Asset Growth Reversals and Investment Anomalies*

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Abstract

We simultaneously test the prominent rational and behavioral explanations of the negative relations between corporate asset growth or investments and subsequent stock returns by extensively examining the effects of realized and predicted subsequent growth on the relations. We find: (i) returns on low growth firms with low subsequent growth are not higher than those on high growth firms with high subsequent growth; (ii) high growth firms that have high subsequent growth do not underperform and the return spreads between low and high growth firms are lower when high growth firms have higher subsequent growth; (iii) the relations between growth and returns are weak or even in opposite direction when subsequent growth tend not to reverse but are significantly negative when subsequent growth tend to reverse and are stronger when the reversals are more extreme. Our findings are consistent with the overreactions hypothesis but less consistent with the other explanations.

JEL Classification: G14, G31, G32, M41, M42

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1. Introduction

Large amount of studies have documented that corporate asset growth and investments are negatively related to future stock returns (see, for example, Sloan, 1996; Hirshleifer, Hou, Teoh, and Zhang, 2004; Titman, Wei, and Xie, 2004; Richardson, Sloan, Soliman, and Tuna, 2005; Daniel and Titman, 2006; Fama and French, 2006, 2008; Cooper, Gulen, and Schill, 2008; Pontiff and Woodgate, 2008; Lyandres, Sun, Zhang, 2008; Xing, 2008; Chen, Novy-Marx, and Zhang, 2010). Recently, Cooper and Priestley (2011) show that the some of the negative relations are largely explained by differences in systematic risks. Besides, consistent with the *q*-theory of investment (see, for example, Zhang, 2005; Xing, 2008; Li, Livdan, and Zhang, 2009; Liu, Whited, and Zhang, 2009; Chen, Novy-Marx, and Zhang, 2010; Wu, Zhang, and Zhang, 2010) and real options model (see, for example, Berk, Green, and Naik, 1999; Carlson, Fisher, and Giammarino, 2004, 2006), firms' systematic risks decrease following high growth and investments.

Furthermore, Li and Zhang (2010) show that the negative relations are stronger when investment frictions are more serious, which is accordant with the *q*-theory with investment frictions. On the other hand, Mashruwala, Rajgopal, and Shevlin (2004) and Lipson, Mortal, and Schill (2011) show that the accrual-return relation and the asset-growth-return relation, respectively, is stronger when limits to arbitrage are more severe, which is consistent with the mispricing hypothesis with limited arbitrage suggested by Shleifer and Vishny (1997). However, Lam and Wei (2011) show that investment frictions proxies and limits to arbitrage proxies are highly correlated and both interactive predictions receive a fair and similar amount of evidence in the data.

In this paper we simultaneously examine the prominent explanations of the negative relations by extensively testing their predictions on the effect of subsequent growth on the relations. Specifically, the rational forward-looking *q*-theory of investment and real options model predict that the subsequent average stock returns or realization of expected returns are uniformly negatively related to growth or investments regardless of subsequent growth. On the other hand, the mispricing explanation based on underreactions to overinvestments proposed by Titman, Wei, and Xie (2004) predicts that overinvested firms which continue to overinvest should underperform more severely hence the negative relations to be stronger when subsequent growth of high growth or investments firm are higher. Finally, the mispricing explanation based on overreactions to business expansions or reductions suggested by Cooper, Gulen, and Schill (2008) predicts that expanding (contracting) firms which continue to expand (contract) should not underperform (outperform) but expanding (contracting) firms which contract (expand) should underperform (outperform). Therefore, the negative relations to be weaker when high (low) growth or investments firms have high (low) subsequent growth and the negative relations to be stronger when high (low) growth or investments firms have low (high) subsequent growth.

We find that in general stock returns are increasing in subsequent growth across each growth or investments grouping. In particular, the returns on low growth or investment firms with low subsequent growth are not higher than those on high growth or investment firms with high subsequent growth. On the other hand, returns on high growth or investment firms that have high subsequent growth are higher than those with low subsequent growth. Specifically, the abnormal returns on high growth or investment firms that have high (low) subsequent growth tend to be non-negative (negative). Besides, the returns on low growth or investment firms that have high subsequent growth are higher than those with low subsequent growth. In particular, the abnormal returns on low growth or investment firms that have high (low) subsequent growth tend to be positive (non-positive).

More importantly, the return spreads between low growth firms which have high subsequent growth and high growth firms which have low subsequent growth are significantly positive and the magnitudes are higher than the spreads simply between low and high growth or investment firms even with value-weighted portfolios. However, the return spreads between low growth or investment firms which have low subsequent growth and high growth or investment firms which have high subsequent growth are non-positive. Besides, the positive return spreads between low growth or investment firms and high growth or investment firms are weaker when the latter have higher subsequent growth. Our findings are consistent with the mispricing explanation based on overreactions to business expansions or reductions but are less compatible with the other explanations. It seems that the relations between corporate asset growth or investments and subsequent stock returns are weak or even in opposite direction when subsequent growth tend not to reverse. The negative relations are significant when subsequent growth tend to reverse and are stronger when the reversals tend to be more extreme.

Recent abnormal stock return, book-to-market equity ratio, idiosyncratic stock return volatility, cash flow volatility, analyst coverage, dispersion in analyst forecasts, institutional ownership, shareholder sophistication, payout ratio, book value of total assets, net cash flow from debt or equity and net share issuance are associated with subsequent growth for low and/or high growth or investment firms. A composite asset growth predictor based on the above firm characteristics is positively correlated with subsequent growth. Low (high) growth or investment firms that have high (low) composite growth prediction score tend to have more salient reversals in asset growth while low (high) growth or investment firms that have low (high) composite growth prediction score does not tend to have material reversals in growth. The findings based on interacting the composite growth predictor with the negative relations between asset growth or investments with subsequent stock returns are largely similar to those based on the interactions with realized subsequent growth. The negative relations are weak when low growth or investment firms are predicted to have low subsequent growth and high growth firms are predicted to have high subsequent growth. The negative relations are strong (stronger) when low growth firms are predicted to have high (higher) subsequent growth and high growth firm are predicted to have low (lower) subsequent growth.

The remainder of this paper is organized as follows. The next section reviews the literature and develops our hypotheses. Section 3 describes our sample. Section 4 examines the relation between subsequent reversals in asset growth and the asset growth anomaly. Section 5 examines the relation between subsequent asset growth reversals and investments related anomalies. Section 6 studies the relations between firm characteristics and subsequent growth reversals, constructs a composite asset-growth predictor, and examines the interactions between the predictor and the anomalies. Finally, Section 7 concludes the paper.

2. Literature Review and Hypothesis Development

The literature has vastly documented that corporate investments and asset growth are negatively related to subsequent stock returns. Specifically, stock returns are shown to be negatively related to accounting accruals (see, for example, Sloan, 1996; Richardson, Sloan, Soliman, and Tuna, 2005), net operating assets (Hirshleifer, Hou, Teoh, and Zhang, 2004), abnormal capital expenditure (Titman, Wei, and Xie, 2004), investment-to-asset ratio (see, for example, Lyandres, Sun, Zhang, 2008; Chen, Novy-Marx, and Zhang, 2010), capital investment growth and investment-to-capital ratio (Xing, 2008), net share issuance (see, for example, Daniel and Titman, 2006; Fama and French, 2008; Pontiff and Woodgate, 2008), and asset growth (see, for example, Fama and French, 2006, 2008; Cooper, Gulen, and Schill, 2008).

There are four prominent explanations for these negative relations: two are rational and the other two are behavioral. One of the rational explanations, which is based on the *q*-theory (see, for example, Zhang, 2005; Xing, 2008; Li, Livdan, and Zhang, 2009; Liu, Whited, and Zhang, 2009; Chen, Novy-Marx, and Zhang, 2010; Li and Zhang, 2010; Wu, Zhang, and Zhang, 2010), argues that firms grow and invest more when expected returns (i.e., costs of capital) are lower but grow and invest less when expected returns are higher, inducing the negative relations between corporate asset growth or investments and subsequent stock returns.[1] The other rational explanation is based on real options model (see, for example, Berk, Green, and Naik, 1999; Carlson, Fisher, and Giammarino, 2004, 2006). Firms that grow their total assets or invest simultaneously turn risky growth options into safer tangible assets hence expectations about future returns are lower due to reduced risk exposure.

The behavioral explanations argue that the anomalies exist because investors fail to incorporate the information from corporate growth and investments into stock prices, which causes the mispricing. The first behavioral explanation (Titman, Wei, and Xie, 2004) attributes the abnormal phenomena to investors' underreactions to overinvestments pursued

[1] Cochrane (1991, 1996), on the other hand, derives a time-series relation between investment and stock returns.

by managers who are empire building.[2] The second behavioral explanation (Cooper, Gulen, and Schill, 2008) attributes the anomalies to investors' overreactions to changes in firms' future business prospects implied by asset expansions or reductions.[3]

2.1. The q-theory of investment and real options model

The *q*-theory of investment argues that firms make optimal corporate investment choices and dynamically trade off free cash flows. The theory argues that with a time-varying discount rate or expected return to capital, rationally forward-looking firms tend to currently grow or invest more in response to higher contemporaneous net present value of new investments when the expectations on future returns are lower, and vice versa (see, for example, Zhang, 2005; Xing, 2008; Li, Livdan, and Zhang, 2009; Liu, Whited, and Zhang, 2009; Chen, Novy-Marx, and Zhang, 2010 Li and Zhang, 2010; Wu, Zhang, and Zhang, 2010). On the other hand, real options model (see, for example, Berk, Green, and Naik, 1999; Carlson, Fisher, and Giammarino, 2004, 2006) argues that when firms grow or invest, growth options are converted into safer real assets. In response to reduced risks, the expectations of future stock returns decrease. As a result, realized asset growth or investments are on average negatively associated with subsequent average stock returns in the cross-section. After all, if expectations on future returns are rationally lower (higher) for high (low) growth

[2] Titman et al (2004) show that the negative relations between abnormal capital expenditure and stock returns are stronger among firms with greater investment discretion as indicated by higher free cash flow or less financial leverage. The abnormal returns also cluster around earnings announcements but that there are no significant returns when hostile takeovers are prevalent. Furthermore, Chan, Karceski, Lakonishok, and Sougiannis (2008) show that the negative relation between asset growth and stock return is driven by the underperformance of high asset-growth stocks and it is stronger when past profitability is poorer and corporate governance is weaker. They also document that the anomaly holds whether asset growth was achieved by mergers and acquisitions, increases in plant, property, and equipment, increases in other current assets or increases in other long-term assets, and whether asset growth was financed by equity or debt.

[3] Cooper et al (2008) find positive earnings surprises for low asset-growth stocks and negative earnings surprises for high asset-growth stocks.

or investments firms, then the subsequent realized average returns on these firms should be lower (higher) regardless of subsequent growth or investments. Our first hypothesis is thus as follows.

H_1: The negative relations between corporate asset growth or investments and subsequent stock returns are unrelated to subsequent asset growth or investments.

2.2. Underreactions to overinvestment and empire building

Titman, Wei, and Xie (2004) argue that investors underreact to overinvestments pursued by managers who are empire building. As the overinvestments and value destructions are subsequently recognized, stock prices decrease in response to valuations being revised downwards. Consequently, realized growth or investments are negatively related with subsequent average stock returns. When further corporate growth or investments are coupled with the recognition of previous overinvestments, stock prices should decrease even more in response to valuations being revised downwards more severely. This argument leads to our second hypothesis.

H_2: The negative relations between corporate asset growth or investments and subsequent stock returns are stronger when subsequent asset growth or investments of high growth or investments firm are high.

2.3. Overreactions to business expansions and contractions

Cooper, Gulen, and Schill (2008) argue that investors positively (negatively) overreact to favorable (unfavorable) changes in firms' future business prospects implied by asset expansions (reductions). As the positive (negative) stock price overreactions are subsequently recognized, stock prices decrease to reverse the previous misreactions. As a result, realized growth or investments are negatively associated with subsequent average stock returns. When more (less) growth or investments follow previous corporate expansions (contractions), it is more likely that the initial positive (negative) overreactions sustain hence stock prices should not decrease (increase) or even increase (decrease). On the other hand, when less (more) growth or investments follow previous corporate expansions (contractions), it is more likely that the initial positive (negative) overreactions being realized and corrected hence stock prices should decrease (increase). This argument leads to our final hypothesis.

H_3: The negative relations between corporate asset growth or investments and subsequent stock returns are weaker when high (low) asset growth or investments are followed by high (low) subsequent growth or investments; the relations are stronger when high (low) asset growth or investments are followed by low (high) subsequent growth or investments.

3. Variable Definitions and Sample Selection

We describe the measures of asset growth, corporate investments, and abnormal returns and the sample data used in testing our hypotheses.

3.1. The measures of corporate asset growth and investments

Like Fama and French (2006, 2008), and Cooper, Gulen, and Schill (2008), we use total asset growth (*TAG*) as an overall measure of corporate asset growth or investments. *TAG* is defined as the annual growth rate of a firm's total assets (*Asset*) between two fiscal year ends. We also involve other well-known corporate investment measures which the literature has shown to have negative relations with future stock returns. These are total accounting accruals (*TAA*) in Richardson, Sloan, Soliman, and Tuna (2005, 2006), an alternative accruals measure in Cohen and Lys (2006), net operating assets (*NOA*) in Hirshleifer, Hou, Teoh, and Zhang (2004), abnormal capital expenditure (*ACE*) in Titman, Wei, and Xie (2004), investment-to-asset ratio (*I/A*) in Lyandres, Sun, Zhang (2008) and Chen, Novy-Marx, and Zhang (2010), capital investment growth (Δ*I/I*) and investment-to-capital ratio (*I/K*) in Xing (2008), and net share issuance (*NSI*) in Daniel and Titman (2006), Fama and French (2008), and Pontiff and Woodgate (2008). More detailed definitions of all the variables are provided in the Appendix.

3.2. The measures of abnormal returns

We employ two measures of subsequent abnormal returns. First, we control for three stock characteristics, which are the market value of equity (*Size*), book-to-market equity ratio (*B/M*), and prior-year stock return, at portfolio formations.[4] Prior-year stock return is the compounded monthly return on a stock over the previous year with the latest month being skipped. By sorting all available stocks independently into *Size* terciles, *B/M* terciles, and prior-year return terciles, we form 27 benchmark portfolios. The benchmark-adjusted returns

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[4] These characteristic adjustments are made to accommodate the possibilities that firm size, the book-to-market equity ratio, and/or previous-year stock returns are priced into stock returns. See, for example, Daniel, Grinblatt, Titman, and Wermers (1997), Daniel and Titman (1997), and Daniel, Titman, and Wei (2001) for more details.

on a stock are the monthly raw stock returns minus the monthly returns on the benchmark portfolio matched to the stock by the *Size*, *B/M*, and prior-year return rankings.

Second, we control for four risk factors. The risk-adjusted return is the estimated intercept from the following regression:

$$R_{p,t} - R_{f,t} = \alpha_p + b_{p,Mkt} R_{Mkt,t} + b_{p,SMB} R_{SMB,t} + b_{p,HML} R_{HML,t} + b_{p,MOM} R_{MOM,t} + \varepsilon_{p,t} \quad (1)$$

where R_p is the monthly return on asset p and R_f is the risk-free rate. R_{MKT}, R_{SMB}, and R_{HML} are the returns on the market, size, and book-to-market factors, respectively, in Fama and French (1993). R_{MOM} is the return on the momentum factor in Carhart (1997).

3.3. Sample selection

The data set used to test the hypotheses involves U.S. domestic firms traded on the NYSE, Amex, and Nasdaq exchanges. Their financial statements are taken from Compustat. Stock market data come from the Center for Research in Security Prices (CRSP). Analyst data are from the Institutional Brokers' Estimate System (I/B/E/S). Institutional holdings records are from CDA/Spectrum Institutional (13f) Holdings. Our sample covers annual firm characteristics from 1970 to 2009 and monthly stock returns from January of 1971 to December of 2009. Due to limitations in the databases, analyses of stock returns in Section 6 involving analyst and institutional features start from 1980.

Like Fama and French (1992, 1993), certificates, American depositary receipts (ADRs), shares of beneficial interest (SBIs), unit trusts, closed-end funds, real estate investment trusts (REITs), and financial firms are excluded. Following Titman, Wei, and Xie (2004), we remove firms with less than $10 million in sales (Compustat item REVT) to exclude firms at an early stage of development. We also delete firms for which we do not have all the data necessary to compute the variables. The remaining firms in the sample have been in the Compustat time series for at least two years hence the survivorship and selection biases inherent in the way Compustat adds firms to its database (Banz and Breen, 1986) is minimzed. Delisting returns are used to mitigate the survivorship bias.[5]

4. Asset Growth Reversals and the Asset Growth Anomaly

We begin to test our hypotheses by examining the effects of subsequent growth on the negative relations between asset growth and subsequent stock returns.

4.1 The negative relations between asset growth and stock returns

Panel A of Table 1 presents total asset growth (*TAG*) and subsequent average monthly stock returns on portfolios sorted by *TAG* at the end of June each year and rebalanced annually during the sample period. Low growth firms have negative growth (asset reductions) while high growth firms have positive growth (asset expansions). Similar to the previous literature, the raw returns on low growth firms are significantly higher than those on high growth firms while the value-weighted return (Ret_{vw}) spread is much lower than the equal-weighted one (Ret_{ew}). Similarly, the equal-weighted benchmark-adjusted ($AdjRet_{ew}$) and risk-adjusted returns (α_{ew}) are significantly higher for low than high growth firms. However, the value-weighted abnormal returns ($AdjRet_{vw}$ and α_{vw}) are insignificantly different between low and high growth firms.

[5] Shumway (1997) suggests that stocks delisted due to poor performance (delisting codes 500 and 520 to 584) usually have missing delisting returns. We use raw returns of –100% for these firms when delisting returns are missing. We use raw returns of 0% for other firms when delisting returns are missing.

4.2 Asset growth reversals and the Asset Growth Effect

We begin testing and distinguishing our three hypotheses by analyzing the subsequent stock returns on quintile subsets, grouped by subsequent asset growth, of asset growth quintiles. Under Hypothesis 1, we should observe the returns on all the subsets of low (high) growth firms to be high (low). Under Hypothesis 2, we should observe the returns on high growth firms that have high subsequent growth to be especially low among high growth firms and their abnormal returns to negative. Finally, under Hypothesis 3, we should observe the stock returns on high growth firms that have low (high) subsequent growth to be low (high) and those on low growth firms that have low (high) subsequent growth to be low (high).

Panel B of Table 1 reports the results when we match stock returns between January and December of year *t* to asset growth of year *t*–1. First of all, there are substantial variations of subsequent asset growth across each asset growth quintile. More importantly, returns are increasing in subsequent asset growth across each quintile. For example, the equal-weighted (value-weighted) benchmark-adjusted return on low growth firms ranges from -1.047 (-0.497) to 2.336 (0.370) between low and high subsequent growth. The equal-weighted (value-weighted) risk-adjusted return on high growth firms ranges from -2.369 (-1.841) to 1.122 (0.789) between low and high subsequent growth. In particular, the returns on low growth firms with low subsequent growth are significantly lower than those on high growth firms with high subsequent growth. These results are inconsistent with Hypothesis 1. On the other hand, the returns on high growth firms that have high subsequent growth are higher than those on high growth firms that have low subsequent growth. Besides, the abnormal returns on high growth firms that have high subsequent growth are all significantly positive. Besides, the positive return spreads between low growth firms and high growth firms decrease when the latter have higher subsequent growth. These findings are inconsistent with Hypothesis 2.

Consistent with Hypothesis 3, all the stock returns on high growth firms that have low subsequent growth are significantly lower than those with high subsequent growth. Specifically, the abnormal returns on high growth firms that have low (high) subsequent growth are significantly negative (positive). On the other hand, the returns on low growth firms that have low subsequent growth are significantly lower than those with high subsequent growth. In particular, the abnormal returns on low growth firms that have high (low) subsequent growth are significantly positive (negative except value-weighted ones). Furthermore, the return spreads between low growth firms which have low subsequent growth and high growth firms which have high subsequent growth are significantly negative. The return spreads between low growth firms which have high subsequent growth and high growth firms which have low subsequent growth are significantly positive and the magnitudes of the spreads are higher than those simply between low and high growth firms.

Panel C of Table 1 reports the results when we match stock returns between June of year t and July of year $t+1$ to asset growth of year $t–1$. The findings are similar to Panel A yet the ranges of the returns positively associated with variations in subsequent growth are narrower across each growth quintile. Most importantly, the results are also consistent with Hypothesis 3 but inconsistent with Hypotheses 1 and 2. In particular, high growth firms do not necessarily underperform: high growth firms which have lower growth do underperform but do not otherwise. Low growth firms do not necessarily outperform: low growth firms which have low growth do not outperform but often do otherwise. The positive return spreads between low growth firms and high growth firms also decrease when the latter have higher subsequent growth.

Interestingly, the relation documented in the literature between asset growth and subsequent stock returns is not necessarily negative. With the July-to-June stock returns, the return spreads between low growth firms which have low subsequent growth and high growth firms which have high subsequent growth are insignificant. The return spreads between low growth firms which have high subsequent growth and high growth firms which have low subsequent growth are significantly positive and the magnitudes of the spreads are higher than the spreads simply between low and high growth firms even with value-weighted portfolios. It seems that there is no relation between asset growth and subsequent stock returns when growth does not reverse. The relation turns negative when growth reverses and the negative relation is stronger when the reversals of growth are more extreme.[6]

5. Asset Growth Reversals and the Investment Anomalies

We continue to test our hypotheses by examining the effects of subsequent growth on the negative relations between corporate investments and subsequent stock returns.

5.1 The negative relations between corporate investments and stock returns

Table 2 presents investments and stock returns on portfolios sorted by previously mentioned investment measures at the end of June each year and rebalanced annually during

[6] The findings are similar when we match stock returns between April of year t and March of year t+1 to asset growth of year t–1. The abnormal return spreads between low growth firms which have low subsequent growth and high growth firms which have high subsequent growth are significantly negative as in Panel A but the magnitudes are less than those in Panel A.

the sample period. The measures are total accounting accruals (*TAA*) in Panel A, an alternative accruals measure in Panel B, net operating assets (*NOA*) in Panel C, abnormal capital expenditure (*ACE*) in Panel D, investment-to-asset ratio (*I/A*) in Panel E, capital investment growth ($\Delta I/I$) in Panel F, investment-to-capital ratio (*I/K*) in Panel G, and net share issuance (*NSI*) in Panel H. Similarly to the previous literature, the equal-weighted returns on low investments firms are significantly higher than those on high investments firms. The value-weighted return spreads are much lower than the equal-weighted ones and are insignificant for *TAA*, *ACE*, *I/A*, $\Delta I/I$, and *I/K* portfolios.

5.2 Asset growth reversals and the Investment Effects

We continue testing and distinguishing our three hypotheses by analyzing the subsequent stock returns on quintile subsets, grouped by subsequent asset growth, of investment quintile. As in the previous section, we continue to study the reversals of asset growth as the overall corporate growth measure as is more salient and easier for the market to observe than other investment measures. Table 3 reports the results of matching stock returns between June of year t and July of year t+1 to investments of year t–1 (results on quintiles 2 to 3 are omitted to save space and are available on request). Low investments firms tend to have low and negative asset growth (business reductions) while high investments firms tend to have high and positive growth (business expansions). There are substantial variations of subsequent asset and, in general, stock returns are increasing in subsequent growth across each investment quintile. Low (high) investment firms which have low (high) subsequent asset growth do not tend to have reversals in asset growth. On the other hand, low (high) investment firms which have high (low) subsequent asset growth tend to have reversals in asset growth, turning sequentially from lower or medium (medium to high) growth to high (low and negative) growth.

The stock returns on low investment firms with low subsequent growth are not higher but often are significantly lower (see, for example, *Acc*, *ACE*, $\Delta I/I$, *I/K*, and *NSI* portfolios) than those on high investment firms with high subsequent growth, which are inconsistent with Hypothesis 1. On the other hand, the abnormal returns on high investment firms that have high subsequent growth are not negative and often significantly positive (see, for example, *Acc*, *ACE*, $\Delta I/I$, and *I/K* portfolios). The returns on high investment firms that have high subsequent growth are higher than those on high investment firms that have low subsequent growth. Besides, the positive return spreads between low investment firms and high investment firms decrease when the latter have higher subsequent growth. These results are inconsistent with Hypothesis 2.

Consistent with Hypothesis 3, the returns on high investment firms that have low subsequent growth are significantly lower than those with high subsequent growth. Specifically, the abnormal returns on high investment firms that have low subsequent growth are significantly negative (except for equal-weighted risk-adjusted return on $\Delta I/I$ portfolio). The abnormal returns on high investment firms that have high subsequent growth are non-negative and often significantly positive (see, for example, *Acc*, *ACE*, $\Delta I/I$, and *I/K* portfolios). On the other hand, the returns on low investment firms that have low subsequent growth are significantly lower than those with high subsequent growth (except for value-weighted benchmark-adjusted return on *TAA* and *Acc* portfolios). In particular, the abnormal returns on low investment firms that have low subsequent growth are non-positive and often significantly negative (see for example, *Acc*, *ACE*, $\Delta I/I$, *I/K*, and *NSI* portfolios). Besides, the abnormal returns on low investment firms that have high subsequent growth are significantly positive except for value-weighted returns on *TAA*, *Acc*, and *NSI* portfolios.

Again, the relations documented in the literature between investments and subsequent stock returns are not necessarily negative. The return spreads between low investment firms which have low subsequent growth and high investment firms which have high subsequent growth are non-positive and sometimes significantly negative (see, for example, *TAA*, *Acc*, *ACE*, $\Delta I/I$, *I/K*, and *NSI* portfolios). The return spreads between low investment firms which have high subsequent growth and high investments firms which have low subsequent growth are significantly positive and the magnitudes of the spreads are higher than those simply between low and high investment firms even with value-weighted portfolios. It seems that there is no relation between investments and subsequent stock returns when asset growth does not reverse and the relations are sometimes positive when overall assets growth expand further and/or contract further. The relations turn negative when asset growth reverses and the negative relations are stronger when the reversals of growth are more extreme.

6. The Relations between Firm Characteristics and Asset Growth Reversals

Previous literature has documented that limits to arbitrage and financial constraints interact with the asset growth and investment anomalies (see, for example, Mashruwala, Rajgopal, and Shevlin, 2004; Lam and Wei, 2011; Li and Zhang 2010; Lipson, Mortal, and Schill, 2011). Specifically, the anomalies seem to be stronger when limits to arbitrage and/or financial constraints are more severe. In this Section, we study whether these and other common firm characteristics are associated with asset growth reversals. We then construct a composite asset growth predictor to categorize low and high growth or investment firms into those that are more likely to have low and high subsequent asset growth.

6.1. Firm attributes and asset growth reversals

To examine the associations of firm characteristics and subsequent asset growth, we run the following Fama and MacBeth (1973) cross-sectional regression for each quintile subsample sorted by total asset growth beween fiscal year-end t–2 and t–1 (TAG_{t-1}):

$$TAG_{i,t} = c_0 + c' X_{i,t-1} + \varepsilon_{i,t} \tag{2}$$

where TAG_t is the percentage growth of total assets between fiscal year-end t–1 and t. Firm characteristics X_{t-1} are the followings: (i) previous six-month benchmark-adjusted stock return ($AdjRet_{prior}$), natural logarithm of book-to-market equity ratio (*B*/*M*), natural logarithm of one plus analyst coverage (*Cov*), dispersion in analyst forecasts (*Disp*) in percentage, percentage of institutional ownership ($Inst^H$), natural logarithm of one plus shareholder sophistication ($Inst^N$), and percentage idiosyncratic stock return volatility (*IVol*) at the end of June of year t; (ii) natural logarithm of one plus firm age (*Age*), cash flow volatility (*CVol*) in percentage, net cash flow from debt (ΔD) as a percentage of asset base, net cash flow from equity (ΔE) as a percentage of asset base, percentage growth in numbers of employee (*Hiring*), net share issuance (*NSI*), payout ratio (*Payout*), research and development expenditures (*R*&*D*) as a percentage of asset base, and natural logarithm of book value of total assets (*Asset*) at fiscal year-end t–1 or between fiscal year-end t–2 and t–1; (iii) availability of credit rating (*Rating*) in the sample.

IVol, *CVol*, *Cov*, *Disp*, $Inst^H$, $Inst^N$ are conventional limits to arbitrage proxies in the literature and *Age*, *Payout*, *Rating*, *Asset* are common financial constraints proxies in the literature. The rest are firm characteristics that might provide ex-ante information about subsequent asset growth. The market reaction and valuation measures $AdjRet_{prior}$ and B/M may be a positive or negative indication, respectively, on firm's growth status. Rising employment (*Hiring*) may signal continuation of growth.[7] The innovation activity measure *R&D* may affect the stock of opportunities for subsequent growth. The net financing activity measures ΔD, ΔE, and *NSI* may affect financing capacity to fund future growth.

Panel A of Table 4 reports the results. Among the limits to arbitrage proxies, *IVol* is negatively (positively) related to subsequent growth for low (high) growth firms. While *CVol* is not significantly related to subsequent growth for neither low not high growth firms, *Cov* is positively related to subsequent growth for low growth firms and *Disp* is negatively related to subsequent growth for high growth firms. On the other hand, both $Inst^H$ and $Inst^N$ are negatively related to subsequent growth for low growth firms and positively related to subsequent growth for high growth firms. Among the financial constraints proxies, *Age* and *Rating* are not significantly associated with subsequent growth for neither low nor high growth firms. *Payout* is negatively related to subsequent growth for high growth firms and *Asset* is negatively related to subsequent growth for low growth firms.

The market reaction measure $AdjRet_{prior}$ and valuation mearsure B/M are positively and negatively, respectively, associated with subsequent growth for both low and high growth firms. While employment (*Hiring*) is not significantly associated with subsequent growth for neither low nor high growth firms, more intensive innovation activity (*R&D*) and correlated with lower subsequent growth for high growth firms. The cash flow based net financing activity measure ΔD is negatively associated with subsequent growth for both low

[7] Bazdresch, Belo, and Lin (2009) show that labor hiring contains signal about future expected returns in a production-based model with convex labor adjustment cost.

and high growth firms and ΔE is negatively associated with subsequent growth for low growth firms. Net share issuance (*NSI*) is positively associated with subsequent growth for high growth firms.

Panel B of Table 4 reports the time-series average of the cross-sectional correlations between a composite asset growth predictor (*Growth*) and subsequent growth for each quintile sorted by TAG_{t-1}. *Growth* is a score based on the above firm characteristics that are significantly associated with subsequent asset growth for either low or high growth firm or both (see the Appendix for details).[8] Overall, *Growth* is significantly positively associated with subsequent growth across all growth quintiles. In other words, low growth firms that have low (high) *Growth* are more likely to have low (high) subsequent growth and high growth firms that have low (high) *Growth* are more likely to have low (high) subsequent growth.

6.2. The composite asset growth predictor and the asset growth and investment anomalies

To examine the interactions between the composite asset growth predictor *Growth* and the asset growth and investment anomalies, we analyze the stock returns between June of year t and July of year $t+1$ on quintile subsets, grouped by *Growth*, of quintiles sorted by asset growth or investments at the end of year t–1. Table 5 reports the results (quintiles 2 to 4 are omitted to save space but are available on request).[9] Across each growth or investment quintile, subsequent growth and abnormal stock returns are increasing in *Growth*. Low (high) growth or investment firms which have low (high) *Growth* do not tend to have material reversals of asset

[8] The findings are qualitatively similar when the firm attributes are measured at the end of December of year t – 1.

[9] The findings are similar when we remove firms with less than \$20 million instead of \$10 million in sales to exclude firms at an early stage of development.

growth. On the other hand, low (high) growth or investment firms which have high (low) *Growth* tend to have more salient reversals of asset growth.

The abnormal stock returns on low growth or investment firms with low predicted subsequent growth (*Growth*) are not higher but are occasionally significantly lower than those on high growth or investment firms with high *Growth* (see, for example, *ACE* and *I/K* portfolios) except for risk-adjusted returns on *TAA* and *NOA* portfolios. On the other hand, the abnormal returns on high growth or investment firms that have high *Growth* are not negative but are often significantly positive (see, for example, *TAG*, *TAA*, *ACE*, and *I/K* portfolios). The abnormal returns on high growth or investment firms that have high *Growth* are not lower than those with high *Growth*. Besides, the positive return spreads between low growth or investment firms and high growth and investment firms decrease when the latter have higher *Growth*.

The abnormal stock returns on low growth or investment firms that have low *Growth* are not higher and often significantly lower than those with high *Growth*. In particular, the abnormal returns on low growth or investment firms that have low *Growth* are non-positive except for risk-adjusted returns on *TAG*, *TAA*, *NOA*, *I/A*, and *NSI* portfolios. Furthermore, the abnormal returns on low growth or investment firms that have high *Growth* are significantly positive except for *Acc*, *ACE*, *I/A*, and *I/K* portfolios. On the other hand, the abnormal returns on high growth or investment firms that have low *Growth* are significantly lower than those with high *Growth*. Specifically, the abnormal returns on high growth or investment firms that have low *Growth* are significantly negative except for value-weighted risk-adjusted returns on *TAG*, *TAA*, and *Acc* portfolios, risk-adjusted return on *NOA*, *ACE*, *I/A*, and $\Delta I/I$ portfolios, and risk-adjusted and value-weight benchmark-adjusted returns on *I/K* and *NSI* portfolios. The abnormal returns on high growth or investment firms that have high *Growth* are non-negative.

The return spreads between low growth or investment firms which have low *Growth* and high growth or investments firm which have high *Growth* are non-positive except for equal-weighted risk-adjusted returns on *TAA*, *NOA*, and *I/A* portfolios. Besides, the equal-weight risk-adjusted return spread is significantly negative for *ACE* portfolio while the value-weight abnormal returns on *I/K* portfolio are significantly negative. The abnormal stock return spreads between low growth or investment firms which have high *Growth* and high growth or investment firms which have low *Growth* are significantly positive (except for risk-adjusted returns on *ACE*, *I/A*, *I/K*, and *NSI* portfolios) and the magnitudes of the spreads are higher than those simply between low and high growth or investments firms even for value-weighted portfolios. It seems that there is no reliable relation between asset growth or investments and subsequent stock returns when asset growth does not tend to materially reverse. The relations are negative when asset growth tends to reverse and the negative relations are stronger when the reversals of growth are more severe.

7. Conclusions

The literature has substantially documented that corporate asset growth and investments are negatively related to subsequent stock returns. This paper simultaneously tests the prominent explanations proposed in the literature, namely the *q*-theory of investment, real options model, underreactions to overinvestments, and overreactions to business expansion and contractions, to the negative relations by extensively examining the effects of subsequent growth on the negative relations as well as the stock returns of extreme growth or investment firms. Firstly, the findings are inconsistent with the rational explanations. We find that that returns are increasing in subsequent growth across each growth or investment grouping and returns on low growth or investment firms with low subsequent growth are lower than those on high growth or investment firms with high subsequent growth. Secondly, the results are also inconsistent with the underreactions hypothesis. Abnormal returns on high growth or investment firms that have high subsequent growth are nonnegative. Besides, the returns on high growth or investment firms that have high subsequent growth are higher than those on high growth or investment firms that have low subsequent growth. The positive return spreads between low growth or investment firms and high growth or investment firms are also weaker when the latter have higher subsequent growth.

Finally, consistent with the overreactions explanation, the negative relations are weak when high (low) growth or investment firms have or are predicted to have high (low) subsequent growth. The negative relations are strong when high (low) growth or investment firms have or are predicted to have low (high) subsequent growth. Overall, our findings suggest that reversals of asset growth play an important role in the negative associations of corporate asset growth or investments with subsequent stock returns.

Appendix

Definition of variables

TAG: Growth in total assets, calculated as the net percentage change in total book value of assets (Compustat item AT) over a fiscal year (between fiscal year end t–2 to fiscal year end t–1 for TAG_{t-1} or between fiscal year end t–1 to fiscal year end t for TAG_t). Data source: Compustat.

TAA: Total accounting accruals, measured as the change in non-cash assets (Compustat item AT less item CHE) less the change in non-debt liabilities (item LT less item DLTT less item DLC) between fiscal year end t–2 to fiscal year end t–1, scaled by average total assets (item AT) over the period.[10] Data source: Compustat.

Acc: An alternative definition of accruals, measured as the change in current assets (Compustat item ACT) less the change in cash and short-term investments (item CHE) less the change in current liabilities (item LCT) less depreciation (item DP) plus the change in short-term debt (item DLC) between fiscal year end t–2 to fiscal year end t–1, scaled by average total assets (item AT) over the period. Data source: Compustat.

NOA: Net operating assets, measured as the difference between operating assets and operating liabilities at fiscal year end t–1 scaled by total assets (Compustat item AT) at fiscal year end t–2. Operating assets is total assets minus cash and short-term investments (item CHE). Operating liabilities is total assets less current liabilities (item DLC), long-term debt (item DLTT), minority interests (item MIB), preferred stocks (item PSTK), and common equity (item CEQ). Data source: Compustat.

ACE: Abnormal capital expenditure, measured as the ratio of capital expenditure (Compustat item CAPX) for fiscal year t–1, scaled by the year's revenue (item SALE), to the three-year average of the scaled capital expenditure over fiscal years t–4, t–3, and t–2 less one. Data source: Compustat.

I/A_{t-1}: Investment to asset ratio, calculated as the sum of change in inventories (Compustat item INVT) and change in gross property, plant, and equipment (item PPEGT) between fiscal year end t–2 and fiscal year end t–1, scaled by total assets (item AT) at fiscal year end t–2. Data source: Compustat.

$\Delta I/I_{t-1}$: Growth in capital expenditure, calculated as the change in capital expenditure (Compustat item CAPX) from fiscal year t–2 to fiscal year t–1, scaled by capital expenditure for fiscal year t–2. Data source: Compustat.

[10] This is an extended measure based on Sloan (1996).

I/K_{t-1}: Investment to capital ratio, calculated as the ratio of capital expenditure (Compustat item CAPX) for fiscal year t–1 to net book value of property, plant, and equipment (item PPENT) at fiscal year end t–2. Data source: Compustat.

NSI: Net share issuance, which is the natural logarithm of the ratio of split-adjusted shares outstanding (Compustat item CSHO multiplied by item ADJEX_C) at fiscal year end t–1 to those at the at fiscal year end t–2. Data source: Compustat.

$AdjRet_{prior}$: Prior six-month benchmark adjusted stock return in percentage, which is the compounded monthly abnormal stock return between the end of February and the end of June of year t. Abnormal stock return is the monthly raw stock returns minus the monthly return on a benchmark portfolio matched to the stocks by market value of equity, book-to-market equity ratio, and prior-year stock return (from January to November) at the end of December of year t–1. Data source: Compustat and CRSP.

Age: Firm age, which is the number of years a stock has appeared in the CRSP database at calender year end t–1. Data source: CRSP.

B/M: Book-to-market equity ratio, which is the book value of equity divided by the market value of equity (*Size*). As in Fama and French (1993), book equity is total assets (Compustat item AT) minus liabilities (item LT), plus balance sheet deferred taxes (item TXDB) and investment tax credits (item ITCI), minus preferred stock liquidation value (item PSTKL) if available, or redemption value (item PSTKRV) if available, or carrying value (item PSTK) if available. Data source: Compustat and CRSP.

Cov: Analyst coverage, measured as the number of analysts following the firm at the end of June of year t. Data source: I/B/E/S.

CVol: Cash flow volatility, measured in percentage as the standard deviation of cash flow from operations over the previous five years (requires a minimum of three years). Cash flow is earnings before extraordinary items (Compustat item IB) minus unscaled total accounting accruals, divided by average total book assets (item AT) over a fiscal year. Unscaled total accounting accruals is the change in current assets (item ACT) less the change in cash and short-term investments (item CHE) less the change in current liabilities (item LCT) less depreciation (item DP) plus the change in short-term debt (item DLC) for the fiscal year. Data source: Compustat.

ΔD: Net cash flow from debt financing, calculated as the cash proceeds from issuance of long-term debt (Compustat item DLTIS) less the cash payments for long-term debt reductions (item DLTR) plus changes in current debt (item DLCCH, set to zero if it is missing), as a percentage of average total assets (item AT) over the period.[11] Data source: Compustat.

ΔE: Net cash flow from equity financing, calculating as the cash proceeds from sales of common and preferred stocks (COMPUSTAT item SCSTKC plus item SPSTKC) less the cash payments for purchases of common and preferred stocks (item PRSTKCC plus PRSTKPC) less cash payments for dividends (item CDVC), as a percentage of average total assets (item AT) over the period. Data source: Compustat.

Disp: Dispersion in analyst forecasts, measured in percentage as the standard deviation of analysts' earnings per share forecasts scaled by the closing stock price at the end of June of year *t*. Data source: CRSP and I/B/E/S.

Hiring: Growth in employees, calculated as the net percentage change in employees (Compustat item EMP) between fiscal year end t–2 to fiscal year end t–1. Data source: Compustat.

$INST^H$: Institutional ownership, measured as the percentage of outstanding shares held by institutional investors at the end of June of year *t*. Data source: CDA/Spectrum Institutional.

$INST^N$: Shareholder sophistication, measured as the number of institutional investors holding a firm's shares at the end of June of year *t*. Data source: CDA/Spectrum Institutional.

IVOL: Idiosyncratic stock return volatility, measured in percentage as the standard deviation of the residual values from the following time-series market model:

$$R_{i,t} = b_{i0} + b_{i1} R_{M,t} + e_{i,t} \,,$$

where $R_{i,t}$ is the monthly individual stock return and $R_{M,t}$ is the monthly market index return. The model is estimated with 36 months of returns (requiring a full 36-month history) ending in June of year *t*. Data source: CRSP.

Payout: Payout ratio tercile ranking, ranked according to all distributions to equity holders, including share repurchases (Compustat item PRSTKC), dividends to preferred stock (items DVP) and dividends to common stock (item DVC), scaled by operating income before depreciation (item OIBDP) between fiscal year end t–2 and fiscal year end t–1. Firms with zero or negative earnings but positive distributions are put into the high payout ratio tercile, while firms with zero or negative earnings and zero distributions are put into the low payout ratio tercile. Data source: Compustat.

[11] Setting a missing value in item DLCCH to zero provides us with a much larger sample. Bradshaw, Richardson, and Sloan (2006) find that the relation between $\Delta XFIN$ and future stock returns is qualitatively similar among firms with non-missing item DLCCH.

Rating: Credit rating dummy, which is zero if a firm has never had an S&P long-term credit rating in the database in the sample period and one otherwise. Data source: Compustat.

R&D: R&D expenditure, calculated as the research and development expenditure (Compustat item XRD) between fiscal year end $t-2$ to fiscal year end $t-1$ as a percentage of average total assets (item AT) over the period. Data source: Compustat.

Size: Market value of equity, which is the closing stock price multiplied by the number of shares outstanding. Data source: CRSP.

Asset: Asset size, which is the book value of total assets (item AT) at fiscal year end t–1. Data source: Compustat.

Growth: Composite asset-growth predictor, which is the quintile ranking of the following total score. The total score is the sum of *Payout* in reverse (low Payout has a ranking score of 3 and high payout has a ranking score of 1), the tercile rankings of *IVol*, *Cov*, $INST^{H}$, $AdjRet_{prior}$, *NSI*, and, and the reverse tercile rankings of *Disp*, $INST^{N}$, *Asset*, *B/M* (with book value of equity at fiscal year end t–1 and market value of equity at the end of June of year t), *R&D*, ΔD, and ΔE. Tercile ranking of *IVol* is replaced by reverse tercile ranking of *IVol* for low growth firms. Data source: Compustat, CRSP, and I/B/E/S.

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Table 1
Asset Growth Reversals and the Relation between Asset Growth and Stock Returns

This table reports characteristics and stock returns on portfolios sorted by quintiles of total assets growth (*TAG*). *N*, $Size_t$, TAG_{t-1}, and TAG_t are the time-series averages of number of firms and median market value of equity (×10^8) at portfolio formation, median total assets growth from fiscal year-end t–2 to fiscal year-end t–1, and median total assets growth from fiscal year-end t–1 to fiscal year-end t. Ret_{ew} (Ret_{vw}) is the time-series average of equal-weighted (value-weighted) monthly raw stock returns. $AdjRet_{ew}$ ($AdjRet_{vw}$) is time-series average of equal-weighted (value-weighted) monthly benchmark-adjusted stock returns, which are the monthly raw stock returns minus the monthly return on a benchmark portfolio matched to the stocks by market value of equity, book-to-market equity ratio, and prior-year stock return (skipping the latest month) at portfolio formation. α_{ew} (α_{vw}) is the estimated intercept from the following regression:

$$R_{p,t} - R_{f,t} = \alpha_p + b_{p,Mkt} R_{Mkt,t} + b_{p,SMB} R_{SMB,t} + b_{p,HML} R_{HML,t} + b_{p,MOM} R_{MOM,t} + \varepsilon_{p,t}$$

where R_p is the monthly return on portfolio *p* and R_f is the risk-free rate; R_{MKT}, R_{SMB}, and R_{HML} are the returns on the market, size, and book-to-market factors, respectively, in Fama and French (1993); R_{MOM} is the return on the momentum factor in Carhart (1997). Panel A reports portfolios sorted by *TAG* from fiscal year-end t–2 to fiscal year-end t–1 and returns from July of year t to June of year t+1. Panel B reports portfolios independently sorted by *TAG* from fiscal year-end t–2 to fiscal year-end t–1 and *TAG* from fiscal year-end t–1 to fiscal year-end t and returns from January of year t to December of year t. Panel C reports portfolios independently sorted by *TAG* from fiscal year-end t–2 to fiscal year-end t–1 and *TAG* from fiscal year-end t–1 to fiscal year-end t and returns from July of year t to June of year t+1. 1 – 5 is the difference between portfolios with low and high *TAG* from fiscal year-end t–2 to fiscal year-end t–1. (1,1) – (5,5) is the difference between portfolio with low *TAG* from fiscal year-end t–2 to fiscal year-end t–1 and low *TAG* from fiscal year-end t–1 to fiscal year-end t and portfolio with high *TAG* from fiscal year-end t–2 to fiscal year-end t–1 and high *TAG* from fiscal year-end t–1 to fiscal year-end t. (1,5) – (5,1) is the difference between portfolio with low *TAG* from fiscal year-end t–2 to fiscal year-end t–1 and high *TAG* from fiscal year-end t–1 to fiscal year-end t and portfolio with high *TAG* from fiscal year-end t–2 to fiscal year-end t–1 and low *TAG* from fiscal year-end t–1 to fiscal year-end t. TAG_{t-1}, TAG_t, and returns that are significant in 5% level are in bold.

Panel A: Stock returns on portfolios sorted by previous *TAG* quintiles

$TAG_{t-1,\text{rank}}$	*N*	$Size_t$	TAG_{t-1}	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	566	0.575	**-9.755**	**1.752**	**1.225**	**0.269**	0.032	**0.678**	**0.278**
2	566	1.551	**1.562**	**1.457**	**1.049**	0.075	-0.102	**0.397**	**0.175**
3	566	2.206	**8.236**	**1.310**	**1.041**	0.023	-0.053	**0.275**	**0.139**
4	566	2.414	**17.212**	**1.206**	**0.967**	0.011	-0.038	**0.209**	**0.235**
5 (high)	566	2.041	**45.482**	**0.687**	**0.754**	**-0.361**	-0.171	-0.180	0.114
1 – 5				**1.065**	**0.471**	**0.630**	0.203	**0.858**	0.164
p value				(0.000)	(0.007)	(0.000)	(0.127)	(0.000)	(0.225)

Table 1 – Continued

$TAG_{t-1,\text{rank}}$	$TAG_{t,\text{rank}}$	*N*	*Size*	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
Panel B: January to December stock returns on portfolios sorted by previous *TAG* quintiles and contemporary *TAG* quintiles											
1 (low)	1 (low)	257	0.416	**-11.536**	**-13.648**	0.566	**0.775**	**-1.047**	**-0.497**	**-0.391**	-0.190
	2	146	0.840	**-7.599**	-0.138	**1.777**	**1.253**	**0.194**	0.000	**0.738**	**0.365**
	3	93	1.498	**-9.162**	**6.785**	**2.142**	**1.363**	**0.624**	0.261	**0.958**	0.336
	4	71	1.043	**-7.890**	**14.981**	**2.695**	**1.573**	**1.140**	**0.370**	**1.633**	**0.483**
	5 (high)	74	0.811	**-9.829**	**43.557**	**3.650**	**1.801**	**2.336**	**0.671**	**2.570**	**0.591**
2	1 (low)	126	0.844	**1.501**	**-10.183**	0.118	**0.605**	**-1.421**	**-0.612**	**-0.838**	**-0.434**
	2	183	1.749	**1.552**	0.539	**1.069**	**0.962**	**-0.313**	-0.170	0.045	0.157
	3	157	2.322	**2.233**	**6.795**	**1.514**	**1.058**	**0.160**	0.029	**0.474**	**0.251**
	4	104	1.803	**2.115**	**14.555**	**2.089**	**1.576**	**0.773**	**0.459**	**0.970**	**0.606**
	5 (high)	70	1.398	**2.101**	**36.127**	**3.014**	**1.985**	**1.675**	**0.932**	**1.832**	**0.926**
3	1 (low)	81	1.066	**8.289**	**-10.335**	-0.143	0.320	**-1.606**	**-0.838**	**-1.155**	**-0.624**
	2	141	2.049	**8.253**	0.850	**0.672**	0.413	**-0.691**	**-0.618**	**-0.351**	**-0.341**
	3	173	3.174	**8.363**	**7.154**	**1.216**	**0.950**	-0.055	-0.086	**0.229**	0.070
	4	153	2.885	**8.789**	**14.433**	**1.751**	**1.272**	**0.465**	0.212	**0.713**	**0.413**
	5 (high)	93	1.834	**8.867**	**36.191**	**2.788**	**1.705**	**1.543**	**0.636**	**1.581**	**0.637**
4	1 (low)	75	1.128	**17.059**	**-10.653**	-0.499	-0.190	**-1.868**	**-1.247**	**-1.296**	**-0.924**
	2	88	1.879	**16.965**	0.624	0.258	0.220	**-1.008**	**-0.757**	**-0.686**	**-0.592**
	3	130	2.645	**16.535**	**7.294**	**0.866**	**0.488**	**-0.366**	**-0.490**	-0.168	**-0.314**
	4	189	3.516	**17.428**	**15.437**	**1.557**	**1.038**	**0.363**	0.062	**0.519**	0.131
	5 (high)	150	2.572	**18.236**	**35.277**	**2.560**	**1.553**	**1.390**	**0.539**	**1.423**	**0.646**
5 (high)	1 (low)	102	0.981	**52.613**	**-12.773**	**-1.625**	**-1.122**	**-2.803**	**-2.127**	**-2.369**	**-1.841**
	2	82	2.380	**44.988**	0.466	-0.124	-0.248	**-1.262**	**-1.217**	**-0.970**	**-1.003**
	3	85	2.057	**45.319**	**7.300**	0.391	**0.627**	**-0.718**	**-0.330**	**-0.577**	-0.218
	4	123	2.648	**40.465**	**16.223**	**0.913**	0.579	-0.175	**-0.419**	-0.047	-0.092
	5 (high)	253	4.543	**45.936**	**45.515**	**2.208**	**1.571**	**1.126**	**0.591**	**1.122**	**0.789**
(1,1) – (5,5)						**-1.642**	**-0.796**	**-2.173**	**-1.088**	**-1.513**	**-0.978**
p value						(0.000)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)
(1,5) – (5,1)						**5.275**	**2.923**	**5.138**	**2.798**	**4.939**	**2.432**
p value						(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 1 – Continued

Panel C: July to June stock returns on portfolios sorted by previous *TAG* quintiles and contemporary *TAG* quintiles											
$TAG_{t-1,\text{rank}}$	$TAG_{t,\text{rank}}$	*N*	*Size*	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	228	0.364	**-11.914**	**-13.938**	**1.415**	**1.219**	-0.143	-0.121	0.347	0.062
	2	132	0.812	**-8.202**	-0.277	**1.758**	**1.125**	**0.252**	-0.075	**0.681**	0.225
	3	79	0.998	**-8.151**	**6.788**	**1.894**	**1.165**	**0.439**	0.074	**0.813**	0.177
	4	64	0.885	**-8.132**	**14.962**	**2.239**	**1.344**	**0.825**	0.189	**1.209**	**0.372**
	5 (high)	62	0.985	**-10.341**	**40.708**	**2.225**	**1.424**	**0.999**	0.275	**1.098**	0.336
2	1 (low)	113	0.728	1.113	**-10.578**	**1.020**	**1.104**	**-0.470**	-0.059	-0.013	0.031
	2	163	1.851	**1.356**	0.433	**1.401**	**1.065**	-0.017	-0.090	**0.328**	0.223
	3	138	2.452	**1.890**	**6.676**	**1.546**	**1.068**	**0.183**	-0.082	**0.477**	0.170
	4	90	2.168	**1.848**	**14.589**	**1.660**	**1.128**	**0.343**	-0.035	**0.578**	0.101
	5 (high)	62	1.651	**1.793**	**36.337**	**1.909**	**1.256**	**0.689**	0.083	**0.870**	**0.415**
3	1 (low)	74	0.854	**8.065**	**-10.717**	**0.783**	**0.876**	**-0.657**	-0.300	-0.246	-0.249
	2	116	1.944	**7.940**	0.695	**1.104**	**0.929**	**-0.251**	-0.146	0.086	0.135
	3	157	3.153	**8.087**	**7.050**	**1.266**	**1.156**	-0.004	0.046	**0.210**	**0.212**
	4	134	2.973	**8.602**	**14.654**	**1.563**	**1.051**	**0.341**	-0.011	**0.502**	0.154
	5 (high)	85	2.132	**8.488**	**34.977**	**1.717**	**1.113**	**0.531**	0.087	**0.714**	0.161
4	1 (low)	66	0.815	**17.165**	**-11.065**	0.481	0.577	**-0.884**	**-0.473**	**-0.453**	-0.177
	2	84	1.582	**16.735**	0.550	**0.995**	**0.926**	**-0.299**	-0.111	**0.006**	0.112
	3	116	2.725	**16.576**	**7.251**	**1.049**	**0.898**	**-0.167**	-0.116	0.052	0.143
	4	163	3.588	**17.188**	**15.472**	**1.333**	**0.941**	**0.183**	-0.047	**0.343**	0.180
	5 (high)	137	2.849	**28.129**	**34.935**	**1.650**	**1.276**	**0.553**	**0.264**	**0.612**	**0.505**
5 (high)	1 (low)	86	0.765	**52.006**	**-13.311**	-0.347	-0.028	**-1.563**	**-1.017**	**-1.024**	**-0.785**
	2	70	1.712	**45.548**	0.240	0.416	0.434	-0.717	**-0.565**	**-0.504**	**-0.323**
	3	76	2.086	**44.085**	**7.251**	**0.675**	**0.691**	-0.398	-0.227	**-0.262**	-0.012
	4	115	2.689	**40.934**	**15.962**	**0.907**	**0.705**	-0.125	-0.177	-0.006	0.082
	5 (high)	219	2.929	**47.587**	**42.743**	**1.067**	**0.973**	0.102	0.037	0.165	**0.319**
(1,1) – (5,5)						0.348	0.246	-0.245	-0.158	0.182	-0.257
p value						(0.155)	(0.363)	(0.085)	(0.424)	(0.398)	(0.186)
(1,5) – (5,1)						**2.572**	**1.452**	**2.561**	**1.293**	**2.122**	**1.122**
p value						(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 2
The Relations between Investment Measures and Stock Returns

This table reports formation characteristics and stock returns from July of year t to June of year t+1 on portfolios sorted by quintiles of investment measures taken at the fiscal year-end t–1. The investment measures are total accounting accruals (*TAA*, Panel A), alternative measure of accruals (*Acc*, Panel B), net operating assets (*NOA*, Panel C), abnormal capital expenditures (*ACE*, Panel D), capital investment growth ($\Delta I/I$, Panel E), investment-to-assets ratio (*I/A*, Panel F), investment-to-capital ratio (*I/K*, Panel G), and net share issuance (*NSI*, Panel H). See the Appendix for the detailed definition of variables. TAA_{t-1}, Acc_{t-1}, NOA_{t-1}, ACE_{t-1}, I/A_{t-1}, $\Delta I/I_{t-1}$, I/K_{t-1}, and NSI_{t-1} are the time-series averages of median total accounting accruals, alternative measure of accruals, net operating assets, abnormal capital expenditures, investment-to-assets ratio, capital investment growth, investment-to-capital ratio, and net share issuance. TAA_{t-1}, Acc_{t-1}, NOA_{t-1}, ACE_{t-1}, I/A_{t-1}, $\Delta I/I_{t-1}$, I/K_{t-1}, NSI_{t-1}, and returns that are significant in 5% level are in bold.

Panel A: Stock returns on portfolios sorted by previous *TAA* quintiles

$TAA_{t-1,\text{rank}}$	N	$Size_t$	TAA_{t-1}	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	562	1.472	**-78.498**	**1.606**	**1.050**	**0.266**	-0.054	**0.560**	**0.192**
2	562	1.924	**-53.778**	**1.446**	**1.026**	**0.095**	-0.065	**0.381**	**0.166**
3	562	1.624	**-39.881**	**1.333**	**0.926**	0.028	-0.110	**0.297**	**0.174**
4	562	1.415	**-26.844**	**1.283**	**0.905**	0.021	-0.095	**0.289**	**0.160**
5 (high)	562	1.526	**-5.628**	**0.742**	**0.681**	**-0.390**	**-0.272**	-0.151	0.062
1 – 5				**0.863**	**0.369**	**0.657**	0.218	**0.711**	0.130
p value				(0.000)	(0.019)	(0.000)	(0.102)	(0.000)	(0.312)

Panel B: Stock returns on portfolios sorted by previous *Acc* quintiles

$Acc_{t-1,\text{rank}}$	N	$Size_t$	Acc_{t-1}	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	547	0.873	**-12.439**	**1.565**	**1.025**	**0.219**	-0.010	**0.561**	**0.308**
2	547	2.092	**-6.342**	**1.430**	**1.054**	**0.118**	-0.038	**0.414**	**0.266**
3	547	2.721	**-3.127**	**1.302**	**0.964**	0.012	-0.112	**0.274**	**0.205**
4	547	1.981	0.343	**1.229**	**0.905**	-0.029	-0.091	**0.204**	0.126
5 (high)	547	1.012	**7.743**	**0.894**	0.582	**-0.290**	**-0.353**	-0.051	-0.155
1 – 5				**0.671**	**0.444**	**0.509**	**0.344**	**0.612**	**0.463**
p value				(0.000)	(0.005)	(0.000)	(0.015)	(0.000)	(0.004)

Table 2 – Continued

Panel C: Stock returns on portfolios sorted by previous *NOA* quintiles									
$NOA_{t-1,\text{rank}}$	*N*	*Size*	NOA_{t-1}	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	513	0.912	**39.521**	**1.636**	**1.106**	**0.374**	0.045	**0.735**	**0.410**
2	513	1.355	**60.142**	**1.513**	**1.058**	**0.168**	0.004	**0.488**	**0.294**
3	513	1.678	**71.138**	**1.387**	**1.061**	0.042	0.006	**0.339**	**0.258**
4	513	1.477	**80.930**	**1.177**	**0.806**	**-0.119**	**-0.250**	0.131	0.026
5 (high)	513	1.540	**99.913**	**0.725**	**0.664**	**-0.445**	**-0.320**	**-0.238**	-0.101
1 – 5				**0.911**	**0.442**	**0.819**	**0.365**	**0.973**	**0.511**
p value				(0.000)	(0.002)	(0.000)	(0.004)	(0.000)	(0.000)

Panel D: Stock returns on portfolios sorted by previous *ACE* quintiles									
$ACE_{t-1,\text{rank}}$	*N*	*Size*	ACE_{t-1}	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	471	0.711	**1.857**	**1.479**	**1.090**	**0.105**	0.034	**0.377**	**0.223**
2	471	1.879	**5.610**	**1.409**	**1.177**	**0.091**	0.087	**0.378**	**0.400**
3	470	3.296	**7.590**	**1.315**	**0.913**	0.062	-0.142	**0.280**	**0.164**
4	471	2.981	**9.523**	**1.222**	**0.857**	-0.020	-0.177	**0.199**	0.081
5 (high)	470	1.308	**12.922**	**1.140**	**0.927**	**-0.122**	-0.079	0.148	0.094
1 – 5				**0.339**	0.163	**0.227**	0.113	**0.229**	0.129
p value				(0.000)	(0.259)	(0.000)	(0.391)	(0.004)	(0.356)

Panel E: Stock returns on portfolios sorted by previous *I/A* quintiles									
$I/A_{t-1,\text{rank}}$	*N*	*Size*	$\Delta I/I_{t-1}$	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	555	0.711	**-4.062**	**1.639**	**1.122**	**0.191**	-0.065	**0.527**	0.158
2	555	1.571	**2.613**	**1.464**	**1.053**	0.120	-0.044	**0.437**	**0.212**
3	555	2.059	**6.611**	**1.344**	**0.997**	0.067	-0.068	**0.374**	**0.223**
4	556	2.156	**12.039**	**1.207**	**0.894**	-0.002	-0.122	**0.238**	**0.207**
5 (high)	555	1.860	**26.594**	**0.758**	**0.712**	**-0.360**	**-0.252**	**-0.199**	-0.027
1 – 5				**0.880**	**0.410**	**0.551**	0.186	**0.726**	0.185
p value				(0.000)	(0.005)	(0.000)	(0.129)	(0.000)	(0.170)

Table 2 – Continued

Panel F: Stock returns on portfolios sorted by previous $\Delta I/I$ quintiles

$\Delta I/I_{t-1,\text{rank}}$	*N*	*Size*	I/A_{t-1}	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	553	0.672	**-50.632**	**1.562**	**1.065**	**0.161**	-0.023	**0.475**	0.146
2	553	2.041	**-15.565**	**1.398**	**1.098**	**0.078**	0.019	**0.340**	**0.272**
3	553	3.345	**9.793**	**1.262**	**0.983**	0.009	-0.109	**0.252**	**0.212**
4	553	2.353	**42.900**	**1.223**	**0.931**	-0.004	-0.080	**0.229**	**0.165**
5 (high)	553	1.133	**140.839**	**0.996**	**0.684**	**-0.201**	**-0.274**	0.105	-0.012
1 – 5				**0.566**	**0.381**	**0.362**	0.251	**0.370**	0.158
p value				(0.000)	(0.011)	(0.000)	(0.055)	(0.000)	(0.285)

Panel G: Stock returns on portfolios sorted by previous *I/K* quintiles

$I/K_{t-1,\text{rank}}$	*N*	*Size*	I/K_{t-1}	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	556	0.962	0.212	**1.520**	**1.141**	0.061	-0.083	**0.397**	0.099
2	556	2.058	**4.470**	**1.377**	**1.042**	0.041	-0.066	**0.303**	**0.174**
3	556	2.127	**8.115**	**1.380**	**0.994**	**0.095**	-0.081	**0.343**	**0.164**
4	556	1.742	**13.003**	**1.196**	**0.984**	-0.020	-0.036	**0.230**	**0.255**
5 (high)	556	1.354	**26.015**	**0.948**	**0.690**	**-0.153**	-0.207	0.115	0.182
1 – 5				**0.572**	0.451	**0.213**	0.124	**0.282**	-0.083
p value				(0.000)	(0.072)	(0.020)	(0.464)	(0.003)	(0.619)

Panel H: Stock returns on portfolios sorted by previous *NSI* quintiles

$NSI_{t-1,\text{rank}}$	*N*	*Size*	NSI_{t-1}	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	541	2.963	**-2.541**	**1.518**	**1.168**	**0.151**	0.049	**0.423**	**0.283**
2	600	1.033	-0.005	**1.405**	**1.019**	-0.016	-0.065	**0.321**	0.141
3	556	1.728	**0.506**	**1.373**	**1.109**	**0.106**	0.063	**0.316**	**0.281**
4	565	1.667	**1.949**	**1.303**	**0.985**	**0.112**	-0.059	**0.354**	**0.264**
5 (high)	565	1.597	**13.685**	**0.789**	**0.629**	**-0.326**	**-0.376**	-0.046	-0.055
1 – 5				**0.729**	**0.539**	**0.477**	**0.425**	**0.469**	**0.338**
p value				(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)

Table 3
Asset Growth Reversals and the Relations between Investment Measures and Stock Returns

This table reports characteristics and stock returns from July of year *t* to June of year *t*+1 on portfolios sorted by quintiles of investment measures taken at the fiscal year-end *t*–1 and subsequent total assets growth (*TAG*). The investment measures are total accounting accruals (*TAA*, Panel A), an alternative measure of accruals (*Acc*, Panel B), net operating assets (*NOA*, Panel C), abnormal capital expenditures (*ACE*, Panel D), capital investment growth ($\Delta I/I$, Panel E), investment-to-assets ratio (*I/A*, Panel F), investment-to-capital ratio (*I/K*, Panel G), and net share issuance (*NSI*, Panel H). See the Appendix for the detailed definition of variables. TAA_{t-1}, Acc_{t-1}, NOA_{t-1}, ACE_{t-1}, I/A_{t-1}, $\Delta I/I_{t-1}$, I/K_{t-1}, and NSI_{t-1} are the time-series averages of median total accounting accruals, the alternative accruals measure, net operating assets, abnormal capital expenditures, investment-to-assets ratio, capital investment growth, investment-to-capital ratio, and net share issuance. TAG_{t-1} and TAG_t are the time-series averages of median total asset growth at fiscal year-end *t*–1 and at fiscal year-end *t*, respectively. TAA_{t-1}, TAG_{t-1}, TAG_t, Acc_{t-1}, NOA_{t-1}, ACE_{t-1}, I/A_{t-1}, $\Delta I/I_{t-1}$, I/K_{t-1}, NSI_{t-1}, and returns that are significant in 5% level are in bold.

Panel A: Stock returns on portfolios sorted by previous *TAA* quintiles and contemporary *TAG* quintiles												
$TAA_{t-1,\mathrm{rank}}$	$TAG_{t,\mathrm{rank}}$	*N*	*Size*	TAA_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	152	0.449	**-81.005**	**-9.392**	**-13.945**	**1.352**	**1.053**	-0.156	-0.176	0.341	0.048
	2	119	0.224	**-77.361**	-0.981	0.130	**1.491**	**0.966**	0.109	-0.115	**0.433**	0.142
	3	104	0.355	**-77.095**	**2.805**	**6.870**	**1.578**	**1.095**	**0.293**	0.039	**0.535**	0.180
	4	100	0.306	**-77.780**	**4.917**	**14.930**	**1.664**	**1.030**	**0.423**	-0.063	**0.637**	0.217
	5 (high)	87	0.183	**-79.123**	**5.106**	**37.520**	**2.170**	**1.235**	**1.020**	0.124	**1.079**	**0.357**
5 (high)	1 (low)	91	0.676	**-4.515**	**33.815**	**-12.531**	-0.078	-0.096	**-1.389**	**-1.135**	**-0.796**	**-0.714**
	2	85	1.166	**-6.635**	**27.958**	0.225	**0.628**	0.532	**-0.629**	**-0.552**	**-0.314**	-0.245
	3	92	1.556	**-7.580**	**26.884**	**7.131**	**0.808**	**0.707**	**-0.356**	**-0.310**	-0.176	-0.098
	4	116	2.061	**-7.444**	**28.732**	**15.577**	**1.057**	**0.940**	-0.040	0.018	0.098	0.251
	5 (high)	178	2.515	**-3.162**	**42.750**	**42.650**	**1.007**	**0.856**	0.002	-0.086	0.085	0.206
(1,1) – (5,5)							0.345	0.197	**-0.158**	-0.090	0.256	-0.158
p value							(0.145)	(0.463)	(0.290)	(0.656)	(0.225)	(0.432)
(1,5) – (5,1)							**2.248**	**1.331**	**2.409**	**1.259**	**1.875**	**1.071**
p value							(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 3 – Continued

Panel B: Stock returns on portfolios sorted by previous *Acc* quintiles and contemporary *TAG* quintiles

$Acc_{t-1,\text{rank}}$	$TAG_{t,\text{rank}}$	*N*	*Size*	TAA_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	164	0.397	**-13.790**	**-8.119**	**-14.115**	**1.200**	**0.867**	**-0.299**	-0.281	0.219	0.092
	2	104	0.833	**-11.834**	-1.410	-0.062	**1.555**	**0.944**	0.137	-0.105	**0.526**	0.214
	3	87	1.205	**-11.649**	**2.381**	**6.920**	**1.698**	**1.033**	**0.355**	0.015	**0.649**	0.349
	4	89	1.705	**-11.834**	**6.803**	**15.258**	**1.846**	**1.304**	**0.591**	0.255	**0.808**	**0.507**
	5 (high)	104	1.767	**-12.812**	**11.992**	**39.879**	**1.778**	**1.051**	**0.670**	0.050	**0.741**	0.269
5 (high)	1 (low)	103	0.420	**8.433**	**15.824**	**-12.897**	0.348	0.297	**-1.031**	**-0.809**	**-0.532**	**-0.498**
	2	87	0.849	**7.071**	**18.187**	0.180	**0.615**	**0.728**	**-0.666**	**-0.293**	**-0.339**	-0.132
	3	87	1.241	**6.899**	**18.517**	**7.078**	**0.939**	0.561	**-0.257**	**-0.369**	-0.021	-0.200
	4	113	1.400	**7.246**	**20.978**	**15.700**	**1.201**	0.603	0.058	**-0.316**	**0.215**	-0.133
	5 (high)	157	1.564	**8.787**	**30.177**	**40.991**	**1.159**	**0.732**	0.135	-0.196	**0.230**	0.023
(1,1) – (5,5)							0.041	0.136	**-0.434**	-0.086	-0.011	0.069
p value							(0.864)	(0.662)	(0.007)	(0.718)	(0.958)	(0.811)
(1,5) – (5,1)							**1.430**	**0.754**	**1.702**	**0.859**	**1.273**	**0.767**
p value							(0.000)	(0.015)	(0.000)	(0.001)	(0.000)	(0.002)

Panel C: Stock returns on portfolios sorted by previous *NOA* quintiles and contemporary *TAG* quintiles

$NOA_{t-1,\text{rank}}$	$TAG_{t,\text{rank}}$	*N*	*Size*	NOA_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	148	0.440	**38.959**	**-8.940**	**-14.944**	**1.303**	**1.040**	-0.122	-0.126	0.430	0.151
	2	91	0.900	**40.896**	-0.356	-0.034	**1.339**	**0.869**	0.010	-0.201	**0.467**	0.107
	3	82	1.293	**40.576**	**3.980**	**7.065**	**1.634**	**1.150**	**0.388**	0.183	**0.715**	**0.325**
	4	92	1.590	**40.032**	**7.749**	**15.587**	**1.806**	**1.025**	**0.645**	-0.059	**0.899**	**0.382**
	5 (high)	101	1.839	**37.641**	**10.862**	**40.729**	**2.181**	**1.427**	**1.116**	**0.433**	**1.220**	**0.753**
5 (high)	1 (low)	75	0.629	**103.094**	**40.167**	**-12.567**	-0.211	0.143	**-1.525**	**-0.987**	**-1.009**	**-0.523**
	2	80	1.115	**98.685**	**28.970**	0.183	**0.609**	0.471	**-0.706**	**-0.618**	**-0.350**	**-0.407**
	3	91	1.671	**97.340**	**16.673**	**7.187**	**0.842**	**0.873**	**-0.372**	-0.208	-0.187	-0.076
	4	113	2.107	**98.073**	**28.067**	**15.571**	**0.992**	**0.860**	-0.139	-0.090	-0.009	0.059
	5 (high)	155	2.192	**104.035**	**43.697**	**41.914**	**1.015**	**0.799**	-0.026	-0.135	0.028	0.060
(1,1) – (5,5)							0.287	0.241	-0.096	0.009	0.402	0.091
p value							(0.291)	(0.356)	(0.612)	(0.965)	(0.118)	(0.707)
(1,5) – (5,1)							**2.392**	**1.284**	**2.641**	**1.420**	**2.229**	**1.276**
p value							(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 3 – Continued

Panel D: Stock returns on portfolios sorted by previous *ACE* quintiles and contemporary *TAG* quintiles

$ACE_{t-1,\text{rank}}$	$TAG_{t,\text{rank}}$	*N*	*Size*	ACE_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	139	0.368	**-64.988**	**-4.429**	**-12.661**	**1.059**	0.649	**-0.473**	**-0.493**	-0.049	**-0.386**
	2	98	0.765	**-60.116**	0.391	-0.046	**1.380**	**0.931**	-0.056	-0.092	**0.257**	0.013
	3	75	0.955	**-58.921**	**3.124**	**6.386**	**1.661**	**1.165**	**0.295**	-0.003	**0.578**	0.209
	4	72	1.082	**-59.805**	**6.255**	**15.175**	**1.751**	**1.103**	**0.487**	0.085	**0.656**	**0.335**
	5 (high)	87	1.174	**-61.635**	**10.227**	**38.083**	**1.935**	**1.557**	**0.765**	**0.505**	**0.879**	**0.691**
5 (high)	1 (low)	88	0.484	**86.250**	**6.135**	**-12.559**	0.581	0.150	**-0.808**	**-0.982**	**-0.377**	**-0.667**
	2	83	1.025	**78.985**	**8.700**	0.341	**1.132**	**0.968**	**-0.242**	-0.100	0.196	0.103
	3	88	1.614	**76.214**	**11.050**	**6.777**	**1.272**	**0.894**	0.020	-0.088	**0.228**	0.013
	4	99	2.060	**76.772**	**14.786**	**14.310**	**1.209**	**0.997**	-0.023	0.029	0.170	0.151
	5 (high)	113	2.080	**84.600**	**22.521**	**35.117**	**1.399**	**1.050**	**0.292**	-0.018	**0.407**	0.251
(1,1) – (5,5)							-0.340	-0.401	**-0.765**	**-0.476**	**-0.456**	**-0.637**
p value							(0.128)	(0.118)	(0.000)	(0.026)	(0.023)	(0.006)
(1,5) – (5,1)							**1.355**	**1.408**	**1.573**	**1.487**	**1.256**	**1.358**
p value							(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)

Panel E: Stock returns on portfolios sorted by previous *I/A* quintiles and contemporary *TAG* quintiles

$I/A_{t-1,\text{rank}}$	$TAG_{t,\text{rank}}$	*N*	*Size*	$\Delta I/I_{t-1}$	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	196	0.405	**-5.457**	**-9.641**	**-13.641**	**1.354**	**1.253**	-0.203	-0.095	0.229	0.129
	2	125	0.905	**-3.453**	**-4.433**	-0.120	**1.581**	**1.004**	0.103	-0.147	**0.463**	0.123
	3	91	1.204	**-3.061**	**-2.010**	**6.729**	**1.724**	**1.184**	**0.308**	-0.032	**0.636**	0.068
	4	73	1.082	**-3.428**	**-1.693**	**14.950**	**1.961**	**1.017**	**0.607**	-0.099	**0.941**	0.179
	5 (high)	70	1.128	**-4.397**	**-1.879**	**39.794**	**2.159**	**1.556**	**0.922**	**0.515**	**1.035**	**0.493**
5 (high)	1 (low)	80	0.633	**27.927**	**38.135**	**-12.297**	-0.251	-0.144	**-1.513**	**-1.094**	**-1.015**	**-0.694**
	2	73	1.299	**25.884**	**31.922**	0.255	**0.658**	0.585	**-0.572**	**-0.420**	**-0.338**	-0.238
	3	87	1.959	**25.301**	**29.493**	**7.188**	**0.919**	**0.813**	**-0.239**	-0.176	-0.099	-0.022
	4	125	2.723	**24.494**	**28.553**	**15.805**	**0.990**	**0.857**	-0.130	-0.118	-0.006	0.004
	5 (high)	190	2.586	**28.631**	**39.428**	**40.869**	**1.012**	**0.761**	0.008	-0.204	0.036	0.059
(1,1) – (5,5)							0.341	0.492	-0.211	0.109	0.193	0.070
p value							(0.131)	(0.052)	(0.135)	(0.576)	(0.338)	(0.728)
(1,5) – (5,1)							**2.410**	**1.700**	**2.435**	**1.609**	**2.050**	**1.187**
p value							(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 3 – Continued

Panel F: Stock returns on portfolios sorted by previous $\Delta I/I$ quintiles and contemporary *TAG* quintiles												
$\Delta I/I_{t-1,\text{rank}}$	$TAG_{t,\text{rank}}$	*N*	*Size*	I/A_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	172	0.374	**-54.253**	**-5.799**	**-13.357**	**1.231**	**1.040**	**-0.315**	-0.264	0.172	-0.008
	2	121	0.753	**-49.621**	-0.301	-0.078	**1.393**	**0.856**	-0.051	**-0.284**	**0.313**	-0.026
	3	92	0.886	**-48.029**	**2.689**	**6.736**	**1.674**	**1.032**	**0.288**	-0.142	**0.558**	0.080
	4	84	1.101	**-49.066**	**5.296**	**14.991**	**1.919**	**1.415**	**0.642**	**0.394**	**0.796**	**0.352**
	5 (high)	84	1.142	**-50.052**	**7.257**	**38.862**	**2.040**	**1.607**	**0.854**	**0.601**	**0.971**	**0.731**
5 (high)	1 (low)	102	0.459	**152.759**	**13.092**	**-12.883**	0.310	0.017	**-1.041**	**-1.068**	-0.375	**-0.569**
	2	85	0.813	**138.800**	**13.089**	0.217	**0.999**	**0.709**	**-0.333**	**-0.343**	0.077	-0.040
	3	90	1.215	**132.297**	**14.641**	**7.181**	**1.017**	**0.613**	**-0.203**	**-0.326**	0.043	-0.303
	4	111	1.598	**131.181**	**19.941**	**15.787**	**1.199**	**0.874**	0.018	-0.094	**0.230**	0.136
	5 (high)	165	1.908	**148.868**	**32.368**	**41.154**	**1.292**	**0.818**	**0.256**	-0.152	**0.352**	0.167
(1,1) – (5,5)							-0.061	0.222	**-0.571**	-0.112	-0.180	-0.175
p value							(0.789)	(0.443)	(0.000)	(0.617)	(0.376)	(0.482)
(1,5) – (5,1)							**1.729**	**1.589**	**1.895**	**1.668**	**1.346**	**1.300**
p value							(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Panel G: Stock returns on portfolios sorted by previous *I/K* quintiles and contemporary *TAG* quintiles												
$I/K_{t-1,\text{rank}}$	$TAG_{t,\text{rank}}$	*N*	*Size*	I/K_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	158	0.465	**7.080**	**-5.399**	**-12.315**	**1.126**	**1.012**	**-0.465**	**-0.311**	-0.026	-0.250
	2	152	1.329	**7.660**	0.190	0.193	**1.543**	**1.206**	0.050	-0.080	**0.427**	**0.227**
	3	111	1.841	**8.396**	**2.478**	**6.551**	**1.518**	**1.194**	0.105	0.013	**0.400**	0.133
	4	74	1.340	**8.276**	**3.059**	**14.598**	**1.876**	**1.212**	**0.516**	0.030	**0.759**	0.074
	5 (high)	61	1.304	**8.001**	**3.684**	**39.005**	**2.143**	**1.500**	**0.848**	**0.306**	**1.001**	**0.414**
5 (high)	1 (low)	100	0.539	**72.249**	**18.929**	**-14.264**	0.175	-0.376	**-1.089**	**-1.313**	**-0.546**	**-0.961**
	2	68	1.041	**54.058**	**18.934**	0.108	**0.717**	0.308	**-0.477**	**-0.557**	-0.113	-0.326
	3	76	1.215	**64.842**	**20.721**	**7.183**	**0.983**	0.439	**-0.168**	**-0.390**	0.080	-0.101
	4	115	1.911	**65.268**	**24.220**	**16.070**	**1.169**	**0.911**	0.064	0.007	**0.272**	**0.395**
	5 (high)	198	2.333	**72.699**	**35.277**	**41.868**	**1.210**	**0.862**	**0.250**	-0.060	**0.309**	0.260
(1,1) – (5,5)							-0.084	0.149	**-0.715**	-0.251	-0.335	**-0.510**
p value							(0.710)	(0.649)	(0.000)	(0.274)	(0.057)	(0.019)
(1,5) – (5,1)							**1.968**	**1.876**	**1.937**	**1.619**	**1.547**	**1.375**
p value							(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 3 – Continued

Panel H: Stock returns on portfolios sorted by previous *NSI* quintiles and contemporary *TAG* quintiles												
$NSI_{t-1,\text{rank}}$	$TAG_{t,\text{rank}}$	N	*Size*	NSI_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	102	1.196	**-2.824**	-0.751	**-11.268**	**1.136**	**0.837**	**-0.403**	**-0.390**	0.071	-0.214
	2	126	2.945	**-2.472**	**2.677**	0.349	**1.455**	**1.311**	0.011	0.156	**0.367**	**0.399**
	3	124	4.412	**-2.359**	**5.422**	**5.913**	**1.529**	**1.272**	**0.184**	0.143	**0.417**	**0.350**
	4	107	4.401	**-2.442**	**7.558**	**14.925**	**1.655**	**1.039**	**0.375**	-0.013	**0.553**	0.087
	5 (high)	82	3.467	**-3.096**	**9.846**	**36.918**	**1.894**	**1.366**	**0.706**	0.287	**0.827**	**0.512**
5 (high)	1 (low)	109	0.574	**14.464**	**15.139**	**-14.323**	0.125	0.277	**-1.133**	**-0.750**	**-0.635**	**-0.510**
	2	83	1.557	**12.657**	**16.112**	0.362	**0.848**	**0.573**	**-0.370**	**-0.584**	-0.047	-0.193
	3	92	2.330	**12.738**	**18.713**	**7.122**	**0.860**	**0.751**	**-0.275**	**-0.317**	-0.001	-0.110
	4	111	2.396	**13.198**	**24.115**	**15.548**	**0.991**	**0.686**	-0.083	**-0.254**	0.105	0.024
	5 (high)	169	2.309	**15.037**	**38.835**	**43.434**	**0.991**	**0.700**	0.001	-0.245	0.098	-0.031
(1,1) – (5,5)							0.145	0.137	**-0.404**	-0.145	-0.027	-0.183
p value							(0.515)	(0.634)	(0.007)	(0.542)	(0.876)	(0.432)
(1,5) – (5,1)							**1.769**	**1.089**	**1.839**	**1.037**	**1.462**	**1.022**
p value							(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 4
The Relations between Firm Characteristics and Asset Growth Reversals

Panel A reports the coefficient estimates (c) of firm characteristics from the following Fama and MacBeth (1973) cross-sectional regression for each quintile subsample sorted by percentage total asset growth from fiscal year-end t–2 to fiscal year-end t–1 (TAG_{t-1}):

$$TAG_{i,t} = c_0 + c^{'} X_{i,t-1} + \varepsilon_{i,t}$$

where TAG_t is growth of total assets from fiscal year-end t–1 to fiscal year-end t. Firm characteristics X_{t-1} are the followings: (i) previous six-month benchmark-adjusted stock return ($AdjRet_{prior}$) in percentage, natural logarithm of book-to-market equity ratio (B/M), natural logarithm of one plus analyst coverage (Cov), dispersion in analyst forecasts ($Disp$) in percentage, percentage of shares belong to institutional ownership ($Inst^H$), natural logarithm of one plus shareholder sophistication ($Inst^N$), and idiosyncratic stock return volatility ($IVol$) in percentage at the end of June of year t; (ii) natural logarithm of one plus firm age (Age), cash flow volatility ($CVol$) in percentage, net cash flow from debt (ΔD) as a percentage of asset base, net cash flow from equity (ΔE) as a percentage of asset base, percentage growth in numbers of employee ($Hiring$), net share issuance (NSI), payout ratio ($Payout$), research and development expenditures ($R\&D$) as a percentage of asset base, and natural logarithm of book value of total assets ($Assets$) at fiscal year-end t–1 or between fiscal year-end t–2 and fiscal year-end t–1; (iii) availability of credit rating ($Rating$) in the sample. Panel B reports the time-series average of cross-sectional correlations between $Growth$ and TAG_t for each TAG_{t-1} quintile subsample. $Growth$ is a composite asset-growth predictor based on the above firm characteristics. See the Appendix for the detailed definition of variables. Estimates that are significant in 5% level are in bold and *p values* are in parentheses.

Panel A: Regression coefficients of contemporaneous *TAG* on previous firm characteristics across sub-samples sorted by previous *TAG* quintiles									
$TAG_{t-1,\text{rank}}$	$AdjRet_{prior}$	B/M	ΔD	ΔE	NSI	$IVol$	$CVol$	Cov	$Disp$
1 (low)	**0.081**	**-10.455**	**-0.256**	**-2.718**	1.010	**-0.349**	0.216	**3.375**	-0.060
	(0.001)	(0.000)	(0.029)	(0.003)	(0.865)	(0.049)	(0.114)	(0.009)	(0.083)
2	**0.067**	**-8.907**	**-0.238**	**-0.831**	-4.030	**-0.236**	0.014	**1.698**	**-0.175**
	0.000	(0.000)	(0.015)	(0.010)	(0.291)	(0.034)	(0.892)	(0.004)	(0.003)
3	**0.099**	**-7.533**	**-0.305**	**-1.000**	7.053	-0.084	-0.025	**1.926**	-0.399
	(0.000)	(0.000)	(0.000)	(0.019)	(0.109)	(0.426)	(0.728)	(0.015)	(0.092)
4	**0.109**	**-11.965**	**0.162**	-0.413	3.826	0.092	-0.010	**1.973**	**-0.460**
	(0.000)	(0.000)	0.013)	(0.432)	(0.146)	(0.506)	(0.898)	(0.034)	(0.019)
5 (high)	**0.100**	**-24.050**	**-0.176**	1.365	**15.003**	**0.363**	-0.023	-1.550	**-0.568**
	(0.000)	(0.000)	(0.000)	(0.659)	(0.021)	(0.011)	(0.730)	(0.241)	(0.040)

Table 4 – Continued

$TAG_{t-1,\text{rank}}$	*Inst*^{H}	*Inst*^{N}	*Age*	*Payout*	*Rating*	*Asset*	*Hiring*	*R&D*
1 (low)	**0.095**	**-1.292**	-0.792	1.051	-1.222	**-2.097**	0.068	-0.080
	(0.001)	(0.023)	(0.482)	(0.191)	(0.223)	(0.007)	(0.201)	(0.473)
2	0.025	**-0.894**	-0.111	**-0.974**	0.251	**-1.351**	**0.203**	**-0.195**
	(0.211)	(0.005)	(0.822)	(0.026)	(0.633)	(0.007)	(0.005)	(0.025)
3	0.018	-0.389	-0.738	**-1.272**	0.941	**-1.339**	**0.188**	**-0.241**
	(0.512)	(0.288)	(0.131)	(0.012)	(0.211)	(0.010)	(0.001)	(0.003)
4	0.022	-0.669	-0.761	**-2.556**	**2.631**	**-1.707**	**0.103**	-0.086
	(0.393)	(0.209)	(0.191)	(0.000)	(0.001)	(0.004)	(0.001)	(0.359)
5 (high)	**0.092**	**-3.668**	-0.717	**-3.777**	2.835	0.112	0.015	**-0.250**
	(0.016)	(0.004)	(0.466)	(0.000)	(0.071)	(0.885)	(0.217)	(0.043)

Panel B: Correlations between *Growth* and contemporaneous *TAG* across sub-samples sorted by previous *TAG* quintiles

$TAG_{t-1,\text{rank}}$	1 (low)	2	3	4	5 (high)
	19.210	**23.530**	**24.310**	**27.670**	**30.088**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 5
Composite Asset-growth Predictor and the Relations between Asset Growth or Investment Measures and Stock Returns

This table reports characteristics and stock returns from July of year t to June of year t+1 on portfolios sorted by quintiles of total asset growth (*TAG*, Panel A) or other investment measures taken at the fiscal year-end t–1 and a composite asset-growth predictor (*Growth*) measured at the end of June of year t. The investment measures are total accounting accruals (*TAA*, Panel B), an alternative measure of accruals (*Acc*, Panel C), net operating assets (*NOA*, Panel D), abnormal capital expenditures (*ACE*, Panel E), capital investment growth ($\Delta I/I$, Panel F), investment-to-assets ratio (*I/A*, Panel G), investment-to-capital ratio (*I/K*, Panel H), and net share issuance (*NSI*, Panel I). See the Appendix for the detailed definition of variables. TAG_{t-1}, TAA_{t-1}, Acc_{t-1}, NOA_{t-1}, ACE_{t-1}, I/A_{t-1}, $\Delta I/I_{t-1}$, I/K_{t-1}, and NSI_{t-1} are the time-series averages of median total asset growth, total accounting accruals, the alternative accruals measure, net operating assets, abnormal capital expenditures, investment-to-assets ratio, capital investment growth, investment-to-capital ratio, and net share issuance. TAG_t is the time-series averages of median total asset growth at fiscal year-end t. TAG_{t-1}, TAG_t, TAA_{t-1}, Acc_{t-1}, NOA_{t-1}, ACE_{t-1}, I/A_{t-1}, $\Delta I/I_{t-1}$, I/K_{t-1}, NSI_{t-1}, and returns that are significant in 5% level are in bold.

Panel A: Stock returns on portfolios sorted by previous *TAG* quintiles and *Growth*

$TAG_{t-1,\mathrm{rank}}$	*Growth*	*N*	*Size*	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	69	2.882	**-6.320**	**-2.800**	**1.494**	**1.474**	0.087	0.134	**0.352**	**0.458**
	2	71	2.578	**-7.705**	**-1.460**	**1.498**	**1.115**	0.154	-0.088	**0.404**	0.200
	3	78	1.764	**-8.120**	-0.912	**1.549**	**1.143**	**0.241**	0.010	**0.539**	0.107
	4	62	1.755	**-9.485**	**1.603**	**1.460**	**1.279**	0.214	0.248	**0.409**	0.235
	5 (high)	42	2.437	**-9.829**	**8.053**	**1.465**	**1.824**	**0.396**	**0.771**	**0.369**	**0.728**
5 (high)	1 (low)	26	4.299	**40.643**	**3.056**	0.360	0.596	**-0.885**	**-0.649**	**-0.613**	-0.339
	2	34	4.024	**41.598**	**5.128**	**0.728**	**0.700**	**-0.437**	**-0.402**	-0.277	-0.142
	3	59	3.820	**42.663**	**8.407**	**0.726**	**0.851**	**-0.325**	-0.125	-0.185	0.096
	4	73	3.441	**45.049**	**12.520**	**0.746**	**1.030**	**-0.218**	0.037	-0.141	0.197
	5 (high)	129	5.204	**45.692**	**27.024**	**0.878**	**1.136**	0.030	0.207	0.010	**0.454**
(1,1) – (5,5)						**0.616**	0.337	0.057	-0.073	0.342	0.004
p value						(0.031)	(0.337)	(0.742)	(0.763)	(0.078)	(0.989)
(1,5) – (5,1)						**1.105**	**1.228**	**1.280**	**1.420**	**0.982**	**1.067**
p value						(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.004)

Table 5 – Continued

Panel B: Stock returns on portfolios sorted by previous *Acc* quintiles and Growth												
$TAA_{t-1,\text{rank}}$	*Growth*	*N*	*Size*	Acc_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	64	6.064	**-77.130**	-0.208	0.392	**1.505**	**1.314**	0.193	0.136	**0.402**	**0.405**
	2	67	9.612	**-79.195**	-0.195	**2.050**	**1.459**	**1.218**	0.171	-0.007	**0.334**	0.178
	3	78	6.504	**-79.818**	0.533	**3.957**	**1.532**	**1.220**	**0.316**	0.100	**0.487**	**0.239**
	4	60	3.623	**-81.496**	0.952	**6.612**	**1.449**	**1.374**	**0.328**	0.340	**0.492**	0.320
	5 (high)	51	3.538	**-82.683**	**4.829**	**15.006**	**1.634**	**1.587**	**0.639**	**0.578**	**0.682**	**0.802**
5 (high)	1 (low)	36	2.782	**-11.901**	**22.040**	**3.899**	0.567	0.549	**-0.730**	**-0.674**	**-0.510**	-0.250
	2	44	2.342	**-9.769**	**25.074**	**4.239**	**0.798**	**0.708**	**-0.416**	**-0.451**	-0.196	-0.193
	3	64	2.654	**-8.895**	**30.047**	**7.512**	**0.692**	**0.769**	**-0.391**	-0.150	**-0.252**	0.081
	4	64	3.075	**-8.066**	**34.554**	**11.315**	**0.717**	0.678	**-0.273**	-0.277	-0.172	-0.121
	5 (high)	104	4.817	**-6.426**	**38.818**	**23.970**	**0.913**	**1.089**	0.021	0.191	-0.012	**0.434**
(1,1) – (5,5)							**0.592**	0.225	0.171	-0.054	**0.414**	-0.029
p value							(0.025)	(0.526)	(0.320)	(0.831)	(0.022)	(0.906)
(1,5) – (5,1)							**1.067**	**1.038**	**1.370**	**1.252**	**1.192**	**1.052**
p value							(0.000)	(0.003)	(0.000)	(0.000)	(0.000)	(0.001)

Panel C: Stock returns on portfolios sorted by previous *Acc* quintiles and *Growth*												
$Acc_{t-1,\text{rank}}$	*Growth*	*N*	*Size*	Acc_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	45	2.713	**-10.998**	-0.425	-1.095	**1.350**	**1.093**	0.026	-0.166	0.222	0.137
	2	55	2.771	**-11.557**	-0.684	0.503	**1.338**	**1.199**	0.056	0.033	0.257	0.214
	3	75	2.357	**-11.804**	0.664	**2.456**	**1.461**	**0.888**	0.194	-0.158	**0.447**	0.035
	4	70	2.740	**-12.266**	**3.001**	**6.786**	**1.364**	**1.198**	0.203	0.170	**0.343**	0.251
	5 (high)	74	3.905	**-12.755**	**11.682**	**17.987**	**1.491**	**1.356**	**0.492**	0.378	**0.443**	**0.568**
5 (high)	1 (low)	36	2.396	**4.118**	**10.676**	0.984	**0.911**	**0.702**	**-0.410**	**-0.464**	**-0.151**	-0.297
	2	45	2.042	**4.706**	**14.129**	**3.176**	**0.936**	**0.793**	**-0.298**	-0.241	**-0.066**	-0.075
	3	65	2.252	**5.300**	**17.296**	**6.384**	**0.969**	**0.945**	-0.156	-0.094	**-0.010**	0.044
	4	74	2.445	**5.902**	**21.131**	**10.085**	**0.988**	**0.968**	-0.053	0.026	0.143	0.086
	5 (high)	101	3.511	**6.791**	**29.439**	**22.092**	**0.799**	**0.977**	-0.085	0.069	-0.143	0.178
(1,1) – (5,5)							**0.551**	0.116	0.111	-0.235	0.365	-0.041
p value							(0.026)	(0.726)	(0.524)	(0.348)	(0.059)	(0.881)
(1,5) – (5,1)							**0.579**	0.654	**0.902**	**0.842**	**0.594**	**0.865**
p value							(0.027)	(0.085)	(0.000)	(0.006)	(0.004)	(0.005)

Table 5 – Continued

Panel D: Stock returns on portfolios sorted by previous *NOA* quintiles and Growth

$NOA_{t-1,\text{rank}}$	*Growth*	*N*	*Size*	NOA_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	29	2.648	**41.509**	**-2.841**	**-1.874**	**1.567**	**1.448**	0.218	0.264	**0.670**	**0.494**
	2	44	2.306	**41.727**	**-1.700**	0.363	**1.487**	**1.078**	**0.240**	-0.035	**0.502**	0.125
	3	60	2.149	**39.369**	0.395	**3.185**	**1.563**	**1.458**	**0.379**	0.408	**0.666**	**0.599**
	4	67	2.383	**38.750**	**3.349**	**5.880**	**1.334**	**0.902**	**0.267**	-0.057	**0.464**	0.108
	5 (high)	79	4.099	**35.544**	**13.781**	**19.974**	**1.684**	**1.670**	**0.772**	**0.682**	**0.785**	**0.881**
5 (high)	1 (low)	47	3.007	**93.561**	**19.101**	**4.237**	**0.744**	0.564	**-0.567**	**-0.682**	-0.276	-0.194
	2	46	2.751	**96.293**	**25.882**	**5.883**	**0.626**	**0.732**	**-0.629**	**-0.408**	**-0.409**	-0.174
	3	59	3.254	**97.850**	**30.776**	**8.589**	**0.697**	**0.646**	**-0.415**	-0.330	**-0.338**	-0.249
	4	58	3.310	**99.595**	**36.812**	**13.196**	**0.706**	**0.948**	**-0.306**	-0.036	-0.188	0.106
	5 (high)	68	4.355	**100.697**	**47.093**	**25.388**	0.745	**0.963**	-0.133	0.043	-0.244	0.218
(1,1) – (5,5)							**0.882**	0.485	0.351	0.221	**0.914**	0.276
p value							(0.002)	(0.157)	(0.074)	(0.406)	(0.000)	(0.333)
(1,5) – (5,1)							**0.940**	**1.105**	**1.339**	**1.364**	**1.061**	**1.075**
p value							(0.002)	(0.007)	(0.000)	(0.000)	(0.000)	(0.002)

Panel E: Stock returns on portfolios sorted by previous *ACE* quintiles and *Growth*

$ACE_{t-1,\text{rank}}$	*Growth*	*N*	*Size*	ACE_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	48	2.363	**-52.364**	0.696	-0.785	**1.258**	**1.059**	-0.106	-0.185	0.127	0.015
	2	51	1.770	**-53.448**	0.689	0.173	**1.282**	**1.119**	-0.053	-0.065	0.204	0.047
	3	70	1.609	**-55.863**	**2.356**	**2.276**	**1.405**	**0.807**	0.131	-0.288	**0.317**	-0.003
	4	68	1.986	**-56.586**	**4.824**	**5.686**	**1.283**	**1.742**	0.124	**0.627**	0.262	**0.771**
	5 (high)	78	2.905	**-56.656**	**12.458**	**17.536**	**1.280**	**1.198**	**0.295**	0.244	0.225	0.436
5 (high)	1 (low)	57	3.575	**65.161**	**8.432**	**3.661**	**1.032**	**0.950**	**-0.296**	**-0.339**	0.048	-0.041
	2	57	2.696	**71.088**	**9.435**	**4.186**	**1.054**	**1.168**	**-0.222**	-0.075	0.100	0.122
	3	66	3.171	**67.968**	**12.836**	**6.983**	**1.088**	**1.066**	-0.068	0.156	0.115	0.257
	4	64	3.025	**69.378**	**16.122**	**10.952**	**1.101**	**0.857**	0.067	-0.100	0.181	0.049
	5 (high)	72	3.804	**78.468**	**25.965**	**21.335**	**1.022**	**1.297**	0.124	**0.372**	0.098	**0.493**
(1,1) – (5,5)							0.236	-0.238	-0.230	**-0.557**	0.029	-0.478
p value							(0.356)	(0.475)	(0.186)	(0.025)	(0.885)	(0.067)
(1,5) – (5,1)							0.248	0.247	**0.592**	**0.583**	0.177	0.387
p value							(0.317)	(0.464)	(0.001)	(0.021)	(0.307)	(0.123)

Table 5 – Continued

Panel F: Stock returns on portfolios sorted by previous *I/A* quintiles and Growth

$I/A_{t-1,\text{rank}}$	*Growth*	*N*	*Size*	$\Delta I/I_{t-1}$	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	70	3.530	**-2.592**	**-3.387**	**-1.883**	**1.357**	**1.318**	-0.011	0.056	0.173	**0.270**
	2	71	3.002	**-2.915**	**-3.383**	-0.242	**1.323**	**1.122**	-0.004	-0.055	0.233	0.218
	3	76	2.333	**-3.031**	**-3.938**	**0.689**	**1.662**	**1.262**	**0.383**	0.190	**0.561**	0.207
	4	59	1.973	**-3.410**	**-4.531**	**3.566**	**1.480**	**1.004**	**0.276**	-0.126	**0.399**	-0.118
	5 (high)	42	2.516	**-3.158**	**-1.818**	**12.948**	**1.489**	**1.458**	**0.438**	0.429	**0.381**	0.359
5 (high)	1 (low)	38	3.672	**21.650**	**23.708**	**5.349**	**0.787**	**0.733**	**-0.499**	**-0.482**	-0.262	-0.146
	2	42	3.662	**23.327**	**25.883**	**5.844**	**0.815**	0.431	**-0.365**	**-0.654**	-0.142	**-0.394**
	3	65	3.940	**23.835**	**29.992**	**8.944**	**0.816**	**0.765**	**-0.396**	-0.260	-0.238	-0.071
	4	72	3.833	**24.518**	**31.991**	**12.766**	**0.786**	**0.885**	**-0.238**	-0.126	-0.212	-0.015
	5 (high)	101	4.691	**25.240**	**36.972**	**24.839**	**0.833**	**1.062**	-0.055	0.127	-0.167	0.334
(1,1) – (5,5)							**0.525**	0.257	0.044	-0.070	**0.340**	-0.064
p value							(0.031)	(0.448)	(0.772)	(0.769)	(0.046)	(0.799)
(1,5) – (5,1)							**0.702**	0.725	**0.937**	**0.911**	**0.643**	0.505
p value							(0.013)	(0.052)	(0.000)	(0.010)	(0.006)	(0.148)

Panel G: Stock returns on portfolios sorted by previous Δ*I/I* quintiles and *Growth*

$\Delta I/I_{t-1,\text{rank}}$	*Growth*	*N*	*Size*	I/A_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	62	2.535	**-39.908**	0.337	**-1.329**	**1.285**	**1.069**	-0.089	-0.219	0.181	0.061
	2	59	1.776	**-42.709**	-0.436	-0.123	**1.416**	**1.144**	0.083	-0.128	**0.318**	0.116
	3	74	1.830	**-43.719**	0.268	**2.058**	**1.492**	**1.173**	**0.199**	0.057	**0.404**	0.153
	4	64	1.959	**-45.130**	**2.105**	**4.995**	**1.358**	**1.601**	0.171	**0.543**	**0.301**	**0.561**
	5 (high)	58	2.982	**-44.453**	**6.956**	**14.691**	**1.420**	**1.497**	**0.410**	**0.556**	**0.330**	**0.634**
5 (high)	1 (low)	36	2.416	**97.849**	**10.746**	**3.428**	0.654	**0.702**	**-0.622**	**-0.547**	-0.258	-0.131
	2	45	2.369	**103.600**	**13.083**	**4.654**	**0.982**	**0.654**	**-0.262**	**-0.492**	0.032	-0.208
	3	63	2.336	**106.045**	**16.634**	**6.879**	**1.124**	**0.875**	-0.033	-0.056	0.197	0.037
	4	72	2.566	**112.238**	**20.840**	**10.689**	**0.948**	0.627	-0.060	-0.290	0.023	-0.196
	5 (high)	101	3.894	**121.716**	**30.249**	**23.335**	**1.003**	**0.998**	0.142	0.071	0.116	0.288
(1,1) – (5,5)							0.282	0.071	-0.231	-0.290	0.065	-0.227
p value							(0.287)	(0.849)	(0.163)	(0.269)	(0.732)	(0.407)
(1,5) – (5,1)							**0.766**	**0.795**	**1.032**	**1.103**	**0.588**	**0.765**
p value							(0.004)	(0.023)	(0.000)	(0.000)	(0.008)	(0.014)

Table 5 – Continued

Panel H: Stock returns on portfolios sorted by previous *I/K* quintiles and Growth

$I/K_{t-1,\text{rank}}$	*Growth*	*N*	*Size*	I/K_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	105	5.201	**8.592**	**2.216**	**1.612**	**1.233**	**1.079**	-0.119	-0.166	0.121	0.072
	2	74	5.319	**8.455**	**0.936**	**1.849**	**1.324**	**1.149**	-0.036	-0.074	0.174	0.140
	3	65	3.064	**8.457**	0.186	**2.581**	**1.417**	**1.202**	0.100	0.003	**0.310**	0.111
	4	45	2.218	**8.405**	-0.941	**2.835**	**1.283**	**1.303**	0.034	0.163	0.154	0.192
	5 (high)	29	2.332	**8.417**	**2.203**	**10.625**	**1.245**	**1.274**	0.158	0.260	0.013	0.144
5 (high)	1 (low)	20	1.815	**54.226**	**15.941**	**2.462**	0.717	0.746	**-0.575**	-0.456	-0.075	-0.036
	2	33	1.616	**58.425**	**16.102**	**3.033**	**0.849**	0.152	**-0.316**	**-0.943**	-0.001	-0.441
	3	57	1.952	**58.146**	**18.860**	**7.127**	**1.048**	**1.137**	-0.046	0.197	0.201	0.496
	4	78	2.607	**60.778**	**23.556**	**10.709**	**0.982**	**0.804**	0.019	-0.064	0.089	0.106
	5 (high)	131	4.794	**65.611**	**31.272**	**24.978**	**1.039**	**1.275**	0.193	**0.340**	0.170	**0.637**
(1,1) – (5,5)							0.194	-0.196	-0.302	**-0.506**	-0.049	**-0.565**
p value							(0.529)	(0.614)	(0.091)	(0.042)	(0.760)	(0.016)
(1,5) – (5,1)							0.527	0.528	**0.733**	0.716	0.088	0.180
p value							(0.134)	(0.247)	(0.018)	(0.083)	(0.791)	(0.683)

Panel I: Stock returns on portfolios sorted by previous *NSI* quintiles and *Growth*

$NSI_{t-1,\text{rank}}$	*Growth*	*N*	*Size*	NSI_{t-1}	TAG_{t-1}	TAG_t	Ret_{ew}	Ret_{vw}	$AdjRet_{ew}$	$AdjRet_{vw}$	α_{ew}	α_{vw}
1 (low)	1 (low)	86	5.110	**-3.306**	**2.493**	**1.649**	**1.368**	**1.280**	0.044	0.076	**0.226**	**0.312**
	2	78	7.550	**-3.274**	**3.443**	**3.829**	**1.215**	**1.109**	-0.054	-0.033	0.149	0.114
	3	76	7.442	**-2.889**	**4.860**	**6.730**	**1.327**	**1.240**	0.134	0.218	**0.317**	**0.363**
	4	47	7.777	**-3.078**	**5.883**	**9.101**	**1.454**	**1.240**	**0.344**	0.231	**0.496**	0.334
	5 (high)	29	6.592	**-4.844**	**11.611**	**19.326**	**1.406**	**1.445**	**0.451**	**0.475**	**0.376**	**0.667**
5 (high)	1 (low)	44	6.022	**11.857**	**13.445**	**4.399**	**1.002**	**0.944**	**-0.300**	-0.291	0.129	0.204
	2	39	4.067	**13.457**	**16.330**	**3.284**	**0.938**	**0.748**	**-0.287**	**-0.501**	-0.037	-0.205
	3	63	2.906	**13.121**	**19.860**	**5.940**	**0.764**	**0.721**	**-0.342**	**-0.376**	-0.154	-0.080
	4	68	2.675	**15.019**	**26.103**	**9.610**	**0.922**	**0.874**	-0.097	-0.139	0.067	-0.025
	5 (high)	108	4.027	**15.329**	**36.715**	**23.245**	**0.861**	0.719	-0.023	-0.191	-0.059	-0.084
(1,1) – (5,5)							**0.507**	0.560	0.068	0.267	0.285	0.396
p value							(0.062)	(0.105)	(0.682)	(0.289)	(0.085)	(0.126)
(1,5) – (5,1)							0.405	0.501	**0.751**	**0.767**	0.247	0.463
p value							(0.157)	(0.187)	(0.000)	(0.016)	(0.318)	(0.170)