Illusion of Growth: Merger-Related Transitory Growth and Its Implications for Growth and Accrual Mispricing

Daniel W. Collins and Jaewoo Kim

Tippie College of Business, The University of Iowa

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Abstract

The asset growth pricing anomaly refers to an empirical regularity that nominal asset growth is negatively associated with future (one-period-ahead) abnormal stock returns. Constant entity growth is measured as the year-to-year growth in financial statement items that represent the same economic entity (parent and subsidiary) at two points in time. We characterize the difference between nominal and constant entity growth of firms that engage in mergers and acquisitions as artificial growth. We show that artificial asset growth and total markup growth that results from the stepped-up basis of the subsidiary assets comprise nearly all of nominal asset growth for firms engaged in M&A activity. Moreover, we find that roughly 28 percent of Compustat/CRSP firm-years are affected by a merger or acquisition. Our findings suggest that artificial asset growth is mispriced and represents a significant portion of the asset growth mispricing that has been widely documented in the finance and accounting literature. We also investigate the impact of merger-related transitory growth on two competing explanations for the accrual anomaly: the growth explanation and the overvaluation explanation. We find that accrual mispricing based on balance sheet measures of accruals persists after controlling for the separate effects of artificial and total markup growth mispricing and for the effects of overvaluation on future returns.

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1. Introduction

Growth rates play a prominent role in both accounting and finance research. This literature includes studies on the mispricing of growth (Lakonishok et al. [1994]; Titman et al. [2004]; Cooper et al. [2008]) and studies that examine competing explanations for the mispricing of accruals (Sloan [1996]; Fairfield et al. [2003]; Desai et al. [2004]; Zhang [2007]; Kothari et al. [2009]). These studies typically compute nominal growth rates as year-to-year growth in sales (Lakonishok et al. [1994]; Desai et al. [2004]; Zhang [2007]), capital expenditures (Titman et al. [2004]; Zhang [2007]), net operating assets (Fairfield et al. [2003]), or total assets (Zhang [2007]; Cooper et al. [2008]) taken from consolidated financial statements and reported on Compustat. When firms engage in mergers and acquisitions, these *nominal growth* rates in assets or sales determined from adjacent year consolidated financial statements yield upward biased growth rate estimates when the combination is accounted for under the purchase method (Revsine et al. [2011]). To illustrate, assume that P company acquires S company on July 1 of Year 2 and that both firms have December 31 year ends. The consolidated income statement amounts reflect the operations of only P for Year 1, P plus one-half year of S's results for Year 2, and a full year of P and S results for Year 3. So the nominal growth rates in sales and earnings from Year 1 to Year 2 and from Year 2 to Year 3 are upward biased because the entities underlying the consolidated totals are not held constant. Similarly, any sort of asset-based nominal growth rate is distorted from Year 1 (P only) to Year 2 (P + S).

Constant entity growth rates (ignoring inflation) can be measured as the year-to-year growth in financial statement items that represent the same economic entity (parent and subsidiary) at two points in time. For example, in the illustration above, to calculate constant entity growth rates in sales, one would combine the full year's sales for P and S in all three years, which makes the growth rate of this flow variable comparable across years. Constant entity growth rates in asset-based measures are more problematic. Combining the assets of P and S at the end of Year 1 (prior to the combination) produces an

asset number that reflects the historical costs of these assets on the respective firms' balance sheets, while the assets on the consolidated balance sheet at the end of Year 2 would mechanically reflect an increase due to the stepped-up basis of the subsidiary assets and the recorded goodwill from the transaction. Thus, constant entity growth (CEG) in assets from Year 1 to Year 2 is comprised of three elements: (1) The stepped-up basis of the recorded assets of the subsidiary (STEP_UP); (2) goodwill recognized in the transaction (GOODWILL); and (3) systemic or organic growth (SG) that results from efficiencies gained from the combination.[1] Because information to compute the stepped-up basis of subsidiary assets was not generally disclosed by acquirers prior to 2002, we combine STEP_UP and GOODWILL to form the *total markup growth* (TMG) component of nominal asset growth for M&A firm-years. We characterize the difference between nominal asset growth (NAG) and constant entity growth (CEG) in years that firms engage in mergers and acquisitions as *artificial asset growth,* which we label AAG. Thus, nominal asset growth of a combined entity taken from annual consolidated balance sheets before and after an acquisition can be written as follows:

$$NAG_t = AAG_t + CEG_t = AAG_t + TMG_t + SG_t \quad (1)$$

Note that for firms not involved in mergers or acquisitions, STEP_UP = GOODWILL = 0. Therefore, $NAG_t = CEG_t = SG_t$ for non-M&A firm-years.

While GAAP requires acquiring firms to provide pro-forma footnote disclosures for making appropriate adjustments to sales and earnings growth measures (see Appendix I for example),[2] these amounts are typically not reported in Compustat. Regrettably, similar pro-forma asset amounts for acquired subsidiaries are typically not provided in parent company consolidated financial statements and, therefore, are not recorded in Compustat. Thus, no adjustment is made to either sales or asset-based growth measures in most academic studies.

In this paper, we demonstrate that distortions in nominal asset growth measures that are due to artificial asset growth and total markup growth and their related pricing effects play a significant role in

[1] Note that all the components of CEG are scaled by the combined assets of the parent and subsidiary at t-1.
[2] FASB Accounting Standards Codification (ASC) Section 805-10-S50: Business Combinations—Overall—Disclosures.

two widely-documented pricing anomalies in the literature: (1) the growth anomaly and (2) the accrual anomaly. To provide evidence on the pervasiveness of distortions in growth measures due to M&A, we examine the percentage of firm-years on Compustat that are affected by M&A transactions. We find that from 1991 to 2008 roughly 28 percent of firm-years are affected by a merger or acquisition. Moreover, we find that M&A firm-years make up a significant proportion of the upper rankings of firms based on nominal asset growth. We also find that AAG + TMG comprise nearly all of the nominal asset growth rate in years firms make acquisitions. *AAG and TMG are highly transitory and will vanish once a firm ceases to make acquisitions.* We maintain that these components of growth are classic examples of expansion rather than real economic growth that are not sources of long-term sustainable value for a firm and, therefore, should not command a market premium (see Fama and Miller [1972, Ch. 2]). However, we find that the market appears to assign a premium to the artificial asset growth component and when this growth vanishes, prices reverse. That is, the market acts as if it is surprised when this component of growth is not sustained.

Given that AAG and TMG comprise a considerable portion of nominal asset growth of M&A firms and that a nontrivial portion of firms engage in M&A activity (and thus are affected by M&A growth distortion), we investigate the implications of AAG and TMG for the asset growth pricing anomaly. The asset growth pricing anomaly refers to an empirical regularity that nominal asset growth is negatively associated with future (one-period-ahead) abnormal stock returns (Cooper et al. [2008]; Fairfield et al. [2003]; Zhang [2007]). Because these studies measure asset growth as year-to-year growth in total assets or net operating assets from the consolidated balance sheet, their findings are confounded by transitory asset growth distortion noted above for those entities that have engaged in mergers and acquisitions.

Our findings are consistent with the performance over-extrapolation hypothesis documented in Lakonishok et al. (1994) and Rau and Vermealen (1998). The market appears to over-extrapolate the past performance (growth) of acquirer stocks. That is, the market appears to assign a premium to the artificial and markup component of nominal asset growth (i.e., the market overvalues these two asset growth

components), and then revises expectations downward when these components of asset growth vanish. Thus, our findings are consistent with Jensen's [2005, p. 11] conjecture about overvaluation: " . . . management makes acquisitions to con the market into believing that management is going to create value that the market expects, and is able to continue to fool it for some time by providing the *illusion of growth*" [emphasis added]. Importantly, despite the fact that M&A firm-years comprise roughly only 28% of all firm-years and that the persistence of M&A induced growth is predictably less persistent than the organic growth component of nominal growth, we find that mispricing of artificial asset growth plays a major role in the more general growth mispricing phenomenon documented in prior literature.

Prior studies suggest that asset growth mispricing (Fairfield et al. [2003]; Desai et al. [2004]; Zhang [2007]) and overvaluation (Kothari et al. [2009]) offer competing explanations for the accrual pricing anomaly first documented by Sloan [1996]. We show that nominal asset growth exhibits mispricing that is incremental to accruals, but a significant portion of growth mispricing is due to AAG for M&A firm-years. We also find that overvaluation is no longer significant in explaining future abnormal returns after controlling for accruals, AAG and TMG. In addition, we investigate whether AAG and TMG mispricing subsume accruals mispricing and find that the explanatory power of accruals with respect to future abnormal returns persists after controlling for these two growth components. These findings suggest that prior studies' failure to control for AAG and TMG components of nominal asset growth and their overvaluation leads to erroneous support for the growth explanation of the accrual anomaly. Our findings also suggest that overvaluation, per se, does not provide a viable explanation for the accrual anomaly once one controls for the effects of M&A-related growth distortion and the related mispricing effects. These results, which are based on balance sheet measures of accruals, also hold when using accruals measures taken from the cash flow statement.

Our findings have important implications for accounting and finance researchers, investors and accounting regulators. The findings of this paper suggest that the anomalous association between growth estimates and future stock returns is, in part, attributable to distortion in nominal asset growth measures due to M&A accounting. Going forward, researchers should carefully examine the effect of M&A-related

growth distortions on inferences drawn from their tests and make appropriate adjustments to growth measures as outlined in this paper. Investors and money managers should carefully consider how the purchase method of accounting complicates financial statement analysis and make appropriate adjustments to negate the effects of artificial growth and markup growth as they consider what premiums, if any, to attach to "growth" stocks. Current reporting rules require acquiring firms to provide a footnote disclosure of pro forma sales and earnings information as if the acquisition had occurred on the first day of the year prior to acquisition and how the deal value is allocated to subsidiary net assets and goodwill. Our findings suggest that investors do not fully utilize these pro forma disclosures to assess the impact of acquisitions on firm growth measures. Currently, no disclosure is provided in acquirer financial statements that allows investors to readily adjust asset-based growth measures for distortions due to artificial growth. Regulators should consider expanding the scope of acquisitions-related disclosures in order to assist investors in understanding the influence of acquisitions on consolidated asset-based growth measures and require that such disclosures be provided to investors on a timely basis.

The remainder of our paper is organized as follows. Section 2 describes our sample construction, discusses the procedures we follow to estimate nominal asset growth and its components and describes other variable measurements. Section 3 provides descriptive statistics on the alternative growth measures along with contemporaneous and future abnormal size-adjusted returns for the samples of firms used in our analyses. Section 4 provides evidence on the persistence properties and mispricing of nominal asset growth for a comprehensive INITIAL sample of M&A and non-M&A firm-years. Section 5 replicates prior findings on the growth mispricing anomaly for a reduced FINAL sample of firm-years, provides evidence that artificial asset growth and total markup growth are overvalued, and investigates how these two growth components impact the findings on nominal asset growth mispricing. Section 6 reviews prior evidence on growth and overvaluation as competing explanations for the accrual anomaly originally documented by Sloan [1996] and re-evaluates these competing explanations after controlling for artificial asset growth and total markup growth. Section 7 concludes and provides suggestions for future research.

2. Sample Construction and Variable Measurements

2.1 Sample Construction

Table 1 summarizes the sample construction procedures for three samples used in our analyses. We begin with the intersection of firm-years from 2010 Compustat and CRSP data files with necessary data to calculate yearly total asset nominal growth measures, two-year contemporaneous and one-year-ahead size-adjusted returns, and balance sheet and cash flow statement measures of accruals from 1991 to 2008. This procedure yields an initial sample of 61,771 firm-years, which we refer to as our INITIAL sample (Step 1). This sample is further subdivided into a non-M&A sample and M&A sample by using the Securities Data Corporation (SDC) Mergers & Acquistions (M&A) Data Base and Mergerstat Data Base. We use the SDC and Mergerstat data bases to identify parent company (acquiring firms) involved in M&A activity. We impose the following restrictions on acquisitions: (1) a parent company acquired more than 50 percent of the shares of a subsidiary; and (2) acquisitions were accounted for under the purchase method of accounting.[3] We begin our sample period in 1991 because SDC is known to be incomplete in covering M&As prior to the early 1990s (Netter et al. [2011]) and Mergerstat begins its coverage in the early 1990s. We identify 17,368 firm-years from the SDC and Mergerstat data bases where a firm was identified as an acquirer in an M&A transaction for that year (Step 2). The remainder of the firm-years in our INITIAL sample (61,771 – 17,368 = 44,403) comprises our non-M&A sample (Step 3). Thus, roughly 28% (17,368/61,771) of firm-years in the INITIAL sample represent cases where an acquiring firm has engaged in M&A activity, while 72% of the firm-years are not impacted by an M&A event.

From the initial M&A sample in Step 2, we identify those firm-years for which target financial information is provided by the SDC M&A data base.[4] Of the 17,368 firm-years identified in Step 2, SDC

[3] Artificial asset growth does not arise under the pooling-of-interests method of accounting (available until 2001) because prior year financial statement information presented in comparative financial statements is retroactively adjusted to include the parent and the subsidiary.

[4] Documentation for the SDC M&A data base indicates that target financial information is mostly provided for those firms covered in the Worldscope data base, which restricts coverage to larger, more widely followed firms. In most

provides sufficient target financial information to compute artificial and constant entity asset growth rates for 2,692 firm-years (Step 4).[5] We refer to this as our M&A sample.

We next construct a representative sample of firm-years that mirrors the sample of firms used in prior studies to test asset growth and accrual mispricing that (1) reflects the relative proportion of firm-years involved in M&A activity; and (2) for which there is sufficient target financial data on the SDC M&A data base to compute artificial and constant entity asset growth rates. We construct this sample in the following fashion:

A. For each year, we identify the M&A (acquiring firms) in our INITIAL sample for which SDC provides target financial information (mainly public targets) and then divide this number by the total number of M&A firms in our Compustat/CRSP sample for that year. This provides the percentage of M&A transactions in the INITIAL sample for which we have target financial information in that year.

B. For each year, we randomly select non-M&A firms from our INITIAL sample of non-M&A firms for that year equal to the percentage from Step A times the total number of non-M&A firms in the INITIAL Compustat/CRSP sample that meet our data availability requirements for that year. This provides a sample of non-M&A firms proportionate to acquiring firms identified in Step A for that year.

C. We repeat Steps A and B for each year in our sample period and aggregate across years. This process results in the FINAL sample of 9,574 firm-years comprised of 2,692 M&A firm-years and 6,882 non-M&A firm-years (See Steps 4 and 5 in Table 1). Note that the FINAL sample has the same proportion (28.1%) of M&A firm-years (2,692/9,574) as our INITIAL Compustat/CRSP

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instances, target financial information is not provided by SDC when the target is a private company (We are not able to use Mergerstat because it does not provide target information about net assets).

[5] For 30% of the 2,692 firm-years when an acquirer purchased a public target, they also purchased one or more private targets in the same year. Because historical financial data are often not available for private targets, we are unable to compute CEG and AAG related to most private targets. Rather than deleting these firm-year observations, which would greatly reduce out sample size (adversely affecting power), we elected to retain these observations in our FINAL sample. We realize this introduces an upward (downward) bias in CEG (AAG), which means that our measure of systemic or organic growth contains some amount of growth in assets related to AAG and mark-up growth of private targets. However, the impact of this measurement error appears to be rather modest as the deal values of private targets are, in aggregate, only 25% of the total deal values of combined public and private targets in those years in which acquirers purchased both public and private targets. We continue to find evidence of AAG mispricing when we limit our sample of M&A firm-years to when acquirers purchased only public targets, which allows us to compute AAG, TMG and SG components of growth with minimal error.

sample (17,368/61,771). Thus, this sample mirrors the proportions of M&A and non-M&A firms that are present in prior studies' tests of asset growth mispricing (e.g. Cooper et al [2008]).

[Insert Table 1 Here]

2.2 Variable Measurements

In this section, we describe the procedures for estimating nominal, constant entity and artificial asset growth, which we refer to as NAG, CEG and AAG, respectively. Further, we describe how we adjust CEG for asset markups (plus goodwill), which we refer to as total markup growth—TMG, that occur under the purchase method to arrive at systemic or organic growth (SG). We also describe how return measures are calculated for (1) the period that encompasses the M&A announcement through the end of the acquisition year [SAR(-1,0)], and (2) the year subsequent to acquisition [RET (+1)]. Size-adjusted returns, SAR(-1,0), are used to assess overvaluation associated with merger-related transitory growth, while raw returns, RET(+1), adjusted for other known determinants of expected returns, are used to test for growth mispricing (return reversal). Finally, we describe how accruals are estimated using successive balance sheet data, which is the predominant method used in prior studies that seek to examine competing explanations for the accrual anomaly.

2.2.1 Asset Growth Measurements

Nominal asset growth (NAG) is simply the year-to-year percentage change in total assets taken from Compustat. Nominal asset growth measures are the growth measures most commonly used in tests of growth mispricing (Fairfield et al. [2003]; Zhang [2007]; Cooper et al. [2008]). We estimate CEG and AAG by using target financial information taken from the SDC M&A database. SDC provides target (subsidiary) financial statement information from the most recent quarterly or annual financial statements that precede the acquisition date. To illustrate, suppose that a parent company acquired a subsidiary on June, 30 and the subsidiary's fiscal year end is December 31. If the subsidiary's quarterly financial statements for the first quarter are available at the time of the effective date of the acquisition, SDC

reports information from the subsidiary quarterly financial statements in the year of acquisition. If the subsidiary's first quarter results are not available, SDC reports subsidiary information from the annual financial statements for the year prior to acquisition.

To approximate the hypothetical total assets of the entity that is comprised of both the parent and subsidiary at the beginning of the acquisition year, we add the subsidiary's total assets from the most recent quarterly or annual financial statement reported by SDC to the parent company's beginning-of-year (t-1) total assets. We measure constant entity total asset growth (CEG) by subtracting the hypothetical total assets for the combined entity (just described) as of t-1 from the parent's total assets reported in the consolidated balance sheet at the end of the acquisition year t, which includes the parent's and subsidiary's (stepped-up basis) assets, and dividing that difference by the hypothetical total assets of the combined entity at the beginning of the year. Artificial asset growth (AAG) arises from comparing unlike consolidated entities in adjacent years, and is computed as NAG – CEG.

As we showed in equation (1), $CEG_t = STEP_UP_t + GOODWILL_t + SG_t$ for M&A firm-years. We determine the total markup in subsidiary assets, which is $STEP_UP_t + GOODWILL_t$, by taking the difference between the deal value and the book value of subsidiary net assets as reported in the SDC data base.[6] Total markup growth (TMG_t) is determined by dividing total markup by the combined total assets of the parent and the subsidiary at t-1, the year prior to acquisition. Systemic or organic growth, SG_t becomes a plug figure computed as $SG_t = CEG_t - TMG_t$. Note, AAG_t and TMG_t only apply to M&A firm-years. An example of how these three growth components are computed is provided in Appendix II for Avery Dennison's acquisition of Paxar in 2007. For non-M&A firm-years, $NAG_t = CEG_t = SG_t$ and there is no artificial asset growth. In subsequent regression specifications, we introduce $MA_{DUM(t)}$ that is set to 1 in M&A firm-years and zero otherwise. We interact $MA_{DUM(t)}$ with AAG_t and TMG_t to determine how these components of asset growth relate to SAR(-1,0) and RET(+1), described more fully below.

[6] Note that this calculation assumes that any subsidiary liabilities assumed as part of the deal value are at book value.

A problem that arises when computing AAG as described above is that these estimates are potentially upward biased when the subsidiary's total assets that are reported on the SDC data base come from the interim financial statements in the year of acquisition. The subsidiary's total assets for interim balance sheets in the year of acquisition are likely larger than those from the previous annual balance sheet due to income (change in net assets) recognized over the intervening interim period. This overstates the subsidiary's total assets at the beginning of the acquisition year, thereby resulting in a downward bias in CEG. AAG, in turn, is overestimated because AAG is the difference between NAG and CEG.

To provide a sense of the frequency and magnitude of the bias in AAG estimates due to using interim rather than prior annual subsidiary balance sheet information, we determine the percentage of acquisitions for which SDC provides data on the subsidiary's total assets from the interim financial statements in the year of acquisition. The results (untabulated) reveal that data on the subsidiary's total assets come from the interim financial statements in the year of acquisition for 41 percent of M&A firm-years, while subsidiary's total assets come from the prior year annual statements for 59 percent of the time. To assess potential bias in AAG, which is the opposite of the bias in CEG, we have to compare the magnitude of CEG for annual and interim data while controlling for differences in NAG.[7] The average upward bias in artificial asset growth is 1.8% for the 41 percent of our sample that uses interim target information from SDC. Adjusting the artificial asset growth measures downward by the 1.8% average difference for those observations where SDC provides quarterly target information does not qualitatively change any of our results.

2.2.2 Abnormal Return Measurements

Following prior studies on growth and accruals mispricing, we use size-adjusted abnormal returns (SAR) measured over two periods. SAR(-1,0) is a two-year buy-and-hold return computed by subtracting the corresponding average size portfolio returns from a firm's buy-and-hold raw returns starting eight months before the beginning of the fiscal year in which the merger/acquisition becomes effective through the fourth month after fiscal year-end in which the acquisition takes place (24 month period). This

[7] Details of this computation are available from the authors.

window, which we refer to as the contemporaneous return window, spans the initial announcement of the merger/acquisition through the release of the first set of annual financial statements that reflect the results of the newly combined entity.[8] We use this return to test for overvaluation of the AAG and TMG growth components outlined above. SAR (+1) is a twelve month (one-year-ahead) buy-and-hold size-adjusted return beginning the fifth month after a firm's fiscal year t year-end. For M&A firms, year t is the year in which an acquisition takes place. Starting the accumulation period four months after the fiscal year close of the parent company ensures that the market's assessment of nominal growth effects determined from adjacent year financial statement data have been impounded in stock price prior to testing for any return reversal. Following prior research, we also use SAR(+1) to test competing explanations for the accrual mispricing anomaly. Cooper et al. (2008) use cumulative twelve month (one-year-ahead) raw returns starting four months after the fiscal year that asset growth measures are determined as the dependent variable when testing for growth mispricing and they include size and book-to-market as independent variables to adjust for expected returns related to these two risk factors. Accordingly, we use RET(+1) in testing for asset growth mispricing.

2.2.3 Accrual Measurements

To maintain consistency with prior studies that test competing explanations for accrual mispricing (Sloan [1996]; Fairfield et al. [2003]; Desai et al. [2004]; Zhang [2007]; Kothari et al. [2009]), we estimate accruals using changes in successive balance sheet values as follows:

- ACC_BS = [Δ in current assets (Compustat Acronym: ACT) – Δ in cash/cash equivalents (Compustat Acronym: CHE)] – [Δ in current liabilities (Compustat Acronym: LCT) - Δ in debt included in current liabilities (Compustat Acronym: DLC) - Δ in income tax payable (Compustat Acronym: TXP)] – depreciation and amortization expense (Compustat Acronym: DP)

[8] In our FINAL sample, the initial announcement date of a merger/acquisition precedes the effective date, on average, by 95 days with a range of 0 to 480 days for the 1st and 99th percentiles of the distribution. Thus, starting the contemporaneous SAR cumulation period 8 months before the year in which the acquisition takes place captures the M&A announcement date for virtually all of our sample firms.

Measuring accruals in this fashion allows us to investigate how artificial M&A-induced growth, which affects balance sheet accrual measurement, asset growth measurements and (potentially) overvaluation, impacts tests of competing explanation of the accruals anomaly. We also measure accruals from the statement of cash flows [see Hribar and Collins (2002)] to assess whether correctly measured accruals reflect mispricing after accounting for the effects of overvaluation and asset growth mispricing.

3. Descriptive Statistics

3.1 M&A Sample

Panel A of Table 2 provides summary statistics for NAG, CEG, TMG, SG, AAG and AAG + TMG as a percentage of nominal asset growth ([AAG + TMG]/NAG) for the 2,692 firm-years in our M&A sample.[9] Average (median) nominal asset growth is 56.9% (33.4%).[10] Note that artificial asset growth and total markup growth are individually substantial and comprise a major portion of nominal asset growth. As shown in Panel A, average (median) AAG is 35.1% (14.9%) and the average (median) TMG is 21.2% (11.5%). Together, AAG and TMG comprise, on average, 86.6% of NAG. The median ratio of (AAG + TMG)/NAG is 85.5%. Interestingly, the average (3.4%) and median (1.3%) systemic or organic growth (SG) is relatively small for those years in which acquirers make acquisitions. These results demonstrate that computing asset growth as year-to-year growth in total assets reported in the successive consolidated balance sheets induces a substantial upward bias in asset growth estimates in years firms engage in M&A activity. In the absence of M&A-related growth distortion, growth of acquiring firms would have been relatively flat in M&A firm-years.

Panel B of Table 2 provides the medians of the various growth measures for each year in the sample period from 1991 to 2008. We present the medians because the distributions of growth measures are right skewed as shown in Panel A. As reported in Panel B, the medians of AAG (TMG) range from a

[9] All variables reported in Table 2 are winsorized to the 1st and 99th percentile values.

[10] We recognize that these summary statistics are likely upward-biased because the data restrictions we must impose in order to measure the AAG and TMG components of nominal asset growth. Specifically, we need the book value of target assets in the year before the acquisition, which is generally only available for public targets. Because public targets are generally much bigger than private targets, this will impart an upward bias to our M&A sample asset growth summary statistics.

low of 4.8% (7.3%) to a high of 22.4% (16.8%). The median ratio of (AAG + TMG)/ NAG ranges from a low of 73.3% in 2002 to a high of 94.6% in 2005. These results suggest that artificial asset growth and total markup growth are substantial throughout our sample period, and vary depending on the general economic climate when M&A activity takes place.

[Insert Table 2 Here]

To gain a sense of the pervasiveness of M&A activity by year, Figure 1 plots the percentage of Compustat/CRSP firms in the INITIAL sample that engage in M&A.[11] As noted previously, on average, 28.1 percent of firm-years are affected by M&A events between 1991 and 2008 with M&A incidence ranging from slightly more than 16% of Compustat firms in 1991 to roughly 34% in 1998. Of those firms that engage in M&As, 99% are accounted for under the purchase method of accounting. In addition, we investigate how often firms engage in serial acquisition activities. We define serial acquirers as those firms that engage in at least one M&A over the previous two years, given that the firms engage in M&A in year t. Figure 2 plots the percentage of serial acquirers relative to all M&A that were accounted for under the purchase method. The results in Figure 2 reveal that approximately 68% of M&A firms are serial acquirers. The results shown in Figure 1 and Figure 2 indicate that a nontrivial proportion of Compustat/CRSP firms are affected by M&A-related asset growth distortion.

[Insert Figures 1 & 2 Here]

Taken together, the results presented in this section show that AAG and TMG comprise a substantial portion of nominal asset growth of M&A firms and that the proportion of firm-years influenced by merger-related transitory growth distortion is non-trivial. These results suggest that prior research that uses year-to-year growth in items from the consolidated financial statements is subject to potentially serious upward bias in growth estimates.

[11] The sample is restricted to M&A where a parent company acquired more than 50 percent of the shares of a subsidiary.

3.2 INITIAL and FINAL Samples

Table 3 provides descriptive statistics for the INITIAL (Panel A) and FINAL (Panel B) samples. Our goal in presenting the descriptive statistics for these two samples is to gain a sense of whether the characteristics of our smaller FINAL sample are similar to the larger INITIAL sample, which is comparable to samples used in prior studies, but for which the data for computing artificial asset growth and the components of constant entity asset growth are not readily available.[12] As shown, the means, medians and interquartile ranges of NAG, ACCBS, ACCCF, SAR(-1,0) and SAR(+1) for the non-M&A firms in these two samples are statistically indistinguishable. For the M&A firm-years, however, we find significant differences for several of the variables across the INITIAL and FINAL samples. Notably, the mean and median nominal asset growth of the FINAL sample of M&A firm-years are significantly higher than for the INITIAL sample.[13] These differences are to be expected because our FINAL sample of M&A firm-years is comprised of cases where the targets are public firms and public targets tend to be much larger than private targets. Thus, nominal asset growth measures are larger for the FINAL sample. We also find that ACCCF (measured as a percent of total assets) is modestly lower for the FINAL sample than for the INITIAL sample (average of -0.042 vs. -0.037). SAR(+1) is also markedly lower for the FINAL sample compared to the INITIAL sample (average of -4.2% vs. -2.0%). We find no meaningful differences between the INTIAL and FINAL samples of M&A firm-years for ACCBS and SAR(-1,0).

Panel B of Table 3 reports summary statistics for various components of NAG for both M&A and non-M&A firm-years in our FINAL sample.[14] Non-M&A firm-years exhibit positive mean (9.6%) and median (3.5%) nominal/constant entity/systemic growth (NAG=CEG=SG). In contrast, virtually all of the constant entity growth in M&A firm-years (mean=23.4% and median=14.3%) is due to the mark-up of the subsidiary assets on the parent company consolidated balance sheet that results from the purchase

[12] For our FINAL sample (Panel B), the average (median) overall nominal asset growth rate is 22.9% (7.9%), which is similar to the average (19%) and median (8%) nominal growth rates reported by Cooper et al. [2008]. Differences can be attributed to the differences in the general economic climate that existed during their sample period (1968-2003) versus our sample period (1991-2008).

[13] Moreover, the NAG for the M&A FINAL sample exhibits considerable more dispersion than for the INITIAL sample, suggesting that the FINAL M&A sample has more extreme values of NAG.

[14] Note that for non-M&A firm-years, CEG = SG and TMG = 0.

method of accounting. The mean (median) TMG is 21.2% (11.5%), while SG mean (median) values are 3.4% (1.3%). Thus, for M&A firm-years, there is relatively little systemic (organic) growth in the consolidated entity from t-1 to t once one holds constant the companies that comprise the consolidated entity. The only way these firms are able to sustain the illusion of growth is by mergers and acquisitions (which introduces artificial growth) and by writing up the target's assets (including recognized goodwill).

[Insert Table 3 Here]

Table 4 shows the relative proportion of M&A and non-M&A firm-years across decile ranks formed on NAG for our FINAL sample. We also report median values of NAG, AAG, CEG, TMG and SG for the M&A subsample and NAG and CEG (=SG) for the non-M&A subsample by NAG decile rank.[15] Consistent with our expectations, M&A firm-years represent nearly a monotonically increasing proportion of NAG growth deciles 1 through 10. M&A firm-years make up only 8% of the lowest asset growth decile (Decile 1) while they make up 70% of the highest growth decile (Decile 10). Similarly, the median AAG (TMG) is only 4.0% (5.2%) for the M&A firm-years in the low NAG growth decile, while it is 71.8% (35.5%) for the high NAG growth decile. These results show that high nominal growth firm-years tend to be populated by firms engaged in M&As and that artificial growth and total markup growth represent a significant proportion of the nominal growth for these high growth firm-years.

Table 5 presents Pearson (upper diagonal) and Spearman (lower diagonal) correlations between the various asset growth measures, size-adjusted returns and accrual measures derived from the balance sheet and cash flow statement. For brevity, we focus on Pearson correlations. We present results for the full FINAL sample (Panel A) and for the M&A subsample of the FINAL sample (Panel B). Several correlations are noteworthy. First, consistent with the evidence reported above, artificial asset growth (AAG) is highly correlated with nominal assets growth (NAG). For the full FINAL sample, the correlation is 0.691 due primarily to the extremely high correlation of 0.826 between NAG and AAG for the M&A sample observations. There is also a strong positive correlation between AAG and CEG for

[15] CEG = NAG for non-M&A firm-years because there is no year-to-year distortion to adjacent-year consolidated total asset numbers that results from changes in the underlying entities that comprise the consolidated totals.

M&A firms (0.332). Thus, M&A firms with high constant entity asset growth tend to also exhibit high artificial asset growth.[16] We observe a strong positive correlation of 0.188 between contemporaneous size-adjusted returns, SAR(-1,0), and NAG for the full FINAL sample (Panel A), but roughly half of this correlation is driven by the significant positive correlation of 0.091 between SAR(-1,0) and the artificial component of nominal asset growth exhibited by the M&A subsample of firms (Panel B). Consistent with prior research that demonstrates asset growth mispricing, Panel A of Table 5 shows a significant negative correlation of -0.066 between NAG and SAR(+1). However, Panel B demonstrates that this negative correlation between NAG and one-year-ahead abnormal returns is much stronger for M&A firm-years (-0.125), but most of this negative correlation is driven by the negative correlation between the AAG component of NAG and SAR(+1), which is -0.091. Thus, these simple correlations suggest that artificial asset growth likely plays an important role in the growth mispricing demonstrated in prior literature.

[Insert Table 5 Here]

4. Preliminary Findings for INITIAL Sample

In this section we present evidence on the persistence properties and mispricing of NAG for our INITIAL sample of M&A and non-M&A firm-years using forecasting and pricing equations in a Mishkin [1983] rational expectations framework.[17] We use the following simple first-order autoregressive specification for the forecasting equation that allows for differences in persistence properties across M&A and non-M&A firm-years:

Forecasting Equation:

$$NAG_{it+1} = \alpha_0 + \alpha_1 MA_{DUM(it)} + \alpha_2 NAG_{it} + \alpha_3 NAG_{it} x\ MA_{DUM(it)} + e_{it+1} \quad (2)$$

[16] The high positive correlation between AAG and CEG is important to keep in mind when interpreting subsequent regression results with both variables in the model. With both variables in the model, the coefficients pick up the incremental effect of one variable over and above (conditional on) the effect of the other variable.

[17] Because we need data for t+1 for the persistence and mispricing tests, our anlysis in this section is based on a slightly smaller subset (52,853 observations) of the 61,771 firm-years that comprise the INITIAL Sample defined in Table 1.

where $MA_{DUM(it)}$ is an indicator variable that takes the value of 1 for M&A firm-years, and zero otherwise. All other variables in this equation and the following equation are as previously defined in Table 3.

Because the artificial asset growth and total markup growth components of NAG will vanish when an M&A firm ceases to engage in M&A activity, we expect NAG of M&A firm-years to be less persistent than that of non-M&A firm-years, so we expect $\alpha_3 < 0$ in Eqn (2).

In the Mishkin [1983] framework, prices (and therefore returns) are modeled as a function of firms' nominal asset growth rates. We adopt this framework to examine whether the market's valuation of unexpected nominal growth rates rationally anticipates the implications of past NAG for future NAG that are imbedded in the forecasting equation. We model the difference between realized return for t+1 and expected return for t+1 conditional on the set of information available at time t about nominal asset growth (θ_t) in eqn. (3) below. That is, size-adjusted abnormal returns for period t+1 are expressed as a function of the difference between realized NAG and expected NAG for t+1 conditional on information available to market participants at the end of period t:

Pricing (Abnormal Returns) Equation:

$$SAR_{it+1} = Ret_{it+1} - E(Ret_{t+1} | \theta_t)$$

$$= \beta[NAG_{it+1} - (\alpha_0 * + \alpha_1 * MA_{DUM(it)} + \alpha_2 * NAG_{it} + \alpha_3 * NAG_{it} x\, MA_{DUM(it)}) + v_{it+1} \qquad (3)$$

Equations (2) and (3) are estimated jointly using nonlinear estimation as described in Mishkin [1983]. A likelihood ratio test statistic,[18] which is distributed asymptotically $\chi^2(k)$ under the null hypothesis of rational pricing (market efficiency), is used to test whether the parameters (or combination of parameters) are significantly different between the forecasting and pricing (abnormal returns) equations

[18] The $\chi^2(k)$ statistic is 2n log (SSR^c/SSR^u) where k = the number of constraints imposed by market efficiency; n = number of observations; SSR^c = the sum of squared residuals from the constrained weighted system; and SSR^u = the sum of squared residuals from the unconstrained weighted system.

(see Sloan, 1996, p. 303). Mispricing is indicated if the weights the market assigns to the NAG components in the pricing equation (α_k*) are significantly larger (smaller) than the weights that these items exhibit in the forecasting equation (α_k).

Consistent with our prediction about persistence, Model (1) results of Table 6 show the persistence of NAG for M&A firm-years is significantly lower than for non-M&A firm-years (α_3 = -0.0564, t-stat = -6.74). That is, the nominal asset growth rates for t+1 are significantly lower when a firm has engaged in a M&A in period t compared to instances when firms have not engaged in a merger or acquisition in period t.

[Insert Table 6 Here]

The tests for mispricing are provided in Model (2) column results in Table 6. For non-M&A firm-years the α_2 from the forecasting equation is 0.1609 while α_2* from the pricing equations is 0.7083. A test of $\alpha_2 = \alpha_2$* yields a χ^2 of 174.36, p-value < 0.0001 indicating that nominal asset growth for non-M&A firm-years is overpriced. That is, the market's expectation for future nominal growth that is implicit in prices exceeds the historical persistence of nominal growth as reflected in the forecasting equation. Thus, the market appears to over-extrapolate the historical growth rates of non-M&A firms into the future.

The surprising finding for Model (2) is that despite the fact that the persistence of NAG of M&A firm-years is predictably smaller than the persistence of non-M&A firm-years the nominal asset growth of M&A firm-years is also overpriced. The test ($\alpha_2 + \alpha_3$) = (α_2* + α_3*) yields χ^2 of 81.09, p-value < 0.0001. We also find that the mispricing for the M&A firm-years is slightly smaller than the mispricing for non-M&A firm-years (($\alpha_3 = \alpha_3$*) yields a χ^2 of 4.08, p-value of 0.043). However, we cannot tell from these results which of the components of NAG (i.e., AAG, TMG or SG) are being mispriced for M&A firm-years. We address this question directly in Section 5 below.

5. The Asset Growth Anomaly

In this section, we examine what influence merger-related transitory growth has on the nominal asset growth mispricing. First, we replicate prior findings that nominal asset growth (NAG) is negatively

associated with future abnormal stock returns. Next, we investigate the extent to which future abnormal stock returns are related to AAG, TMG, and SG components of nominal asset growth. Because we need details on subsidiary asset values just prior to the acquisition and the mark-up of subsidiary assets to isolate the three components of nominal asset growth, the analyses conducted throughout this section and the rest of the paper are based on the smaller (but representative) FINAL described in Section 2.1 above.

5.1 Replication of Cooper et al. (2008) Results

Cooper et al. [2008] find a negative cross-sectional relation between nominal total asset growth and one-year-ahead realized returns after controlling for size, book-to-market (BM), momentum and price reversal. This finding is particularly interesting because total assets encompass other growth measures that are shown to be negatively related to future abnormal returns (e.g., inventories, capital expenditures, or net operating assets). Because Cooper et al. [2008] measure asset growth as year-to-year growth in total assets from the consolidated balance sheets as reported by Compustat, their findings are subject to the confounding effects of merger-related transitory growth distortion outlined above. In this section, we investigate in more detail the extent to which artificial asset growth (AAG) and markup of subsidiary assets (TMG) contribute to the mispricing of nominal asset growth documented in Cooper et al. [2008].

We begin by replicating the main findings in Cooper et al. [2008] for our FINAL sample of firm-years. Cooper et al. [2008] use the following regression to test for growth mispricing:

$$RET(+1) = \propto + \gamma_1 NAG_t + \gamma_2 BM_t + \gamma_3 MV_t + \gamma_4 BHRET6 + \gamma_5 BHRET36 + \varepsilon_{t+1} \quad (4)$$

where RET (+1) is the buy-and-hold raw returns over twelve months beginning the fifth month after a firm's fiscal year-end; NAG_t is nominal asset growth for year t; BM_t is the ratio of the book value of equity to the market value of equity measured at the end of year t; MV_t is the market capitalization at the end of year t; BHRET6 is the buy-and-hold raw returns over six months before the fourth month after a firm's fiscal year-end; BHRET36 is the buy-and-hold raw returns over thirty six months before the fourth month after a firm's fiscal year-end. Equation (4) is estimated cross-sectionally by year and the means of the coefficient estimates are tested for significance using Fama and MacBeth [1973] standard errors.

Panel A of Table 7 presents the Cooper et al. [2008] results for the equation (4) specification estimated with data from 1968-2003. Panel B presents our replication of Cooper et al. using our FINAL sample estimated with data from 1991-2008. The main focus is on the coefficient for NAG. Consistent with the findings in Cooper et al. [2008], we find nominal asset growth is significantly negatively associated with one-period-ahead raw returns after controlling for the effects of book-to-market (BM), size (MV), momentum (BHRET6) and return reversal (BHRET36).[19] Also, as in Cooper et al. [2008], we find a significant positive association between the book-to-market ratio at the end of year t and one-period-ahead returns.[20] Overall, the findings reported in this section suggest that our FINAL sample of firm-years is representative of the samples used in prior studies to test the growth mispricing.

[Insert Table 7 Here]

5.2 Decomposition of Nominal Asset Growth into its AAG, TMG and SG Components

To investigate what influence merger-related transitory growth has on the tests of nominal asset growth mispricing, we re-specify equation (4) in two ways. First, we decompose NAG_t into its AAG_t, TMG_t and SG_t components for M&A firm-years. Note that for non-M&A firm years, AAG and TMG are zero, so NAG=CEG=SG. Next, we introduce a dummy variable (MA_{DUM}) set equal to 1 for M&A firm-years, and zero otherwise. We do this to identify the observations for which the AAG and TMG growth measures are relevant. We then interact this dummy variable with AAG_t and TMG_t growth components for M&A firm-years. Second, to make it easier to compare the relative contribution of AAG, TMG and SG growth components to one-period-ahead returns, we use the scaled decile rank for each growth measure and each control variable instead of the continuous variable measurements. For each variable for each year, firms are ranked into deciles 0 through 9 and these decile values are divided by 9 to obtain a scaled rank value that ranges from 0 to 1.[21] Using scaled rank values allows for easy comparison of the coefficients across the different variables and allows us to gain a better sense of which variables have the

[19] The differences in coefficient values on NAG for the two studies are most likely due to differences in the sample periods covered in our study (1991-2008) versus the Cooper et al. [2008] study (1968-2003).
[20] Contrary to the findings in Cooper et al., we do not find a significant negative relation between firm size (MV) and one-period ahead returns for our sample period.
[21] Note for AAG and TMG growth measures, ranked values are assigned only for M&A firms for a particular year.

largest effect on one-period ahead returns (see Abarbanell and Bushee (1998) for further explanation of this technique).

The individual coefficients represent the return to a zero-investment portfolio optimally formed to exploit the information in the associated independent variable that is orthogonal to the information in the other independent variables. The portfolios are constructed with OLS-derived weights for each independent variable for each firm that are given by the rows of the matrix $(X'X)^{-1}X'$ where X is the design matrix comprised of the intercept and scaled-ranked values of the independent variables outlined in the equations below. Our strategy involves taking positions in firms that have reported results within 4 months of the fiscal-year end to allow for the determination of portfolio weights from $(X'X)^{-1}X'$ used to ascertain the investment positions. Thus, firms receiving negative weights are sold short and firms with positive weights are bought. The long and short positions are closed after one year. The trading strategy takes a long (short) position in firms within the highest (lowest) deciles of a particular growth measure after controlling for the effects of other growth measures and control variables.[22] Because the weights do not require knowledge of future returns, we are investigating implementable investment strategies. Further, because we include scaled ranked values of SIZE, B/M, BHRET6 and BHRET36, the regression coefficients on the various growth measures can be interpreted as abnormal returns after controlling for these other determinants of expected returns that have been widely documented in the literature.

To provide a benchmark for comparing the rank-regression results with the regression results that use continuous data reported in Table 7, we first estimate the following specification using scaled-rank values of NAG and control variables as given in equation (4). (Note: Subscript numbers on β coefficients correspond to labeling for alternative models in Table 8 reported below):

$$RET(+1) = \alpha + \beta_2 NAG_RANK_t \quad + \beta_8 BM_RANK_t \quad + \beta_9 MV_RANK_t \quad + \beta_{10} BHRET6_RANK_t$$

[22] Note that if one wanted to exploit this growth pricing anomaly, the strategy would be to take a short position in the highest growth decile of firms and invest the proceeds in stocks in the lowest growth decile. Our goal here is to demonstrate growth-related mispricing. Accordingly, we do not implement this zero-investment hedge portfolio strategy which would convert the negative abnormal returns that we document below to positive returns.

$$+ \beta_{11} BHRET36_RANK_t + \varepsilon_{t+1} \quad (5)$$

The equation (5) specification is estimated for each of the 18 years in our sample period. The mean of the estimated coefficients and t-statistics based on the standard deviation of the eighteen parameter estimates are presented in Model (1) column of Table 8. Consistent with the findings reported in Table 7, we find that nominal asset growth (book-to-market) is significantly negatively (positively) related to future returns. None of the other variables is significantly related to future returns.

[Insert Table 8 Here]

Next, we introduce the MA_{DUM} variable and the decomposition of NAG into its AAG, TMG and SG component parts for M&A firm-years and NAG=CEG=SG for non-M&A firm-years. Because systemic or organic growth measures are available for all firms (both M&A and non-M&A), we do not interact this growth component with the MA_{DUM} variable.

$$RET(+1) = \alpha + \beta_1 MA_{DUM(t)} + \beta_3 SG_RANK_t + \beta_4 MA_{DUM(t)} * TMG_RANK_t + \beta_5 MA_{DUM(t)} * AAG_RANK_t + \beta_8 BM_RANK_t + \beta_9 MV_RANK_t + \beta_{10} BHRET6_RANK_t + \beta_{11} BHRET36_RANK_t + \varepsilon_t \quad (6)$$

The results for this specification are presented in Model (2) column of Table 8, which includes the same control variables as in equation (5). This specification allows us to test whether the market appears to misprice the portion of nominal asset growth that represents growth distortion—artificial asset growth (AAG) and total mark-up growth (TMG)—relative to systemic or organic growth component of NAG. The results show that AAG is significantly negatively related to future returns with an estimated coefficient of -0.079, while systemic or organic growth (SG) and TMG are not significantly related to future returns. This implies that firms with high AAG experience an incremental return of -7.9% relative to low AAG firms in the year following the acquisition after controlling for other determinants of expected returns. Note that the β_5 coefficient on AAG is more than twice as large as the β_3 coefficient on

SG (-0.079 vs. -0.035).[23] These results suggest that the artificial asset growth mispricing is the major contributor to nominal asset growth mispricing documented in prior research and this mispricing dominates any mispricing related to systemic (organic) growth.

5.3 Competing Explanations for the Post-Acquisition Underperformance of Acquirers

An extensive literature in finance documents systematic underperformance of acquirer firms over long windows (3-5 years) following acquisitions and investigates competing explanations for this phenomenon (Loughran and Vijh [1997]; Rau and Vermaelen [1998]; Agrawal and Jaffee [1999]; Moeller, Schlingemann and Stulz [2005]). Among the factors considered, the variables found to be most negatively associated with post-acquisition performance of acquirers are: (1) whether the acquiring firm is a glamour stock, which is the inverse of the BM variable in the previous specifications; (2) whether the acquisition is a merger; and (3) whether the deal is financed with stock. Although our RET(+1) performance is measured over a twelve month period starting four months after the fiscal year-end close of the year of acquisition, there is still some overlap of the return time frame used to investigate growth mispricing with the time frame used to investigate the post–acquisition performance of acquirers. Therefore, factors found to be associated with post-acquisition performance of acquirers could be correlated omitted variables in the equation (6) tests of growth mispricing. To address this concern, we augment the specification in equation (6) and test whether factors found to be associated with post-acquisition under-performance of acquirers help to explain the mispricing of growth. The model used is as follows:

$$RET(+1) = \alpha + \beta_1 MA_{DUM(t)} + \beta_3 SG_RANK_t + \beta_4 MA_{DUM(t)} * TMG_RANK_t + \beta_5 MA_{DUM(t)} * AAG_RANK_t + \beta_6 MA_{DUM(t)} * MERGER_{DUM(t)} + \beta_7 * MA_{DUM(t)} * STK_{DUM(t)} + \beta_8 BM_RANK_t + \beta_9 MV_RANK_t + \beta_{10} BHRET6_RANK_t + \beta_{11} BHRET36_RANK_t + \varepsilon_{t+1} \quad (7)$$

where $MERGER_{DUM(t)}$ = 1 if the acquisition is a merger, zero otherwise; $STK_{DUM(t)}$ = 1 if the deal is 100% stock-financed, zero otherwise. [24] All other variables are as previously defined.

[23] As shown at the bottom of Table 8, we cannot reject the null hypothesis that the coefficients on these two growth components are equal primarily due to the low power of this test (n=18).

The results for this specification are presented in the Model (3) column of Table 8. Interestingly, after controlling for other determinants of post-acquisition performance of acquirers, the β_5 coefficient on AAG_RANK is -0.070 and remains marginally significant at $\alpha = 0.10$. BM_RANK, which is the inverse of the glamour proxy that is used in prior research, is found to be significantly associated with the post-acquisition performance of acquirers ($\beta_8 = 0.135$, significant at $\alpha = 0.01$). Neither the merger or stock acquisition dummy variables, when interacted with the MA_{DUM} variable, are significant in Model (3). The evidence reported for Model (3) of Table 8 suggests that long-term post-acquisition under-performance of acquirers that has been widely documented in the literature can, in part, be explained by the market over-extrapolating AAG transitory growth that arises in M&As. AAG mispricing appears to dominate the type of acquisition (merger or tender offer) or the form of payment (stock or cash) as an explanation for the post-acquisition underperformance of acquirers.

5.4 Evidence on Overpricing of Growth Components

To provide additional insights into the mispricing of the various components of nominal asset growth we examine whether artificial asset growth (AAG), total markup growth (TMG), and systemic growth (SG) are positively associated with *contemporaneous* size-adjusted abnormal returns during the time frame that encompasses the M&A announcement through the release of the first post-merger financial statements. We use two-year size-adjusted abnormal returns as a proxy for overvaluation of firms' stock price. We run the following Fama-MacBeth regression for M&A firm-years to determine whether the market places an incremental premium on artificial asset growth and total markup growth relative to systemic or organic growth in the time frame that encompasses the merger and acquisition. To facilitate comparison of results across the three components of NAG, we again use scaled-ranked values of the growth measures as in Table 8.

$$SAR(-1,0) = \propto + \beta_1 AAG_RANK_t + \beta_2 TMG_RANK_t + \beta_3 SG_RANK_t + \varepsilon_{(-1,0)} \quad (8)$$

[24] If a firm engages in multiple acquisitions, this indicator takes the value of one if more than 50% of acquisitions are mergers (100% stock-financed).

where all variables are as previously defined.

The incremental premium that the market attaches to AAG and TMG is shown clearly by the equation (8) regression results reported in the Table 9. The coefficients on AAG (0.300) and TMG (0.214) are positive and highly significant and represent two-year size-adjusted returns from taking a long (short) position in firms with high (low) AAG and TMG.[25] We also find that the market appears to attach a significant premium to firms with higher systemic or organic growth (as might be expected) as revealed by the positive and significant coefficient (0.667) on SG. Because AAG, TMG and SG are positively correlated (see Table 5), the coefficients on AAG and TMG can be interpreted as the incremental premium that the market assigns to artificial growth and total markup growth over and above systemic or organic growth.

Collectively, the results in this section suggest that artificial asset growth and total markup growth are associated with overvaluation of acquirers' stock. Investors seem to place a high premium on firms with high artificial and markup asset growth. In the subsequent year, investors appear to be negatively surprised when these highly transitory components of nominal asset growth are not sustained.

[Insert Tables 9 Here]

6. The Effect of AAG and TMG on Tests of Competing Explanations of the Accrual Anomaly

The accrual anomaly, first documented by Sloan [1996], refers to an empirical regularity that firms with high accruals subsequently earn negative abnormal returns, while firms with low accruals subsequently earn positive abnormal returns. Sloan [1996] attributes this phenomenon to investors fixating on earnings without understanding the differential persistence of two components of earnings: cash flows and accruals. Subsequently, researchers have put forth alternative explanations. One alternative explanation is that the accrual anomaly is a special case of a more general growth anomaly

[25] The positive and significant coefficients on AAG and TMG are consistent with two alternative explanations. The first is that firms experiencing a significant run-up in their stock price are more likely to use their highly valued stock to engage in mergers and acquisitions that contribute to higher AAG and TMG growth measures. An alternative explanation is that the market attaches a significant premium to firms that exhibit high nominal growth due to M&As and, therefore, high AAG and TMG. Unfortunately, we are unable to disentangle these competing explanations.

(Fairfield et al. [2003]; Desai et al. [2004]; Zhang [2007]). Because investment in working capital (e.g., receivables and inventory) is part of firms' investment strategy, this line of research attributes the accrual mispricing to investors failing to understand the impact of growth on future profitability. We refer to this explanation as the growth explanation.

Kothari et al. [2009] offer the agency theory of overvalued equity (Jensen [2005]) as another competing explanation for the accrual anomaly. They argue that overvalued firms engage in earnings management to sustain overvaluation and consequently end up with high (income-increasing) accruals. Because overvaluation cannot be sustained, stock prices eventually decline. This leads to a negative relation between the level of accruals and subsequent performance. We refer to this explanation as the overvaluation explanation.

Both the growth and overvaluation explanations for the accrual anomaly face several limitations. First, studies that offer these competing explanations for the accrual anomaly tend to use the balance sheet approach to measuring accruals in their main tests, which can induce upward bias to accrual estimates for firms engaged in M&A activity (Hribar and Collins [2002]). Second, studies that support the growth explanation are subject to potential confounding effects of artificial growth that can add measurement error both to balance sheet accrual estimates and to growth measures computed as year-to-year nominal growth in items from the consolidated financial statements (net operating assets (Fairfield et al. [2003]); sales (Desai et al. [2004]); employees and total assets (Zhang [2007]). Third, as we demonstrated earlier, firms with high artificial growth and high markup growth exhibit high contemporaneous abnormal stock returns, consistent with overvaluation. Therefore, the strong relation between balance sheet accruals and overvaluation documented by Kothari et al. [2009] is confounded by merger-related transitory growth distortion. Finally, both the growth and overvaluation explanations are subject to another sort of correlated omitted variable problem. The studies that test the growth explanation fail to control for overvaluation, whereas Kothari et al. [2009] fail to control for growth. These limitations complicate the interpretation of evidence reported in prior studies that claim to support either the growth explanation or the overvaluation explanation for the accrual anomaly. In an attempt to address these concerns, we

examine the growth and overvaluation competing explanations for the accrual anomaly simultaneously while controlling for the effects of AAG and TMG on nominal growth.

We use the following general multivariate regression framework to test individually, and simultaneously, the competing explanations for future one-year ahead size-adjusted returns. Again to facilitate comparison of the magnitude of coefficients, we use scaled-ranked values of the various independent variables determined annually.

$$SAR\ (+1) = \propto + \beta_1 ACCBS_RANK_t + \beta_2 NAG_RANK_t + \beta_3 OVAL_RANK_t + \beta_4 MA_{DUM(t)} + \beta_5 MA_{DUM(t)} * AAG_RANK_t + \beta_6 CEG_RANK_t + \beta_7 MA_{DUM(t)} * TMG_RANK_t + \beta_8 SG_RANK_t + \beta_9 BM_RANK_t + \varepsilon_{t+1} \quad (9)$$

where ACCBS are the accruals measured as non-cash changes in working capital balance sheet accounts plus depreciation and amortization, and $OVAL_t$ equals SAR(-1,0).[26] All other variables are as defined previously. We estimate a series of yearly cross-sectional regressions with various combinations of explanatory variables and report the results in Table10. The coefficients are the means of the eighteen annual regressions, and the *t*-statistics are based on the standard deviations of time-series parameter estimates (Fama and MacBeth [1973]).

Models 1, 2 and 3 of Table 10 report the results of estimating equation (9) by including scaled-rank values of ACCBS, NAG and OVAL separately, along with BM to control for the positive relation between this variable and size-adjusted return documented in Section 5 above and in prior research. Consistent with the evidence in prior studies, we find a significant negative association between one-year ahead size-adjusted returns and both ACCBS and NAG. These results suggest that accruals and nominal asset growth exhibit evidence of mispricing when considered in isolation. Contrary to the evidence in

[26] We also estimate specifications using accruals taken from the cash flow statement as recommended by Hribar and Collins [2002], and the results for all models presented in Table 10 are qualitatively the same.

Kothari et al (2009), we do not find a significant negative relation between overvaluation and one-year-ahead size adjusted returns after controlling for BM (glamour) effects.[27]

Model 4 in Table 10 compares the accrual and nominal growth explanations for future abnormal returns head to head. The coefficients on both ACCBS_RANK and NAG_RANK are significantly negative, but the coefficient on NAG_RANK (-0.085) is roughly 2 ½ times larger than the coefficient on ACCBS_RANK (-0.035). The results from this specification suggest that each variable incrementally explains future size-adjusted returns after controlling for the effect of the other variable, but the nominal asset growth mispricing effect is considerably larger than the accruals mispricing effect. Accruals estimated from the balance sheet are upward biased (and noisy) when firms engage in M&A activity (Hribar and Collins [2002]). We demonstrate earlier in this paper that artificial asset growth arises when firms engage in M&A. Accordingly, balance sheet accrual estimates and artificial asset growth are likely correlated through M&A. Consequently, it is possible that the mispricing of accruals is confounded by the mispricing of artificial asset growth.

To assess the role of artificial growth in tests of the growth explanation for the accrual anomaly, we next estimate equation (9) by replacing scaled-rank values of NAG with AAG and CEG and include both these variables along with scaled-rank values of ACCBS and BM to explain one-year-ahead size-adjusted abnormal returns. We introduce the $MA_{DUM(t)}$ term and interact it with AAG because artificial asset growth only arises in years when firms engage in M&A activity (i.e., $MA_{DUM(t)} = 1$). The results for this specification are reported in the Model 5 row of Table10. The results show that the average coefficient on ACCBS_RANK (-0.037) remains significantly negative when both AAG_RANK and CEG_RANK are included in the model. The coefficients on AAG_RANK (-0.069) and CEG_RANK (-0.060) are roughly similar and both are significantly negative implying that both artificial asset growth

[27] BM_RANK (glamour) is highly negatively correlated with OVAL_RANK (ρ= -0.20). When we drop BM_RANK from the model, the coefficient on OVAL_RANK becomes much more negative (-0.052), but remains insignificant. Because the sample size underlying this test is small (n = 18), we attribute the lack of significance on this variable to the low power of the test.

and constant entity growth are marginally mispriced after controlling for the effects of each other and for accruals mispricing.

Model 6 of Table 10 decomposes CEG into the total markup growth (TMG) and systemic growth (SG). As is the case for AAG, TMG is interacted with $MA_{DUM(t)}$ because TMG only arises in M&A firm-years. For M&A firm-year observations, SG = CEG – TMG and for non-M&A firm-year observations, SG = CEG. The Model 6 results show that accruals continue to be mispriced after controlling for the mispricing effects of AAG, TMG and SG. In addition, AAG_RANK exhibits incremental mispricing (-0.085) relative to ACCBS_RANK (-0.040). Interestingly, TMG exhibits no incremental mispricing after controlling for accruals mispricing.

Model 7 simultaneously tests the accruals, overvaluation, artificial growth and constant entity growth explanations for mispricing. The coefficient on ACCBS_RANK remains negative and highly significant, and is virtually the same magnitude as in previous specifications. The coefficient on OVAL is small and insignificant, while the coefficients on AAG_RANK and CEG_RANK are roughly the same magnitude (-0.068 vs. -0.067) and each is marginally significant in explaining SAR(+1). Model 8 of Table 10 decomposes CEG into TMG and SG and pits these growth components against accruals, overvaluation and artificial asset growth as explanations for one-year-ahead abnormal returns. We once again find ACCBS_RANK and AAG_RANK are significantly negatively related to SAR(+1) with the mispricing of artificial asset growth being roughly twice as large as the mispricing of accruals (-0.084 vs. -0.041). The coefficients on OVAL_RANK and TMG_RANK are insignificant. Interestingly, systemic or organic growth appears to be marginally mispriced after controlling for accruals and artificial growth mispricing (β_8 coefficient on SG_RANK = -0.052), but part of this may be due to our inability to properly measure the artificial asset growth related to private targets, which ends up being part of the SG measure (see footnote 5).

[Insert Table 10 Here]

Collectively, the results reported in this section suggest that accruals mispricing persists after controlling for nominal asset growth mispricing and overvaluation. Moreover, artificial asset growth

mispricing is a dominant component of nominal growth mispricing. Our results indicate that the growth explanation for the accrual anomaly is, at least in part, attributable to failing to control for the artificial component of nominal growth. Our results cast doubt on the argument that the agency theory of overvalued equity explains the accrual anomaly.

7. Conclusion and Suggestions for Future Research

The objective of this paper is to assess the magnitude and pervasiveness of merger-related transitory growth distortion on nominal asset growth rates and its implication for the asset growth anomaly and the accrual anomaly. Our results reveal that the magnitude of artificial asset growth and total markup growth is substantial among firms that engage in M&As, and that the proportion of firm-years that are affected by merger-related transitory growth distortion is nontrivial.

Using our larger INITIAL sample of firm-years, we find the persistence of nominal asset growth is significantly lower for M&A firm-years than for non-M&A firms years and we find that nominal asset growth is mispriced for both M&A and non-M&A firm-years. To assess the impact of merger-related transitory growth on growth mispricing, we re-examine the asset growth pricing anomaly documented in Cooper et al. [2008] using a representative reduced sample of firm-years for which we can obtain sufficient data to decompose nominal asset growth into artificial asset growth, total markup growth and systemic or organic growth components. We find that artificial asset growth is negatively associated with future realized returns after controlling for size, BM, momentum and price reversal effects. Further tests show that the market attaches an incremental premium to artificial growth relative to systemic or organic growth, which suggests that the market is fooled by merger-related transitory growth. Thus, when artificial asset growth vanishes, as it inevitably will, expectations are revised downward leading to negative future abnormal returns. This is a quite different explanation from the diminishing marginal returns to additional investment that has been offered in prior studies to explain the growth mispricing phenomenon (Fairfield et al. [2003]; Dechow et al. [2008]).

We also investigate the implications of merger-related transitory growth for the tests of competing explanations for the accruals anomaly: the growth explanation and the overvaluation explanation. We find that accrual mispricing persists after controlling for the separate effects of artificial and constant entity growth mispricing and for the effects of overvaluation on future returns. Further, we show that artificial asset growth mispricing is the dominant component of nominal asset growth mispricing.

The dominate role that growth measures play in other streams of accounting and finance research suggests several avenues for future research. Prior research shows that analyst forecasts are optimistically biased (Lim [1998]; Richardson et al. [1999]; Easterwood and Nutt [1999]). This naturally raises the question of whether analysts properly adjust for merger-related transitory components of growth in forming future long-term revenue and profit forecasts. Barth, Elliott and Finn [1999] and Myers, Myers and Skinner [2007] show that the market rewards firms with sustained patterns of earnings growth. The role that artificial growth plays in these findings poses an interesting avenue for future research. Another body of literature focuses on executive compensation. Prior research by Murphy [1985] and Coughlan and Schmidt [1985] documents a strong positive association between executive compensation and sales growth. Future research could examine whether board of directors adjust for artificial components of sales growth when making CEO compensation decisions. Finally, prior research (Francis et al. [2005]; Liu and Wysocki [2006]) documents a strong positive association between accrual noise from the Dechow and Dichev [2002] model and firm growth. Prior studies (Francis et al. [2004]; Core et al. [2008]; Kim and Qi [2010]) also examine the association between the cost of equity capital and accrual quality and provide mixed evidence. As we have shown in this paper, M&A activities can severely distort firm growth measures as well as the lead-lag relation between accruals and cash flows from operations producing upward biased estimates of standard deviations of abnormal accruals in a Dechow and Dichev [2002] framework. Thus, the role of artificial growth on tests of accrual quality deserves further attention.

Appendix I

Example of Pro-Forma M&A Disclosures
Avery Dennison Acquisition of Paxar in 2007

Pro Forma Results of Operations

The following table represents the unaudited pro forma results of operations for the Company as though the acquisition of Paxar had occurred at the beginning of 2006. The pro forma results include estimated interest expense associated with commercial paper borrowings to fund the acquisition; amortization of intangible assets that have been acquired; adjustment to income tax provision using the worldwide combined effective tax rates of both the Company and Paxar; elimination of intercompany sales and profit in inventory; fair value adjustments to inventory; and additional depreciation resulting from fair value amounts allocated to real and personal property over the estimated useful lives. The pro forma results of operations have been prepared based on the preliminary allocation of the purchase price and are expected to be adjusted as a result of the finalization of the purchase price allocation. This pro forma information is for comparison purposes only, and is not necessarily indicative of the results that would have occurred had the acquisition been completed at the beginning of 2006, nor is it necessarily indicative of future results.

(In millions, except per share amounts)	**2007**[1]	**2006**[2]
Net sales	$6,722.3	$6,442.1
Net income from continuing operations	278.9	333.1
Net income per common share from continuing operations	2.84	3.34
Net income per common share from continuing operations, assuming dilution	2.82	3.31

(1) The pro forma results of operations for fiscal year 2007 include the Company's restructuring costs and other charges discussed in Note 12, "Segment Information."

(2) The pro forma results of operations for fiscal year 2006 include the impact of Paxar's gain on a lawsuit settlement of $39.4, partially offset by restructuring costs and other charges of $10, as well as the Company's restructuring costs and other charges discussed in Note 12, "Segment Information."

Prior to the acquisition, the Company sold certain roll materials products to Paxar. The Company's net sales to Paxar prior to the acquisition were approximately $8 million and approximately $15 million during 2007 and 2006, respectively.

Appendix II

In this appendix, we illustrate how the purchase method of accounting distorts growth rates measured as year-to-year changes in adjacent-year items reported in the consolidated financial statements and how mergers and acquisitions distort accruals estimated from the balance sheet. We consider Avery Dennison, a manufacturer and distributor of pressure sensitive adhesive materials and office and consumer products. On June 15, 2007, Avery Dennison acquired a 100% interest in Paxar Corporation for $1.3 billion in cash. The acquisition was accounted for under the purchase method of accounting.

First, we estimate growth rates in total assets reported in Avery Dennison's consolidated balance sheets. Panel A in Exhibit 1 presents Avery Dennison's year-to-year nominal growth in total assets as reported on Compustat (Acronym: AT). As shown, the computed nominal growth rate in total assets (which we refer to as *NAG*) from 2006 to 2007 is 45.4%. This total asset growth rate is upward biased because Avery Dennison's 2007 end-of-year total assets ($6,245 million) include Paxar's total assets, whereas Avery Dennison's 2006 end-of-year total assets reported on Compustat ($4,294 million) excludes Paxar's assets. To compute the constant entity growth rate in total assets (which we refer to as *CEG*) for the combined entity (Avery Dennison + Paxar), the 2006 number needs to be adjusted. Using the procedures outlined in Section 2.2 of the paper, we add Paxar's 2006 end-of-year total assets obtained from Securities Data Corporation (SDC) M&A data base ($771 million) to Avery Dennison's 2006 end-of-year total assets ($4,294 million) and compute the constant entity growth rate in total assets for 2007 (in millions) $6,245 ÷ ($4,294 + $771) - 1 = 23.3% as shown in Panel B. We characterize the difference between NAG and CEG as artificial asset growth (AAG), which is 22.1% as shown in Panel C. Thus, the nominal growth rate in total assets or other asset-based growth measures, which are the growth rates used in virtually all tests of asset growth mispricing (e.g., Cooper et al. [2008]), is nearly twice as large as the constant entity growth rate of the combined entity (45.4% / 23.3% = 1.95).

Next we decompose the constant entity growth (CEG) for Avery Dennison in 2007 into total markup growth (TMG) and systemic or organic growth (SG). To determine the total markup of Paxar's assets, we subtract Paxar's total net asset (assets - liabilities) from the total deal value reported by SDC

and then divide this markup by the combined assets of Avery Dennison and Paxar in 2006. The computations are shown in Panel D and result in total markup growth (TMG) of 15.5%.

Computation of systemic or organic growth (SG) is reported in Panel E. First we subtract the total markup of Paxar's assets from consolidated total assets at the end of 2007. This removes the step-up in basis of Paxar's assets and the recognized goodwill from the consolidated total asset amounts. We divide this difference ($5,462 million) by the combined book value of Avery Dennison and Paxar's assets at the end of 2006 ($5,065). The systemic growth (SG) in total assets compared to the prior year is 7.8% as shown at the bottom of Panel E. Note that NAG = AAG + TMG + SG = 22.1% + 15.5% + 7.8% = 45.4%. Thus, nearly 83% [(22.1% + 15.5%)/45.5%] of Avery Dennison's nominal asset growth from 2006 to 2007 is made up of AAG and TMG, which are highly transitory growth components.

Next, we compute Avery Dennison's nominal sales (operating revenue) growth (NSG) from its consolidated income statements from 2006 to 2008. Panel F in Exhibit 1, computed from Compustat (Acronym: SALE), shows a nominal growth rate in sales from 2006 to 2007 of 13.1% and from 2007 to 2008 of 6.4%. These sales growth rates are upward biased because, under purchase method of accounting, Avery Dennison's 2006 sales ($5,576 million) do not include any of Paxar's sales, Avery Dennison's 2007 sales ($6,308 million) include Paxar's sales from June 15 to December 31, 2007 (Avery Dennison's fiscal year end), and Avery Dennison's 2008 sales ($6,710 million) incorporate Paxar's sales for the full year. The existing disclosure rules require acquiring firms to provide pro-form note disclosures for key financial statement items (generally revenues and profits) as if the acquisition had occurred the first day of the year before acquisition. Using these pro-forma numbers, the constant entity sales growth (CESG) rates are reported in Panel G and are 4.3% for 2007 and -0.2% for 2008. Thus, the artificial sales growth (difference between NSG and CESG) is 8.8% in 2007 and 6.6% in 2008. The nominal sales growth in 2007 (13.1%) based on Avery Dennison's consolidated income statement data is roughly three times greater than the constant entity growth rate in 2007 for Avery Dennison + Paxar as a combined entity (4.3%). Interestingly, the constant entity growth rate in 2008 for Avery Dennison + Paxar as a combined

entity is negative 0.2%, whereas the nominal sales growth based on Avery Dennison's consolidated income statement data is positive 6.4% for 2008.[28]

Finally, we illustrate how Avery Dennison's acquisition of Paxar induces an upward bias in 2007 accruals estimated from successive balance sheets in 2006 and 2007. We estimate Avery Dennison's accruals both from the balance sheet and from the cash flow statement and display the results in Panel I of Exhibit 1. The definitions are as follows:

- ACCBS = [Δ in current assets (Compustat Acronym: ACT) – Δ in cash/cash equivalents (Compustat Acronym: CHE)] – [Δ in current liabilities (Compustat Acronym: LCT) - Δ in debt included in current liabilities (Compustat Acronym: DLC) - Δ in income tax payable (Compustat Acronym: TXP)] – depreciation and amortization expense (Compustat Acronym: DP)
- ACCCF = − [decrease (increase) in account receivable (Compustat Acronym: RECCH) + decrease (increase) in inventory (Compustat Acronym: INVCH) + increase (decrease) in account payable (Compustat Acronym: APALCH) + the net change in other current asset (Compustat Acronym: AOLOCH) + depreciation expense (Compustat Acronym: DPC)].[29]

As expected, the difference between balance sheet and cash flow accrual estimates as a percentage of the beginning-of-year total assets is much higher for 2007 (4.94 percent) than for 2006 (0.48 percent) and 2008 (-1.70 percent). This indicates that measuring Avery Dennison's 2007 accruals as the change in working capital accounts from two successive balance sheets results in significantly upward biased accrual estimates in the year of a merger or acquisition (see Hribar and Collins [2002]).

[28] In 2008 annual report, Avery Dennison acknowledges that "Net sales were $6.71 billion, compared to $6.31 billion in 2007, an increase primarily attributable to *acquisitions* and currency translation." [emphasis added]
[29] All items come from the operating section of the cash flow statement.

Exhibit 1, Appendix
Avery Dennison Consolidated Financial Data

Panel A: Nominal Asset Growth (NAG)

($ in millions)	2008	2007	2006	2005
Total Assets as reported on Compustat	$6,036	$6,245	$4,294	$4,204
Nominal growth in total assets compared to prior year	-3.3%	**45.4%**	2.1%	

Panel B: Constant Entity Growth (CEG)

($ in millions)	2008	2007	2006	2005
Total Assets as reported on Compustat	$6,036	$6,245	$4,294	$4,204
Paxar's total assets from SDC			$771	
Adjusted total assets of the combined entity in 2006			$5,065	
Constant entity growth (CEG) in total assets compared to prior year	-3.3%	**23.3%**	2.1%	

Panel C: Artificial Asset Growth (AAG) = NAG – CEG **22.1%**

Panel D: Total Markup Growth (TMG)

($ in millions)	2008	2007	2006	2005
Deal Value		$1,333		
Less: Paxar's total net assets (assets – liabilities) at acquisition		($550)		
Total markup of Paxar's assets on Avery Dennison books		$783		
Adjusted total assets of the combined entity in 2006			$5,065	
Total markup growth (TMG) compared to prior year		**15.5%**		

Panel E: Systemic (Organic) Growth (SG)

($ in millions)	2008	2007	2006	2005
Total Assets as reported on Compustat	$6,036	$6,245	$4,294	$4,204
Less: Deal Value – net assets of Paxar ($1,333 - $ 550)		($783)		
		$5,462		
Add: Paxar's total assets from SDC			$771	
Adjusted total assets of the combined entity in 2006			$5,065	
Systemic growth (SG) in total assets compared to prior year		**7.8%**		

NOTE: NAG = AAG + TMG + SG = 22.1% + 15.5% + 7.8% = 45.4%

Panel F: Nominal Sales Growth (NSG)

($ in millions)	2008	2007	2006	2005
Operating revenues as reported on Compustat	$6,710	$6,308	$5,576	$5,474
Nominal growth in operating revenues compared to prior year	**6.4%**	**13.1%**	1.9%	

Panel G: Constant Entity Sales Growth (CESG)

($ in millions)	2008	2007	2006	2005
Total revenues from consolidated statements	$6,710			
Total revenue from Avery Dennison's pro forma disclosure (Avery Dennison + Paxar)		$6,722	$6,442	
Real growth in operating revenues compared to prior year	**-0.2%**	**4.3%**		

Panel H: Artificial Sales Growth (ASG) = NSG – CESG = **6.6%** **8.8%**

Panel I: Comparison of accruals under the balance sheet and cash flow statement methods

($ in millions)	2008	2007	2006	2005
ACCBS (1)	-$397	$35	-$111	-$144
ACCCF (2)	-$291	-$177	-$132	-$127
(1) – (2)	-$106	$212	$21	-$16
Difference in Accruals relative to the-beginning-of-year total assets	-1.70%	**4.94%**	0.48%	

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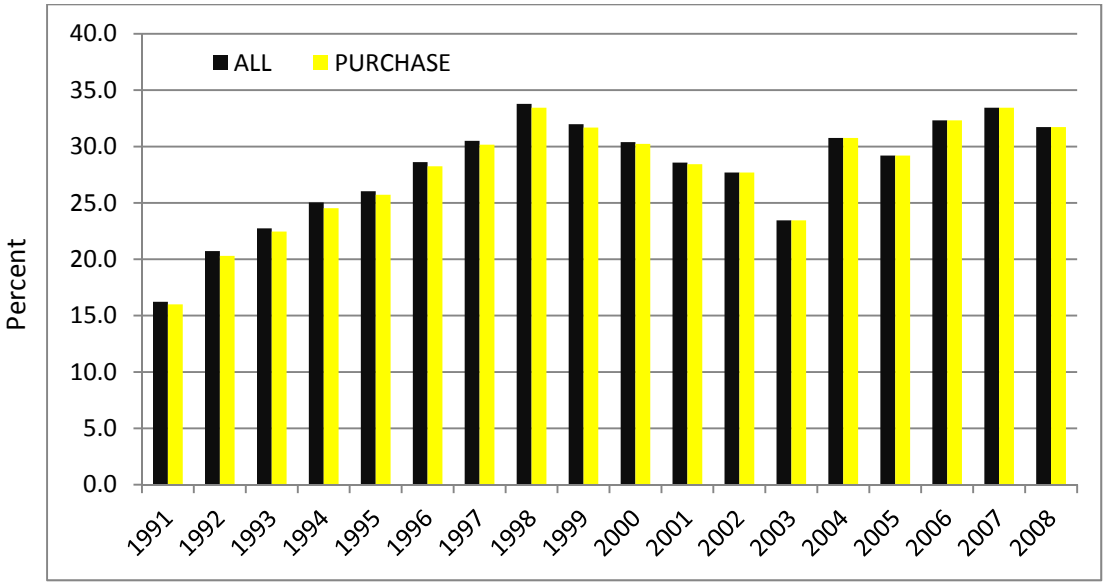
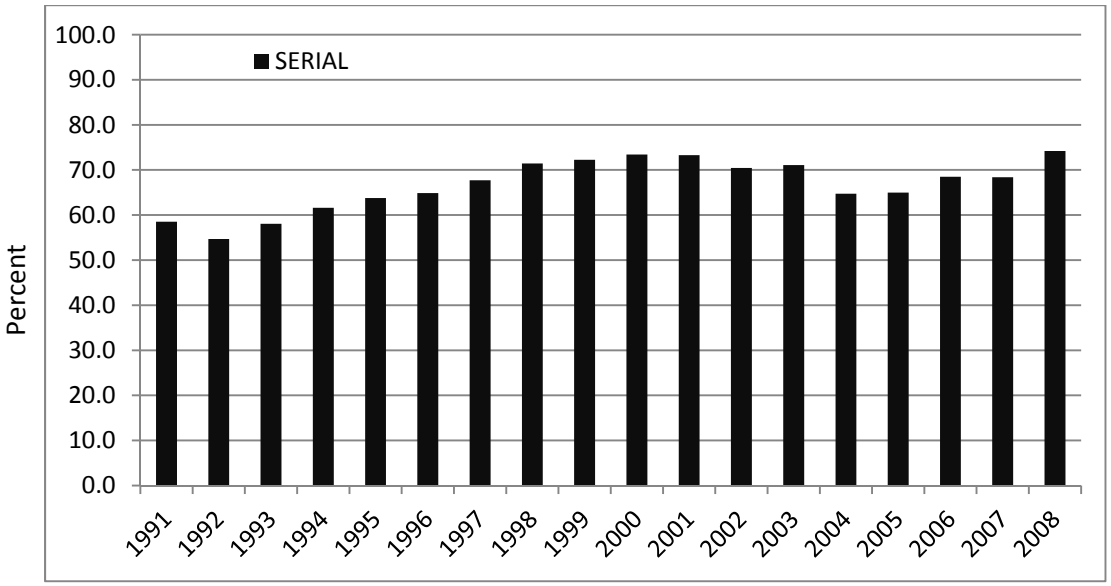
Figure 1: Percentage of M&A firm-years



This figure presents the percentage of firms that engage in M&A, where a parent company acquired more than 50 percent of the shares of a subsidiary and firms that account for M&A under the purchase method of accounting. ALL represents M&A and PURCHASE represents M&A that are accounted for under the purchase method.

Figure 2: Percentage of serial acquirers



This figure presents the percentage of serial acquirers relative to M&A accounted for under the purchase method. SERIAL represents serial acquirers that are defined as those firms that engage in at least one M&A over the previous two years, given that the firms engage in M&A in year t.

Table 1

Sample Construction

	Number of firm-years
Step 1: The intersection of Compustat and CRSP firm-years having necessary data to compute one-year nominal asset growth rates, two-year contemporaneous and one-year-ahead size-adjusted returns, and sufficient data to estimate accruals from the balance sheet and the statement of cash flows—[INITIAL sample]	61,771
Step 2: Of 61,771 firm-years in Step 1, we identify firms from the SDC M&A data base and Mergerstat that engaged in acquisitions that satisfy the following conditions: (1) acquisition was accounted for under the purchase method of accounting; and (2) the parent company (acquirer) acquired more than 50 percent of the outstanding shares of a subsidiary—[M&A INITIAL sample]	(17,368)
Step 3: Of 61,771 firm-years in Step 1, firm-years in which a firm does not engage in acquisitions—[non-M&A INITIAL sample]	44,403
Step 4: Of 17,368 M&A firm-years in Step 2, firm-years for which SDC provides target information about total assets and net assets—[M&A FINAL sample]	2,692
Step 5: Of 44,403 non-M&A firm-years identified in Step 3, firm-years that are randomly selected to form a representative sample of firm-years that mirrors the composition of samples in studies that test for growth mispricing—[non-M&A FINAL sample]	(6,882)
FINAL sample = Step 4 + Step 5	9,574

Table 2

Descriptive Statistics on Asset Growth Measures—M&A Sample

Panel A: Descriptive statistics on asset growth measures

	N	Mean	Std. Dev	1Q	Median	3Q
NAG	2692	0.569	0.728	0.115	0.334	0.744
CEG	2692	0.234	0.423	0.008	0.143	0.336
TMG	2692	0.212	0.309	0.029	0.115	0.268
SG	2692	0.034	0.345	-0.131	0.013	0.138
AAG	2692	0.351	0.550	0.043	0.149	0.411
(AAG+TMG)/NAG	2692	0.866	2.310	0.397	0.855	1.188

Panel B: The medians of asset growth measures by year from 1991 to 2008

	1991	1992	1993	1994	1995	1996
N	66	104	159	163	104	104
NAG	0.275	0.361	0.298	0.451	0.339	0.398
CEG	0.051	0.095	0.119	0.193	0.146	0.176
TMG	0.097	0.079	0.083	0.128	0.078	0.109
SG	-0.013	0.002	0.026	0.046	0.043	0.024
AAG	0.193	0.205	0.183	0.189	0.181	0.187
(AAG+TMG)/NAG	0.928	0.906	0.833	0.841	0.786	0.796
	1997	1998	1999	2000	2001	2002
N	133	183	180	186	166	125
NAG	0.394	0.389	0.443	0.359	0.252	0.276
CEG	0.176	0.173	0.187	0.175	0.100	0.102
TMG	0.140	0.134	0.133	0.120	0.102	0.080
SG	0.036	0.041	0.008	0.001	-0.019	-0.018
AAG	0.164	0.174	0.224	0.155	0.111	0.146
(AAG+TMG)/NAG	0.793	0.840	0.925	0.835	0.811	0.733
	2003	2004	2005	2006	2007	2008
N	145	146	156	200	203	169
NAG	0.283	0.341	0.251	0.348	0.335	0.115
CEG	0.160	0.131	0.120	0.185	0.179	0.054
TMG	0.073	0.103	0.120	0.168	0.148	0.118
SG	0.052	0.023	-0.041	0.022	0.033	-0.052
AAG	0.155	0.120	0.101	0.126	0.112	0.048
(AAG+TMG)/NAG	0.797	0.845	0.946	0.892	0.880	0.865

Panel A presents descriptive statistics on asset growth measures for 2,692 M&A firm-years. Panel B presents the medians of asset growth measures for each year from 1991 to 2008. Variable definitions are as follows: NAG is nominal asset growth; CEG is constant entity growth; TMG is total markup growth; SG is systemic (organic) growth; AAG is artificial asset growth.

Table 3

Descriptive Statistics on the INITAL and the FINAL Sample

Panel A: The INITIAL sample

	N	Mean	Std. Dev	1Q	Median	3Q
NAG	61,771	0.148	0.417	-0.036	0.061	0.199
non-M&A	44,403	0.090	0.360	-0.059	0.036	0.147
M&A	17,368	0.296	0.506	0.033	0.145	0.362
ACCBS	61,771	-0.040	0.099	-0.085	-0.042	0.000
non-M&A	44,403	-0.045	0.096	-0.089	-0.044	-0.004
M&A	17,368	-0.026	0.104	-0.076	-0.034	0.011
ACCCF	61,771	-0.041	0.088	-0.082	-0.041	-0.002
non-M&A	44,403	-0.026	0.104	-0.076	-0.034	0.011
M&A	17,368	-0.037	0.087	-0.077	-0.039	-0.001
SAR (-1, 0)	61,771	-0.031	0.968	-0.589	-0.236	0.217
non-M&A	44,403	-0.023	0.980	-0.587	-0.237	0.223
M&A	17,368	-0.051	0.939	-0.592	-0.235	0.199
SAR (+1)	61,771	-0.008	0.610	-0.360	-0.081	0.214
non-M&A	44,403	-0.003	0.636	-0.371	-0.086	0.222
M&A	17,368	-0.020	0.538	-0.332	-0.070	0.194

Panel B: The FINAL sample

	N	Mean	Std. Dev	1Q	Median	3Q
NAG	9,574	0.229***	0.552	-0.029	0.079***	0.282
non-M&A	6,882	0.096	0.392	-0.060	0.035	0.150
M&A	2,692	0.569***	0.728	0.115	0.334***	0.744
CEG	9,574	0.130	0.375	-0.044	0.057	0.200
non-M&A	6,882	0.089	0.345	-0.060	0.035	0.150
M&A	2,692	0.234	0.423	0.008	0.143	0.336
TMG	9,574	0.060	0.189	0.000	0.000	0.000
non-M&A	6,882	0.000	0.000	0.000	0.000	0.000
M&A	2,692	0.212	0.309	0.029	0.115	0.268
SG	9,574	0.071	0.338	-0.076	0.029	0.147
non-M&A	6,882	0.086	0.334	-0.060	0.035	0.150
M&A	2,692	0.034	0.345	-0.131	0.013	0.138
AAG	9,574	0.099	0.332	0.000	0.000	0.013
non-M&A	6,882	0.000	0.000	0.000	0.000	0.000
M&A	2,692	0.351	0.550	0.043	0.149	0.411
ACCBS	9,574	-0.037**	0.107	-0.086	-0.040	0.003
non-M&A	6,882	-0.043	0.100	-0.088	-0.043	-0.003
M&A	2,692	-0.023	0.124	-0.080	-0.033	0.021
ACCCF	9,574	-0.041	0.092	-0.083	-0.041	-0.002
non-M&A	6,882	-0.041	0.091	-0.084	-0.040	-0.002
M&A	2,692	-0.042**	0.094	-0.082	-0.042**	-0.003
SAR (-1, 0)	9,574	-0.039	0.963	-0.600	-0.245	0.210
non-M&A	6,882	-0.025	0.983	-0.592	-0.244	0.216
M&A	2,692	-0.073	0.909	-0.616	-0.248	0.188

Table 3, continued--

SAR (+1)	9,574	-0.018	0.591	-0.372	-0.084	0.214
non-M&A	6,882	-0.008	0.622	-0.381	-0.085	0.230
M&A	2,692	-0.042*	0.502	-0.347	-0.082	0.176

***, **, * indicate significant differences between the INITIAL sample and the FINAL sample at the 0.01, 0.05, and 0.10 level (two tailed). Differences in the means and medians are assessed using a t-test and Wilcoxon rank sum test, respectively.

Panel A presents descriptive statistics for the INITIAL sample. Panel B presents descriptive statistics for the FINAL sample. Variable definitions are as follows: NAG is nominal asset growth; CEG is constant entity growth; TMG is total markup growth; SG is systemic (organic) growth; AAG is artificial asset growth; ACCBS is the accruals that are computed from the balance sheets; ACCCF is the accruals that are computed from the statement of cash flows; SAR (-1,0) is a two-year buy-and-hold size-adjusted return computed by subtracting the corresponding average size portfolio returns from a firm's buy-and-hold raw returns, where the return measurement window is from the eighth month before the beginning of a firm's fiscal year t to the fourth month after a firm's year t fiscal year-end; SAR (+1) is a one-year-ahead buy-and-hold size-adjusted return computed by subtracting the corresponding average size portfolio returns from a firm's buy-and-hold raw returns, where the return measurement window begins from the fifth month after a firm's fiscal year t year-end.

Table 4

Medians of Asset Growth Measures for Deciles Formed on NAG in the FINAL Sample (N=9,574)

Decile	M&A	N	Weight	NAG	AAG	CEG	TMG	SG
1	Yes	79	0.08	-0.238	0.040	-0.320	0.052	-0.436
	No	878	0.92	-0.266	--	-0.266	--	-0.266
2	Yes	91	0.10	-0.102	0.027	-0.143	0.027	-0.192
	No	866	0.90	-0.100	--	-0.100	--	-0.100
3	Yes	85	0.09	-0.029	0.033	-0.062	0.029	-0.117
	No	873	0.91	-0.029	--	-0.029	--	-0.029
4	Yes	114	0.12	0.019	0.040	-0.026	0.037	-0.079
	No	843	0.88	0.015	--	0.015	--	0.015
5	Yes	159	0.17	0.060	0.031	0.025	0.032	-0.021
	No	799	0.83	0.056	--	0.056	--	0.056
6	Yes	215	0.22	0.106	0.046	0.056	0.041	0.007
	No	742	0.78	0.104	--	0.104	--	0.104
7	Yes	273	0.28	0.174	0.058	0.113	0.062	0.027
	No	685	0.72	0.169	--	0.169	--	0.169
8	Yes	434	0.45	0.288	0.117	0.172	0.092	0.048
	No	523	0.55	0.277	--	0.277	--	0.277
9	Yes	573	0.60	0.529	0.259	0.255	0.171	0.056
	No	385	0.40	0.482	--	0.482	--	0.482
10	Yes	669	0.70	1.285	0.718	0.572	0.355	0.119
	No	288	0.30	1.240	--	1.240	--	1.240

This table presents the relative proportion of M&A and non-M&A firm-years for decile ranks formed on nominal asset growth (NAG) along with median values for AAG, CEG, TMG and SG for each NAG decile. Variable definitions are as follows: NAG is nominal asset growth; AAG is artificial asset growth; CEG is constant entity growth; TMG is total markup growth; SG is systemic (organic) growth.

Table 5

Panel A: Correlation matrix (Pearson (Spearman) correlations above (below) the diagonal) for the FINAL sample (N=9,574)

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	NAG		**0.691**	**0.854**	**0.556**	**0.626**	**0.188**	**-0.066**	**0.145**	**0.045**	**-0.173**	**0.038**	**-0.040**	**0.263**
2	AAG	**0.492**		**0.258**	**0.587**	**-0.024**	**0.029**	**-0.048**	**0.076**	**-0.037**	**-0.044**	0.018	-0.007	**0.080**
3	CEG	**0.913**	**0.236**		**0.374**	**0.878**	**0.243**	**-0.053**	**0.151**	**0.103**	**-0.212**	**0.042**	**-0.050**	**0.312**
4	TMG	**0.427**	**0.817**	**0.295**		**-0.083**	**0.022**	**-0.029**	-0.005	**-0.059**	**-0.094**	**0.050**	**-0.048**	**0.091**
5	SG	**0.715**	**-0.085**	**0.864**	**-0.069**		**0.260**	**-0.044**	**0.165**	**0.138**	**-0.187**	**0.021**	**-0.028**	**0.297**
6	SAR (-1,0)	**0.207**	-0.007	**0.233**	-0.002	**0.241**		**-0.040**	**0.094**	**0.094**	**-0.165**	**-0.024**	**0.371**	**0.651**
7	SAR (+1)	-0.019	-0.009	-0.014	-0.006	-0.007	**-0.022**		**-0.027**	**-0.024**	**0.058**	0.001	0.008	-0.020
8	ACCBS	**0.220**	**0.080**	**0.211**	**0.065**	**0.199**	**0.072**	**-0.023**		**0.720**	**-0.067**	**-0.034**	**-0.029**	**0.118**
9	ACCCF	**0.105**	-0.010	**0.130**	0.000	**0.152**	**0.069**	-0.020	**0.733**		**-0.050**	**-0.035**	**-0.037**	**0.109**
10	BM	**-0.262**	**-0.102**	**-0.279**	**-0.135**	**-0.235**	**-0.185**	**0.042**	**-0.051**	**-0.026**		**-0.155**	0.005	**-0.310**
11	MVAL	**0.286**	**0.313**	**0.267**	**0.297**	**0.184**	**-0.023**	**0.122**	**0.026**	-0.002	**-0.383**		-0.013	**0.055**
12	BHRET6	-0.013	-0.011	-0.011	-0.019	0.003	**0.365**	**0.055**	**-0.028**	**-0.039**	-0.018	**0.077**		**0.285**
13	BHRET36	**0.386**	**0.123**	**0.401**	**0.122**	**0.369**	**0.573**	**0.041**	**0.120**	**0.095**	**-0.389**	**0.331**	**0.342**	

Panel B: Correlation matrix (Pearson (Spearman) correlations above (below) the diagonal) for M&A firm-years of the FINAL sample (N=2,692)

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	NAG		**0.826**	**0.775**	**0.600**	**0.432**	**0.191**	**-0.125**	**0.062**	**-0.038**	**-0.041**	**-0.104**	-0.037	**0.227**
2	AAG	**0.730**		**0.332**	**0.457**	**0.019**	**0.091**	**-0.091**	**0.068**	**-0.074**	**0.068**	**-0.130**	0.025	**0.083**
3	CEG	**0.776**	**0.257**		**0.553**	**0.728**	**0.222**	**-0.110**	0.018	0.030	**-0.156**	-0.018	**-0.096**	**0.288**
4	TMG	**0.548**	**0.474**	**0.484**		**-0.102**	**0.077**	**-0.041**	**-0.089**	**-0.122**	**-0.074**	**-0.094**	**-0.074**	**0.103**
5	SG	**0.410**	**-0.090**	**0.694**	**-0.149**		**0.230**	**-0.108**	**0.084**	**0.114**	**-0.148**	**0.057**	**-0.050**	**0.273**
6	SAR (-1,0)	**0.189**	**0.063**	**0.217**	**0.056**	**0.210**		-0.033	**0.047**	**0.047**	-0.211	-0.017	0.373	0.674
7	SAR (+1)	**-0.125**	**-0.090**	**-0.091**	**-0.055**	**-0.063**	**-0.012**		-0.030	-0.023	0.127	0.014	0.061	-0.031
8	ACCBS	**0.097**	**0.078**	**0.068**	-0.012	**0.098**	**0.039**	-0.024		**0.649**	0.034	**-0.087**	-0.010	**0.048**
9	ACCCF	-0.026	**-0.076**	**0.040**	**-0.051**	**0.104**	**0.048**	-0.034	**0.634**		-0.007	**-0.049**	-0.029	**0.055**
10	BM	**-0.052**	**0.158**	**-0.198**	**-0.066**	**-0.187**	**-0.258**	0.035	**0.051**	-0.006		**-0.206**	**-0.057**	**-0.322**
11	MVAL	**-0.147**	**-0.339**	**0.061**	**-0.178**	**0.164**	-0.001	**0.144**	**-0.113**	**-0.063**	**-0.361**		0.008	**0.041**
12	BHRET6	-0.035	-0.004	**-0.039**	**-0.079**	0.002	**0.362**	**0.094**	-0.007	-0.022	**-0.083**	**0.091**		**0.297**
13	BHRET36	**0.251**	**0.067**	**0.322**	**0.067**	**0.300**	**0.610**	-0.005	**0.059**	**0.062**	**-0.413**	**0.190**	**0.346**	

Bold text indicates significance at the 0.05 level.

Table 5, continued –

Panel A and Panel B present a correlation matrix for the FINAL sample and M&A firm-years in the FINAL sample, respectively. Variable definitions are as follows: NAG is nominal asset growth; AAG is artificial asset growth; CEG is constant entity growth; TMG is total markup growth; SG is systemic (organic) growth; SAR (-1,0) is a two-year buy-and-hold size-adjusted return computed by subtracting the corresponding average size portfolio returns from a firm's buy-and-hold raw returns, where the return measurement window is from the eighth month before the beginning of a firm's fiscal year t to the fourth month after a firm's year t fiscal year-end; SAR (+1) is a one-year-ahead buy-and-hold size-adjusted return computed by subtracting the corresponding average size portfolio returns from a firm's buy-and-hold raw returns, where return measurement window begins from the fifth month after a firm's fiscal year t; ACCBS is the accruals that are computed from the balance sheets. ACCCF is the accruals that are computed from the statement of cash flows. BM is the ratio of the book value of equity to the market value of equity at the end of a firm's fiscal year t; MV is the market capitalization at the end of a firm's fiscal year t; BHRET6 is the buy-and-hold raw returns over six months before the fourth month after a firm's fiscal year-end t; BHRET36 is the buy-and-hold raw returns over thirty six months before the fourth month after a firm's fiscal year-end t.

Table 6

Tests of Persistence and Mispricing of NAG

Forecasting Equation:

$$NAG_{it+1} = \alpha_0 + \alpha_1 MA_{DUM(it)} + \alpha_2 NAG_{it} + \alpha_3 NAG_{it} x\ MA_{DUM(it)} + e_{it+1}$$

Pricing Equation:

$$SAR_{it+1} = \beta[NAG_{it+1} - (\alpha_0{*} + \alpha_1{*}MA_{DUM(it)} + \alpha_2{*}NAG_{it} + \alpha_3{*}NAG_{it} x\ MA_{DUM(it)}) + v_{it+1}$$

	(1) Forecasting	(2) Pricing
Intercept (α_0)	0.1117	-0.0210
t-statistics	*54.27*	*-1.33*
$MA_{DUM(t)}$ (α_1)	0.0166	0.1045
t-statistics	*3.93*	*3.34*
NAG (α_2)	0.1609	0.7083
t-statistics	*29.00*	*15.85*
NAG* $MA_{DUM(t)}$ (α_3)	-0.0564	-0.1827
t-statistics	*-6.74*	*-2.95*
<u>Forecasting = Pricing Tests</u>		
	$\boldsymbol{\alpha_2 = \alpha_2^*}$	
Likelihood ratio statistics	174.36	
p-value	<.0001	
	$\boldsymbol{\alpha_2 + \alpha_3 = \alpha_2^* + \alpha_3^*}$	
Likelihood ratio statistics	81.09	
p-value	<.0001	
	$\boldsymbol{\alpha_3 = \alpha_3^*}$	
Likelihood ratio statistics	4.08	
p-value	0.043	
N	52853	52853

This table presents the results of nonlinear generalized estimation of the stock price reaction to information in nominal asset growth. Variable definitions are as follows: $MA_{DUM(t)}$ =1 for years in which a firm engages in M&A activity, zero otherwise; NAG is nominal asset growth; SAR (+1) is a one-year-ahead buy-and-hold size-adjusted return computed by subtracting the corresponding average size portfolio returns from a firm's buy-and-hold raw returns, where the return measurement window begins from the fifth month after a firm's fiscal year t year-end.

Table 7

Fama-MacBeth Regressions of One-Year-Ahead Raw Stock Returns on Nominal Asset Growth and Control Variables

Panel A: Results reported in Cooper et al. [2008, Table III]

$$RET(+1) = \propto + \gamma_1 NAG_t + \gamma_2 BM_t + \gamma_3 MV_t + \gamma_4 BHRET6 + \gamma_5 BHRET36 + \varepsilon_{t+1}$$

Sample Period: 1968 ~ 2003

	Constant	NAG	BM	MV	BHRET6	BHRET36
Mean	0.1373	-0.0922	0.0290	-0.0044	0.0248	0.0056
t-statistic	4.55***	-6.52***	3.40***	-1.57*	1.09	0.57

Panel B: Replication of Cooper et al. [2008] for the FINAL sample

$$RET(+1) = \propto + \gamma_1 NAG_t + \gamma_2 BM_t + \gamma_3 MV_t + \gamma_4 BHRET6 + \gamma_5 BHRET36 + \varepsilon_{t+1}$$

Sample Period: 1991 ~ 2008

	Constant	NAG	BM	MV	BHRET6	BHRET36
Mean	0.0959	-0.0665	0.0686	0.0000	0.0140	-0.0172
t-statistic	1.91*	-3.49***	2.56***	0.59	0.44	-1.25

***, **, * indicate significance at the 0.01, 0.05, and 0.10 level, respectively (one-tailed (two-sided for intercept)).

Panel A presents the results in Cooper, Gulen, and Schill [2008, Table III]. Panel B presents the results of running the same test for our FINAL sample. The coefficients are averages of the annual regressions and t-statistics are based on the means and standard deviations of parameter estimates. Variable definitions are as follows: RET (+1) is the buy-and-hold raw returns over twelve months beginning the fifth month after a firm's fiscal year-end t; NAG is nominal asset growth for year t; BM is the ratio of the book value of equity to the market value of equity at the end of fiscal year t; MV is the market capitalization at the end of year t; BHRET6 is the buy-and-hold raw returns over six months before the fourth month after a firm's fiscal year-end t; BHRET36 is the buy-and-hold raw returns over thirty six months before the fourth month after a firm's fiscal year-end t.

Table 8

Fama-MacBeth Rank Regressions of One-Year-Ahead Raw Stock Returns on Asset Growth Measures and Controls

	Model 1	Model 2	Model 3
Intercept	0.106	0.095	0.094
t-statistics	*1.11*	*0.98*	*0.96*
$MA_{DUM(t)}$ (β_1)		-0.017	0.001
t-statistics		*-0.81*	*-0.73*
NAG_RANK_t (β_2)	-0.069		
t-statistics	*-1.99***		
SG_RANK_t (β_3)		-0.035	-0.032
t-statistics		*-1.31*	*-1.19*
$MA_{DUM(t)}$ * TMG_RANK_t (β_4)		0.006	0.014
t-statistics		*0.17*	*0.38*
$MA_{DUM(t)}$ * AAG_RANK_t (β_5)		-0.079	-0.070
t-statistics		*-1.98***	*-1.62**
$MA_{DUM(t)}$ * $MERGER_{DUM(t)}$ (β_6)			-0.019
t-statistics			*-0.66*
$MA_{DUM(t)}$ * $STK_{DUM(t)}$ (β_7)			-0.018
t-statistics			*-0.47*
BM_RANK_t (β_8)	0.125	0.133	0.135
t-statistics	*2.30***	*2.49***	*2.56***
MV_RANK_t (β_9)	0.014	0.027	0.026
t-statistics	*0.31*	*0.57*	*0.54*
BHRET6_RANK (β_{10})	0.051	0.051	0.048
t-statistics	*1.25*	*1.27*	*1.22*
BHRET36_RANK (β_{11})	-0.056	-0.058	-0.058
t-statistics	*-0.95*	*-1.02*	*-1.02*
Test of the Equality of coefficients (two-tailed *p*-value)			
$\beta_3 = \beta_4$		*0.373*	*0.314*
$\beta_3 = \beta_5$		*0.362*	*0.453*

***,**,* indicates significance at 1%, 5%, 10%, respectively (one-tailed (two-sided for intercept)).

Table 8, continued –

This table presents the results of estimating Fama-MacBeth rank regressions of one-year-ahead stock returns on various asset growth measures and a set of control variables. The coefficients are averages of the annual regressions and the t-statistics are based on the means and standard deviations of eighteen parameter estimates. Variable definitions are as follows: RET (+1) is the buy-and-hold raw returns over twelve months beginning the fifth month after a firm's fiscal year-end t; $MA_{DUM(t)}$ =1 for years in which a firm engages in M&A activity, zero otherwise; NAG_RANK is the scaled decile rank of nominal asset growth; CEG_RANK is the scaled decile rank of constant entity growth; SG_RANK is the scaled decile rank of systemic (organic) growth; TMG_RANK is the scaled decile rank of total markup growth; AAG_RANK is the scaled decile rank of artificial asset growth; $MERGER_{DUM(t)}$ = 1 if the acquisition is a merger, zero otherwise (if a firm engages in multiple acquisitions in year t, more than 50% of acquisitions are mergers); $STK_{DUM(t)}$ = 1 if the deal is 100% stock-financed, zero otherwise (if a firm engages in multiple acquisitions in year t, more than 50% of acquisitions are 100% stock-financed); BM_RANK is the scaled decile rank of the ratio of the book value of equity to the market value of equity at the end of year t; MV_RANK is the scaled decile rank of the market capitalization at the end of year t; BHRET6_RANK is the scaled decile rank of the buy-and-hold raw returns over six months before the fourth month after a firm's fiscal year-end t; BHRET36_RANK is the scaled decile rank of the buy-and-hold raw returns over thirty six months before the fourth month after a firm's fiscal-year-end t.

<u>Model 1</u>

$$RET(+1) = \alpha + \beta_2 NAG_RANK_t + \beta_8 BM_RANK_t + \beta_9 MV_RANK_t + \beta_{10} BHRET6_RANK_t + \beta_{11} BHRET36_RANK_t + \varepsilon_{t+1}$$

<u>Model 2</u>

$$RET(+1) = \alpha + \beta_1 MA_{DUM(t)} + \beta_3 SG_RANK_t + \beta_4 MA_{DUM(t)} * TMG_RANK_t + \beta_5 MA_{DUM(t)} * AAG_RANK_t + \beta_8 BM_RANK_t + \beta_9 MV_RANK_t + \beta_{10} BHRET6_RANK_t + \beta_{11} BHRET36_RANK_t + \varepsilon_{t+1}$$

<u>Model 3</u>

$$RET(+1) = \alpha + \beta_1 MA_{DUM(t)} + \beta_3 SG_RANK_t + \beta_4 MA_{DUM(t)} * TMG_RANK_t + \beta_5 MA_{DUM(t)} * AAG_RANK_t + \beta_6 MA_{DUM(t)} * MERGER_{DUM(t)} + \beta_7 MA_{DUM(t)} * STK_{DUM(t)} + \beta_8 BM_RANK_t + \beta_9 MV_RANK_t + \beta_{10} BHRET6_RANK_t + \beta_{11} BHRET36_RANK_t + \varepsilon_{t+1}$$

Table 9

Fama-MacBeth Rank Regressions of Contemporaneous Size-Adjusted Returns on AAG, TMG, and SG for 2,692 M&A firms

$$SAR(-1,0) = \propto + \beta_1 AAG_RANK_t + \beta_2 TMG_RANK_t + \beta_3 SG_RANK_t + \varepsilon_{(-1,0)}$$

	Constant	AAG_RANK (β_1)	TMG_RANK (β_2)	SG_RANK (β_3)
Mean	-0.623	0.300	0.214	0.667
t-statistic	-9.30***	4.05***	3.69***	11.65***

***,**,* indicates significance at 1%, 5%, 10%, respectively (one-tailed (two-sided for intercept)).

This table presents the results of estimating Fama-MacBeth rank regressions of contemporaneous size-adjusted returns on various components of nominal asset growth for 2,692 M&A firm-years in the FINAL sample. The coefficients are averages of the annual regressions and the t-statistics are based on the means and standard deviations of eighteen parameter estimates. Variable definitions are as follows: SAR (-1,0) is a two-year buy-and-hold size-adjusted return computed by subtracting the corresponding average size portfolio returns from a firm's buy-and-hold raw returns, where the return measurement window is from the eighth month before the beginning of a firm's fiscal year t to the fourth month after a firm's year t in which the merger/acquisition becomes effective through the fourth month after fiscal year-end in which the acquisition takes place; AAG_RANK is the scaled decile rank of artificial asset growth; TMG_RANK is the scaled decile rank of total markup growth; SG_RANK is the scaled decile rank of systemic (organic) growth.

Table 10
Fama-MacBeth Rank Regressions of One-Year-Ahead Size-Adjusted Returns on Accruals, Overvaluation, Asset Growth Measures, and a Set of Control Variables

$$SAR\ (+1) = \propto + \beta_1 ACCBS_RANK_t + \beta_2 NAG_RANK_t + \beta_3 OVAL_RANK_t + \beta_4 MA_{DUM(t)} + \beta_5 MA_{DUM(t)} * AAG_RANK_t + \beta_6 CEG_RANK_t + \beta_7 MA_{DUM(t)} * TMG_RANK_t + \beta_8 SG_RANK_t + \beta_9 BM_RANK_t + \varepsilon_{t+1}$$

Model		ACCBS_RANK	NAG_RANK	OVAL_RANK	$MA_{DUM(t)}$	$MA_{DUM(t)}$ * AAG_RANK	CEG_RANK	$MA_{DUM(t)}$* TMG_RANK	SG_RANK	BM_RANK
1	Mean	-0.054								0.171
	t-statistic	*-2.36***								*2.99****
2	Mean		-0.093							0.150
	t-statistic		*-2.92***							*2.59*****
3	Mean			-0.008						0.168
	t-statistic			*-0.15*						*3.38****
4	Mean	-0.035	-0.085							0.150
	t-statistic	*-2.13***	*-2.03***							*2.58****
5	Mean	-0.037			-0.003	-0.069	-0.060			0.151
	t-statistic	*-2.35***			*-0.20*	*-1.96***	*-1.58**			*2.63****
6	Mean	-0.040			0.000	-0.085		-0.011	-0.045	0.154
	t-statistic	*-2.41***			*-0.02*	*-2.31***		*-0.28*	*-1.22*	*2.73****
7	Mean	-0.039		0.006	-0.009	-0.068	-0.067			0.144
	t-statistic	*-2.47***		*0.11*	*-0.48*	*-1.84***	*-2.06***			*2.75****
8	Mean	-0.041		0.003	-0.006	-0.084		-0.014	-0.052	0.147
	t-statistic	*-2.51***		*0.06*	*-0.30*	*-2.14***		*-0.34*	*-1.66**	*2.87****

Table 10, continued –

***,**,* indicates significance at 1%, 5%, 10%, respectively (one-tailed).

This table presents the results of estimating Fama-MacBeth rank regressions of one-year-ahead size-adjusted returns on accruals, overvaluation, asset growth measures, and a set of control variables for the FINAL sample. The coefficients are averages of the annual regressions and the t-statistics are based on the means and standard deviations of eighteen parameter estimates. Variable definitions are as follows: SAR (+1) is a one-year-ahead buy-and-hold size-adjusted return computed by subtracting the corresponding size portfolio returns from a firm's buy-and-hold raw returns, where the return measurement window begins from the fifth month after a firm's fiscal year t year-end; ACCBS_RANK is the scaled decile rank of the accruals that are computed from the balance sheets; NAG_RANK is the scaled decile rank of nominal asset growth; OVAL_RANK is the scaled decile rank of contemporaneous SAR (-1,0), a two-year buy-and-hold size-adjusted return, computed by subtracting the average corresponding size portfolio returns from a firm's buy-and-hold raw returns, where the return measurement window starts eight months before the beginning of a firm's fiscal year t to the fourth month after a firm's year t; $MA_{DUM(t)}$ is an indicator variable that takes the value of one for years in which a firm engages in M&A activity, zero otherwise; AAG_RANK is the scaled decile rank of artificial asset growth; CEG_RANK is the scaled decile rank of constant entity growth; TMG_RANK is the scaled decile rank of total markup growth; SG_RANK is the scaled decile rank of systemic (organic) growth; BM_RANK is the scaled decile rank of the book-to-market ratio at the end of a firm's fiscal year t.