrual anomaly is driven by discretionary accruals, which he attributes to earnings management. If earnings management is the *sole* cause underlying the negative association between accruals and future profitability, an investment measure that is free of earnings management/estimation error should show no association with future profitability. But when I replace long-term asset accruals with growth in number of employees or investing cash flows, the associations remain significantly negative.

While the above evidence cannot be explained by earnings management or measurement errors *separately*, it may be explained by earnings management and firm over-investment *jointly*. The contracting-based theory of accounting often postulates that managers opportunistically choose particular accounting procedures at the expense of other stake holders. Non-value-maximizing management may portray an optimistic picture of firm performance to justify high levels of investment. Beneish et al. (2012) find that firms with high growth rates are more likely to engage in earnings management. If asset accruals entail more subjectivity and measurement error than liability accruals, they could be easier targets for earnings management. Eventually, the inflated earnings (through inflated accruals) will reverse in the future. Thus, earnings management, measurement error, and over-investment could be complementary, rather than mutually exclusive, explanations. I cannot totally rule out earnings management or measurement error as possible interpretations. The interaction among these analyses may warrant further investigation.

V. CONCLUSION

This paper represents the first attempt to examine whether agency costs can affect the negative associations between accruals/long-term asset accrual and future profitability. My results show that the associations are, indeed, exacerbated when firms have high free cash flow, low leverage, or over-valued equity, consistent with management empire-building incentives. The negative association is also stronger in the fourth fiscal quarter, when managers are often in a position to either spend the money or "waste" the investment budget. Further analysis reveals that it is the positive discretionary investment sample that drives the negative associations.

My findings may have implications for the accrual anomaly. Xie (2001) finds that the accrual anomaly is driven by discretionary accruals. Specifically, he applies a

modified Jones (1991) model and documents evidence that discretionary accruals are less persistent than non-discretionary accruals in predicting future earnings. While discretionary accruals are often interpreted as a proxy for earnings manipulation, it is interesting to note that explanatory variables that are applied in various versions of the Jones model, such as growth in sales and PPE/total assets, might also proxy for investment opportunities.[10] Thus, it is possible that discretionary accruals actually capture discretionary investment. Future study in this area seems warranted. For example, researchers may follow Liu and Peng (2008) and investigate how corporate governance structures mediate the negative association between accruals/long-term asset accruals and future profitability.

ENDNOTES

1. This paper is based on my dissertation at the University of California, Berkeley. I thank my committee members, Terry Marsh, Sunil Dutta, and Roger Craine for their guidance and help. I would also like to thank workshop participants at UC Berkeley, Singapore Management University, National University of Singapore, George Washington University, Baruch College, HKUST, the 11th Int'l Business and Economy Conference, and the 2012 AAA south-western regional conference for their valuable comments. I also benefited from discussions with George Li, Franco Wong, Bok Baik, Tatiana Fedyak, Wenli Huang, and Katherine Gunny. All remaining errors are mine.
2. Accruals, also known as working capital accruals, are defined in the accounting literature as firm earnings minus cash flow from operating activities. They could be alternatively measured as the change in noncash working capital minus depreciation expenses.
3. Many anecdotes suggest that managers prefer to expand their companies faster than they should. For example, prior to its leveraged buyout (LBO) in 1988, RJR Nabisco's baking unit devised a plan to revamp and modernize its baking facility at a cost of $2.8 billion. The annual savings from the modernization would have been only $148 million, providing a pretax return of only 5 percent. After the LBO, the modernization plan was scaled back (*The Wall Street Journal*, March 14, 1989).
4. The earnings management literature generally predicts less accrual manipulation in the fourth quarter than in other quarters (e.g., Brown and Pinello, 2007). Thus, evidence in the fourth fiscal quarter can help distinguish between explanations of over-investment and of earnings management.
5. On the other hand, the capital rationing theory predicts that high free cash flow and high cash holdings can benefit a firm by reducing the cost of information asymmetry that places a wedge between the costs of internal and external capital. Under this theory, high free cash flow may enable firms to make optimal investments and improve operating performance. Recently, there has been increasing evidence against the capital rationing theory (Kaplan and Zingales, 1997; Cleary, 1999); I, thus, expect the agency cost effect to dominate the rationing effect.
6. I start my sample from 1962 because, from that year on, the data is available for a substantial number of firms and also because Compustat data prior to 1962 suffers from serious survivorship bias.

7. To avoid the effect of outliers, variables are winsorized at the top and bottom 1% values. Following the literature, ROA is winsorized between -1 and 1.
8. Investment (accruals) will likely inflate future total assets—the denominator of ROA (Fairfield et al., 2003b). Thus, a negative association between accruals and future ROA could be no more than a mechanical relation. To address this concern, I also examine the impact of accruals/long-term asset accruals on earnings deflated by sales (industry adjusted) and get qualitatively similar results.
9. If underinvestment prevails in this group, more investment should improve future profitability, implying positive coefficients on LTAA.
10. Shin and Stulz (1996) use growth in sales as a proxy for investment opportunity. Skinner (1993) applies PPE/firm value to proxy for investment opportunity.

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