Skin in the Game:
Operating Growth, Firm Performance, and Future Stock Returns

Sean Shun Cao, Zhe Wang, and P. Eric Yeung*

Abstract

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JEL classification: G12; G14; G15

Key words: Asset growth; Return predictability; Product market; Underreaction

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* Cao, scao@gsu.edu, J. Mack Robinson College of Business, Georgia State University; Wang, zhe_wang@kenan-flagler.unc.edu, Kenan-Flagler Business School, University of North Carolina at Chapel Hill; and Yeung (corresponding author), eric.yeung@cornell.edu, Samuel Curtis Johnson Graduate School of Management, SC Johnson College of Business, Cornell University. We thank helpful comments from Vikas Agarwal, David McLean, Siew Hong Teoh, Teri Yohn, conference and workshop participants, and conference discussants at the 2019 China International Conference in Finance; MFA Annual Meeting 2019; Temple Accounting 100th Anniversary Conference, the 31st Australasian Finance and Banking Conference, the 2019 AAA Financial Accounting and Reporting Section Mid-Year Meeting, Cornell University, Georgia State University, and Southwest Jiaotong University.

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I. Introduction

The literature on the pricing implications of asset growth has focused on the *negative* relation between firm-level growth and future stock returns. For example, Cooper, Gulen, and Schill (2008) show that a simple measure of growth (i.e., annual growth rate of firm's total assets) is a strong predictor of negative future stock returns. The beauty of this asset growth measure is that, as a simple "left-hand-side" balance sheet variable, it aggregates various kinds of "right-hand-side" corporate financing events that have been previously demonstrated to be negatively associated with future stock returns.[1]

Note that the firm-level growth examined by prior studies focuses primarily on capital provided by capital market participants such as debt and equity investors (i.e., "financing growth"). However, other types of capital providers play different economic roles, and their lending decisions may have different implications for future firm performance. In particular, the effect of growth financed by product market stakeholders (i.e., "operating growth") can be very different from that of financing growth, because the typical product market stakeholders (e.g., vendors, customers, and contractors) have i) information advantage and ii) stronger economic incentives to screen and select when lending.

More specifically, comparing with debt and equity investors, product market stakeholders have the distinct information advantage to overcome adverse selection by accessing to i) more timely private information via more frequent on-site visits and ii) operation-level data such as the size and timing of sales orders (Mian and Smith 1992; Petersen and Rajan 1997; Biais and Gollier 1997; Cohen and Frazzini 2008). Information advantage also comes from less biased information sources. Debt and equity investors have to rely on information disclosed by firm managers, which is potentially selective or biased in favor of themselves (Teoh, Welch, and Wong 1998a, 1998b; Ducharme, Malatesta, and Sefcik 2004; Kim and Park 2005; Jiang 2008; Liu, Ning, and Davidson 2010). In contrast, the operation-level private

[1] See prior evidence from initial public offerings (Ritter 1991), seasoned equity offerings (Loughran and Ritter 1997), debt offerings (Spiess and Affleck-Graves 1999), bank loans (Billet, Flannery, and Garfinkel 2006), aggregate financing activities (Bradshaw, Richardson, and Sloan 2006) and accumulative accrual income (Hirshleifer, Hou, Teoh, and Zhang 2004).

signals observed by product market stakeholders through daily business interactions are inherently less unbiased.

Compared with debt and equity investors, product market stakeholders also have stronger economic incentives to screen and select among the firms they transact with when making lending decisions because of higher risks in their lending and operational activities. Because product market participants are not specialized in lending diversification, their lending portfolio is more susceptible to idiosyncratic firm default risk compared with debt and equity investors. As such, they should have stronger incentives to discriminate among the firms and select the healthier ones to finance (Brennan, Miksimovic, and Zechner 1988). Perhaps most importantly, unlike debt and equity investors, product market stakeholders' business activities (i.e., their own survival and success) are closely tied to the chosen firm's performance. Thus, they have strong incentives to select firms with better performance to finance.

In short, our basic argument is that the product market stakeholders' information advantage and stronger economic incentives suggest that operating growth is a signal of high future firm performance.[2] In our empirical work, we first test whether this hypothesis is supported by data. Motivated by prior evidence that investors misprice financing growth, we then predict and test the hypotheses that capital market participants under-estimate the positive effects of operating growth on future firm performance. Finally, we test whether cross-sectional variations in return predictability are consistent with mispricing the signal from product market stakeholders.

We empirically define operating growth as total asset growth minus financing growth (i.e., change in debt and equity) and growth in taxes and accounts payable.[3] This variable largely captures diverse types of growth in tangible and intangible assets financed by vendors, customers, and contractors. For instance, operating growth of Netflix Inc., an Internet television network company, reflects the collected fees from

[2] Of course, a necessary condition is that product market stakeholders have the bargaining power to choose among the firms whom they transact with to finance.

[3] We do not consider accounts payable because it is governed by short-term routine purchase contracts and lacks consistent return predictability (Chan, Chan, Jegadeesh, and Lakonishok 2006). Thus, operating growth in our study excludes trade credit.

upstream producers for multi-year broadcasting contracts, while the operating growth of Depomed Inc., a specialty pharmaceutical company, contains the upfront payments under collaborative agreements with its customers including Valeant and Abbott. We confirm empirically that operating growth is positively associated with increases in the firm's major customers and suppliers.

During our 47-year sample period (1971-2017), we find strong *positive* earnings predictability by operating growth (i.e., annual operating growth rate is positively associated with one-year-ahead earnings growth). For instance, the spread in one-year-ahead growth in earnings (as a percentage of average assets, i.e., ROA) between equal-weighted firms in the top- and bottom-decile of operating growth is about 2%. In contrast, consistent with prior studies, financing growth and working capital accruals (Sloan 1996) *negatively* predict future earnings growth.

We also document strong *positive* return predictability by operating growth. We document significant positive spread in monthly returns for portfolios sorted by operating growth during the following 12-month period. The positive spread is robust to controlling for the Fama-French five factors (Fama and French 2015), the two mispricing factors (Stambaugh and Yuan 2017), as well as the 14-characteristics (Lewllen 2015; Bessembinder, Cooper, and Zhang 2019).

We find evidence consistent with the hypothesis that sell-side security analysts under-estimate the positive effects of operating growth on future earnings. We show that analysts' one-year-ahead forecast errors (i.e., actual earnings of year t+1 minus analyst consensus forecast) are *positively* associated with the operating growth of current year t, suggesting that analysts under-estimate the high future profitability associated with operating growth. (In contrast, analysts' forecast errors are *negatively* associated with financing growth, consistent with analysts being overly optimistic about the low rate of profitability). Our evidence suggests that analysts gradually correct their error-in-expectations over the course of year t+1. However, about 40% of their pessimism associated with operating growth still remains by the month before the announcement of year t+1 earnings, which results in relatively large, predictable returns at the earnings announcement of year t+1.

Stock prices behave as if investors also under-estimate the high future earnings predicted by operating growth. We find strong positive associations between a firm's annual operating growth and one-year-ahead stock returns. For instance, we document over 50 basis points (bps) spread in the one-year-ahead monthly 14-characteristics abnormal returns between the top- and bottom-decile of operating growth. This positive return predictability of operating growth is more pronounced in small and medium-sized firms, consistent with better information environment and/or lower arbitrage costs mitigating the potential mispricing within larger firms. Our results are not affected by including other accounting anomaly variables such as net operating assets (Hirshleifer, Hou, Teoh, and Zhang 2004), profitability (Fama and French 2008; Novy-Marx 2013), various measures of accruals (Sloan 1996; Richardson, Sloan, Soliman, and Tuna 2005), growth in research and development expenditures (R&D, Eberhart, Maxwell, and Siddique 2004), and various corporate events such as share repurchases (Ikenberry, Lakonishok, and Vermaelen 1995), dividend initiations and omissions (Michaely, Thaler, and Womack 1995), and stock splits (Ikenberry and Ramnath 2002).

We find that about 20% of the future annual returns are earned around the four earnings announcements within the one-year window, suggesting that investors are disproportionally surprised by the better-than-expected earnings news. In addition, the magnitude of abnormal returns around subsequent earnings announcements declines over the subsequent quarters, consistent with larger (smaller) belief-revision early (late) in the following year.

Can our return results be explained by higher expected return for high operating growth firms (i.e., a risk-based explanation)? First, to explain our results, one would have to argue that a firm financed by product market stakeholders would be *more* risky, which is an argument that is very difficult to make. If anything, such a firm should be *less* risky due to their screening. (Note that our results are new and cannot be explainable by the investment-based *q*-theory because the theory predicts *negative* association between stock returns and investment variables.)

Second, our evidence of i) positive analyst forecast errors, ii) clustered abnormal returns around subsequent earnings announcements, and iii) the declining abnormal returns over subsequent earnings announcements cannot be explained by any risk-based story. These results suggest that investors and analysts under-estimate the future performance of firms with high operating growth (while over-estimate future performance of firms with high financing growth). When future quarterly earnings are announced, the market is surprised and gradually revises its expectations about future earnings.

We conduct further tests to examine the cross-sectional variations in the return predictability by operating growth. In particular, if the return predictability is driven by the product market stakeholders' information advantage and screening, we expect that the return predictability should be stronger when their information advantage is larger and bargaining power is stronger.

We use two segment-based proxies to capture product market stakeholders' information advantage: i) number of operating segment (i.e., their information advantage is relatively larger among single segment firms), and ii) segment sales volatility (i.e., their information advantage is relatively larger among firms with higher demand uncertainty). We also use two industry-based proxies to captue product market stakeholders' bargaining power: i) the firm's industry exit rate (i.e., product market stakeholders' bargaining power is relatively larger when the firm operates in a more competitive industry), and ii) the firm's sales relative to the sales of its top suppliers and customers (i.e., their bargain power is relatively larger when the firm depends more on them). We find results consistent with these predictions. In contrast, we do not find any variation in return predictability of financing growth using these proxies.

Our primary contribution is identifying an "island" of positive return predictability by a growth variable in the "ocean" of negative return predictability by numerous growth variables (total assets, debt growth, equity growth, loan growth, net operating asset growth, etc.). Our operating growth variable is motivated based on the information advantage and economic incentives of product market stakeholders, whose own survival is linked cruelly to the firm and often have access to the first-hand "soft" information and unbiased operational data. While prior research debates about the explanations for the negative return predictability of growth variables,[4] results from our analyses strongly support the error-in-expectation explanation as opposed to risk-based explanations, indicating that market participants under-estimate the positive implications of operating growth for future firm performance.

Our study continues as follows. Section 2 discusses the related literature on assets growth; Section 3 summarizes sample and empirical design; Sections 4 and 5 reports empirical results; Section 6 concludes.

II. Prior Studies and Main Hypothesis

A large body of finance and accounting research documents that firms experiencing positive (negative) asset growth subsequently have low (high) stock returns. There are two major streams of theories in this asset growth literature, and both attribute the negative relation to the information asymmetry between the manager of the growing firm and the outside capital market participants.

The first explanation lies on the premise of agency problem that managers' value-destroying empire-building is financed by the capital markets (i.e., Jensen 1986; Titman, Wei and Xie 2004). The evidence of the negative relation between asset growth and future stock returns implies that shareholders are not well informed to discern the managers' sub-optimal investment choices. The second explanation assumes limits to arbitrage and that managers tend to time the market when raising capital (Baker and Wurgler 2002; Billet, Flannery, and Garfinkel 2006; Loughran and Ritter 2004; Spiess and Affleck-Graves 1999). For instance, managers of overvalued firms tend to time the capital market by issuing new equity and acquiring public/private debt right before their operating performance is going to decline. Such market timing behavior leads to a negative relation between asset growth and future performance. Prior research also provides evidence that over-valuation could be introduced by earnings management in the settings of initial public offerings or seasoned equity offerings (Teoh, Welch and Wong 1998a; 1998b).

[4] Prior studies provide mixed evidence regarding whether the negative relation between asset growth and future stock returns reflects error-in-expectations (i.e., management and investor over-confidence for growth firms) or lower risk (i.e., expected lower returns for high growth firms) (e.g., Li and Zhang 2010, Lam and Wei 2011, Watanabe, Xu, Yao, and Yu 2013, Titman, Wei, and Xie 2013).

The asset growth literature is also related to the accrual anomaly literature in accounting because accruals, a component of earnings, can also be viewed as growth in working capital (Sloan 1996; Fairfield et al. 2003). One explanation for the negative relation between accruals and future stock returns is that the persistence of accruals in relation to future earnings is lower than that of cash flows because accruals are subject to managerial discretion. However, investors perceive that the persistence of accruals and cash flows is similar and thus apply the same valuation multiplier to both of them. Richardson et al. (2005) subsequently expand the scope of accruals, which are defined more similarly to the asset growth variable examined in Cooper et al. (2008).

Our study also relates to the stream of asset growth studies in accounting literature. For example, Cao (2016) shows that net operating asset (NOA) growth (i.e. total accruals) is superior than total asset growth in predicting future *negative* returns. He shows that total asset growth is less powerful as it contains a noisy growth component - accounts payable. However, Cao (2016) does *not* document this noisy growth component predicts positive future stock returns. By the construct and empirics, our operating growth is different (orthogonal) from accounts payable examined in Cao (2016).

The unifying premise in all these explanations is that capital market participants are not well informed regarding the negative implications of asset growth on future performance, causing negative return predictability. In contrast, product market stakeholders such as vendors, customers, and contractors have distinct information advantage about the nature of the firm's growth (i.e., whether positive net present value projects). As argued in Section I, comparing to capital market participants, product market stakeholders have access to more timely information through natural business transactions with the firm. In addition, while capital market participants have to rely on information disclosed by firm management, which is potentially selective or biased in favor of management, product market stakeholders are less subject to this issue.[5] Timely and unbiased access to customer conditions makes product market

[5] Although banks may have access to firms' nonpublic disclosures (e.g., internal budget statements), Billet, Flannery and Garfinkel (2006) empirically show growth financed by bank loans is also negatively associated with future stock returns.

stakeholders better understand the risk and profitability of projects undertaken by the firm. Therefore, their decision to finance the firm attests to the quality of the firm's growth.

In addition, product market stakeholders are not in the business of lending. Consequently, the firm's credit default is more devastating for product market stakeholders compared with debt and equity investors who specialize in financial diversification. The lower tolerance for idiosyncratic default risk enables product market stakeholders a stronger incentive to screen healthy growth of individual firms. Therefore, unlike creditors and equity investors, product market stakeholders' own survival and success are more tied to the chosen firm's future performance. Therefore, a significant increase in operating growth can generally serve as a testament to product quality or can represent a surge in general demand for customers' products (i.e., healthy growth) (Long, Malitz, and Ravid 1993).[6] Note that product market stakeholders must have a certain level of bargaining power to choose among the firms whom they transact with to finance. If they lack bargaining power, operating financing should not be informative about firm future performance.

Another major camp proposes that the negative relation between asset growth and future stock returns is consistent with the lower (higher) cost of capital for high (low) growth firms (Cochrane 1991; 1996; Liu, Whited, and Zhang 2009). Lyandres, Sun, and Zhang(2008) and Li, Livdan, and Zhang (2009) also argue that higher investments are associated with lower expected returns via both decreasing return to scale and the discount rate effect. If these investment-based arguments are true, the methods of financing should not matter much. Therefore, we would predict that operating growth should be *negatively* associated with future stock returns.

III. Sample and Key Variables

[6] It is unlikely that vendors' potential low financing cost can explain a firm's future positive performance because the portion of operating growth is relatively small comparing to total assets, and such a saving is marginal in economic magnitude. Operating growth is thus more of *signal* of a firm's heathy growth instead of providing actual economic benefit.

A. Sample Selection

Our detailed sample selection procedures are illustrated in Appendix A. To be brief, we start with all NYSE, AMEX, and NASDAQ firms, excluding utilities (four-digit SIC does between 4900 and 4999) and financials (with four-digit SIC codes between 6000 and 6999) for the fiscal period 1971-2017.[7] We then restrict the sample to firms with a year-end price no less than $5 and total assets no less than $10 million, which eliminates very small firms with high transaction costs and illiquidity (Fama 1998; Fama and French 2008). We also exclude the first two years when a firm first appears on Compustat to mitigate backfilling biases (e.g., Fama and French 1993; Cooper et al. 2008). We exclude firms without the requisite financial data in Compustat, allowing us to construct measures in the empirical analyses (e.g., operating growth, financing growth, earnings announcement dates). These sample selection criteria result in 84,658 firm-year observations. For the analysis of analysts' forecast errors, we merge our main sample with I/B/E/S and obtain 44,304 firm-year observations.

B. Definition of Growth Variables

We decompose asset growth into two major components, financing growth and non-financing growth (i.e. asset growth = non-financing growth + financing growth). Financing growth is calculated as changes in debt and equity.[8] Specifically, financing growth during fiscal year t ($\text{FINANCING\_GROWTH}_t$) is defined as:

$$\text{FINANCING\_GROWTH}_t = \Delta\ \text{Debt}_t\ (\text{DLC} + \text{DLTT}) + \Delta\ \text{Minority Interests}_t\ (\text{MIB} + \text{MIBN})$$
$$+\ \Delta\ \text{Preferred Stocks}_t\ (\text{PSTK}) + \Delta\ \text{Common Equity}_t\ (\text{CEQ}),$$
$$\text{deflated by average total assets (AT) of year t.}$$

For convenience, the respective Compustat item number is included in parenthesis. Appendix B also shows the detailed variable definitions.

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[7] As explained in Appendix A, we start our sample in 1971 before earnings announcement dates are available from Compustat after 1970.

[8] We review redeemable (non-redeemable) minority interests as debt (equity).

We model non-financing growth as the sum of operating growth, accounts payable growth, and tax growth (i.e., non-financing growth = operating growth + A/P growth + tax growth). We exclude A/P growth from operating growth because A/P is determined by short-term routine purchase contracts and less informative, consistent with the prior mixed empirical evidence regarding its return predictability (Gu and Jain 2011; Chan, Chan, Jegadeesh, and Lakonishok 2006; Cao 2016). Tax growth (changes in tax payable plus deferred taxes) also has a very different nature compared with other operating items.

Our empirical measure of operating growth during fiscal year t ($OPERATING\_GROWTH_t$) is defined as:

$$OPERATING\_GROWTH_t = \Delta \text{ Total Assets}_t \text{ (AT)} - FINANCING\_GROWTH_t - \Delta \text{ A/P}_t \text{ (AP)}$$
$$- \Delta \text{ Taxes}_t \text{ (TXP + TXDITC), deflated by average total assets } (AT) \text{ of year t.}$$

Note that Cooper et al. (2008) also consider the decomposition of asset growth, but they do not go as deep as what we do in this study. Once Operating Growth is isolated from A/P growth and tax growth, we document the significantly positive return predictability (see Section 4.3.3).

Another way to define operating growth is the sum of current other liabilities (Compustat LCO) and long-term other liabilities (Compustat LO). Thus, the operating growth measure consists of diverse types of growth in tangible and intangible assets financed by vendors, customers, and contractors. These assets include inventories, loyalties, rebates, customer deposits, properties, and equipment.[9] We acknowledge the noise components in this variable such as legal penalties or derivative contract liabilities, which are relatively small in magnitudes and create biases against our findings.

C. Operating Growth and Growth in Major Customers and Suppliers

[9] Firms typically do not voluntarily disclose the components of other liabilities in their financial statement footnotes. A firm may choose to reveal one or two material components (without disclosing related magnitudes). By analyzing the financial statements of subsample firms with large other liabilities, we confirm that the most frequently mentioned components are financing from customers, suppliers or contractors, including deferred revenue, warranty obligations, liability related to the sale of future from customers, accrued royalties from vendors, and deferred rent from contractors.

Before we conduct our main analyses, we conduct validity tests to confirm that our operating growth variable captures product market stakeholders' "skin in the game". Specifically, we run the following regression:

(1) $\text{OPERATING\_GROWTH}_t = \alpha + \beta\ \text{GROWTH\_SUPPLIER}_t / \text{GROWTH\_CUSTOMER}_t + \varepsilon.$

where GROWTH_SUPPLIER or GROWTH_CUSTOMER is a dummy variable equal to one if the firm adds new major supplier(s) or customer(s) according to its major customer disclosures, and zero otherwise.[10] We expect positive coefficients for these dummy variables if i) operating growth captures operating financing by product market stakeholders and ii) newly disclosed major suppliers and customers are likely involved with financing activities. Untabulated results indicate that estimated β is positive for GROWTH_SUPPLIER (t = 3.64), GROWTH_CUSTOMER (t = 1.75), or the combination of them (t = 3.53). Note that we do not test whether the termination of major customers/ suppliers leads to contemporaneous decreases in operating growth because the long-term liabilities are not settled in the same year.

IV. Main Results

A. Descriptive Evidence

Panel A of Table 1 presents the summary statistics of firm characteristics for the decile portfolios formed by OPERATING_GROWTH. For firms in the top-decile, positive operating growth is on average about 12.2% of a firm's average total assets. In the bottom-decile, operating growth is on average about -5.7% of average total assets. In general, we do not observe strong correlations between operating growth and selected firm characteristics, such as firm size, B/M ratio, earnings, accruals, and cash flows. Therefore, our results are unlikely to be driven by these firm characteristics. Note that the negative

[10] Because smaller suppliers and customers are unobservable, we focus on corporate disclosures on major customers to construct GROWTH_CUSTOMER and invert the firm-customer relationship to construct GROWTH_SUPPLIER.

correlation with B/M ratio indicates that high operating growth firms are not distressed firms without the option of capital market financing.

On the other hand, we do observe monotonic increases in financing growth, accounts payable growth, and tax growth across OPERATING_GROWTH deciles. This is hardly surprising because all these variables are correlated with the underlying growth of the firm. Given these correlations, it is striking that operating growth has the opposite earnings/return predictability compared with financing growth.

B. The Implication of Operating Growth for Future Earnings

In Panel A of Table 2, we present firm performance (i.e., earnings growth ΔEARNINGS) in the year for which operating growth deciles are constructed (i.e., year t) and the following year (i.e., year t+1). We report both equal-weighted and value-weighted ΔEARNINGS. For year t, we do not observe any clear directional pattern of earnings growth. However, we do observe a monotonic increase in the growth of one-year-ahead earnings ($\Delta EARNINGS_{t+1}$) across the OPERATING_GROWTH deciles. In the equal- (value-) weighted portfolio, the spread of one-year-ahead earnings growth between firms in the top and bottom deciles of operating growth is 2.07% (1.71%) of total assets. This result indicates a strong positive correlation between operating growth and firms' future profitability. In contrast, prior studies find that growth financed by other channels (stocks, debts or loans) is negatively correlated with future earnings growth.

To formally test the implication of operating growth, we run the following yearly Fama-MacBeth (1973) regressions:

$$(2)\qquad EARNINGS_{t+1} = \alpha + \beta_1\, OPERATING\_GROWTH_t + \beta_2\, EARNINGS_t + \sum \beta_x X_t + \varepsilon.$$

In this regression model, $EARNINGS_t$ is calculated as income before extraordinary items (IB) in year t, divided by the average of total assets measured at the beginning and end of year *t*. X_t includes control variables with predictive power regarding future earnings, such as $ACCRUALS_t$ and $FINANCING\_GROWTH_t$. We include current earnings as a control variable (Fairfield et al. 2003).

Thus, the coefficients on growth variables indicate their incremental predictive power beyond that of current earnings.

Panel B of Table 2 presents the regression results. In model (1), operating growth alone has significant incremental predictive power for future earnings (*t-statistic* = 4.59) over that of current earnings. Models (2), (3) and (4) show that the incremental predictive power of operating growth cannot be explained by its potential correlation with accruals or financing growth. Including financing growth in the regression actually improves the incremental predictive power of operating growth (*t-statistic* > 8), which is explained by the positive correlation between the two types of growth and their respective different associations with future firm performance. Furthermore, in model (4), the estimated coefficient for OPERATING_GROWTH is 0.143, while that for FINANCING_GROWTH is -0.066. Thus, one standard deviation change in operating growth increases earnings by 58.6 bps of average total asset, which is 3.3 times larger than accruals (i.e., 17.5 bps) and about 41% of financing growth (i.e., 142.6 bps). The results in model (5) indicate that growth in accounts payable (or tax-related items) has much smaller incremental predictive power for future earnings. Overall, our results show that operating growth has significant positive earnings predictability. In addition, this earnings predictability of operating growth is incremental to those of accruals and other growth variables.

C. The Implication of Operating Growth for Future Stock Returns

1. Sorting Results

Table 3 Panel A presents the one-year-ahead average monthly raw returns of five portfolios sorted by OPERATING_GROWTH. The one-year-ahead return period starts from the fourth month after the end of fiscal year t, based on OPERATING_GROWTH calculated with accounting data of year t. Both equal-weighted (EW) and value-weighted (VW) results show a similar pattern: Returns are higher for firms in relatively high OPERATING_GROWTH portfolios than those in relatively low OPERATING_GROWTH portfolios. This pattern is stronger for EW portfolios with a spead of monthly raw return between the High and Low OPERATING_GROWTH quntile of 16.69 bps EW (13.75 bps VW).

We also form three groups of firms (small, medium and large) based on their market capitalization by year and expect the return predictability to be more pronounced in small firms because market frictions are higher among them.[11] We have two types of frictions in mind: i) poor information environment for small firms causing larger underreaction to begin with and ii) higher transaction costs causing difficulty to arbitrage away market underreaction. Consistent with mispricing, Table 3 Panel A shows that the spread of return between the High and Low OPERATING_GROWTH quntile is 24.21 bps EW (27.40 VW) per month in small firms, compared to a spread of 8.36 bps EW (7.54 VW) in medium-sized firms and a spread of 6.55 bps EW (11.59 VW) in large firms. The return patterns across small, medium and large firms are also similar to those in Table 2 Panel C of Cooper et al. (2008).

Panel B presents the results of one-year-ahead average monthly abnormal returns (FF4, FF5, M4, and C14). The FF4 abnormal returns are calculated from time-series regressions of the excess returns of the hedge portfolio on the Fama-French four factor model including beta, size, book-to-market, and momentum (Carhart 1997). The FF5 abnormal returns are calculated from time-series regressions of the excess returns of the hedge portfolio on the Fama-French five factor model including beta, size, book-to-market, profitability, and investment (Fama and French 2015). We also construct M4 abnormal returns, which are obtained from the mispricing factor model including beta, size, and MGMT and PERF following Stambaugh and Yuan (2017). Finally, we calculate the C14 abnormal returns, which are excess returns adjusted using a group of 14 important firm characteristics following Bessembinder et al. (2019).[12]

The inferences are similar to those obtained with raw returns. Abnormal returns are higher for firms in relatively high operating growth portfolios than those in relatively low operating growth portfolios. The High-Low spreads in abnormal returns for both EW and VW portfolios are significant across all

[11] Size groups are defined by ranking firms into one of three groups (small, medium, and large) using the 30th and 70th NYSE market equity percentiles at year t..

[12] We thankHank Bessembinder, Michael Cooper, Robert F. Stambaugh and Feng Zhang for providing the risk and mispricing factors for calculating M4 and C14 returns.

abnormal return measures. They are also economically meaningful. For instance, the spreads in various measures of abnormal returns for EW portfolios range from about 0.26 to 0.52 percent per month.

To test consistency in the operating growth effect over time, we examine the annual abnormal returns in the 12 months after portfolio formation for each of the 47 years in our sample period. In particular, we plot the annualized one-year-ahead C14 abnormal returns for EW and VW portfolios of operating growth quntile 1 (low growth) and quntile 5 (high growth) in Figure 1. We also plot the spread between these two series (the bold line), which is simply the difference between low growth and high growth portfolio returns. The graph shows that returns of low growth firms consistently exceed those of high-growth firms, particularly for the equal-weighted portfolios. Over our 47 year sample period, for the EW portfolio, the spread between low growth and high growth firms is positive in all but four years. In other words, over this 47-year period, high growth firms outperform low growth firms in EW portfolio 91% of the years. The effect is also consistent (but less so) based on VW with high growth firm returns beating low growth firm returns in about 80% of the years.

2. Multiple Regression Results

Next, we demonstrate the positive associations between operating growth and future stock returns by running the Fama-MacBeth yearly regressions models similar to Cooper et al. (2008):

(3a) $\mathrm{RET}_{t+1} = \alpha + \beta_1\,\mathrm{OPERATING\_GROWTH}_t + \beta_2\,\mathrm{FINANCING\_GROWTH}_t + \sum \beta_x X_t + \varepsilon.$

where RET_{t+1} is 12-month buy-and-hold return, starting from the fourth month after the end of fiscal year t, and X_t consists of a set of control variables that predict future stock returns, including six-month lagged returns (RET(-6, -1)), firm size (SIZE), book-to-market ratio (B/M), and accruals (Fama and French 1992; Jegadeesh and Titman 1993; Lakonishok, Shleifer, and Vishny 1994; Sloan 1996). To help interpret the estimated coefficients, all independent variables are converted into deciles by year and then scaled to a value between -0.5 and 0.5. The estimated coefficients thus indicate the incremental abnormal returns of a zero-value investment portfolio in their respective variables.

Besides the traditional one-year-ahead stock returns (RET regression in 3a), we also focus on subsequent earnings announcements returns (EA_RET regression in 3b):

(3b) $\quad EA\_RET_{t+1} = \alpha + \beta_1$ OPERATING_GROWTH$_t$ + β_2 FINANCING_GROWTH$_t$ + $\sum \beta_x X_t + \varepsilon$.

where EA_RET$_{t+1}$ is the subsequent earnings announcement returns in the year t+1, calculated as the sum of four three-day returns around each quarterly earnings announcements in year t+1. The motivation of examining EA_RET is that return concentration around earnings announcements helps us to rule out the alternative hypothesis that the stock returns associated with operating growth reflect expected higher risk premium associated with high operating growth. If the return predictability associated with operating growth is explained by error-in-expectation, we expect to observe a disproportionally concentration of stock returns around information events (e.g., quarterly earnings announcement) as the market learns. On the other hand, if the abnormal return associated with operating growth reflects risk premium, we should not observe predicted return concentration around earnings announcements and returns predicted by operating growth should be distributed evenly among all trading days.

In Table 4 panel A, we show that one-year-ahead returns are positively associated with operating growth. In the univariate regression in model (1), we observe about 3.8% spread in the one-year-ahead returns (*t-statistics* = 4.02) across the top- and bottom-decile of OPERATING_GROWTH. After controlling for FINANCING_GROWTH, the spread in the one-year-ahead returns increases to above 5% with a *t-statistic* above 5 in models (3), (5), and (7).

Regarding earnings announcement returns, in model (2) we find that the average daily spread between the top- and bottom- operating growth deciles around quarterly earnings announcement is 6.5 bps (=0.782/12 days). In model (8), we find that the average daily spread is 8.3 bps (=1.004/12 days). Annualizing the daily returns would yield a return of 16% (=6.5×250) and 21% (=8.3×250), respectively, which are about four times larger than the actual annual returns. Thus, we document strong evidence of return concentration around future earnings announcements. This evidence suggests that the predictable returns are unlikely explained by the potential higher risk associated with operating growth.

Consistent with the univariate results, Table 4 Panel B shows that the spread of one-year-ahead return between the top and bottom OPERATING_GROWTH deciles is 4.944% in small firms (model 1), compared to a spread of 2.163% in medium-sized firms (model 2) and a spread of 2.675% in large firms (model 3). We also find similar results for FINANCING_GROWTH in models (4) to (6). Since firm size is a proxy for market frictions, these results are expected under mispricing as higher return predictability for small firms in general.

3. Comparison with Cooper et al. (2008)

Note that Cooper et al. (2008) also decompose asset growth into various financing components and report the results in their Table 4. Specifically, asset growth is decomposed into Operating Liability Growth, Debt Growth, Stock Growth, and Retained Earnings Growth. They show that Operating Liability Growth does not predict future stock returns. However, they do not further decompose Operating Liability Growth into Operating Growth, A/P Growth, and Tax Growth.

Appendix C provides our replication of their results. Consistent with their results, we find an insignificant coefficient for Operating Liability Growth using their sample period (i.e., 1968-2003) in model (1). This evidence indicates that this insignificant result for Operating Liability Growth is robust to whether i) using size-adjusted or raw return, ii) including micro-stocks, and iii) including risk factors in the regression. The coefficient for Operating Liability Growth continues to be insignificant when we use ranked independent variables in model (2).

In model (3), we decompose Operating Liability Growth into the three components that we propose (i.e., OPERATING_GROWTH, TAX_GROWTH, and AP_GROWTH) and show a highly significant positive coefficient for OPERATING_GROWTH. Again, this evidence indicates that our main result holds in the 1968-2003 sample period.

Models (4) to (6) provide results using our sample period (i.e., 1971-2017), and the inferences are similar. The coefficients for Operating Liability Growth in models (4) and (5) turns positive for this longer sample period, but this positive effect is mainly explained by the positive return predictability of OPERATING_GROWTH.

D. Do Analysts Under-estimate the Effects of Operating Growth on Future Earnings?

The stock return predictability could be consistent with investors' error-in-expectation (i.e., failure to fully anticipate higher earnings) or higher risk for high operating growth firms. We thus specifically test the error-in-expectation hypothesis by examining whether (sell-side) financial analysts fully incorporate the implication of operating growth for future earnings in their earnings forecasts. We run the following monthly Fama-MacBeth regressions:

(4) $\text{F\_ERROR}_{m,\,t+1} = \beta_0 + \beta_1\,\text{OPERATING\_GROWTH}_t + \beta_2\,\text{FINANCING\_GROWTH}_t + \varepsilon_{t+1}$.

where $\text{F\_ERROR}_{m,\,t+1}$ is the forecast error for annual earnings of fiscal year *t+1*, measured in month m, calculated as realized earnings for fiscal year *t+1* less the I/B/E/S median earnings forecast in month m, scaled by stock price in month 1. For instance, month m=1 is the first month following the year t's earnings announcement, month m=2 is the second month following the year t's earnings announcement, and so on. For presentation purposes, we multiple F_ERROR by 100.

In this regression model, we focus on OPERATING_GROWTH and FINANCING_GROWTH because they exhibit significant incremental predictive power for future earnings (Table 2). Adding other variables such as accruals, accounts payable growth and tax-related growth does not change inferences. For the ease of interpreting the results, all independent variables are converted into deciles by year and then scaled to a value between -0.5 and 0.5. Thus, the coefficients indicate the spread in forecast errors across the top- and bottom-decile of the respective variables.

Table 5 presents the average coefficients and *t*-statistics estimated from these regressions. The positive associations between analyst forecast errors and operating growth suggest that analysts are excessively pessimistic about the high profitability associated with operating growth (i.e., underreacting to the implication of operating growth for future earnings). In contrast, analysts' forecast errors are negatively associated with financing growth, suggesting that analysts are overly optimistic about the low profitability associated with financing growth.

We observe a declining pattern in the magnitude of coefficients for OPERATING_GROWTH in Table 5. This pattern suggests that analysts gradually correct their error-in-expectations over the course of year *t+1*. Comparing the coefficients from months 1 and 11, about 37% (= 0.468 / 1.253) of their original pessimism associated with operating growth remains by month 11 (i.e., the month before the earnings announcement of year *t+1*). We also observe a declining pattern in the magnitude of coefficients for FINANCING_GROWTH.

E. Declining Pattern of Subsequent Quarterly Earnings Announcement Returns

To further rule out the alternative explanation of risk premium, we examined the patterns of earnings announcement returns over the subsequent quarters. Specifically, we run the following Fama-MacBeth regressions:

(5) $$\text{EA\_RET}_{q,\, t+1} = \alpha + \beta_1\, \text{OPERATING\_GROWTH}_t + \beta_2\, \text{FINANCING\_GROWTH}_t + \sum \beta_x X_t + \varepsilon.$$

where $\text{EA\_RET}_{q,\, t+1}$ is the three-day return around earnings announcement of quarter q in the year t+1, q=1, 2, 3, 4 for the first, second, third and fourth quarter, respectively.

If our findings are driven by the error-in-expectation hypothesis, we expect quarterly earnings announced earlier in the year should be most helpful in revising investors' underreaction (e.g., Bernard and Thomas 1990). Thus, we expect to observe a declining predictive power of operating growth for earnings announcement returns over the quarterly earnings announcements (i.e., β_1 declines over q within year t). On the other hand, if any missing risk factors drive the results, we should observe an equal distribution of subsequent earnings announcement returns.

As shown in Table 6, the coefficients on OPERATING_GROWTH for the four quarters in models (1) to (4) are 0.474, 0.313, 0.211 and 0.126 respectively, corresponding to 54%, 35%, 24% and 14% of the full 12-day return (Table 4, Panel A, model 6). This declining pattern provides an important piece of evidence supporting the error-in-expectation hypothesis (i.e., risk cannot explain such declining pattern).

Inferences are similar when we separately control for the four lagged three-day earnings announcement returns in models (5) to (8).

In sum, our evidence of positive forecast errors, clustered abnormal returns around earnings announcement, and the declining abnormal returns over subsequent earnings announcement support the error-in-expectation hypothesis. Collectively, these results suggest that investors and analysts under-estimate the future performance of firms associated with high operating growth. When quarterly earnings are announced in the future, the market is surprised and gradually revise its expiations about future earnings.

V. Additional Analyses

A. Tests Regarding Product Market Stakeholders' Information Advantage and Bargainging Power

Our main hypothesis is that product market stakeholders have i) an information advantage over external financiers and ii) the ability to select the firms with which they are willing to transact. We first shed light on this information advantage channel and provide evidence that the return predictability by operating growth is larger when product market stakeholders' information advantage is relatively larger. In contrast, the return predictability of financing growth should be less sensitive to the product market stakeholders' information advantage.

Specifically, we run the following Fama-MacBeth regressions with interaction terms between the growth variables and the information advantage proxies:

(6a) $\text{RET}_{t+1} = \alpha + \beta_1\ \text{OPERATING\_GROWTH}_t + \beta_2\ \text{OPERATING\_GROWTH}_t \times \text{HETERO}_t + \beta_3\ \text{Financing Growth}_t + \beta_4\ \text{Financing Growth}_t \times \text{HETERO}_t + \beta_5\ \text{HETERO}_t + \sum\beta_x X_t + \varepsilon.$

(6b) $\text{RET}_{t+1} = \alpha + \beta_1\ \text{OPERATING\_GROWTH}_t + \beta_2\ \text{OPERATING\_GROWTH}_t \times \text{SEG\_SALES\_VOL}_t + \beta_3\ \text{Financing Growth}_t + \beta_4\ \text{Financing Growth}_t \times \text{SEG\_SALES\_VOL}_t + \beta_5\ \text{SEG\_SALES\_VOL}_t + \sum\beta_x X_t + \varepsilon.$

We proxy information advantage with two different segment-based variables: number of segments (HETERO) and segment sales volatility (SEG_SALES_VOL). In regression (6a), information advantage is proxied by $HETERO_t$, calculated as the number of business segments of the firm in year t. When a firm has more segments, there are more diverse business fundamentals contribute to firm performance, which leads to relatively small information advantage for a particular supplier/customer who is familiar with only one segment of the firm.

In regression (6b), information advantage is proxied with $SEG\_SALES\_VOL_t$, calculated as the equal-weighted volatility of the sales to asset ratio of each business segment of the firm during the eight-year period ending year t. When sales at the segment-level are more volatile, the demand for the products is more uncertain. As such, private information gathered by product market stakeholders become more valuable.

To perform the formal tests, firms in our sample are assigned to two groups with roughly the same number of firms in each group every year, based on one of the two proxies for information advantage. We code information advantage proxies as -0.5 for firms in the bottom tercile and 0.5 for firms in the top tercile. We then compare the return predictability of operating growth and financing growth between the top and bottom terciles using the interaction terms in regressions.

Consistent with our expectation, we observe a significantly negative coefficient for the interaction terms between OPERATING_GROWTH and HETERO in Table 7 Panel A. In other words, the return predictability of operating growth is lower for firms with less information advantage. In Panel B, we observe positive coefficients for the interaction term between OPERATING_GROWTH and SEG_SALES_VOL, consistent with higher information advantage when product demand is more uncertain.

In contrast, the coefficients for the interaction terms between financing growth and information advantage proxies are insignificantly different from zero in both regressions, indicating that the effects of operating growth are primarily driven by variation in product market stakeholders' information advantage (i.e., general market friction proxies such as size would affect both operating growth and financing growth).[13]

We also run the following similar Fama-MacBeth regressions with interaction terms between the growth variables and the stakeholders' bargaining power proxies:

(7a) $RET_{t+1} = \alpha + \beta_1$ $OPERATING\_GROWTH_t + \beta_2$ $OPERATING\_GROWTH_t \times IND\_EXIT_t + \beta_3$ $FINANCING\_GROWTH_t + \beta_4$ $FINANCING\_GROWTH_t \times IND\_EXIT_t + \beta_5$ $IND\_EXIT_t + \sum \beta_x X_t + \varepsilon$.

(7b) $RET_{t+1} = \alpha + \beta_1$ $OPERATING\_GROWTH_t + \beta_2$ $OPERATING\_GROWTH_t \times RELATIVE\_SALES_t + \beta_3$ $FINANCING\_GROWTH_t + \beta_4$ $FINANCING\_GROWTH_t \times RELATIVE\_SALES_t + \beta_5$ $RELATIVE\_SALES_t + \sum \beta_x X_t + \varepsilon$.

We use two industry-based proxies to capture product market stakeholders' bargaining power that determines the extent to which they are able to select the firms with which they are willing to transact : i) the firm's industry exit rate, and ii) the firm's sales relative to the sales of its top suppliers and customers (RELATIVE_SALES, Hui, Klasa, and Yeung 2012).

In regression (7a), bargaining power is proxied by IND_EXIT_t, calculated as the fraction of exiting firms to the total number of firms in an industry at the two-digit SIC level, averaged over the three-year period ending year t. A firm is defined as an existing firm if it is in the last two years in Compustat. We expect product market stakeholders' bargaining power is relatively larger when the firm operates in a more competitive industry evidenced by high industry exit rate. In this type of industry, the firm may be more concerned about losing its major suppliers and customers, while its product market stakeholders may have more opportunities to switch to new firms that they transact with.

In regression (7b), bargaining power is proxied by $RELATIVE\_SALES_t$, which is calculated as the average relative sales of the top-25% supplier and customer industries. Specifically, for each of the top-

[13] If our proxies are correlated with omitted variable such as firms' overall information environment, we should observe a similar impact on the financing growth variable. The distinct impact on operating growth confirms that these two proxies are indeed specific to product markets stakeholders' information advantage.

25% supplier industry, the relative sales is defined as the average sales of all suppliers in that industry divided by a firm's own sales, while for each of the top-25% customer industry, the relative sales is defined as the firm's sales divided by the average sales of all customers in that industry.[14] Essentially, RELATIVE_SALES aggregates i) the average tendency of the suppliers to depend on the firm (the supplier has a lot to be sold to the firm) and ii) the average tendency of the firm to depend on the customers (the firm has a lot to be sold to the customers). When RELATIVE_SALES is higher, the stakeholders depend more on the firm and thus have lower bargaining power.

To perform the formal tests, firms in our sample are first assigned to two groups with roughly the same number of industries (for IND_EXIT) or firms (for RELATIVE_SALES) in each group. We code bargaining power proxies as zero for firms in the bottom group and one for firms in the top group and compare the return predictability of operating growth and financing growth between the top and bottom groups using the interaction terms in regressions.

Consistent with our expectation, we observe a significantly positive coefficient for the interaction terms between OPERATING_GROWTH and IND_EXIT in Panel C. In other words, the return predictability of operating growth is higher for firms whose stakeholders have higher bargaining power. In Panel D, we observe significantly negative coefficient for the interaction term between OPERATING_GROWTH and RELATIVE_SALES, consistent with stakeholders' lower bargaining power relative to the firm when they depend more on the firm. Again, the coefficients for the interaction terms between financing growth and information advantage proxies are insignificantly different from zero.

B. Deferred Revenues in Operating Growth

The only separately identified Compustat item in our operating growth variable is deferred revenues. One unique story associated with deferred revenues is that future revenues (income) are higher when

[14] Supplier and customer industries of a firm is identified by the input-output accounts of Bureau of Economic Analysis.

these deferred revenues are realized. To the extent that analysts and investors under-estimate their impact on future profitability, deferred revenues might explain our results.

As a robustness test, we examine the effects of deferred revenues and document the following. First, only 31.9% of the observations have non-missing value for deferred revenues in Compustat, indicating that deferred revenues are immaterial for the majority of the firms in our sample. Second, for those observations with non-missing values, DEFERRED_REVENUE (growth in deferred revenues scaled by average assets) is small in magnitude, only 2% of that of OPERATING_GROWTH. Third, DEFERRED_REVENUE is insignificant in the regressions of one-year-ahead profitability (Table 2) and stock returns (Table 3), while OPERATING_GROWTH continues to be significant with similar estimated coefficients and t-statistics. Thus, deferred revenues cannot explain the effects of OPERATING_GROWTH.

C. Controlling for Additional Anomaly Variables

As robustness tests, we first show that the return predictability of operating growth is largely uncorrelated with the documented return predictability of other accounting anomaly variables. Specifically, we including the following anomaly variables in regressions (4a): level of net operating assets (NOA_LEVEL, Hirshleifer et al. 2004), profitability (Y/B, Fama and French 2008), gross profit (GROSS_PROFIT, Novy-Marx 2013), and total accruals (TACC, Richardson et al. 2005). Table 8 models (1) to (5) show that the effect of operating growth retains in the regressions of one-year-ahead stock returns after including each of the above anomaly variables.

We then show that the return predictability of operating growth is robust after controlling for various corporate events. Specifically, we including the following anomaly variables in regressions (4a): growth in research and development (R&D) expenditures (Eberhart et al. 2004), share repurchase announcements (Ikenberry et al. 1995), dividend initiations (Michaely et al. 1995), and stock split announcements (Ikenberry and Ramnath 2002). Table 8 models (6) to (10) show that the effect of operating growth remains after including each of these controls.[15] Model (11) includes all anormaly controls, and the effect of operating growth continues to be significant. Overall, the results indicate that the effects of operating growth are distinct from those identified in prior work.

VI. Conclusion

A large body of research documents that asset growth is negatively associated with future firm performance (total assets, debt growth, equity growth, loan growth, net operating asset growth, etc.). In this study, we test the main hypotheses that operating growth (i.e., growth financed by product market stakeholders) is a signal of high future firm growth and that market participants underreact to this signal. Our hypotheses are motivated by product market stakeholders' relative information advantage and stronger economic incentives to monitor.

Our results strongly support these hypotheses. We show that operating growth is *positively* associated with one-year-ahead earnings growth. However, security analysts under-estimate the incremental positive effects of operating growth on future performance. Analysts' forecasts are overly pessimistic for firms with high operating growth. Stock market investors also under-estimate the positive effects of operating growth, leading to positive associations between operating growth and future stock returns. This positive return predictability of operating growth is more pronounced in small- and medium-sized firms, consistent with better information environment and/or lower arbitrary costs mitigating the potential mispricing. Our return results are not affected by including other accounting anomaly variables (e.g., net operating assets, profitability, and accruals), R&D growth, and various corporate events (e.g., share repurchases, dividend initiations and omissions, and stock splits).

Our return results cannot be explained by higher expected returns for high operating growth firms. Our evidence of positive analyst forecast errors, clustered abnormal returns around subsequent earnings

[15] The sample periods vary across these models depending on data availability. We identify potential dividend initiation and omission event dates and the repurchase announcement dates from the Capital IQ's Key Developments. Stock split data are obtained from I/B/E/S.

announcements, and the declining abnormal returns over subsequent earnings announcements are consistent with the error-in-expectation hypothesis as opposed to risk-based explanations. Additional tests further show that variations in the return predictability by operating growth are consistent with product market stakeholders' information advantage and bargaining power. In particular, we find higher stock return predictability of operating growth for single-segment firms and when segment sales are more volatile. Furthermore, we find higher stock return predictability of operating growth for high exiting industries and high dependence on top suppliers and customers. In contrast, we do not find any variation in return predictability of financing growth using these proxies of product market stakeholders' information advantage.

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Appendix A. Empirical Details

Variables in our tests are constructed in the following ways:

1. Using data from Compustat, we calculate growth variables and other accounting measures (EARNINGS, B/M, SIZE, ACCRUALS, CASH_FLOWS, AP_GROWTH, TAX_GROWTH, NOA_LEVEL, Y/B, GROSS_PROFIT) following Appendix B (Variable definition) for the fiscal period 1971-2017. We obtain quarterly earnings announcement days from Compustat, which is available after 1970.

2. Using data from CRSP, we calculate the stock return-related variables (RET_{t+1}, EA_RET_{t+1}, $EA\_RET_{q, t+1}$, and RET(-6, -1)). RET_{t+1} is calculated as the 12-month buy-and-hold return, starting from the fourth month after the end of fiscal year t. $EA\_RET_{q,t+1}$ is the 3-day return around earnings announcement of quarter q in the year t+1. q=1, 2, 3, 4 for the first, second, third and fourth quarter, respectively. We compound the four 3-day returns around each quarterly earnings announcements in year t+1 to get EA_RET_{t+1}. RET(-6, -1) is the buy-and-hold return over past 6 months.

To maintain a constant sample across all our tests that do not require analyst forecast data, we apply the following data selection criteria:

1. We exclude i) firms in the utility industries (sic code between 4900 and 4999) and the financial industries (sic code between 6000 and 6999), ii) firms with a stock price lower than $5 or total assets below $10m at the end of the fiscal year, and iii) the first two years when a firm first appears on Compustat to mitigate backfilling biases. These two exclusions result in 135,132 observations for the fiscal period 1971-2017.

2. We exclude firms that miss key accounting measures, one-year-ahead stock returns, or one-year-ahead earnings, which results in our final sample of 84,658 observations for the fiscal period 1971-2017.

We handle the extreme values in the testing variables in the following ways:

1. All independent variables are converted to ranks within the final sample and scaled to a [-0.5,0.5] range before they were used for the empirical tests (except for Table 2).

2. All continuous variables are winsorized at 1% and 99% annually.

Appendix B. Variable Definition

Operating and Financing Growth:	
FINANCING _GROWTH$_t$	= Δ Debt included in current liabilities$_t$ (DLC) + Δ Long Term Debt$_t$ (DLTT) + Δ Minority Interests$_t$ (MIB+MIBN) + Δ Preferred Stocks$_t$ (PSTK) + Δ Common Equity$_t$ (CEQ), deflated by average total assets (AT) at the beginning and the end of year t.
OPERATING _GROWTH$_t$	= Δ Total Assets$_t$ (AT) – Δ Accounts Payable$_t$ (AP) – Δ Income Taxes Payable$_t$ (TXP) – Δ Deferred Taxes and Investment Tax Credit$_t$ (TXDITC) – FINANCING_GROWTH$_t$, deflated by average total assets (AT) at the beginning and the end of year t.
Firm Performance:	
EARNINGS$_t$	Income Before Extraordinary Items$_t$ (IB), deflated by average total assets (AT) at the beginning and end of year t.
RET$_{t+1}$	12-month buy-and-hold return, starting from the fourth month after the end of fiscal year t.
FF4	The FF4 abnormal returns are calculated from time-series regressions of the excess returns of the hedge portfolio on the Fama-French four factor model including beta, size, book-to-market and momentum (Carhart, 1997).
FF5	The FF5 abnormal returns are calculated from time-series regressions of the excess returns of the hedge portfolio on the five factor model including beta, size, book-to-market, profitability and investment (Fama and French 2015).
M4	The M4 abnormal returns are calculated from time-series regressions of the excess returns of the hedge portfolio on the four factor model including beta, size, MGMT and PERF (Stambaugh and Yuan 2017).
C14	The C14 abnormal returns are calculated by subtracting the monthly return estimates computed using a group of 14 important firm characteristics from firm monthly returns (Bessembinder et al., 2019).
EA_RET$_{t+1}$	Four subsequent earnings announcement returns in the year t+1, calculated as the sum of four 3-day returns around each quarterly earnings announcements in year t+1.
EA_RET$_{q,\ t+1}$	3-day return around earnings announcement of quarter q in the year t+1. q=1, 2, 3, 4 for the first, second, third and fourth quarter, respectively.
Firm Characteristics:	
B/M	Calculated as book equity divided by market cap by the end of the fiscal year.
SIZE	log(market cap), calculated as log(market capitalization) by the end of the fiscal year.
RET(-6, -1)	Past 6-month buy-and-hold return.
ACCRUALS$_t$ (Sloan,1996)	Following Sloan (1996), defined as Δ Current Assets$_t$ (ACT) - Δ Cash and Short-Term Investments$_t$ (CHE) - (Δ Current Liabilities$_t$ (LCT) - Δ Debt in Current Liabilities$_t$ (DLC) - Δ Income Taxes Payable$_t$ (TXP)) - Δ Depreciation and Amortization$_t$ (DP), deflated by average total assets (AT) at the beginning and the end of year t
CASH_FLOWS$_t$	EARNINGS$_t$ - ACCRUALS$_t$
AP_GROWTH$_t$	Δ Accounts Payable$_t$ (AP), deflated by average total assets (AT) at the beginning and the end of year t.
TAX_GROWTH$_t$	Δ Income Taxes Payable$_t$ (TXP) + Δ Deferred Taxes and Investment Tax Credit$_t$ (TXDITC), deflated by average total assets (AT) at the beginning and the end of year t.

$F\_ERROR_{m, t+1}$	$F\_ERROR_{m,t+1}$ is the forecast error for fiscal year t+1, measured in month s. Month m=1 is the first month following the year t's earnings announcement, month m=2 is the second month following the year t's earnings announcement, and so on. $F\_ERROR_{m,t+1}$ is calculated as realized annual earnings for year t +1 less the median of forecasted earnings in month m, scaled by stock price in month 1, and multiple by 100.
$HETERO_t$	The number of business segments of the firm in year t.
$SEG\_SALES\_VOL_t$	The equal-weighted volatility of the sale to asset ratio of each business segment of the firm during the eight-year period ending year t.
IND_EXIT_t	IND_EXIT_t is calculated as the fraction of exiting firms to the total number of firms in an industry at the two-digit SIC level, averaged over the three-year period ending year t. A firm is defined as an existing firm if it is in the last two years in Compustat.
$RELATIVE\_SALES_t$	$RELATIVE\_SALES_t$ is calculated as the average relative sales of the top-25% supplier and customer industries. Specifically, for each of the top-25% supplier industry, the relative sales is defined as the average sales of all suppliers in that industry divided by a firm's own sales, while for each of the top-25% customer industry, the relative sales is defined as the firm's sales divided by the average sales of all customers in that industry. Supplier/customer industries are based on the input-output accounts of the Bureau of Economic Analysis. This measure is restricted to years between 1997 and 2017 due to data availability.
Other Known Anomalies:	
NOA_LEVEL	Following Hirshleifer et al. (2004), defined as Debt included in current liabilities (DLC) + Long Term Debt (DLTT) + Minority Interests (MIB) + Preferred Stocks (PSTK) + Common Equity (CEQ) - Cash and Short-Term Investments (CHE), deflated by average total assets (AT) measured at the beginning and the end of year t.
Y/B	Following Fama and French (2008), defined as Income Before Extraordinary (IB) - Dividends on Preferred (DVP) + Income Statement Deferred Taxes (TXDI), divided by book equity.
GROSS_PROFIT	Following Novy-Max (2013), defined as Revenues (REVT) - Cost of Goods Sold (COGS), deflated by Total Assets (AT).
$TACC_t$	Following Richardson et al. (2005), defined as Δ Total Assets (AT) + Δ Short-Term Investments (IVST) – Δ Cash and Short-Term Investments (CHE) – Δ Total Liabilities (LT) – Δ Preferred Stock (PSTK) , deflated by average total assets (AT) measured at the beginning and the end of year t.
$R\&D\_GROWTH_t$	R&D growth is an indicator variable that equals 1 if a firm has abnormal R&D expenditure growth in year t. Definition of abnormal R&D expenditure growth follows Eberhart, Maxwell, and Siddique (2004).
DIV_INITt	DIV_INITt is an indicator variable that equals 1 if a firm starts to pay dividend during the 3-year period prior to the fourth month of year t+1.
$REPURCHASE_t$ $REPURCHASE_{t-1}$ $REPURCHASE_{t-2}$	Indicator variables that equal 1 if a firm announces a stock buyback during the first-, second-, and third-year period prior to the fourth month of year t+1.
$SPLIT_t$	$SPLIT_t$ is an indicator variable that equals 1 if a firm announces stocks split during the one-year period prior to the fourth month of year t+1.

Appendix C. Replication of Cooper et al. Table 4 Panel A

This table presents coefficients (*t-statistics*) from Fama and MacBeth (1973) regressions of one-year-ahead on the components of asset growth. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

The dependent variable is RET $_{t+1}$, which is the 12-month buy-and-hold return starting from the fourth month following the end of fiscal year t.

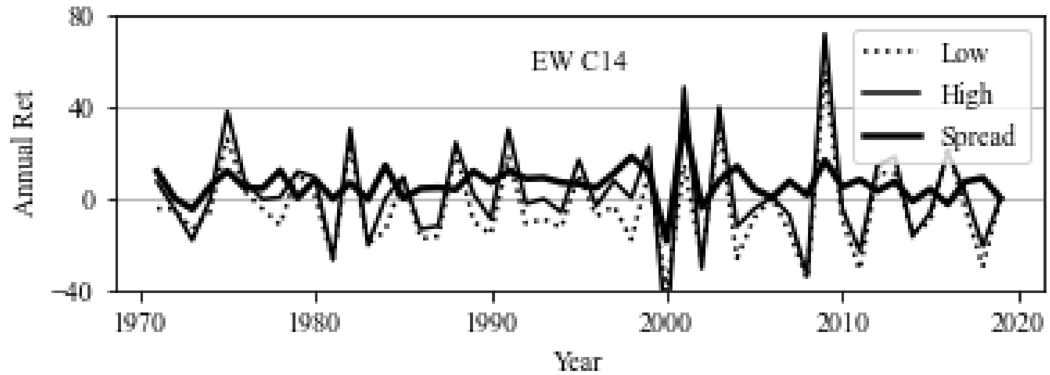
Following Cooper et al. (2008), growth in Total Assets (AT Growth) is decomposed as the sum of Operating Liability Growth (OP_LIAB_GROWTH) and Financing Growth (which is DEBT_GROWTH + STOCK_GROWTH + RE_GROWTH). Following our methodology, Operating Liability Growth is further decomposed into OPERATING_GROWTH, TAX_GROWTH, and AP_GROWTH.

In Models (1) and (4), all independent variables are continuous, consistent with Cooper et al. (2008). In Model (2), (3), (5) and (6) all independent variables are converted to ranks and scaled to a [-0.5,0.5] range.

Models (1) – (3) replicate Table 4 of Cooper et al. (2008) using the same time period as Cooper et al. (2008) (i.e., 1968 – 2003), while models (4) – (6) reports the results using our sample period. Table 4 of Cooper et al. (2008) uses raw stock returns as the dependent variable and also includes micro-stocks (price < $5). Results in models (1) and (2) show that these two empirical choices do not affect the inference (i.e., Operating Liability Growth is insignificant). Results are also similar when we start the return in June of year t+1. To be conservative, our main analyses report the results excluding micro stock.

Model	Sample Period	OPERATING _GROWTH	TAX _GROWTH	AP _GROWTH	OP_LIAB _GROWTH	DEBT _GROWTH	STOCK _GROWTH	RE _GROWTH	R^2
(1)	1968-2003				3.099	-22.708***	-26.358***	-2.343	0.027
					(0.87)	(-11.40)	(-6.58)	(-0.52)	
(2)	1968-2003				1.618	-9.106***	-11.179***	3.512*	0.032
					(1.44)	(-10.80)	(-3.94)	(1.79)	
(3)	1968-2003	5.229***	2.740***	-3.984***		-8.865***	-11.167***	3.048	0.036
		(4.88)	(3.34)	(-4.26)		(-10.39)	(-3.94)	(1.58)	
(4)	1971-2017				3.265	-16.773***	-22.495***	-3.739	0.024
					(1.17)	(-7.03)	(-6.65)	(-0.97)	
(5)	1971-2017				1.536*	-6.234***	-9.625***	1.786	0.028
					(1.73)	(-6.00)	(-4.27)	(0.95)	
(6)	1971-2017	5.408***	1.832**	-4.514***		-5.922***	-9.566***	1.640	0.032
		(6.60)	(2.62)	(-5.03)		(-5.62)	(-4.24)	(0.90)	

Figure 1. Time series of annual returns for operating growth portfolios
The figure plots the annualized buy-and-hold C14 abnormal returns for equal-weighted (EW C14) and value-weighted (VW C14) portfolios sorted by past operating growth rates during our sample period 1971-2017. The C14 abnormal returns are calculated by subtracting the monthly return estimates computed using a group of 14 important firm characteristics (Bessembinder et al., 2019) from firm monthly returns. Low refers to firms in the lowest operating growth quintile and high refers to firms in the highest operating growth quintile. The spread is the difference between the returns of the low growth stocks and those of the high growth stocks.



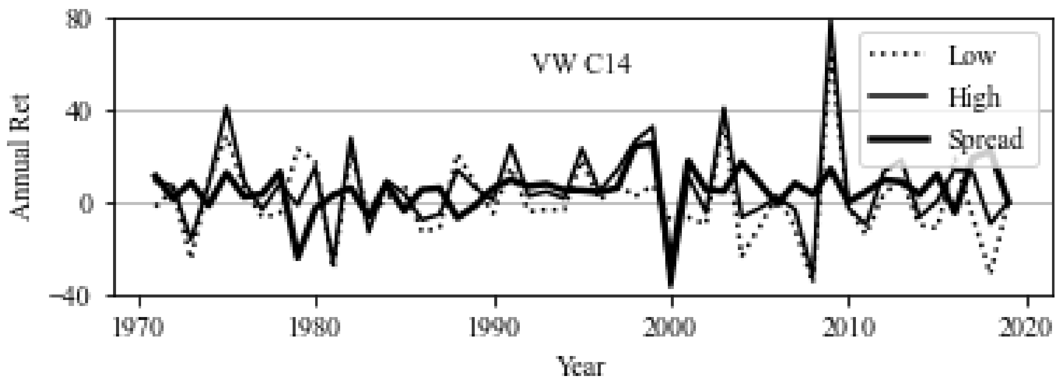


Table 1. Firm Characteristics by Decile Portfolios of Operating Growth

The table reports firm characteristics in each operating growth decile. At the end of each fiscal year between 1971 and 2017, stocks are sorted into deciles based on OPERATING_GROWTH. SIZE is market value; B/M is book equity over market value; EARNINGS is defined as Income Before Extraordinary Items (IB), deflated by average total assets (AT) at the beginning and end of year t. ACCRUALS is calculated following Sloan, 1996. CAHS_FLOWS is calculated as EARNINGS-ACCRUALS. AP_GROWTH is defined as Δ Accounts Payable $_t$ (AP), deflated by average total assets (AT) at the beginning and the end of year t. TAX_GROWTH is defined as Δ Income Taxes Payable$_t$ (TXP) + Δ Deferred Taxes and Investment Tax Credit$_t$ (TXDITC), deflated by average total assets (AT) at the beginning and the end of year t. (See variable definition for more details).

OPERATING_GROWTH Decile	OPERATING _GROWTH	SIZE	B/M	EARNINGS	ACCRUALS	CASH_FLOWS	FINANCING _GROWTH	AP _GROWTH	TAX _GROWTH
Low	-0.057	1764	0.749	0.023	0.022	0.001	0.051	0.002	0.003
1	-0.011	2533	0.794	0.041	0.013	0.028	0.051	0.005	0.003
2	-0.003	2470	0.776	0.045	0.013	0.033	0.059	0.007	0.003
3	0.003	2634	0.770	0.050	0.014	0.036	0.067	0.008	0.004
4	0.008	3069	0.714	0.055	0.016	0.039	0.079	0.010	0.004
5	0.013	4131	0.695	0.057	0.016	0.041	0.091	0.011	0.005
6	0.020	3640	0.653	0.058	0.017	0.041	0.106	0.012	0.006
7	0.029	3137	0.621	0.052	0.017	0.035	0.123	0.015	0.006
8	0.046	3467	0.585	0.051	0.015	0.035	0.147	0.017	0.007
High	0.122	2862	0.544	0.013	-0.004	0.015	0.170	0.018	0.006
Mean	0.017	2971	0.690	0.045	0.014	0.031	0.094	0.010	0.005
Median	0.010	1549	0.588	0.052	0.015	0.034	0.083	0.010	0.004
Corr. With OPERATING_GROWTH		0.006	-0.095	-0.082	-0.123	-0.008	0.125	0.133	0.034

Table 2. Regressions of One-Year-Ahead Earnings

Panel A reports firm performance in each operating growth decile. At the end of each fiscal year between 1971 and 2017, stocks are sorted into deciles based on operating growth. EARNINGS is defined as Income Before Extraordinary Items$_t$ (IB), deflated by an average of total assets (AT) measured at the beginning and end of the year. Panel B presents coefficients (*t-statistics*) from regressions of one-year-ahead earnings (EARNINGS$_{t+1}$) on growth variables. FINANCING_GROWTH is defined as Δ DEBT included in current liabilities (DLC) + Δ Long Term Debt (DLTT) + Δ Minority Interests (MIB+MIBN) + Δ Preferred Stocks (PSTK) + Δ Common Equity (CEQ), deflated by average total assets (AT) measured at the beginning and the end of year. OPERATING_GROWTH is defined as Δ Total Assets (AT) – Δ Accounts Payable (AP) – Δ Income Taxes Payable (TXP) – Δ Deferred Taxes and Investment Tax Credit (TXDITC) – FINANCING_GROWTH, deflated by average total assets (AT) measured at the beginning and the end of the year. ACCRUALS are calculated following Sloan (1996). AP_GROWTH is defined as Δ Accounts Payable (AP), deflated by average total assets (AT) at the beginning and the end of the year. TAX_GROWTH is defined as Δ Income Taxes Payable (TXP) + Δ Deferred Taxes and Investment Tax Credit (TXDITC). Fama and MacBeth (1973) coefficients (t-statistics) are reported. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Firm Performance (ΔEARNINGS) by Decile Portfolios of Operating Growth

OPERATING_GROWTH Decile	Equal-Weighted ΔEARNINGS		Value-Weighted ΔEARNINGS	
	t	t+1	t	t+1
Low	0.0147	-0.0088	0.0166	-0.0003
1	0.0030	-0.0061	0.0072	-0.0007
2	0.0032	-0.0022	0.0098	0.0032
3	0.0064	-0.0004	0.0109	0.0055
4	0.0076	0.0013	0.0102	0.0072
5	0.0089	0.0008	0.0111	0.0072
6	0.0122	0.0024	0.0144	0.0056
7	0.0094	0.0042	0.0161	0.0108
8	0.0117	0.0043	0.0233	0.0121
High	0.0008	0.0119	0.0071	0.0168
High - Low	-0.0139	0.0207***	-0.0095	0.0171***
(t-statistics)	(-1.47)	(4.92)	(-1.51)	(3.81)

Panel B: Regression of one-year-ahead earnings ($EARNINGS_{t+1}$)

Model	EARNINGS	OPERATING _GROWTH	FINANCING _GROWTH	ACCRUALS	AP _GROWTH	TAX _GROWTH	R^2
(1)	0.772***	0.104***					0.520
	(63.59)	(4.59)					
(2)	0.788***	0.094***		-0.080***			0.526
	(64.54)	(4.42)		(-10.14)			
(3)	0.805***	0.148***	-0.072***				0.535
	(71.77)	(10.12)	(-22.06)				
(4)	0.808***	0.143***	-0.066***	-0.027***			0.538
	(71.54)	(9.48)	(-17.89)	(-3.35)			
(5)	0.806***	0.141***	-0.068***	-0.028***	0.019	0.070**	0.540
	(73.07)	(8.85)	(-16.70)	(-3.40)	(1.29)	(2.31)	

Table 3. Monthly Stock Returns

This table presents the one-year-ahead monthly raw stock returns (Panel A) and abnormal stock returns (Panel B) of portfolios based on OPERATING_GROWTH. The portfolio starts from the fourth month after fiscal end of year t based on growth variables calculated with accounting data of year t. The size groups are defined by ranking firms into one of three groups (small, medium, and large) using the 30th and 70th NYSE market equity percentiles at the end of year t. The abnormal returns (except for C14) are calculated from time-series regressions of the excess returns of the hedge portfolio on i) the Fama-French four factor model including beta, size, book-to-market and momentum (FF4), ii) the Fama-French five factor model including beta, size, book-to-market, profitability and investment (FF5, Fama and French, 2015), and iii) the four factor model with mispricing factors including beta, size, MGMT and PERF (M4, Stambaugh and Yuan, 2017). The C14 abnormal returns are calculated by subtracting the monthly return estimates computed using a group of 14 important firm characteristics (Bessembinder et al., 2019) from firm monthly returns. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Raw returns by operating growth quintiles

Equal-weighted Raw Returns							
Raw	1(Low)	2	3	4	5(High)	Spread (5-1)	t(spread)
All Firms	0.9048	1.0475	1.0605	1.0994	1.0717	0.1669**	(2.08)
Small	0.8318	1.0575	1.0715	1.1251	1.0739	0.2421***	(3.27)
Medium	1.0033	1.0506	1.1951	1.1070	1.0869	0.0836	(0.79)
Large	0.9799	1.0588	1.0129	1.0489	1.0453	0.0655	(0.46)

Value-weighted Raw Returns							
Raw	1(Low)	2	3	4	5(High)	Spread (5-1)	t(spread)
All Firms	0.9207	0.9683	0.9649	0.9079	1.0581	0.1375	(1.05)
Small	0.8337	1.0924	1.1091	1.1491	1.1077	0.2740***	(3.20)
Medium	1.0072	1.0562	1.1640	1.1167	1.0826	0.0754	(0.63)
Large	0.9115	1.0460	0.8604	0.9365	1.0274	0.1159	(0.80)

Panel B. Abnormal returns by operating growth quintiles

Equal-weighted Abnormal Returns							
	1(Low)	2	3	4	5(High)	Spread (5-1)	t(spread)
FF4	-0.1190	0.0547	0.0749	0.1525	0.1436	0.2626***	(3.97)
FF5	-0.2450	-0.1094	-0.0840	0.0338	0.1515	0.3964***	(6.00)
M4	-0.1265	-0.0112	0.0573	0.1678	0.3102	0.4367***	(4.51)
C14	-0.3522	-0.2005	-0.0951	0.0182	0.1651	0.5173***	(7.06)

Value-weighted Abnormal Returns							
	1(Low)	2	3	4	5(High)	Spread (5-1)	t(spread)
FF4	-0.0270	0.1429	0.1351	0.1326	0.2661	0.2931***	(2.78)
FF5	-0.2206	-0.0616	-0.0139	0.0370	0.3215	0.5421***	(5.42)
M4	-0.1428	0.0662	0.1403	0.1335	0.4143	0.5572***	(3.99)
C14	0.0662	0.1146	0.2478	0.2486	0.5130	0.4468***	(3.63)

Table 4. Regressions of One-Year-Ahead Stock Returns and Subsequent Earning-Announcement Returns

Panel A presents coefficients (*t-statistics*) from regressions of one-year-ahead stock returns on growth variables. Panel B presents coefficients (*t-statistics*) from the same regressions in sub-samples partitioned by market capitalization. The dependent variables are RET_{t+1} and EA_RET_{t+1}. RET_{t+1} is the 12-month buy-and-hold return starting from the fourth month following the end of fiscal year t. EA_RET_{t+1} is the four subsequent earnings announcement returns in the year t+1, calculated as the sum of four 3-day returns around each quarterly earnings announcements in year t+1. All independent variables are converted to ranks and scaled to a [-0.5,0.5] range. FINANCING_GROWTH is defined as Δ Debt included in current liabilities (DLC) + Δ Long Term Debt (DLTT) + Δ Minority Interests (MIB+MIBN) + Δ Preferred Stocks (PSTK) + Δ Common Equity (CEQ), deflated by average total assets (AT) measured at the beginning and the end of year. OPERATING_GROWTH is defined as Δ Total Assets (AT) – Δ Accounts Payable (AP) – Δ Income Taxes Payable (TXP) – Δ Deferred Taxes and Investment Tax Credit (TXDITC) – FINANCING_GROWTH, deflated by average total assets (AT) measured at the beginning and the end of the year. ACCRUALS are calculated following Sloan (1996). AP_GROWTH is defined as Δ Accounts Payable (AP), deflated by average total assets (AT) at the beginning and the end of the year. TAX_GROWTH is defined as Δ Income Taxes Payable (TXP) + Δ Deferred Taxes and Investment Tax Credit (TXDITC). RET(-6, -1) is the past 6-month buy-and-hold return. SIZE is defined as log(market capitalization) by the end of the fiscal year. B/M is defined as book equity divided by market cap by the end of the fiscal year. Fama and MacBeth (1973) coefficients (t-statistics) are reported. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Regression in Full Sample

Model	Dep. Variable	OPERATING _GROWTH	FINANCING _GROWTH	ACCRUALS	AP _GROWTH	TAX _GROWTH	EA_RET_t	RET (-6, -1)	SIZE	B/M	R^2
(1)	RET_{t+1}	3.781***						6.760**	-0.477	7.582***	0.049
		(4.02)						(2.50)	(-0.22)	(2.77)	
(2)	EA_RET_{t+1}	0.782**					1.247***	1.239***	0.334	2.176***	0.017
		(2.24)					(3.78)	(3.83)	(0.78)	(5.58)	
(3)	RET_{t+1}	5.229***	-8.567***					6.312**	-0.600	5.372*	0.055
		(5.69)	(-7.28)					(2.38)	(-0.27)	(2.00)	
(4)	EA_RET_{t+1}	1.067***	-2.017***				1.297***	1.113***	0.450	1.661***	0.020
		(2.87)	(-6.14)				(3.94)	(3.66)	(1.31)	(4.97)	
(5)	RET_{t+1}	5.039***	-6.750***	-3.462***				6.134**	-0.982	5.323*	0.057
		(6.04)	(-6.15)	(-3.18)				(2.32)	(-0.43)	(1.98)	
(6)	EA_RET_{t+1}	0.884*	-1.181***	-1.069*			1.551***	0.959***	0.089	1.724***	0.023
		(1.70)	(-2.99)	(-1.78)			(3.29)	(3.64)	(0.16)	(4.71)	
(7)	RET_{t+1}	5.626***	-6.420***	-3.481***	-3.502***	2.376***		5.922**	-1.251	5.095*	0.064
		(6.36)	(-5.93)	(-3.15)	(-3.49)	(2.80)		(2.26)	(-0.55)	(1.92)	
(8)	EA_RET_{t+1}	1.004**	-1.028**	-1.050*	-0.607**	-0.095	1.690***	0.889***	0.052	1.689***	0.025
		(2.08)	(-2.51)	(-1.86)	(-2.39)	(-0.35)	(2.86)	(3.33)	(0.09)	(4.75)	

Panel B. Regression in Sub-Samples Partitioned by Market Capitalization

Model	Dep. Variable	Firm Size Rank	OPERATING _GROWTH	FINANCING _GROWTH	ACCRUALS	AP _GROWTH	TAX _GROWTH	RET (-6,-1)	SIZE	B/M	R^2
(1)	RET_{t+1}	Small	4.944***					7.724***	0.316	7.883***	0.040
			(4.43)					(2.86)	(0.12)	(2.81)	
(2)	RET_{t+1}	Mid	2.163**					4.378	1.591	5.752*	0.063
			(2.19)					(1.48)	(0.36)	(1.99)	
(3)	RET_{t+1}	Large	2.675*					7.867**	-5.434	3.268	0.090
			(1.70)					(2.23)	(-0.48)	(1.14)	
(4)	RET_{t+1}	Small	6.837***	-5.580***	-3.957**	-2.935**	3.441***	7.198***	0.238	5.583*	0.061
			(5.85)	(-2.99)	(-2.54)	(-2.60)	(4.09)	(2.72)	(0.09)	(2.01)	
(5)	RET_{t+1}	Mid	3.923***	-4.799***	-5.123***	-4.921***	2.672***	3.211	0.705	3.174	0.086
			(4.27)	(-2.75)	(-3.70)	(-3.08)	(2.69)	(1.10)	(0.16)	(1.14)	
(6)	RET_{t+1}	Large	4.217***	-4.884**	-2.803*	-3.640**	-0.376	7.481**	-7.696	0.874	0.117
			(3.05)	(-2.63)	(-2.00)	(-2.49)	(-0.36)	(2.21)	(-0.69)	(0.32)	

Table 5. Regressions of One-Year-Ahead Analyst Forecast Errors

This table presents coefficients (*t-statistics*) from regressions of analyst forecast errors ($F\_ERROR_{s,t+1}$) on growth variables. All independent variables are converted to ranks and scaled to a [-0.5,0.5] range. The dependent variable $F\_ERROR_{m,t+1}$ is calculated as realized earnings for year t +1 less the median of forecasted earnings in month m, scaled by stock price in month 1, and multiplied by 100. (For instance, month m=1 is the first month following the year t's earnings announcement). FINANCING_GROWTH is defined as Δ Debt included in current liabilities (DLC) + Δ Long Term Debt (DLTT) + Δ Minority Interests (MIB+MIBN) + Δ Preferred Stocks (PSTK) + Δ Common Equity (CEQ), deflated by average total assets (AT) measured at the beginning and the end of year. OPERATING_GROWTH is defined as Δ Total Assets (AT) – ΔAccounts Payable (AP) – Δ Income Taxes Payable (TXP) – Δ Deferred Taxes and Investment Tax Credit (TXDITC) – FINANCING_GROWTH, deflated by average total assets (AT) measured at the beginning and the end of the year. Fama and MacBeth (1973) coefficients (t-statistics) are reported. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Month	OPERATING_GROWTH	FINANCING_GROWTH	R^2
1	1.253***	-1.241**	0.019
	(3.09)	(-2.53)	
2	1.191***	-1.196**	0.019
	(3.07)	(-2.40)	
3	1.105***	-1.085**	0.018
	(2.83)	(-2.30)	
4	1.012***	-0.955**	0.017
	(2.77)	(-2.26)	
5	0.959**	-0.862**	0.017
	(2.57)	(-2.06)	
6	0.871**	-0.790*	0.016
	(2.31)	(-1.90)	
7	0.773**	-0.709	0.015
	(2.11)	(-1.65)	
8	0.705*	-0.619	0.014
	(2.02)	(-1.46)	
9	0.619*	-0.530	0.013
	(1.93)	(-1.31)	
10	0.512*	-0.434	0.012
	(1.98)	(-1.24)	
11	0.468*	-0.418	0.012
	(1.80)	(-1.19)	

Table 6. A Declining Pattern of Subsequent Quarterly Earnings Announcement Returns

This table presents coefficients (*t-statistics*) from regressions of quarterly earnings announcement return on growth variables**.** The dependent variable $EA\_RET_{q,t+1}$ is the 3-day return around earnings announcement of quarter q in the year t+1. q=1, 2, 3, 4 for the first, second, third and fourth quarter, respectively. EA_RET_t is the four earnings announcement returns in the year t, calculated as the sum of four 3-day returns around each quarterly earnings announcements in year t. EA_RET_{q-1}, EA_RET_{q-2}, EA_RET_{q-3} and EA_RET_{q-4} are the 3-day returns around earnings announcements of the previous one, two, three and four quarter, respectively. All independent variables are converted to ranks and scaled to a [-0.5,0.5] range. FINANCING_GROWTH is defined as Δ Debt included in current liabilities (DLC) + Δ Long Term Debt (DLTT) + Δ Minority Interests (MIB+MIBN) + Δ Preferred Stocks (PSTK) + Δ Common Equity (CEQ), deflated by average total assets (AT) measured at the beginning and the end of year. OPERATING_GROWTH is defined as Δ Total Assets (AT) – ΔAccounts Payable (AP) – Δ Income Taxes Payable (TXP) – Δ Deferred Taxes and Investment Tax Credit (TXDITC) – FINANCING_GROWTH, deflated by average total assets (AT) measured at the beginning and the end of the year. RET(-6,-1) is the past 6-month buy-and-hold return. SIZE is defined as log(market cap) by the end of the fiscal year. B/M is defined as book equity divided by market cap by the end of the fiscal year. Fama and MacBeth (1973) coefficients (t-statistics) are reported. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Model	Dep. Variable	OPERATING _GROWTH	FINANCING _GROWTH	EA_RET_t	EA_RET_{q-1}	EA_RET_{q-2}	EA_RET_{q-3}	EA_RET_{q-4}	RET (-6,-1)	SIZE	B/M	R^2
(1)	$EA\_RET_{q,t+1}$	0.474***	-0.506***	0.214					0.373**	0.553***	0.189	0.015
	(q=1)	(4.35)	(-4.42)	(1.64)					(2.51)	(4.33)	(1.20)	
(2)	$EA\_RET_{q,t+1}$	0.313***	-0.602**	0.555***					0.578**	0.123	0.523***	0.017
	(q=2)	(2.84)	(-2.12)	(3.13)					(2.60)	(0.84)	(3.06)	
(3)	$EA\_RET_{q,t+1}$	0.211	-0.528***	0.308**					0.308**	-0.052	0.199	0.013
	(q=3)	(1.31)	(-3.24)	(2.63)					(2.58)	(-0.32)	(0.80)	
(4)	$EA\_RET_{q,t+1}$	0.126	-0.240	0.190*					-0.011	0.124	0.550***	0.009
	(q=4)	(1.19)	(-1.49)	(1.79)					(-0.09)	(0.80)	(3.56)	
(5)	$EA\_RET_{q,t+1}$	0.472***	-0.496***		-0.073	-0.030	0.287***	0.281	0.448***	0.533***	0.257	0.023
	(q=1)	(4.34)	(-4.21)		(-0.60)	(-0.15)	(3.09)	(1.60)	(3.15)	(4.27)	(1.30)	
(6)	$EA\_RET_{q,t+1}$	0.233	-0.683*		0.521***	-0.094	0.790*	-0.331	0.553**	0.340*	0.567***	0.030
	(q=2)	(1.41)	(-1.79)		(4.49)	(-0.29)	(1.74)	(-0.86)	(2.43)	(1.85)	(2.74)	
(7)	$EA\_RET_{q,t+1}$	0.165	-0.500***		0.577***	0.416**	0.193	-0.116	0.304***	0.018	0.239	0.023
	(q=3)	(0.89)	(-3.14)		(5.02)	(2.03)	(1.29)	(-0.76)	(2.95)	(0.13)	(1.24)	
(8)	$EA\_RET_{q,t+1}$	0.195	-0.097		0.308**	0.552***	0.633*	0.150	-0.022	0.037	0.497***	0.021
	(q=4)	(1.60)	(-0.38)		(2.39)	(3.17)	(1.94)	(1.65)	(-0.18)	(0.22)	(3.46)	

Table 7. Potential Mechanisms Underlying Return Predictability

This table presents coefficients (*t-statistics*) from regressions of one-year-ahead stock return on the interaction terms between growth variables and proxies for product market stakeholders' information advantage ($HETERO_t$ and $SEG\_SALES\_VOL_t$) or bargaining power (IND_EXIT_t and $RELATIVE\_SALES_t$). The dependent variable is RET_{t+1}. $HETERO_t$ is calculated as the number of business segments of the firm in year t. $SEG\_SALES\_VOL_t$ is calculated as the equal-weighted volatility of the sales to asset ratio of each business segment of the firm during the eight-year period ending year t. IND_EXIT_t is calculated as the fraction of exiting firms to the total number of firms in an industry at the two-digit SIC level, averaged over the three-year period ending year t. A firm is defined as an existing firm if it is in the last two years in Compustat. $RELATIVE\_SALES_t$ is calculated as the average relative sales of the top-25% supplier and customer industries. Specifically, for each of the top-25% supplier industry, the relative sales is defined as the average sales of all suppliers in that industry divided by a firm's own sales, while for each of the top-25% customer industry, the relative sales is defined as the firm's sales divided by the average sales of all customers in that industry. In Panels A and B (i.e., the tests of information advantage), firms in our sample are first assigned to two groups with roughly the same number of firms in each group, based on one of the two proxies for information advantage. We code information advantage proxies as -0.5 for firms in the bottom group and 0.5 for firms in the top group. In Panels C and D (i.e., to perform the test of bargaining power), firms in our sample are first assigned to two groups with roughly the same number of industries (for IND_EXIT) or firms (for RELATIVE_SALES) in each group, based on one of the two proxies for bargaining power. We code bargaining power proxies as 0 for firms in the bottom group and 1 for firms in the top group. OPERATING_GROWTH and FINANCING_GROWTH are defined in the same way as Table 2. RET(-6, -1) is the past 6-month buy-and-hold return. SIZE is defined as log(market cap) by the end of the fiscal year. B/M is defined as book equity divided by market cap by the end of the fiscal year. In each regression, RET(-6, -1), SIZE and B/M are included as control variables. Fama and MacBeth (1973) coefficients (t-statistics) are reported. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Effects by Business Heterogeneity (HETERO)

Dep. Variable	OPERATING_GROWTH	OPERATING_GROWTH × HETERO	FINANCING_GROWTH	FINANCING_GROWTH × HETERO	HETERO	Control	R^2
RET_{t+1}	3.505***	-4.483**	-7.958***	1.390	0.106	YES	0.046
	(3.45)	(-2.68)	(-6.42)	(0.95)	(0.15)		

Panel B. Effects by Segment-Level Sales Volatility (SEG_SALES_VOL)

Dep. Variable	OPERATING_GROWTH	OPERATING_GROWTH × SEG_SALES_VOL	FINANCING_GROWTH	FINANCING_GROWTH × SEG_SALES_VOL	SEG_SALES_VOL	Control	R^2
RET_{t+1}	5.160***	2.175**	-8.685***	-1.638	-0.274	YES	0.045
	(5.26)	(2.06)	(-6.30)	(-1.40)	(-0.41)		

Panel C. Effects by Industry Exit Rate (IND_EXIT)

Dep. Variable	OPERATING_GROWTH	OPERATING_GROWTH × IND_EXIT	FINANCING_GROWTH	FINANCING_GROWTH × IND_EXIT	IND_EXIT	Control	R^2
RET_{t+1}	5.546***	3.859***	-8.470***	-0.497	0.441	YES	0.064
	(5.73)	(3.18)	(-7.20)	(-0.25)	(0.84)		

Panel D. Effects by Relative Sales (RELATIVE_SALES)

Dep. Variable	OPERATING_GROWTH	OPERATING_GROWTH × RELATIVE_SALES	FINANCING_GROWTH	FINANCING_GROWTH × RELATIVE_SALES	RELATIVE_SALES	Control	R^2
RET_{t+1}	3.633	-4.459*	-6.996**	-4.862	0.486	YES	0.053
	(1.48)	(-1.83)	(-2.76)	(-0.89)	(0.16)		

Table 8. Robustness Tests

This table presents coefficients (*t-statistics*) from regressions in the robustness test. Dependent variables are RET_{t+1}. Following Hirshleifer et al (2004), NOA_LEVEL is defined as Debt included in current liabilities (DLC) + Long Term Debt (DLTT) + Minority Interests (MIB+MIBN) + Preferred Stocks (PSTK) + Common Equity (CEQ) - Cash and Short-Term Investments (CHE), deflated by average total assets (AT) measured at the beginning and the end of year. Following Fama and French (2008), Y/B is defined as Income Before Extraordinary (IB) - Dividends on Preferred (DVP) + Income Statement Deferred Taxes (TXDI), divided by book equity. Following Novy-Max (2013), GROSS_PROFIT is defined as Revenues (REVT) - Cost of Goods Sold (COGS), deflated by Total Assets (AT). Following Richardson et al (2005), TACC is defined as Δ Total Assets (AT) + Δ Short-Term Investments (IVST) – Δ Cash and Short-Term Investments (CHE) – Δ Total Liabilities (LT) – Δ Preferred Stock (PSTK), deflated by average total assets (AT) measured at the beginning and the end of year. R&D_GROWTH is an indicator variable that equals 1 if a firm has abnormal R&D expenditure growth in year t. Definition of abnormal R&D expenditure growth follows Eberhart, Maxwell, and Siddique (2004), DIV_INIT_t is an indicator variable that equals 1 if a firm starts to pay dividend during the 3-year period prior to the fourth month of year t+1. $REPURCHASE_t$, $REPURCHASE_{t-2}$, $REPURCHASE_{t-3}$ are indicator variables that equal 1 if a firm announces a stock buyback during the first, second, or third year prior to the fourth month of year t+1, respectively. $SPLIT_t$ is an indicator variable that equals 1 if a firm announces stocks split during the one-year period prior to the fourth month of year t+1. In each regression, RET(-6, -1), SIZE and B/M are included as control variables. Fama and MacBeth (1973) coefficients (t-statistics) are reported. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	1	2	3	4	5	6	7	8	9	10
OPERATING_GROWTH	5.229***	4.927***	5.204***	4.709***	5.159***	4.963***	4.498***	5.103***	5.026***	3.014***
	(5.69)	(5.73)	(6.28)	(4.98)	(5.77)	(5.55)	(3.42)	(4.11)	(5.68)	(2.98)
FINANCING_GROWTH	-8.567***	-8.236***	-9.890***	-9.620***	-7.458***	-7.801***	-8.814***	-8.944***	-9.068***	-6.700***
	(-7.28)	(-7.44)	(-9.62)	(-8.09)	(-7.57)	(-7.41)	(-4.62)	(-5.06)	(-6.96)	(-3.83)
NOA_LEVEL		-2.564								-1.385
		(-0.60)								(-0.22)
Y/B			6.805***							3.997
			(2.75)							(1.39)
GROSS_PROFIT				5.544***						4.200**
				(2.90)						(2.10)
TACC					-2.506**					-5.254***
					(-2.13)					(-4.14)
R&D_GROWTH						5.379*				7.415*
						(1.72)				(1.94)
DIV_INIT							4.221			3.819
							(1.53)			(1.49)
$REPURCHASE_t$								2.023		0.213
								(0.93)		(0.12)
$REPURCHASE_{t-1}$								6.043*		5.929*
								(1.80)		(1.72)
$REPURCHASE_{t-2}$								7.480**		7.491**
								(2.64)		(2.34)
SPLIT									14.435***	17.473***
									(9.81)	(8.72)
RET(-6, -1)	6.312**	6.158**	5.516**	5.887**	6.609**	6.444**	2.914	3.800	5.139*	1.833
	(2.38)	(2.44)	(2.11)	(2.24)	(2.45)	(2.40)	(0.66)	(0.96)	(1.84)	(0.46)