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Purchase Obligations, Earnings Persistence and Stock Returns

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Purchase Obligations, Earnings Persistence and Stock Returns

By

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Abstract

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This dissertation examines whether purchase obligations data disclosed in the MD&A section of 10-K filings are useful in predicting and understanding firm performance. The SEC defines a purchase obligation as an enforceable and legally binding agreement to purchase goods and services in the future. Consequently, by entering into purchase obligations, firms procure resources that will be used as production inputs, but they also have an obligation to make payments to their suppliers. Therefore, purchase obligations have aspects of both assets and liabilities.

When the SEC first introduced a rule requiring the disclosure of purchase obligations, the SEC's main concern was the liability aspect of purchase obligations. Thus, a firm's purchase obligations were viewed by the SEC as having a potential negative impact on the firm's future liquidity. However, the level of a firm's purchase obligations depends on the firm's degree of outsourcing, and the growth in a firm's purchase obligations indicates that the firm expects to use more production resources in the future period. Therefore, an alternative view is that an increase in purchase obligations leads to better future operating performance. Given these conflicting views, this dissertation examines the implications that annual change in a firm's purchase obligations has for its future operating performance.

The first essay provides background information on purchase obligations. We begin by explaining the details of the SEC rule which requires the disclosure of purchase obligations. Then, we describe data collection and sample formation procedure, and provide examples of contractual obligations disclosure. After that, we summarize the types and amount of purchase obligations reported by our sample firms. Also, we document the strong persistence over time in the amount of purchase obligations as well as the short-term nature of purchase obligations. Finally, we discuss the differences between purchase

obligations and on-balance-sheet assets, which lead to the main results of this work.

The second essay examines the implications of annual changes in purchase obligations for future operating performance and asset growth. We predict that firms enter into additional purchase obligations when they expect an increase in demand for their products. Consistent with this prediction, we find annual change in purchase obligation is positively associated with future sales and earnings. The results of DuPont analysis shows that annual change in purchase obligation is positively associated with future asset turnover, but it is insignificantly associated with future profit margin. Additionally, we find that annual change in purchase obligations is positively associated with both contemporaneous and future growth in on-balance-sheet assets, particularly fixed assets. These results suggest that the disclosure of purchase obligations provides useful information to investors in predicting future performance and identifying growth stage.

The last essay examines whether equity investors and analysts fully incorporate the information contained in the disclosure of purchase obligations. First, we find that annual change in purchase obligations is positively associated with both contemporaneous and future annual stock returns. This suggests that although investors appear to appreciate the value-relevance of the information in purchase obligations before 10-Ks are filed, they do not fully incorporate the resulting implications of the information in determining stock prices. Second, we find that analyst forecast errors are positively correlated with annual change in purchase obligations in the periods following the filing of a 10-K. This suggests that analysts fail to fully incorporate the information in purchase obligations when they forecast one-year-ahead earnings. This also suggests that the delayed stock price response to the information in purchase obligations can be at least partially explained by analysts' inability to fully incorporate the information.

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Chapter 1: Purchase Obligations Data

This thesis is the first rigorous academic research that investigates the implications of annual change in a firm's purchase obligations for the firm's future operating performance and asset growth. Thus, we devote this chapter to providing background information on purchase obligations because purchase obligations have never been investigated in the academic literature. In Section 1.1, we discuss the details of the SEC rule that requires the disclosure of purchase obligations. In Sections 1.2 and 1.3, we describe the data collection and sample formation procedures, and show the examples of contractual obligations disclosure. In Section 1.4, we present the types of purchase obligations reported by leading firms in each industry. In Section 1.5, we summarize the amount of purchase obligations by industry and year. In Section 1.6, we present the portion of purchase obligations due by each period in the future. In Section 1.7, we document the strong persistence over time in the amount of a firm's purchase obligations. Finally, in Section 1.8, we discuss the differences between purchase obligations and on-balance-sheet assets.

1.1 Disclosure of Purchase Obligations

On July 30, 2002, the Sarbanes-Oxley Act of 2002 was enacted. Section 401(a) of the Sarbanes-Oxley Act, entitled "Disclosures in Periodic Reports," added Section 13(j) to the Securities Exchange Act of 1934. The new section of the Securities Exchange Act of 1934 directed the Securities and Exchange Commission (SEC) to adopt final rules to require disclosure of all material off-balance-sheet activities within 180 days after the date of enactment. On January 28, 2003, the SEC issued a final rule to implement Section 13(j) of the Securities Exchange Act of 1934 and required registrants to provide an explanation of their off-balance-sheet arrangements in the Management's Discussion and Analysis (MD&A) section of their 10-K filing.[1]

In addition to the disclosure of off-balance-sheet arrangements which was specifically directed by Section 13(j) of the Securities Exchange Act of 1934, the final SEC rule imposed another disclosure requirement on registrants - tabular disclosure of their known contractual obligations in the MD&A section of their 10-K filings. The SEC mandated the disclosure of contractual obligations because the Commission reasoned that disclosure of aggregate information about a registrant's contractual obligations in a single location will provide useful context for investors to assess the registrant's short- and long-term liquidity and capital resource needs and demands.

With respect to the disclosure of contractual obligations, the SEC rule requires registrants to report four major categories of contractual obligations - long-term debt

[1] The complete text of this rule can be found at http://sec.gov/rules/final/33-8182.htm.

obligations, capital lease obligation, operating lease obligations and purchase obligations. Because U.S. GAAP had already required registrants to aggregate and assess the first three categories of contractual obligations, they were defined by reference to the relevant U.S. GAAP accounting pronouncements and had been disclosed in 10-K filings since the 1980s. Therefore, the additional information that registrants are required to disclose under the new SEC rule is purchase obligations - the amount and timing of payments under purchase obligations due in future periods.

The SEC defines a purchase obligation as an agreement to purchase goods or services that is enforceable and legally binding on the registrant and that specifies all significant terms regarding quantities, price and approximate timing of transaction. This definition indicates that purchase obligations are executory contracts where neither party to the contract has yet performed its duties, and therefore are not recognized as liabilities in accordance with U.S. GAAP.[2] Nonetheless, the new rule mandated disclosure of purchase obligations because the SEC reasoned that purchase obligations might have a significant effect on the registrant's future liquidity.

The disclosure of contractual obligations is required for 10-K filings for fiscal years ending on or after December 15, 2003, and registrants are required to use the tabular format in Figure 1.1 when they disclose contractual obligations in the MD&A section of their 10-K flings.

According to the SEC rule, the table of contractual obligations must cover at least the periods set forth in the column headings in the above tabular format, and the table must provide dollar amounts, aggregated by type of contractual obligation. However, the SEC rule allows registrants to disaggregate the specified categories of contractual obligations using other categories suitable to its business if the presentation includes all of the company's obligations that fall within the categories specified in the table. Moreover, the SEC rule requires the table to include footnotes to describe provisions that create, increase or accelerate obligations, to the extent necessary for understanding the timing and

[2] FASB Statement of Financial Accounting Concepts No. 6 (SFAC 6) states that an asset must have three essential characteristics. First, it embodies a probable future benefit that involves a capacity, singly or in combination with other assets, to contribute directly or indirectly to future net cash inflows. Second, a particular entity can obtain the benefit and control others' access to it. Third, the transaction or other event giving rise to the entity's right to or control of the benefit has already happened. Similarly, FASB SFAC 6 states that a liability must have three essential characteristics. First, it embodies a present duty or responsibility to one or more entities that entails settlement by probable transfer or use of assets at a specified or determinable date, on the occurrence of a specified event, or on demand. Second, the duty or responsibility obligates a particular entity, leaving it little or no discretion to avoid the future sacrifice. Third, the transaction or other event obligating the entity has already happened. A purchase obligation clearly displays the first two characteristics of an asset and a liability, but it does not have the third characteristic. Therefore, FASB apparently does not view a purchase obligation as an event that would trigger recognition of an asset or a liability. The complete text of FASB SFAC 6 can be found at http://www.fasb.org/pdf/con6.pdf.

amount of the company's specified contractual obligations.

Regarding the disclosure of purchase obligations, the SEC rule requires registrants to provide estimates of the payments due if the purchase obligations are subject to variable price provisions, and the table to include footnotes to inform investors of the payments that are subject to market risk, if that information is material to investors. In addition, the SEC rule requires the footnotes to discuss any material termination or renewal provisions to the extent necessary for an understanding of the timing and amount of the registrant's payments under its purchase obligations.

The SEC rule released on January 22, 2003 mandated tabular disclosure of contractual obligations by registrants other than small business issuers.[3] Therefore, an SEC registrant with annual revenues of less than $25 million and a public float of less than $25 million was exempt from the disclosure requirements.[4] On December 19, 2007, the SEC adopted amendments to its disclosure and reporting requirements, and increased the number of registrants exempt from the mandatory tabular disclosure of contractual obligations.[5] The SEC amendments allowed a registrant with a public float of less than $75 million (or annual revenues of less than $50 million if the registrant's public float is not calculable) to have the option to use the new scaled disclosure requirements when filing its periodic reports due after February 4, 2008.[6] Therefore, once a registrant elects to comply with the new scaled disclosure requirements, it is not required to disclose contractual obligations in its 10-K filings due after February 4, 2008.

1.2 Data Collection and Sample Formation

This section describes the procedure of constructing the base sample that is used for the preliminary analyses in the remaining sections of this chapter. This section also explains how we collect purchase obligations data from the 10-K filings submitted by the firms in the base sample.

We construct the base sample using firm-year observations on the Compustat annual database, and the sample period extends from fiscal years 2003 to 2007. We require each firm-year observation to have non-missing values of total assets, stock price at fiscal

[3] A company qualifies as a small business issuer if it has revenues of less than $25 million and has a public float of less than $25 million.

[4] A firm's public float is the aggregate market value of the firm's voting and non-voting common equity held by non-affiliates.

[5] The complete text of the amendments can be found at http://www.sec.gov/rules/final/2007/33-8876.pdf.

[6] A company qualifies as a smaller reporting company if it has a public float of less than $75 million. A company without a calculable public float qualifies as a smaller reporting company if its revenues are below $50 million.

year end, number of common shares outstanding at fiscal year end, and CIK-GVKEY links.

First, we exclude small business issuers and smaller reporting companies from the sample because they are not required to provide information on purchase obligations in their company annual filings. In order to determine if a firm qualifies as a small business issuer or a smaller reporting company, we collect data on the public float from the first page of each firm's 10-K filing and data on the company's revenues from Compustat. We also investigate each firm's self-reported filing status which is also presented in the first page of 10-K filings. Based on each company's annual revenues, public float and filing status, we determine if the firm qualifies as a small business issuer or a smaller reporting company.

For example, Dell Inc. has annual revenues of $61,133 million for the fiscal year ending on February 1, 2008. The first page of Dell Inc.'s 10-K filing indicates that the company is a large accelerated filer, and the company's public float as of the last business day of its most recently completed second fiscal quarter is $54.0 billion. Therefore, Dell Inc. must provide a tabular disclosure of contractual obligations in the MD&A section of its 10-K filing because the company does not qualify either as a small business issuer or a smaller reporting company (Figure 1.2).

Second, we exclude financial companies from the sample. Purchase obligations reported by financial companies often include obligations to provide funding under certain terms and conditions (e.g., loan commitment). These obligations constitute a financial service, which is arguably more similar to an obligation to sell than an obligation to purchase. Therefore, we exclude financial companies because they follow an extended definition of purchase obligations.

For example, purchase obligations reported by Prudential Financial Inc. in its 2007 10-K filing consist of commitments to purchase or fund investments totaling $10,638 million and commercial mortgage loan commitments totaling $2,937 million. Among these, commercial mortgage loan commitments represent legally binding commitments to extend credit to customers (Figure 1.3).

Finally, if a firm does not disclose any purchase obligations in its 10-K filing for the fiscal year ending before December 15, 2003, we drop the firm-year observation. On the other hand, we assume that a firm has zero purchase obligations if the firm does not disclose any purchase obligations in its 10-K filing for the fiscal year ending on or after December 15, 2003.[7]

[7] Compliance date for the required disclosure of contractual obligations is December 15, 2003. Also, the table of contractual obligations must include all of the obligations that fall within specified categories, one of which is purchase obligations. Therefore, if a firm does not disclose any purchase obligations in its 10-K filing for the fiscal year ending on or after December 15, 2003, we assume that the firm has zero purchase obligations.

The resulting sample is called the base sample, and is used for the preliminary analysis in the remaining sections of this chapter. The base sample consists of 4,897 firms and 18,006 firm-year observations, and the sample period extends from fiscal years 2003 to 2007. The procedure of constructing the base sample is summarized in Table 1.1. For the empirical analyses in Chapters 2 and 3, we use a subset of the base sample, called the test sample. The procedure of constructing the test sample will be explained in respective chapters.

From the 10-K filings submitted by the companies in the base sample, we collect purchase obligations data that are disclosed in the MD&A section. The procedure of collecting purchase obligations data is as follows:

As a pilot study, we manually collect purchase obligations data from the 10-K filings submitted by the S&P 500 constituents. We copy the table of contractual obligations from the MD&A section of each 10-K filing and paste it into an Excel spreadsheet. After that, we organize the Excel spreadsheet to get the data in the precise format we want. Finally, we identify purchase obligations among different categories of contractual obligations reported by the S&P 500 constituents. By going through this process, we detect variations in the format of contractual obligations disclosure as well as the various types of purchase obligations reported by the firms constituting the S&P 500 Index.

After the pilot study is finished, we expand the sample to include non-S&P 500 constituents. To extract the table of contractual obligations from the 10-K filings submitted by the non-S&P 500 constituents, we use the directEDGAR extraction engine developed by Burch Kealey. The extraction engine enables us to extract a table including certain search terms from a SGML or HTML document. We use various combinations of search terms such as (1) "contractual" and "obligation", (2) "contractual" and "commitment", (3) "purchase" and "obligation", and (4) "purchase" and "commitment". In case the extraction engine cannot extract the table of contractual obligations from a 10-K filing, we manually copy the table from the 10-K filing. After that, we merge all the collected tables of contractual obligations into an Excel spreadsheet, and organize the spreadsheet to get the data in the format we want. Finally, we identify purchase obligations among different categories of contractual obligations reported by the firms in this group. If we open the dataset in Microsoft Excel or any other statistical software, it looks like Figure 1.4.

1.3 Examples of Contractual Obligations Disclosure

In this section, we provide a couple of examples of contractual obligations disclosure. The first example is the table of contractual obligations reported in Verizon Communications Inc.'s 2007 10-K filing, and the second example is the table of contractual obligations from Kellogg Company's 2007 10-K filing (Figure 1.5). Both firms disclose an overview of their contractual obligations in the MD&A section of their 2007 10-K filings, as directed by the

SEC rule released on January 28, 2003. Also, both of them report four major categories of contractual obligations – long-term debt obligations, capital lease obligations, operating leases obligations and purchase obligations.

However, these companies use slightly different tabular formats. While Verizon Communications Inc.'s table of contractual obligations uses exactly the same column headings as in the tabular format required by the SEC, Kellogg Company discloses its contractual obligations using a modified tabular format, where the company reports payments due by each year up to five years after the current fiscal year end. These two tabular formats are most commonly used by the firms in the base sample. Our analysis indicates that approximately 75% of the sample firms use the tabular format in Panel A of Figure 1.5, and approximately 22% of the sample firms use the tabular format in Panel B of Figure 1.5. The rest of the sample firms use different column headings with respect to when the payments are due.[8]

Both companies disclose only the dollar amount of payment, aggregated by major category, in the table of contractual obligations; therefore, we need to collect detailed information from the footnotes attached to the contractual obligations table or notes to consolidated financial statements in order to see what each category consists of. For instance, we should read the footnotes to the table of contractual obligations in order to know that Kellogg Company's purchase obligations consist of contracts for future delivery of commodities, packaging materials and equipment as well as fixed commitments under various co-marketing agreements and service agreements. Also, we should read the notes to consolidated financial statements in order to know that Verizon Communication Inc.'s purchase obligations consist of commitments primarily to purchase programming and network services, equipment and software.

1.4 Types of Purchase Obligations Reported in 10-Ks

This section summarizes the types of purchase obligations reported by leading firms in each industry group in fiscal year 2007. We use the industry classification schemes suggested by Eugene Fama and Kenneth French, and assign the sample firms into industry groups based on their standard industrial classification (SIC) code.[9] From each industry group, we select firms that are large in terms of market capitalization and also well-known to the general public. Firms do not typically disaggregate purchase obligations into components in the table of contractual obligations; however, this information is contained in the footnotes attached to the table or notes to consolidated financial statements. Therefore, we read the footnotes attached to the table of contractual obligations or notes to consolidated financial

[8] In total, more than 40 variations in the column headings of contractual obligations table are used by the sample firms.

[9] We use the Fama-French industry classification schemes based on 49 industry portfolios.

statements in each firm's 10-K filing, and summarize the types of purchase obligations reported by the firm in Table 1.2.

Table 1.2 shows that firms enter into various types of purchase obligations, with inventory purchase commitments being the most common category of purchase obligations. As can be seen from the table, most companies have commitments to purchase inventory – raw material, product components, supplies, merchandise, etc. Also, the majority of firms report service-related contracts as parts of their purchase obligations. Such contracts include information technology, marketing and advertising, research and development, and transportation services. Capital expenditures and construction commitments, minimum royalty payment obligations and licensing agreements are common as well.

Table 1.2 shows that the types of purchase obligations reported in 10-K filings vary significantly across industries. For instance, while retailers have purchase obligations which primarily consist of commitments to purchase merchandise inventory, utilities companies have a substantial amount of power purchase agreements. On the other hand, companies in the communication industry have a large amount of programming commitments, and companies in the printing and publishing industry have contracts to purchase paper and printing service agreements as parts of their contractual obligations.

In addition to this across-industry variation in the types of purchase obligations, there is also a substantial difference in the types of purchase obligations among firms within the same industry. A good example demonstrating that two firms in the same industry, with analogous operations, might enter into different types of purchase obligations is Merck & Co, Inc. and Pfizer Inc. As Appendix B shows, both firms are in the same industry group (pharmaceutical products), and they both discover, develop, manufacture and market medicines for humans and animals. However, Merck & Co, Inc. reports inventory contracts, R&D and advertising agreements as its purchase obligations, while Pfizer Inc.'s purchase obligations primarily consist of advertising agreements, information technology services and employee benefit administration services.

It is also possible that firms in the same industry may have similar but varying operating activities, so they enter into different types of purchase obligations. For example, both Microsoft Corp. and Google Inc. are in the computer software industry. However, the former develops and manufactures a wide range of software products for various computing devices, while the latter provides an automated search engine service and generates revenue by delivering online advertising. These differences in the two firms' operating activities partly explain why they enter into different types of purchase obligations; Google Inc.'s purchase obligations consist of commitments related to data center operations and facility build-outs, while Microsoft Corp.'s purchase obligations consist of open purchase orders and take-or-pay contracts.

1.5 Amount of Purchase Obligations Reported by Sample Firms

In this section, we summarize the amount of purchase obligations reported by our sample firms. Each year, we calculate the present value of each firm's total purchase obligations using a 5% discount rate, and then divide it by the firm's total assets. As mentioned in Section 1.2, we assume that a firm has zero purchase obligations if the firm does not disclose any purchase obligations in the MD&A section of its 10-K filing.

We make a couple of assumptions when we calculate the present value of each firm's total purchase obligations. First, if a column heading indicates a multi-year period, then an equal amount of payment is due each year during the period, and the dollar amount of payment due each year during the period is calculated as the total dollar amount of payment due within the period divided by the number of years during the period. Second, the number of years in the "thereafter" period is the smallest integer that is not less than the dollar amount of purchase obligations due during the period divided by the dollar amount of purchase obligations due in the year immediately before the "thereafter" period.

For example, the present value of Verizon Communications Inc.'s purchase obligations as of December 31, 2007 is calculated as follows:

$$\text{PV} = \frac{613}{1.05} + \frac{(94)}{(1.05)^2} + \frac{(94)}{(1.05)^3} + \frac{(16.5)}{(1.05)^4} + \frac{(16.5)}{(1.05)^5} + \frac{10}{(1.05)^6}$$

At the end of fiscal year 2007, Verizon Communications Inc. has purchase obligations of $188 million due in the period 2009-2010, $33 million due in the period 2011-2012, and $10 million due after 2012. Therefore, $94 million is due in 2009, $94 million is due in 2010, $16.5 million is due in 2011 and $16.5 million is due in 2012. Also, the number of years in the "more than 5 years" period is one, which is the smallest integer that is not less than 0.61 (= $10 million / $16.5 million).

The present value of Kellogg Company's purchase obligations outstanding as of December 31, 2007 is calculated as follows:

$$\text{PV} = \frac{477}{1.05} + \frac{91}{(1.05)^2} + \frac{34}{(1.05)^3} + \frac{4}{(1.05)^4} + \frac{4}{(1.05)^5} + \frac{2}{(1.05)^6}$$

At the end of fiscal year 2007, Kellogg Company has purchase obligations of $2 million that are due after year 5, and the amount of the company's purchase obligations due in year 5 is $4 million. Therefore, the number of years in the "more than 5 years" period is one, which is the smallest integer that is not less than 0.5 (= $2 million / $4 million).

Table 1.3 summarizes the amount of purchase obligations by industry in fiscal year 2007. The table shows that there are large across- and within-industry variations in the

amount of purchase obligations measured in terms of total assets.

First, the amount of purchase obligations varies significantly across industries. For instance, utilities companies have purchase obligations that are, on average, larger than 30% of their total assets. Firms in the defense industry also have purchase obligations that are large relative to their total assets. On the other hand, companies in the healthcare and precious metals industries have the smallest amount of purchase obligations relative to their total assets.

In addition to the across-industry variation in the amount of purchase obligations, we find large within-industry variations in the amount of purchase obligations. A simple way to check the within-industry variations is to compare the mean and maximum magnitudes of purchase obligations for each industry group. Appendix C shows that, for 42 out of the 45 industry groups, the maximum magnitude of purchase obligations is at least three times larger than the mean magnitude, and this can be interpreted as a direct evidence of the large within-industry variation in the magnitude of purchase obligations.

Lastly, by comparing the mean and median magnitudes of purchase obligations for each industry, we find that the magnitude of purchase obligations has a skewed distribution. For 48 out of the 49 industry groups, the mean magnitude of purchase obligations is larger than the median magnitude, which indicates that the distribution of the magnitude of purchase obligations is skewed to the right.

Table 1.4 summarizes the amount of purchase obligations by fiscal year. Panels A and B show the cross-sectional distribution of purchase obligations measured in terms of total assets. On the other hand, Panel C shows the aggregate dollar amount of purchase obligations reported by our sample firms.

Panels A and B show that the average magnitude of purchase obligations measured in terms of total assets is slightly increasing over time during the sample period. The mean ratio of purchase obligations to total assets is approximately 0.080 in 2003, 0.083 in 2004, 0.089 in 2005, 0.095 in 2006 and 0.098 in 2007. If we exclude utilities companies from our base sample, the mean ratio of purchase obligations to total assets is about 0.072 in 2003, 0.076 in 2004, 0.081 in 2005, 0.087 in 2006 and 0.090 in 2007.

Panel C compares the aggregate dollar amount of purchase obligations with that of other economic variables such as total assets and the U. S. Gross Domestic Product (GDP). The aggregate dollar amount of total assets is calculated by summing our sample firms' total assets, and the U. S. GDP is obtained from the Bureau of Economic Analysis at the U. S. Department of Commerce. The panel shows that the aggregate dollar amount of purchase obligations reported by our sample firms has sharply increased from approximately $1.04 trillion in 2003 to $1.92 trillion in 2007. The panel also shows that the aggregate amount of purchase obligations grows faster than that of total assets or U.S. GDP

during the sample period.

1.6 Portion of Purchase Obligations Due by Future Period

This section presents the portion of purchase obligations due by future period relative to total purchase obligations. For each firm in our base sample with non-zero purchase obligations, we calculate the ratio of purchase obligations due by each future period to total purchase obligations. Ratio_1 is defined as purchase obligations due within one year divided by total purchase obligations. Ratio_23 is defined as purchase obligations due between one and three years divided by total purchase obligations. Ratio_45 is defined as purchase obligations due between three and five years divided by total purchase obligations. Ratio_TA is defined as purchase obligations due after five years divided by total purchase obligations.

Panels A and B of Table 1.5 show the cross-sectional distributions of these ratios for fiscal year 2007. Panel A shows the distributions of the ratios based on all firms in our base sample, and Panel B shows those based on all but utilities firms in the sample. Panels A and B show that, for an average firm in the base sample, approximately 70% of its total purchase obligations are due within one year. In addition, Panel C shows that approximately 30% of the sample firms do not have any purchase obligations due after one year. This indicates that firms tend to limit the majority of their purchase obligations to the one-year period subsequent to the current fiscal year. This short-term nature of purchase obligations enables firms to have the flexibility to adjust the amount of their purchase obligations each year in response to their expectation about future demand for their products.

Panel D presents the distribution of Ratio_1 for each fiscal year. During the sample period, the mean values of Ratio_1 are within the range of 0.675 to 0.709, and the median values of the ratio are within the range of 0.762 to 0.834. Moreover, the panel shows that, for each fiscal year during the sample period, more than one quarter of the sample firms have zero purchase obligations due after one year. These results indicate that the short-term nature of purchase obligations continues over time during the sample period.

1.7 Persistence of Purchase Obligations

This section documents the strong persistence over time in the amount of a firm's purchase obligations. We investigate 2,778 firms that are in the base sample for three consecutive years from 2005 to 2007, and present the results of our analysis in Table 1.6.

Among the 2,778 firms, 1,734 firms report non-zero purchase obligations during the three-year period. In fiscal year 2005, we assign the 1,734 firms into quintiles based on

the magnitude of purchase obligations measured in terms of total assets. Then, we count how many firms remain in the same quintile and how many firms move to different quintiles in the subsequent periods. Panel A shows that, among the 1,734 firms, 1,071 firms remain in the same quintile in 2006, and 539 firms move to the contiguous quintile in 2006. Panel B shows that among the 1,734 firms, 950 firms continue to remain in the same quintile in 2007, while 576 firms are in the contiguous quintile in 2007. These results suggest that the magnitude of a firm's purchase obligations tends to persist over time.

Moreover, we find that most firms with no purchase obligations in a given period continue to have no purchase obligations in the subsequent periods. Among the 2,778 firms that are in the base sample from fiscal years 2005 to 2007, 933 firms have zero purchase obligations in fiscal year 2005. Panel C shows that, among these 933 firms, 830 firms have zero purchase obligations in 2006, and 748 firms have zero purchase obligations in 2007.

1.8 Differences between Purchase Obligations and On-Balance-Sheet Assets

In this section, we briefly discuss the differences between purchase obligations and on-balance-sheet assets. In particular, we compare purchase obligations with inventory and fixed assets because inventory commitments and capital expenditure commitments are the most common categories of purchase obligations.

As the name implies, purchase obligations represent a firm's commitment to purchase production resources during a certain period of time in the future, though the amount of purchase obligations is measured at a point of time (e.g. fiscal year end). They are in effect comparable to inventory purchase (capital expenditure) during a period of time, as opposed to the level of inventory (fixed assets) at a point of time. Therefore, the change in purchase obligations should be compared to the change in inventory purchase (capital expenditure), not to the change in inventory (fixed assets).

Another fundamental difference is that purchase obligations are forward-looking; that is, purchase obligations represent commitments to purchase production resources in the future, not those that have already been purchased and/or are currently in use. Moreover, purchase obligations are not one of the components of contemporaneous earnings, and they are not recorded on the balance sheet, either. Consequently, the reported amount of purchase obligations is unlikely to contain a considerable amount of intentional estimation error. In contrast, on-balance-sheet assets such as inventory and fixed assets are production resources that have already been purchased and recorded on the balance sheet. In addition, the contemporaneous changes in those assets are components of contemporaneous earnings. Therefore, the reported amount of these assets is more likely to be subject to intentional estimation error.

Chapter 2: Purchase Obligations and Future Operating Performance

2.1 Introduction

This chapter examines whether the disclosure of purchase obligations in the MD&A section of 10-K filings provides useful information to investors for understanding and predicting firm performance. In particular, we examine the implications that annual change in a firm's purchase obligations has for its future operating performance.[10]

As defined by the SEC, a purchase obligation represents an enforceable and legally binding agreement to purchase goods or services in the future. Therefore, by entering into purchase obligations, firms procure resources that will be used as production inputs. But, at the same time, they have obligations to make payments in the future. In other words, purchase obligations have aspects as both assets and liabilities, though they are not recognized as assets and liabilities on the balance sheet under U.S. GAAP.

As mentioned in Chapter 1, when the SEC issued the rule requiring the disclosure of contractual obligations in January 2003, the SEC's stated intention to mandate the disclosure of purchase obligations was to provide investors with information that is useful for assessing a firm's liquidity and capital resource needs. That is, the SEC's main concern was the liability aspect of purchase obligations – a potential negative impact purchase obligations might have on a firm's future liquidity.

However, a firm's purchase obligations represent the firm's efforts to procure resources that will be used as production inputs. Consequently, a firm will likely adjust the amount of its purchase obligations in response to its expectation about future demand for its products. Therefore, an increase in a firm's purchase obligations could indicate that the firm expects an increase in future demand.

Given these conflicting views, this chapter examines the implications that annual change in a firm's purchase obligations has for its future operating performance. If a firm makes an accurate estimation about future demand for its products, then an increase in the firm's purchase obligations will be translated into better future operating performance.

[10] We focus on the annual change in purchase obligations rather than the level of purchase obligations. As documented in Chapter 1, there is a strong persistence over time in the amount of purchase obligations reported by our sample firms. This is because the level of a firm's purchase obligations largely depends on the firm's business practice associated with procuring resources, which does not dramatically change over a short period of time. For example, firms that are more active in outsourcing resources tend to have a larger amount of purchase obligations than those that are less active. Also, whether a firm procures resources through purchase obligations or in the spot market affects the amount of the firm's purchase obligations. For this reason, the level of a firm's purchase obligations might not contain useful information for predicting the firm's future operating performance. Instead, we suggest that annual change in purchase obligations is a better means of comparison.

If not, the firm will have to recognize losses associated with its purchase obligations. We empirically test the association between growth in purchase obligations and future operating performance by investigating a subset of the base sample. This subsample, called the test sample, is constructed by following the procedure described in Section 2.2.

Our empirical findings can be summarized as follows:

First, we find that ΔPurchase, defined as annual change in purchase obligations due within one year, is positively associated with future sales and earnings. The positive relations among ΔPurchase, future sales and future earnings are robust to the inclusion of contemporaneous sales growth and accrual components of contemporaneous earnings.

Second, we find that ΔPurchase is positively associated with future asset growth. Results indicate that ΔPurchase has a positive association with future inventory change, future growth in fixed assets and future accruals. The positive relation between ΔPurchase and future asset growth is robust to the inclusion of contemporaneous sales growth and contemporaneous asset growth.

Third, we find that ΔPurchase is positively associated with future asset turnover, but not significantly associated with future profit margin. The relations between ΔPurchase and DuPont components of future earnings indicate that an increase in purchase obligations leads to growth in future sales, but it does not improve future profit margin. This suggests that firms primarily enter into purchase obligations in order to secure quantities rather than favorable pricing terms.

Finally, we find that ΔPurchase is positively associated with contemporaneous earnings, sales growth and asset growth. This indicates that a firm's purchase obligations data enables us to identify the firm's growth stage - e.g. whether the firm's earnings and sales will continue to grow in the future or whether the firm's accruals will reverse in the future.

The remainder of this chapter is organized as follows. Section 2.2 explains the procedure to construct the test sample and provides the definitions of financial variables. Section 2.3 provides the descriptive statistics of the financial variables used in this chapter. Main empirical findings are presented in Sections 2.4 to 2.6. Section 2.7 concludes the chapter.

2.2 Sample Formation and Variable Definition

For the empirical analyses in this chapter, we use a subset of the base sample in Chapter 1, which is called the test sample. In this section, we construct the test sample by following the procedure detailed in Table 2.1. First, we exclude firms in the utilities industry from the

base sample.[11] Then, we eliminate observations for fiscal year 2003 because purchase obligations data for two consecutive years are required for constructing ΔPurchase. Moreover, we delete firm-year observations with no annual changes in purchase obligations. Finally, we eliminate firm-years in the top and bottom 1% of each financial variable in order to avoid the undue influence of extreme observations. The resulting sample consists of 6,444 firm-year observations, and the sample period extends from fiscal years 2004 to 2007.

Next, we define the financial variables that are used in the empirical tests. ΔPurchase is defined as the annual change in purchase obligations due within one year.[12, 13] ΔSales_Q4 is defined as the annual change in the fourth-quarter sales. ΔINV is defined as the annual change in total inventories. ΔPPE is defined as the annual change in total property, plant and equipment. Total accruals (TACC) are defined as the sum of the annual change in non-cash working capital (ΔWC), the annual change in net non-current operating assets (ΔNCO) and the annual change in net financial assets (ΔFIN). ΔSales is defined as the annual change in total sales. As in previous research, we deflate these variables by average total assets. As a measure of accounting income, we use return on assets (ROA), which is defined as operating income after depreciation deflated by average total assets. Table 2.2 provides formal definitions of these financial variables.

2.3 Descriptive Statistics

This section provides summary statistics of the financial variables defined in Section 2.2. Table 2.3 reports the distribution of ΔPurchase by fiscal year. The table shows that ΔPurchase has a positive mean in each fiscal year, indicating that firms in the test sample, on average, increase the within-one-year portion of their purchase obligations over time. The table also shows that the mean value of ΔPurchase is greater than the median value of ΔPurchase in each fiscal year, suggesting that the distribution of ΔPurchase is skewed to the right.

Table 2.4 reports the distributions of other financial variables. First, ΔSales_Q4

[11] Firms in the utilities industry are considered to have stable demand for their products. Therefore, the changes in these firms' purchase obligations are unlikely to indicate the change in their expectation about future demand. For this reason, we exclude utilities companies.

[12] In constructing ΔPurchase, we use the within-one-year portion of purchase obligations, rather than total purchase obligations. The within-one-year portion directly represents the amount of resources that will be purchased and used by the firm in the next year. Thus, defining ΔPurchase using the within-one-year portion of purchase obligations makes ΔPurchase a more precise indicator of the next year's firm performance. The tenor of the results remains unchanged when we define ΔPurchase using total purchase obligations.

[13] The tenor of the results remains unchanged when we define ΔPurchase as a percent change in purchase obligations due within one year or log growth rate of purchase obligations due within one year.

has a mean of 0.0289, indicating that the average growth in the fourth-quarter sales is approximately a 2.89% of total assets. Second, ΔINV has a mean of 0.0106, and ΔPPE has a mean of 0.0229. This indicates that the average annual growth in total inventories and total property, plant and equipment are approximately 1.06% and 2.29% of total assets, respectively. Third, TACC has a mean of 0.0432, indicating that the magnitude of total accruals is, on average, as large as 4.32% of total assets. Lastly, the mean value of ROA is 0.0624. This indicates that an average firm in the test sample earns approximately 6.24% of its total assets as annual operating income after depreciation.

Table 2.5 provides correlations among ΔPurchase and contemporaneous financial variables. For ease of exposition, we discuss the Spearman correlations that are presented below the main diagonal. First, $\Delta Purchase_t$ is positively correlated with $\Delta Sales\_Q4_t$ (0.1809). Second, $\Delta Purchase_t$ is positively correlated with ROA_t (0.0978). Third, $\Delta Purchase_t$ is positively correlated with accrual components of earnings, ΔINV_t (0.1587), ΔPPE_t (0.1071) and $TACC_t$ (0.1106). Overall, these results indicate that ΔPurchase is positively correlated with variables measuring contemporaneous operating performance, with the strongest correlation with ΔSales_Q4. This suggests that firms tend to increase their purchase obligations when they have good contemporaneous operating performance, especially when they experience sales growth in the last quarter of the current fiscal year.

Table 2.6 provides correlations among ΔPurchase and future financial variables. For ease of exposition, we discuss the Spearman correlations that are presented below the main diagonal. First, ΔPurchase is positively correlated with $\Delta Sales_{t+1}$ (0.1705). Second, ΔPurchase is positively correlated with ROA_{t+1} (0.1120). Third, ΔPurchase is positively correlated with accrual components of future earnings, ΔINV_{t+1} (0.1202), ΔPPE_{t+1} (0.1621) and $TACC_{t+1}$ (0.1148). These results indicate that ΔPurchase is positively correlated with variables measuring future operating performance.

2.4 ΔPurchase and Future Operating Performance

In this section, we document the positive association between ΔPurchase and future operating performance. Table 2.7 shows future operating performance for portfolios of sample firms formed on ΔPurchase. Each year, firms are ranked into deciles based on ΔPurchase. The table shows that ΔPurchase is positively correlated with one-year-ahead change in sales and one-year-ahead change in ROA. For instance, firms in the bottom decile of ΔPurchase have an average one-year-ahead change in ROA of -0.0191, while firms in the top decile of ΔPurchase have an average one-year-ahead change in ROA of -0.0002. Also, firms in the bottom decile have an average one-year-ahead change in ROA of 0.0269, while firms in the top decile have an average one-year-ahead change in ROA of 0.1506.

Now, we present the results of multivariate regressions. In each regression model, X_t denotes control variables such as $\Delta Sales\_Q4_t$, ΔINV_t, ΔPPE_t, and $TACC_t$. To

control for year and industry fixed effects, year and industry dummies are also included. YD denotes year dummies, and ID denotes industry dummies. Because the sample covers four fiscal years from 2004 to 2007, three year dummies are included. Industry dummies indicate industry groups based on the Fama-French industry classification scheme. The regression models are estimated using a pooled, cross-sectional time-series regression, and the reported t-statistics are based on White standard errors that are clustered by both fiscal year and industry (Petersen 2009).

In Table 2.8, we estimate regression models using one-year-ahead change in sales ($\Delta Sales_{t+1}$) as a dependent variable, and $\Delta Purchase_t$ as an independent variable. In particular, we estimate the following regression:

$$\Delta Sales_{t+1} = \beta_0 + \beta_1 \Delta Purchase_t + \beta_2 X_t + \beta_3 YD + \beta_4 ID + \varepsilon_t \quad (2.1)$$

Results in Table 2.8 indicate that there is a positive relation between $\Delta Purchase_t$ and $\Delta Sales_{t+1}$. In the first regression model, the coefficient estimate on $\Delta Purchase_t$ is 0.5804. This indicates that an increase in purchase obligations equal to one percent of average total assets is associated with an increase in future sales equal to approximately 0.58 percent of average total assets. The second regression model shows that the coefficient on $\Delta Purchase_t$ is still positive after controlling for $\Delta Sales\_Q4_t$, though it drops significantly from 0.5804 to 0.2826. This indicates that $\Delta Purchase_t$ has incremental explanatory power for $\Delta Sales_{t+1}$, while $\Delta Sales\_Q4_t$ has a predominant impact on $\Delta Sales_{t+1}$. The last regression model shows that the positive coefficient on ΔPurchase is robust to the inclusion of accrual components of contemporaneous earnings.

In Table 2.9, we document a positive relation between ΔPurchase and future ROA. In Panel A, we estimate regression models using one-year-ahead ROA (ROA_{t+1}) as a dependent variable, and $\Delta Purchase_t$ and contemporaneous ROA (ROA_t) as independent variables. ROA_t is included in the regression model to control for autocorrelation of ROA. In particular, we estimate the following regression:

$$ROA_{t+1} = \beta_0 + \beta_1 ROA_t + \beta_2 \Delta Purchase_t + \beta_3 X_t + \beta_4 YD + \beta_5 ID + \varepsilon_t \quad (2.2)$$

Results in Panel A indicate that there is a positive relation between $\Delta Purchase_t$ and ROA_{t+1}, after controlling for ROA_t. In the first regression model, the coefficient estimate on $\Delta Purchase_t$ is 0.0636, indicating that an increase in purchase obligations equal to one percent of average total assets leads to approximately a 0.06 percentage point increase in next year's return on assets. The second regression model shows that the positive coefficient on ΔPurchase drops from 0.0636 to 0.0463, indicating that ΔSales_Q4 partially subsumes the positive association between ΔPurchase and future ROA. The last regression model shows that the positive coefficient on $\Delta Purchase_t$ is robust to the inclusion of accrual components of contemporaneous earnings, while the coefficients on the accrual components are all negative.

In Panel B of Table 2.9, we confirm the positive association between ΔPurchase and future ROA using a different regression specification. We estimate regression models using one-year-ahead change in ROA (ΔROA_{t+1}) as a dependent variable, and $\Delta Purchase_t$ as an explanatory variable.

$$\Delta ROA_{t+1} = \beta_0 + \beta_1 \Delta Purchase_t + \beta_2 X_t + \beta_3 YD + \beta_4 ID + \varepsilon_t \quad (2.3)$$

Results in Panel B indicate that there is a positive relation between $\Delta Purchase_t$ and ΔROA_{t+1}. The coefficient estimate on $\Delta Purchase_t$ is 0.0578 in the first regression model, but it drops to 0.0456 in the second regression model where $\Delta Sales\_Q4_t$ is included as an additional explanatory variable. The last regression model shows the positive coefficient on $\Delta Purchase_t$ is robust to the inclusion of accrual components of contemporaneous earnings, while the coefficients on the accrual components are all negative.

Results presented in Tables 2.8 and 2.9 indicate that ΔPurchase provides an incremental signal about future operating performance that is not available from existing information. In particular, ΔPurchase supplements ΔSales_Q4 in predicting one-year-ahead sales and earnings. This suggests that ΔPurchase captures short-term momentum in fundamentals.

In Table 2.10, we examine the association between DuPont components of one-year-ahead ROA and ΔPurchase. Regression models in Panel A use one-year-ahead change in profit margin (ΔPM_{t+1}) as a dependent variable, and those in Panel B use one-year-ahead change in asset turnover (ΔATO_{t+1}) as a dependent variable. In particular, we estimate the following regressions:

$$\Delta PM_{t+1} = \beta_0 + \beta_1 \Delta Purchase_t + \beta_2 X_t + \beta_3 YD + \beta_4 ID + \varepsilon_t \quad (2.4)$$

$$\Delta ATO_{t+1} = \beta_0 + \beta_1 \Delta Purchase_t + \beta_2 X_t + \beta_3 YD + \beta_4 ID + \varepsilon_t \quad (2.5)$$

Results in Panel A show that the coefficient estimate on $\Delta Purchase_t$ is positive, but statistically insignificant. This indicates that ΔPurchase is not significantly associated with one-year-ahead change in profit margin. On the other hand, results in Panel B show that the coefficient estimate on $\Delta Purchase_t$ is positive and statistically significant, indicating that ΔPurchase is positively associated with one-year-ahead change in asset turnover. These relations between ΔPurchase and the multiplicative components of one-year-ahead ROA explain the mechanics of the positive association between ΔPurchase and one-year-ahead ROA.

This positive relation between $\Delta Purchase_t$ and ΔATO_{t+1} supplements the positive relation between $\Delta Purchase_t$ and $\Delta Sales_{t+1}$ documented in Table 2.8, and these relations together support the conjecture that firms enter into additional purchase obligations when they expect an increase in demand for its products. On the other hand, the insignificant association between $\Delta Purchase_t$ and ΔPM_{t+1} suggests that firms primarily enter into

purchase obligations in order to secure quantities rather than favorable pricing terms. If firms enter into purchase obligations primarily for input price hedging, an increase in purchase obligations would lead to higher future profit margin.

2.5 ΔPurchase and Future Asset Growth

In this section, we document the positive association between ΔPurchase and future asset growth. Table 2.11 shows future asset growth for portfolios of sample firms formed on ΔPurchase. Each year, we rank firms into deciles based on ΔPurchase. Then, we calculate the mean values of ΔINV_{t+1}, ΔPPE_{t+1} and $TACC_{t+1}$ for each decile of ΔPurchase. The table shows that ΔPurchase is positively correlated with one-year-ahead change in inventory and one-year-ahead change in fixed assets. The table also shows that ΔPurchase is positively associated with one-year-ahead accruals. These results indicate that ΔPurchase is positively associated with future asset growth. This positive relation between annual change in purchase obligations and future asset growth explains why the change in purchase obligations is positively associated with future operating performance.

Next, we estimate multivariate regression models using one-year-ahead asset growth as a dependent variable and ΔPurchase as an independent variable, and present the results of the multivariate regression in Table 2.12.

In Panel A, we estimate regression models using one-year-ahead change in inventory (ΔINV_{t+1}) as a dependent variable, and $\Delta Purchase_t$ as an independent variable.

$$\Delta INV_{t+1} = \beta_0 + \beta_1 \Delta Purchase_t + \beta_2 X_t + \beta_3 YD + \beta_4 ID + \varepsilon_t \quad (2.6)$$

In Panel B, we estimate regression models using one-year-ahead change in fixed assets (ΔPPE_{t+1}) as a dependent variable, and $\Delta Purchase_t$ as an independent variable.

$$\Delta PPE_{t+1} = \beta_0 + \beta_1 \Delta Purchase_t + \beta_2 X_t + \beta_3 YD + \beta_4 ID + \varepsilon_t \quad (2.7)$$

In Panel C, we estimate regression models using one-year-ahead accruals ($TACC_{t+1}$) as a dependent variable, and $\Delta Purchase_t$ as an independent variable.

$$TACC_{t+1} = \beta_0 + \beta_1 \Delta Purchase_t + \beta_2 X_t + \beta_3 YD + \beta_4 ID + \varepsilon_t \quad (2.8)$$

In each regression model, X_t denotes control variables such as $\Delta Sales\_Q4_t$, ΔINV_t, ΔPPE_t, and $TACC_t$. To control for year and industry fixed effects, year and industry dummies are also included. YD denotes year dummies, and ID denotes industry dummies. Because the sample covers four fiscal years from 2004 to 2007, three year dummies are included. Industry dummies indicate industry groups based on the Fama-French industry classification scheme. The regression models are estimated using a pooled, cross-sectional time-series regression, and the reported t-statistics are based on White standard errors that

are clustered by both fiscal year and industry (Petersen 2009).

Results in Panel A indicate that there is a positive relation between $\Delta Purchase_t$ and ΔINV_{t+1}. In the first regression model, the coefficient estimate on $\Delta Purchase_t$ is 0.0774. In the second regression model, the coefficient on $\Delta Purchase_t$ is still positive, though it drops to 0.0519. The last regression model shows that the positive coefficient on $\Delta Purchase_t$ is robust to the inclusion of accrual components of contemporaneous earnings.

Results in Panel B show that $\Delta Purchase_t$ is positively associated with ΔPPE_{t+1}. In the first regression model, the coefficient estimate on $\Delta Purchase_t$ is positive and statistically significant. It is also positive and statistically significant in the second regression model, though it drops from 0.1898 to 0.1557. The last regression model shows that the positive coefficient on $\Delta Purchase_t$ is robust to the inclusion of accrual components of contemporaneous earnings.

Results in Panel C follow a similar pattern as in Panels A and B. The coefficient estimate on $\Delta Purchase_t$ is positive and statistically significant in the first regression model, but it becomes smaller in the second regression model. The last regression model shows that the coefficient is still positive and statistically significant after controlling for accrual components of contemporaneous earnings.

2.6 Time-Series Properties of Financial Variables

So far, we have documented that ΔPurchase is positively associated with future sales and earnings as well as future asset growth. In this section, we present the time-series properties of financial variables for firms in the top and bottom deciles of ΔPurchase. Each year, we assign firms into deciles based on ΔPurchase, and examine how the mean values of financial variables change over time in the extreme deciles of ΔPurchase.

Figures 2.1 shows the time-series properties of financial variables using a constant sample of 901 firms from fiscal years 2004 to 2007. Each panel in Figure 2.1 provides the mean value of the corresponding financial variable for firm-years in the top and bottom deciles of ΔPurchase, adjusted by the mean value of the variable for all the firm-years in the constant sample. Lowest ΔPurchase portfolio consists of 360 firm-years in the bottom decile of ΔPurchase, and highest ΔPurchase portfolio consists of 364 firm-years in the top decile of ΔPurchase. Year 0 is the year in which firms are ranked into deciles based on ΔPurchase.

Panel A shows that firms in the top decile of ΔPurchase tend to have a higher average ROA in Year 0 than those in the bottom decile, and the difference in ROA becomes larger in Year 1. This pattern suggests that earnings do not appear to mean-revert for firms in the top and bottom deciles of ΔPurchase. Panel B shows that sales growth (ΔSales) in

Year 0 tends to be significantly higher for firms in the top decile than those in the bottom decile. The panel also shows that sales growth in Year 1 continues to be low in the bottom decile, while it remains high in the top decile.

Panel C shows that firms in the top decile of ΔPurchase tend to have significantly higher total accruals (TACC) in Year 0 than those in the bottom decile of ΔPurchase, and the significant difference in total accruals persists into Year 1. Panels D and E show that ΔINV and ΔPPE have similar time-series properties: firms in the top decile tend to have significantly larger changes in inventory (ΔINV) and fixed assets (ΔPPE) in Year 0 than those in the bottom decile, and the significant differences persist into Year 1. These time-series properties of TACC, ΔINV and ΔPPE suggest that firms in the extreme deciles do not appear to reverse their accruals in a subsequent period.

2.7 Conclusion

In this chapter, we examine the implications that annual change in a firm's purchase obligations has for the firm's future operating performance. When the SEC mandated the disclosure of purchase obligations in January 2003, the SEC's main concern was the liability aspect of purchase obligations - a potential negative impact purchase obligations might have on a firm's future liquidity. However, we view a firm's purchase obligations as the firm's efforts to procure resources, and acknowledge the asset aspect of purchase obligations. In particular, we predict firms enter into additional purchase obligations when they expect an increase in demand for their products, and investigate if contemporaneous increase in purchase obligations is actually translated into better operating performance in the future period.

Consistent with the prediction, we find that annual change in purchase obligations is positively associated with future sales and earnings. We also find that annual change in purchase obligations is positively associated with future asset growth. Additional tests show that annual change in purchase obligations is positively associated with contemporaneous earnings, sales growth and asset growth. These findings suggest that purchase obligations data can be used in addressing important issues in empirical financial accounting such as earnings persistence and accrual reversals.

Empirical findings in this chapter have the following implications for standard setters and academic researchers.

First, our findings suggest that the disclosure of purchase obligations is useful for predicting firm performance. Purchase obligations are executory contracts where neither party to the contract has yet performed its duties. As such, purchase obligations do not meet the FASB definitions of an asset and a liability; therefore, they are not recorded on the balance sheet. However, a large number of firms engage in purchase obligations, and

purchase obligations may also have a significant impact on the firms' liquidity. Thus, the SEC reasoned that investors could benefit from this information. As a result, the SEC mandated the disclosure of purchase obligations in the Management's Discussion and Analysis section of 10-Ks as part of firms' contractual obligations. This dissertation confirms that the disclosure of purchase obligations provides useful information to investors for predicting future operating performance as well as future asset growth.

Findings in this chapter also contribute to the literature on corporate investment. Since a firm's purchase obligations represent the firm's commitment to purchase production resources during a period of time in the future, they can be viewed as the firm's intended future investment. We find that annual change in the intended investment is positively associated with future sales and earnings. We also find that growth in purchase obligations is in part translated into assets on the future balance sheet, especially fixed assets. This positive relation between annual change in purchase obligations and future asset growth explains why the change in purchase obligations is positively associated with future performance. These findings are in sharp contrast to the negative association between contemporaneous asset growth and future performance that has been extensively documented in the literature on corporate investment.[14]

[14] See, for example, Fairfield, Whisenant and Yohn (2003a), Fairfield, Whisenant and Yohn (2003b); Richardson, Sloan, Soliman and Tuna (2005); and Ge (2006).

Chapter 3: How Do Investors and Analysts Incorporate the Information Contained in the Disclosure of Purchase Obligations?

3.1 Introduction

In Chapter 2, we established a positive relation between annual change in purchase obligations (ΔPurchase) and future operating performance. In this chapter, we examine whether investors and analysts fully incorporate the implications of ΔPurchase for future operating performance. As purchase obligations data are disclosed in the MD&A section of 10-K filings, we investigate stock returns and analyst forecast revisions in the periods surrounding the filing of 10-Ks.

First, we test whether investors respond to the information contained in the disclosure of purchase obligations when the information is released. We measure stock returns over a period of three trading days beginning from the 10-K filing dates, and examine whether the stock returns are positively associated with ΔPurchase. We find that ΔPurchase is not significantly associated with the filing-period returns, suggesting that investors do not respond to this information at the 10-K filing dates.

Given this insignificant stock price reaction to the information in purchase obligations, we investigate stock returns over a one-year period prior to the 10-K filing dates, and examine whether investors appear to anticipate the contribution of ΔPurchase to future operating performance before 10-Ks are filed. We find that ΔPurchase is positively associated with stock returns over the one-year period. This suggests that investors appear to appreciate the value-relevance of ΔPurchase before 10-Ks are filed.

Next, we examine whether the stock price reaction to the information in purchase obligations is complete. We investigate stock returns over a one-year period following the three-day 10-K filing window, and find that ΔPurchase is positively associated with the one-year-ahead stock returns. This suggests that although investors appear to anticipate the contribution of ΔPurchase to future operating performance before 10-Ks are filed, they do not fully impound the resulting implications of ΔPurchase into stock prices. Therefore, there is a delayed stock price response to ΔPurchase. Additional tests show that a strategy of buying firms in the top decile of ΔPurchase and selling short firms in the bottom decile of ΔPurchase generates a positive hedge return over a 12-month holding period.

Finally, we examine whether analysts incorporate the positive relation between ΔPurchase and future operating performance in their forecasts of future earnings. We investigate the time-series pattern of analyst forecast errors in the periods surrounding the filing of a 10-K, and find that forecast errors are positively correlated with ΔPurchase in the periods following the filing of a 10-K. This suggests that analysts fail to incorporate the

implications of ΔPurchase in their forecasts of one-year-ahead earnings at the time 10-Ks are filed. Consequently, analyst forecasts tend to be more pessimistic for firms with high ΔPurchase in the periods after the filing of a 10-K. This result suggests that the delayed stock price response to ΔPurchase can be at least partially attributable to analysts' inability to incorporate the implications of ΔPurchase when generating earnings forecasts.

The remainder of this chapter is organized as follows. In the next Section, we construct the test samples, and define measures of stock returns and analyst forecast error. In Sections 3.3 and 3.4, we present our main empirical findings. Finally, we conclude this chapter in Section 3.5.

3.2 Sample Formation and Variable Definition

In this section, we construct two test samples based on the sample used in Chapter 2. For the empirical analysis in Section 3.3 where we examine the stock price response to ΔPurchase, we eliminate 209 firm-year observations for which stock price and return data are unavailable from the CRSP, 44 firm-year observations where 10-K filings occur more than 120 days after fiscal year end, and 54 firm-year observations with a stock price less than $1. Therefore, the test sample used in Section 3.3 consists of 6,137 firm-year observations. For the analysis in Section 3.4 where we examine the time-series pattern of forecast errors, we eliminate 2,213 firm-year observations without I/B/E/S coverage. Therefore, the test sample used in Section 3.4 consists of 4,231 firm-year observations. The procedure of constructing these test samples is summarized in Table 3.1.

In Section 3.3, we use size-adjusted returns that are computed by deducting the value-weighted average return on the size-matched portfolio. At the end of each June, stocks are matched with one of the 10 size portfolios based on market capitalization. The size-matched portfolios are based on the market capitalization deciles of NYSE, AMEX and NASDAQ firms. Daily returns on the size-matched portfolios are obtained from CRSP.

Formally, we measure filing-period return, contemporaneous annual stock return and one-year-ahead stock return for firm i in year t in the following manners:

$$FPR_t = \prod_{k=0}^{2}(1+R_{i,k}) - \prod_{k=0}^{2}(1+R_{p,k}) \tag{3.1}$$

$$SAR_t = \prod_{k=1}^{252}(1+R_{i,-k}) - \prod_{k=1}^{252}(1+R_{p,-k}) \tag{3.2}$$

$$SAR_{t+1} = \prod_{k=3}^{254}(1+R_{i,k}) - \prod_{k=3}^{254}(1+R_{p,k}) \tag{3.3}$$

where $R_{i,k}$ is the return on stock *i* on trading day *k* relative to the firm's 10-K filing date, and $R_{p,k}$ is the return on the size-matched portfolio on trading day *k* relative to the firm's 10-K filing date.

In Section 3.3, we also use size-B/M adjusted returns that are calculated by deducting the value-weighted average return on the size-B/M-matched portfolio. Stocks are matched with one of the 25 size-B/M-matched portfolios based on the market capitalization and book-to-market ratio. The book-to-market ratio is defined as the book equity of the fiscal year ending in the prior calendar year divided by the market value of equity at the end of the prior calendar year. Daily returns on the size-B/M-matched portfolios are obtained from Kenneth French's data library.

In Section 3.4, we sort analysts' forecast into twelve groups by 30-day blocks in order to track analyst forecast revisions leading up to the announcement of one-year-ahead earnings. We measure analyst forecast errors as the actual earnings per share (EPS) minus the median forecast of EPS divided by the stock price at the beginning of the year. We obtain analyst forecast data from Institutional Brokers Estimate System (I/B/E/S) detail history file.

Formally, forecast error for firm i in year t and month m is calculated as:

$$(FE)_{t,m} = \frac{(\text{Actual EPS})_{i,t} - (\text{Median EPS Forecast})_{i,t,m}}{(\text{Stock Price})_{i,t}} \tag{3.4}$$

3.3 ΔPurchase and Stock Returns

In this section, we examine how investors incorporate the information contained in the disclosure of purchase obligations. First, we investigate whether investors respond to the information in purchase obligations when the information is released. In particular, we estimate multivariate regression models using filing-period return (FPR_t) as a dependent variable and $\Delta Purchase_t$ as an independent variable.

$$FPR_t = \beta_0 + \beta_1 \Delta Purchase_t + \beta_2 X_t + \beta_3 YD + \beta_4 ID + \varepsilon_t \tag{3.5}$$

X_t denotes control variables such as $\Delta Sales\_Q4_t$, ΔINV_t, ΔPPE_t, $TACC_t$, B/M_t and MOM_t. B/M is defined as the book equity of the fiscal year ending in the prior calendar year divided by the market value of equity at the end of the prior calendar year. MOM is defined as the cumulative stock return over a six-month period ending on the last trading day before a 10-K filing. To control for year and industry fixed effects, year and industry dummies are also included. The regression models are estimated using a pooled, cross-sectional time-series regression, and the reported t-statistics are based on White standard errors that are clustered by fiscal year and industry (Petersen 2009).

Results of multivariate regressions are presented in Table 3.2. In the first regression model, the coefficient on $\Delta Purchase_t$ is negative (β_1 = -0.0093), but it is statistically insignificant. In the second regression model where $\Delta Sales\_Q4_t$ is added as an additional variable, the coefficient on $\Delta Purchase_t$ drops to -0.0125, but it is still statistically insignificant. In the third regression model where all other control variables are included, the coefficient on $\Delta Purchase_t$ is negative (β_1 = -0.0117), but statistically insignificant. These results indicate that ΔPurchase is not significantly associated with the filing-period returns. This suggests that investors do not respond to the information contained in the disclosure of purchase obligations.

Given that stock prices do not react to the information in purchase obligations at the time the information is released, we examine whether investors anticipate and incorporate the contribution of ΔPurchase to future operating performance before 10-Ks are filed. In particular, we investigate the relationship between ΔPurchase and size-adjusted stock returns over the one-year period prior to the 10-K filing dates.

$$SAR_t = \beta_0 + \beta_1 ROA + \beta_2 \Delta ROA + \beta_3 \Delta Purchase_t + \beta_4 X_t + \beta_5 YD + \beta_6 ID + \varepsilon_t \quad (3.6)$$

We estimate regression models using contemporaneous annual stock return (SAR_t) as a dependent variable and $\Delta Purchase_t$, ROA_t and ΔROA_t as independent variables. X_t denotes control variables such as $\Delta Sales\_Q4_t$, ΔINV_t, ΔPPE_t, and $TACC_t$. To control for year and industry fixed effects, year and industry dummies are also included. The regression models are estimated using a pooled, cross-sectional time-series regression, and the reported t-statistics are based on White standard errors that are clustered by fiscal year and industry (Petersen 2009).

Results of these regressions are presented in Table 3.3. In the first regression model, the coefficient on $\Delta Purchase_t$ (β_1 = 0.7473) is positive and statistically significant. In the second model where $\Delta Sales\_Q4_t$ is added as an additional variable, the coefficient on $\Delta Purchase_t$ drops to 0.4515, but it is still positive and statistically significant. In the third regression model where all other control variables are included, the coefficient on $\Delta Purchase_t$ (β_1 = 0.5047) is positive and statistically significant. These results indicate that ΔPurchase is positively associated with the filing-period returns. This suggests that investors appear to appreciate the value-relevance of ΔPurchase before 10-Ks are filed.

Finally, we examine whether the stock price reaction to the information in purchase obligations is complete. In particular, we examine the relationship between ΔPurchase and size-adjusted stock returns over the one-year period following the three-day 10-K filing window.

$$SAR_{t+1} = \beta_0 + \beta_1 \Delta Purchase_t + \beta_2 X_t + \beta_3 YD + \beta_4 ID + \varepsilon_t \quad (3.7)$$

We estimate regression models using one-year-ahead stock return (SAR_{t+1}) as a

dependent variable and $\Delta Purchase_t$ as an independent variable. X_t denotes control variables such as $\Delta Sales\_Q4_t$, ΔINV_t, ΔPPE_t, $TACC_t$, B/M_t and MOM_t. To control for year and industry fixed effects, year and industry dummies are also included. The regression models are estimated using a pooled, cross-sectional time-series regression, and the reported t-statistics are based on White standard errors that are clustered by fiscal year and industry (Petersen 2009).

Results of multivariate regressions are presented in Table 3.4. The results show that the coefficient estimate on ΔPurchase is positive and statistically significant. In the first regression model, the coefficient estimate on $\Delta Purchase_t$ (β_1 = 0.3250) is positive and statistically significant. In the second regression model where $\Delta Sales\_Q4_t$ is added as an additional variable, the coefficient on $\Delta Purchase_t$ slightly drops to 0.2823, but it is still positive and statistically significant. In the third regression model where all other control variables are included, the coefficient on $\Delta Purchase_t$ (β_1 = 0.2986) is positive and statistically significant. These results indicate that ΔPurchase is positively associated with one-year-ahead stock return following the three-day 10-K filing window. This positive relation between ΔPurchase and one-year-ahead stock returns suggests that investors fail to fully incorporate the implications of ΔPurchase in determining stock prices.

In Table 3.5, we present one-year-ahead stock returns for portfolios of sample firms formed on ΔPurchase. Each year, we rank firms into deciles based on ΔPurchase and calculate the mean value of one-year-ahead stock returns for each decile. The hedge returns are calculated as the difference of portfolio returns between the top and bottom deciles.

When we examine the one-year-ahead raw returns, companies in the bottom decile of ΔPurchase have an average stock return of -10.28%, while those in the top decile of ΔPurchase have an average return of 0.18%. Therefore, a strategy of buying firms in the top decile and selling short firms in the bottom decile generates a hedge return of 10.46%. When we examine the one-year-ahead size-adjusted returns, companies in the bottom decile of ΔPurchase have an average return of -3.50%, while those in the top decile of ΔPurchase have an average return of 3.49%. Therefore, the hedge return is 6.99%. Finally, we examine the one-year-ahead size-B/M-adjusted returns. Companies in the bottom decile of ΔPurchase have a mean return of -3.70%, while those in the top decile of ΔPurchase have a mean return of 3.04%. Therefore, the hedge return is 6.74%.

Results presented in Tables 3.4 and 3.5 indicate that there is a delayed stock price response to ΔPurchase in the one-year period after the filing of a 10-K. This suggests that although investors appear to appreciate the value-relevance of ΔPurchase before 10-Ks are filed, they do not fully incorporate the implications of ΔPurchase into stock prices.

3.4 ΔPurchase and Analyst Forecast Revisions

In this section, we examine whether analysts fully understand the information contained in the disclosure of purchase obligations, and incorporate the information into their forecasts of one-year-ahead earnings. We use data on individual analysts' forecasts of annual EPS obtained from Institutional Brokers Estimate System (I/B/E/S) Detail History file in order to calculate consensus forecasts and forecast errors.

Following Richardson, Teoh and Wysocki (2004), we sort analysts' forecasts of one-year-ahead EPS into twelve groups by 30-day blocks in order to track analyst forecast revisions leading up to the announcement of one-year-ahead earnings. Forecasts made less than 30 days prior to the announcement of one-year-ahead earnings are grouped in Month-1, forecasts between 30- and 60-day lags in Month-2, and so on up to Month-12. Figure 3.1 illustrates how we group analysts' forecasts of one-year-ahead EPS.

Because one-year-ahead earnings are announced on the last day of Month-1, we can assume that earnings for the most recent fiscal year are announced on the first day of Month-12.[15] Additionally, we assume that a 10-K for the most recent fiscal year is filed with the SEC on the last day of Month-12, and the first-quarter earnings are announced on the first day of Month-9.[16]

To examine how analysts revise their forecast of one-year-ahead earnings in response to the information contained in the disclosure of purchase obligations, we investigate the time-series pattern of analyst forecast errors in the periods surrounding the filing of a 10-K. In this section, we define analyst forecast error as the actual one-year-ahead EPS minus the median forecast of one-year-ahead EPS scaled by the stock price at the beginning of the year. Then, for each firm-year observation in the test sample, we calculate 12 monthly analyst forecast errors for each of the 12 month groups.

If analysts correctly understand the implications of ΔPurchase for future earnings, they should revise their forecast of one-year-ahead earnings in light of ΔPurchase immediately after the filing date of a 10-K for the most recent fiscal year. Therefore, forecast errors for a given month group after the filing of a 10-K should not be explained by ΔPurchase. If, however, analysts fail to fully incorporate the positive association between ΔPurchase and one-year-ahead earnings into their forecasts, then forecast errors will be positively correlated with ΔPurchase in the periods following the filing of a 10-K.

Figure 3.2 shows the time-series pattern of analyst forecast errors for our sample firms in the extreme deciles of ΔPurchase. Each year, we rank sample firms into deciles based on ΔPurchase and calculate the mean values of monthly analyst forecast errors for each decile. The figure shows how monthly analyst forecast error change over time for

[15] By "the most recent fiscal year", we refer to the fiscal year which just ended (year t).

[16] The average number of calendar days between the announcement of annual earnings and the filing of a 10-K is 28.9 for firm-years in the test sample.

firms in the top and bottom deciles of ΔPurchase. We find that firms in the top decile have, on average, positive forecast errors during the period of Month-12 to Month-9, but those in the bottom decile have, on average, negative forecast errors during the same period. This indicates that analyst forecasts are more pessimistic for firms in the top decile of ΔPurchase during the period of Month-12 to Month-9. We also find that the difference in forecast errors between the two groups continues to exist in the remaining periods, but the difference is statistically insignificant. These results suggest that analysts fail to fully incorporate the information in purchase obligations into their forecast of one-year-ahead earnings until after the first-quarter earnings are announced.

Now, we supplement the time-series pattern of analyst forecast errors documented in Figure 3.2 with regression tests. For each month group, we run a multivariate regression using actual analyst forecast error as a dependent variable and ΔPurchase as an independent variable. Following Richardson et al. (2004), we include size, market-to-book and a profit dummy as control variables. The regression model is specified as follows:

$$(FE)_{t+1,m} = \beta_0 + \beta_1 \Delta Purchase_t + \beta_2 SIZE_t + \beta_3 (MB)_t + \beta_4 Profit_{t+1} + \varepsilon_t \qquad (3.8)$$

$Size_t$ is defined as the market capitalization at the end of year t, MB_t is defined as market value of equity divided by the book equity at the end of year t, and $Profit_{t+1}$ is a dummy variable which equals 1 if actual earnings for year t are positive, and 0 otherwise.

We estimate the regression model (3.8) by each Month group, and report the estimated coefficient on $\Delta Purchase_t$ in Table 3.8. The table shows the estimated coefficients on $\Delta Purchase_t$ are positive and statistically significant from Month-12 to Month-9. The estimated coefficients on ΔPurchase continue to be positive in the remaining month groups, but they are statistically insignificant in these month groups.

Results presented in Figure 3.2 and Table 3.6 indicate that analyst forecast errors are positively associated with ΔPurchase during the period of Month-12 to Month-9. This suggests that security analysts do not fully understand the implications of ΔPurchase for future earnings and thus fail to incorporate the implications into their forecast of future earnings at the time 10-Ks are filed. We also find that the positive relation between ΔPurchase and analyst forecast errors weakens beginning in Month-8, which suggests that analyst forecasts of one-year-ahead earnings begin to reflect the information in purchase obligations after the first-quarter earnings are announced.

3.5 Conclusion

Given the positive relation between annual change in purchase obligations and future operating performance documented in the previous chapter, this chapter examine whether

investors and analysts correctly understand the positive relation and fully incorporate it into stock prices and their forecasts of one-year-ahead earnings.

In Section 3.3, we find that annual change in purchase obligations is not significantly associated with stock returns over a three-day 10-K filing window. We find, however, that it is positively associated with both contemporaneous and future stock returns. These findings suggest that although investors appear to anticipate the contribution of annual change in purchase obligations to future operating performance before 10-Ks are filed, they do not fully incorporate the resulting implications of ΔPurchase in determining stock prices.

In Section 3.4, we find that annual change in purchase obligations is positively associated with analyst forecast errors in the periods before and after the filing of a 10-K. This suggests that analysts fail to incorporate the implications of ΔPurchase in their forecasts of one-year-ahead earnings at the time 10-Ks are filed. This also suggests that the delayed stock price reaction to annual change in purchase obligations can be at least partially attributable to analysts' inability to fully incorporate the information in purchase obligations.

Our findings contribute to the literature documenting the relationship between stock prices and non-GAAP leading indicators. Existing research on non-GAAP leading indicators has primarily focused on the value-relevance of the indicators.[17] Moreover, several recent studies have examined whether the stock market correctly prices the contribution of non-GAAP leading indicators to future performance.[18] We investigate both the value-relevance of and the stock market's pricing of annual change in purchase obligations. Findings in this chapter suggest that annual change in purchase obligations is a leading indicator of future sales and earnings, and stock prices act as if investors anticipate the value-relevance of ΔPurchase before 10-Ks are filed. However, the delayed stock price reaction suggests that investors fail to fully incorporate the implications of ΔPurchase for future sales and earnings.

[17] Examples of value-relevant leading indicators examined in the literature include product market size and market penetration information in the wireless industry (Amir and Lev 1996), customer satisfaction scores (Ittner and Larcker 1998) and web traffic measures in the Internet industry (Trueman, Wong, and Zhang 2001).

[18] For example, Rajgopal, Shevlin and Venkatachalam (2003) find that stock prices act as if investors overweight the contribution of level of order backlogs in predicting future earnings. Regarding customer satisfaction scores, recent studies find that customer satisfaction scores do not predict future abnormal stock returns (Ittner, Larcker and Taylor 2009; Jacobson and Mizik 2009).

Chapter 4: Conclusion

This dissertation examines whether the disclosure of purchase obligations in the MD&A section of 10-K filings provides useful information to investors. As outsourcing has become more prevalent in the US economy, investors' need for the information about purchase obligations has grown as well. However, since a purchase obligation does not meet the FASB definition of an asset or a liability, such information was unavailable until the SEC mandated its disclosure in the MD&A section of 10-K filings in January 2003. By requiring the disclosure of purchase obligations, the SEC intended to provide investors with information that is useful for assessing a firm's liquidity and capital resource needs. That is, the SEC's main concern was the liability aspect of purchase obligations – a potential negative impact purchase obligations might have on a firm's future liquidity. In contrast, we view a firm's purchase obligations as the firm's efforts to procure resources, and acknowledge the asset aspect of purchase obligations. In particular, we predict firms enter into additional purchase obligations when they expect an increase in demand for their products, and examine the relation between annual change in purchase obligations and future operating performance.

In Chapter 1, we provide background information on purchase obligations because purchase obligations have never been investigated in the academic literature. In that chapter, we summarize the types and amount of purchase obligations reported by sample firms. We also document the short-term nature of purchase obligations as well as the strong persistence over time in the amount of purchase obligations.

In Chapter 2, we examine the implications of annual change in a firm's purchase obligations for the firm's future operating performance. Consistent with our prediction, we find that annual change in purchase obligations is positively associated with future sales and earnings. We also find that annual change in purchase obligations is positively associated with future asset returns. Further, we find that annual change in purchase obligations is positively associated with contemporaneous sales and earnings and contemporaneous asset growth. These findings suggest that purchase obligations have implications for important issues in empirical financial accounting such as earnings persistence and accrual reversals.

In Chapter 3, we examine whether investors and analysts correctly understand the positive relation and fully incorporate the information contained in the disclosure of purchase obligations. We find that annual change in purchase obligations is positively associated with both contemporaneous and future stock returns. We also find that analyst forecast errors are positively correlated with annual change in purchase obligations in the periods following the filing of a 10-K. These results suggest that both investors and analysts do not fully incorporate the information in purchase obligations at the time 10-Ks are filed.

This dissertation makes three contributions to the literature. First, we document that the disclosure of purchase obligations provides useful information to investors. This suggests that the disclosure of executory contracts mandated by the SEC has information content. Second, this dissertation contributes to the asset growth literature by documenting that annual changes in purchase obligations predict future asset growth as well as future sales and earnings. Finally, this paper contributes to the literature documenting the relationship between stock prices and non-GAAP leading indicators by investigating stock price reaction to annual change in purchase obligations before, during and after the 10-K filing window.

The newly disclosed data on purchase obligations and the empirical evidence presented in this paper raise questions for future research. For example, do different types of purchase obligations have different implications for future operating performance and stock returns? Since some firms enter into purchase obligations that do not affect revenues in the immediate future, e.g. research and development contracts, it might be worthwhile to investigate that question. Also, why do utilities companies enter into large amount of purchase obligations and what are the benefits they can get? Do purchase obligations have anything to do with a firm's business strategy, e.g. vertical or horizontal integrations? These are the research questions that could be pursued using the purchase obligations data.

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Appendix 1: Tables

Table 1.1: Sample Formation

We construct the base sample using firm-years on the Compustat annual database, and the sample period extends from fiscal years 2003 to 2007. We require each firm-year observation to have non-missing values of total assets, stock price at fiscal year end, number of common shares outstanding at fiscal year end, and CIK-GVKEY links. We exclude (1) small business issuers and smaller reporting companies, (2) financial companies, and (3) firm-years with a missing value of purchase obligations. The resulting sample is called the base sample, and consists of 4,897 firms and 18,006 firm-year observations.

Sample Formation Procedure	Number of Firm-Years
Total number of firm-years (Firm-years with non-missing values of total assets, stock prices at fiscal year end, number of common shares at fiscal year end, and CIK-GVKEY links)	37,330
Less:	
Small business issuers and smaller reporting companies	13,271
Financial Companies	5,469
Firm-years with a missing value of purchase obligations*	584
Base Sample	18,006

* If a firm does not disclose any purchase obligations in its 10-K filing for the fiscal year ending before December 15, 2003, we drop the firm-year observation.

Table 1.2: Description of Purchase Obligations by Industry

This table summarizes the types of purchase obligations reported by leading companies in each industry in fiscal year 2007. We use the industry classification schemes based on 49 industry portfolios suggested by Eugene Fama and Kenneth French. Kenneth French's data library provides detailed information on industry classification schemes.

Industry Group	Company	Description of Purchase Obligations
Agriculture	Dole Food Co., Inc.	• Agreements with independent growers
	Monsanto Co.	• Capital expenditures, inventories and breeding research
Food Products	Kellogg Co.	• Co-marketing and service agreements, commodities, packaging materials, and equipment
Candy & Soda	Pepsi Bottling Group Inc.	• Raw materials and capital expenditure
	Coca-Cola Enterprises Inc.	• Purchase agreements with various suppliers
Beer & Liquor	Anheuser-Busch Co Inc.	• Brewing and packaging material, capital expenditures, and royalty arrangements
	PepsiCo Inc.	• Oranges and orange juice, packaging materials, cooking oil, and marketing commitments
Tobacco Products	Altria Group Inc.	• Raw materials, indirect materials and supplies, packaging, co-manufacturing arrangements, storage and distribution • Marketing, advertising, capital expenditures, information technology and professional services
Recreation	Hasbro Inc.	• Royalty payments, and minimum expenditures on marketing and promotional activities
	Mattel Inc.	• Inventory, other assets, services, and licensing minimum guarantees
Entertainment	Harrahs Entertainment Inc.	• Purchase orders, construction commitments, and entertainment obligations
	Caesars Entertainment Inc.	• Construction commitments, and purchase orders
Printing and Publishing	McGraw-Hill Companies Inc.	• Paper and printing services, broadcast rights for television programming, creative talent agreements, contracts for data, voice and optical network transport services, contracts for IT software licensing and maintenance.
Consumer Goods	Eastman Kodak Co.	• Agreements with suppliers production and administrative services, marketing and advertising
	Procter & Gamble Co.	• Information technology, human resources facilities management
Apparel	Polo Ralph Lauren Corp	• Inventory purchase commitments

Table 1.2 (Continued)

Industry Group	Company	Description of Purchase Obligations
Apparel	Nike Inc.	• Agreements to purchase products, service and marketing commitments
Healthcare	Tenet Healthcare Corp	• Information technology services, and purchase orders
Medical Equipment	Boston Scientific Corp	• Inventory commitments and capital expenditures
	Medtronic Inc.	• Inventory purchases
Pharmaceutical Products	Merck & Co. Inc.	• Inventory contracts, research and development, and advertising agreements
	Pfizer Inc.	• Advertising, information technology services and employee benefit administration services.
Chemicals	E. I. du Pont de Nemours and Co.	• Information technology infrastructure & services, raw material, utility obligations, health care / benefit administration, research and development and other professional and consulting contracts.
	Dow Chemical Co.	• Ethylene-related products, steam, electrical power, materials, property and other items
Rubber and Plastic Products	Pactiv Corp	• Raw materials and other long-term vendor agreements
	Newell Rubbermaid Inc.	• Finished goods, raw materials, components and services
Textiles	Mohawk Industries Inc.	• Natural gas, electricity and raw material
	Hanesbrands Inc.	• Raw materials, supplies, packaging and manufacturing arrangements, and capital expenditures • Marketing services, license agreement payments and other professional services
Construction Materials	Gillette Co.	• Take-or-pay arrangements or firm commitments entered into as part of the normal course of business
	Fortune Brands Inc.	• Raw material, finished goods and capital expenditures • Advertising, selling and administrative services
Construction	Centex Corp.	• No explanation provided for purchase obligations
Steel Works Etc	United States Steel Corp	• Gases and certain energy and utility services, and capital expenditures
	Alcoa Inc.	• Energy and raw materials

Table 1.2 (Continued)

Industry Group	Company	Description of Purchase Obligations
Fabricated Products	Tower Automotive Inc.	• Tooling obligations and capital expenditures
Machinery	Deere & Co.	• No explanations provided for purchase obligations
	Caterpillar Inc.	• Material and services, and commitments with suppliers
Electrical Equipment	Emerson Electric Co.	• Inventory purchases
Automobiles and Trucks	Ford Motor Co.	• Raw materials, components and services
	General Motors Corp	• Material, information technology, marketing, facilities and rental car repurchases
Aircraft	Boeing Co.	• Production goods, tooling costs, electricity and natural gas contracts, property, plant and equipment, inventory and raw materials
Shipbuilding, Railroad Equipment	Brunswick Corp	• Raw materials and other supplies
Defense	Lockheed Martin Corp	• Direct materials, obligations to subcontractors, outsourcing arrangements, and facilities and equipment
Non-Metallic and Industrial Metal Mining	Vulcan Materials Co.	• Mineral royalties, capital expenditures, and transportation and electrical contracts
	Freeport-McMoran Copper & Gold Inc.	• Copper concentrates and cathodes, and transportation contracts
Coal	CONSOL Energy Inc.	• Gas transportation obligations, and purchase order
	Peabody Energy Corp	• Coal reserve and royalty obligations, and purchase agreements with vendors
Petroleum and Natural Gas	Chevron Corp	• Pipeline and storage capacity, drilling rigs, utilities, and petroleum products
	Exxon Mobil Corp	• Manufacturing supply, pipeline and terminaling agreements
Utilities	American Electric Power Co., Inc.	• Fuel purchase contracts, energy and capacity purchase contracts, and construction contracts for capital assets
	PG&E Corp	• Power purchase, natural gas supply and transportation, and nuclear fuel • Telecommunications and information system contracts

Table 1.2 (Continued)

Industry Groups	Company	Description of Purchase Obligations
Communication	News Corp	• Sports programming rights, entertainment programming rights, News America marketing, and capital expenditures
	Verizon Communications Inc.	• Network services, equipment and software
Personal Services	Block (H&R) Inc.	• Advertising
	Avis Budget Group Inc.	• Vehicle purchase and information technology and telecommunications contracts
Business Services	Automatic Data Processing Inc.	• Purchase and maintenance agreements on software, equipment and other assets.
Computer Hardware	Apple Inc.	• Components for final products from suppliers • Long-term supply agreements with Semi-conductor manufacturers
	Dell Inc.	• Raw materials, product components, and million marketing services agreement
Computer Software	Google Inc.	• Data center operations and facility build-outs
	Microsoft Corp	• Open purchase orders and take-or-pay contracts
Electronic Equipment	Motorola Inc.	• Inventory, raw material, components, license of software, promotional activities, and research and development
	Intel Corp	• Capital expenditures, licenses, raw materials or other goods
Measuring and Control Equipment	Agilent Technologies Inc.	• Product components, inventory, and contracts with professional services suppliers
Business Supplies	3M Co.	• Take or pay contracts, capital expenditures, service agreements and utilities
	International Paper Co.	• Fiber supply agreements
Shipping Containers	Ball Corp	• Aluminum, steel, plastic resin, other direct materials, natural gas and electricity, aerospace and technologies contracts
Transportation	FedEx Corp	• Aircraft, aircraft modifications, vehicles, facilities, computers and other equipment
	Delta Air Lines Inc.	• Aircraft order commitments, contract carrier agreements, outsourced human resource services, marketing, maintenance and obligations related to technology, sponsorship and other services and products

Table 1.2 (Continued)

Industry Group	Company	Description of Purchase Obligations
Wholesale	Sysco Corp	• Hardware and hardware hosting services, electricity and fuel purchase commitments
	McKesson Corp	• Inventory purchases, capital commitments and service agreements
Retail	Target Corp	• Inventory purchases, merchandise royalties, purchases of equipment, marketing-related contracts, software acquisition/license
	Wal-Mart Stores Inc.	• Inventory, utility, capital expenditures, software acquisition/license commitments and legally binding service contracts
Restaurants, Hotels, Motels	Darden Restaurants Inc.	• Food, beverage, supplies, capital projects and other miscellaneous commitments
	Starbucks Corp	• Green coffee and other commodities
Other	General Electric Co.	• Take-or-pay arrangements, capital expenditures, equipment, software acquisition/license commitments, and contractual minimum

Table 1.3: Amount of Purchase Obligations by Industry

This table summarizes the amount of purchase obligations by industry in fiscal year 2007. For each firm in each industry group, we calculate the present value of the firm's total future purchase obligations using 5% discount rate, and then divide it by the firm's total assets at the end of fiscal year 2007. If a firm does not disclose any purchase obligations in its 10-K, we assume that the firm has zero purchase obligations. We use the industry classification schemes suggested by Eugene Fama and Kenneth French. Kenneth French's data library provides detailed information on industry classification schemes.

Fama-French Industry Classification	Number of Firms	Mean	Median	Q1	Q3	Min	Max
Agriculture	8	0.082	0.027	0.004	0.081	0	0.432
Food Products	56	0.168	0.103	0.020	0.204	0	1.570
Candy & Soda	10	0.159	0.074	0.018	0.256	0	0.480
Beer & Liquor	7	0.235	0.187	0.127	0.346	0.027	0.543
Tobacco Products	5	0.116	0.097	0.019	0.147	0	0.317
Recreation	23	0.066	0.080	0	0.107	0	0.213
Entertainment	50	0.056	0.013	0	0.075	0	0.332
Printing and Publishing	31	0.042	0.013	0	0.064	0	0.200
Consumer Goods	46	0.145	0.035	0	0.094	0	2.654
Apparel	48	0.140	0.120	0.018	0.230	0	0.465
Healthcare	72	0.023	0	0	0.022	0	0.267
Medical Equipment	127	0.036	0.009	0	0.056	0	0.267
Pharmaceutical Products	290	0.072	0.013	0	0.070	0	1.900
Chemicals	77	0.426	0.077	0.007	0.208	0	16.899
Rubber and Plastic Products	19	0.042	0.004	0	0.045	0	0.247
Textiles	10	0.082	0.050	0.010	0.093	0	0.335
Construction Materials	60	0.037	0.005	0	0.050	0	0.419
Construction	47	0.059	0	0	0.029	0	0.515
Steel Works Etc	46	0.180	0.049	0.002	0.196	0	1.376
Fabricated Products	8	0.061	0.015	0	0.144	0	0.167
Machinery	107	0.049	0.022	0	0.086	0	0.414
Electrical Equipments	58	0.092	0.027	0	0.081	0	0.994
Automobile and Trucks	50	0.111	0.013	0	0.075	0	1.950
Aircraft	18	0.177	0.084	0	0.210	0	1.562

Table 1.3 (Continued)

Fama-French Industry Classification	Number of Firms	Mean	Median	Q1	Q3	Min	Max
Shipbuilding, Railroad Equipment	11	0.106	0.041	0	0.103	0	0.588
Defense	9	0.269	0.102	0	0.393	0	0.837
Precious Metals	9	0.011	0	0	0.009	0	0.048
Non-Metalic and Industrial Metal Material	15	0.039	0.012	0	0.035	0	0.214
Coal	15	0.103	0.042	0.022	0.206	0	0.370
Petroleum and Natural Gas	192	0.094	0.013	0	0.082	0	4.299
Utilities	118	0.302	0.222	0.068	0.453	0	1.442
Communication	119	0.115	0.049	0.006	0.123	0	1.937
Personal Services	45	0.049	0	0	0.031	0	0.377
Business Services	195	0.044	0.002	0	0.025	0	1.673
Computer Hardware	82	0.079	0.034	0.016	0.073	0	1.078
Computer Software	280	0.018	0	0	0.015	0	0.353
Electronic Equipment	236	0.094	0.039	0.002	0.079	0	3.578
Measuring and Control Equipment	71	0.036	0.018	0	0.063	0	0.180
Business Supplies	36	0.070	0.038	0	0.093	0	0.374
Shipping Containers	10	0.163	0.020	0	0.135	0	0.915
Transportation	113	0.218	0.068	0.002	0.252	0	2.184
Wholesale	113	0.100	0.002	0	0.119	0	1.504
Retail	187	0.124	0.025	0	0.169	0	2.714
Restaurant, Hotels, Motels	65	0.064	0.035	0	0.074	0	0.526
Other	78	0.057	0	0	0.024	0	1.518
All Companies	3,272	0.098	0.018	0	0.088	0	16.899
All but Utilities Companies	3,154	0.090	0.016	0	0.080	0	16.899

Table 1.4: Amount of Purchase Obligations by Year

This table summarizes the amount of purchase obligations by fiscal year. Panels A and B show the cross-sectional distribution of purchase obligations measured in terms of total assets. For each sample firm, we calculate the present value of the firm's total future purchase obligations using 5% discount rate, and then divide it by the firm's total assets. If a firm does not disclose any purchase obligations in its 10-K, we assume that the firm has zero purchase obligations. Panel C shows the aggregate dollar amount of purchase obligations by fiscal year. The aggregate dollar amount of purchase obligations is calculated by summing the present value of each sample firm's purchase obligations.

Panel A: All Companies

Fiscal Year	Number of Firms	Mean	Median	Q1	Q3	Min	Max
2003	3,202	0.080	0.008	0	0.063	0	16.462
2004	3,738	0.083	0.009	0	0.067	0	20.091
2005	3,707	0.089	0.014	0	0.079	0	15.706
2006	3,712	0.095	0.015	0	0.084	0	19.988
2007	3,272	0.098	0.018	0	0.088	0	16.899
All Years	17,630	0.089	0.012	0	0.076	0	20.091

Panel B: All but Utilities Companies

Fiscal Year	Number of Firms	Mean	Median	Q1	Q3	Min	Max
2003	3,089	0.072	0.007	0	0.056	0	16.462
2004	3,620	0.076	0.007	0	0.061	0	20.091
2005	3,587	0.081	0.012	0	0.073	0	15.706
2006	3,591	0.087	0.013	0	0.074	0	19.988
2007	3,154	0.090	0.016	0	0.080	0	16.899
All Years	3,089	0.072	0.007	0	0.056	0	16.462

Table 1.4 (Continued)

Panel C: Purchase Obligations vs. Other Economic Variables (dollars in billions)

Fiscal Year	Number of Firms	Purchase Obligations	Total Assets	U.S. GDP
2003	3,202	1,035.6	9,607.8	11,142.1
2004	3,738	1,240.2	10,845.6	11,867.8
2005	3,707	1,489.8	11,301.0	12,638.4
2006	3,712	1,710.6	11,954.9	13,398.9
2007	3,272	1,917.8	12,720.4	14,077.6

Table 1.5: Portion of Purchase Obligations Due By Period

This table summarizes the portion of purchase obligations due by future period relative to total purchase obligations. For each firm with non-zero purchase obligations, we calculate the ratio of purchase obligations due by each future period to total purchase obligations. Ratio_1 is defined as purchase obligations due within one year divided by total purchase obligations. Ratio_23 is defined as purchase obligations due between one and three years divided by total purchase obligations. Ratio_45 is defined as purchase obligations due between three and five years divided by total purchase obligations. Ratio_TA is defined as purchase obligations due after five years divided by total purchase obligations. Distributions of these ratios for fiscal year 2007 are presented in Panels A and B. Panel A shows the distributions for all firms, and Panel B shows the distributions for all but utilities firms. Panel C shows the number of firms which do not report any purchase obligations due after one year in their 2007 10-K filings. Panel D presents the distribution of Ratio_1 for each fiscal year.

Panel A: Portion of Purchase Obligations Due by Period (All Firms) - FY2007 Only

Ratio	#Obs.	Mean	Lower Quartile	Median	Upper Quartile
Ratio_1	2,143	0.700	0.430	0.804	1
Ratio_23	2,143	0.181	0	0.126	0.309
Ratio_45	2,143	0.058	0	0	0.094
Ratio_TA	2,143	0.061	0	0	0.019

Panel B: Portion of Purchase Obligations Due by Period (All but Utilities Firms) - FY2007 Only

Ratio	#Obs.	Mean	Lower Quartile	Median	Upper Quartile
Ratio_1	2,038	0.718	0.460	0.836	1
Ratio_23	2,038	0.178	0	0.110	0.309
Ratio_45	2,038	0.054	0	0	0.080
Ratio_TA	2,038	0.050	0	0	0.008

Panel C: Number of Firms with Zero Purchase Obligations Due After One Year - FY2007 Only

	#Obs.	# of Firms with Ratio_1=1	% of Firms with Ratio_1 = 1
All Firms	2,143	631	29.4%
All but Utilities Firms	2,038	626	30.7%

Table 1.5 (Continued)

Panel D: Distribution of Ratio_1 by Year

Fiscal Year	#Obs.	Mean	Lower Quartile	Median	Upper Quartile
2003	1,926	0.675	0.374	0.762	1
2004	2,283	0.705	0.425	0.823	1
2005	2,372	0.709	0.427	0.834	1
2006	2,357	0.709	0.445	0.818	1
2007	2,143	0.700	0.430	0.804	1
All Years	11,081	0.701	0.421	0.812	1

Table 1.6: Persistence of Purchase Obligations

This table shows the persistence over time in the amount of a firm's purchase obligations. In Panels A and B, we investigate 1,734 firms that are in the base sample for three consecutive years from 2005 to 2007 and report non-zero purchase obligations in fiscal year 2005. In fiscal year 2005, we assign the 1,734 firms into quintiles based on the magnitude of purchase obligations measured in terms of total assets. Then, we count how many firms remain in the same quintile and how many firms move to different quintiles in the subsequent periods. In Panel C, we investigate 933 firms that are the base sample for three consecutive years from 2005 to 2007 and report zero purchase obligations in fiscal year 2005. Among these firms, we count the number of firms which continue to report zero purchase obligations in fiscal years 2006 and 2007.

Panel A: Distribution of Firms across Purchase Obligations Quintiles (FY2005 and FY2006)

		FY 2006 Quintile				
		Bottom	2	3	4	Top
FY 2005 Quintile	Bottom	**248**	64	17	12	5
	2	77	**180**	64	19	7
	3	15	80	**171**	68	13
	4	5	18	88	**193**	43
	Top	1	5	7	55	**279**

Panel B: Distribution of Firms across Purchase Obligations Quintiles (FY2005 and FY2007)

		FY 2007 Quintile				
		Bottom	2	3	4	Top
FY 2005 Quintile	Bottom	**221**	71	31	17	6
	2	88	**147**	69	30	13
	3	25	88	**149**	67	18
	4	9	34	83	**172**	49
	Top	3	7	15	61	**261**

Panel C: Number of Firms That Continue to Report Zero Purchase Obligations

Fiscal Year	2005	2006	2007
Number of Firms That Continue to Report Zero Purchase Obligations	933 (100%)	830 (89.0%)	748 (80.2%)

Table 2.1: Construction of Test Sample

In Chapter 2, we use a subset of the base sample, which is called the test sample. The test sample is constructed by excluding (1) utilities companies, (2) observations for fiscal year 2003, (3) firm-years without sufficient data to construct financial variables, (4) firm-years with zero changes in purchase obligations, and (5) firm-years in the top and bottom 1% of financial variables**.** The resulting sample consists of 6,444 firm-year observations, and the sample period extends from fiscal years 2004 to 2007.

Sample Formation Procedures	Number of Firm-Years
Base Sample	18,006
Less:	
Utilities firms	596
Observations for fiscal year 2003	3,157
Firm-years with zero changes in purchase obligations	4,454
Firm-years without sufficient data to construct financial variables ($\Delta Sales_{t+1}$, ROA_{t+1}, ROA_t, $\Delta Purchase_t$, $\Delta Sales\_Q4_t$, ΔINV_t, ΔPPE_t, $TACC_t$)	2,668
Top and bottom 1% of financial variables (ROA_t, $\Delta Purchase_t$, $\Delta Sales\_Q4_t$, ΔINV_t, ΔPPE_t, $TACC_t$)	687
Test Sample	6,444

Table 2.2: Variable Definitions

Variable	Definition
ΔPurchase	annual change in purchase obligations due within one year, deflated by average total assets (at)
ΔSales_Q4	annual change in the fourth-quarter sales (revtq), deflated by average total assets (at)
ΔINV	annual change in inventories (invt), deflated by average total assets (at)
ΔPPE	annual change in property, plant and equipment (ppent), deflated by average total assets (at)
ΔSales	annual change in sales (revt), deflated by average total assets (at)
ROA	operating income after depreciation (oiadp), deflated by average total assets (at)
PM	operating income after depreciation (oiadp) divided by sales (revt)
ATO	sales (revt) divided by average total assets (at)
TACC	sum of annual change in non-cash working capital (ΔWC), annual change in net noncurrent operating assets (ΔNCO) and annual change in net financial assets (ΔFIN), deflated by average total assets (at)
WC	current operating assets minus current operating liabilities, where current operating assets are current assets (act) minus cash and short-term investments (che), and current liabilities are current liabilities (lct) minus debt in current liabilities (dlc)
NCO	non-current operating assets minus non-current operating liabilities, where non-current operating assets are total assets (at) minus current assets (act) minus investments and advances (ivao), and non-current operating liabilities are total liabilities (lt) minus current liabilities (lct) minus long-term debt (dltt)
FIN	financial assets minus financial liabilities, where financial assets are short-term investments (ivst) plus long-term investments (ivao), and financial liabilities are long-term debt (dltt) plus debt in current liabilities (dlc) plus preferred stock (pstk)

* Compustat variable names are indicated in lower cases in parentheses next to each item.

Table 2.3: Distribution of ΔPurchase by Fiscal Year

This table shows the distribution of ΔPurchase by fiscal year. ΔPurchase is the annual change in purchase obligations due within one year, divided by average total assets.

Fiscal Year	# Obs.	Mean	Standard Deviation	Min	Lower Quartile	Median	Upper Quartile	Max
2004	1,492	0.0137	0.0517	-0.1721	-0.0035	0.0033	0.0210	0.3750
2005	1,698	0.0119	0.0458	-0.1665	-0.0041	0.0032	0.0196	0.3087
2006	1,664	0.0115	0.0494	-0.1807	-0.0044	0.0025	0.0214	0.3205
2007	1,590	0.0092	0.0502	-0.1481	-0.0060	0.0011	0.0181	0.3714
Total	6,444	0.0116	0.0492	-0.1807	-0.0046	0.0025	0.0200	0.3750

Table 2.4: Distribution of Other Financial Variables

This table shows the distributions of other financial variables used in Chapter 2. ΔSales_Q4 is the annual change in the fourth-quarter sales. ΔINV is the annual change in inventories. ΔPPE is the annual change in property, plant and equipment. ROA is operating income after depreciation. TACC is ΔWC+ΔNCO+ΔFIN, where ΔWC is the change in non-cash working capital, ΔNCO is the change in net non-current operating assets and ΔFIN is the change in net financial assets. Each of these variables is deflated by average total assets.

Variable	# Obs.	Mean	Standard Deviation	Min	First Quartile	Median	Third Quartile	Max
ΔSales_Q4	6,444	0.0289	0.0555	-0.1888	0.0010	0.0210	0.0508	0.3317
ΔINV	6,444	0.0106	0.0292	-0.1210	0.0001	0.0024	0.0186	0.1799
ΔPPE	6,444	0.0229	0.0624	-0.1939	-0.0053	0.0069	0.0330	0.4356
TACC	6,444	0.0432	0.1441	-0.5282	-0.0214	0.0381	0.1021	0.7114
ROA	6,444	0.0624	0.1428	-0.8810	0.0308	0.0837	0.1363	0.3947

Table 2.5: Correlations between ΔPurchase and Contemporaneous Financial Variables

This table shows the correlations between ΔPurchase and contemporaneous financial variables. ΔPurchase is the annual change in purchase obligations due within one year. ΔSales_Q4 is the annual change in the fourth-quarter sales. ΔINV is the annual change in inventories. ΔPPE is the annual change in property, plant and equipment. ROA is operating income after depreciation. TACC is ΔWC+ΔNCO+ΔFIN, where ΔWC is the change in non-cash working capital, ΔNCO is the change in net non-current operating assets and ΔFIN is the change in net financial assets. Each of these variables is deflated by average total assets. Spearman (Pearson) correlations are presented below (above) the main diagonal. All correlations in this table are significant at one percent level.

	$\Delta Purchase_t$	ROA_t	$\Delta Sales\_Q4_t$	ΔINV_t	ΔPPE_t	$TACC_t$
$\Delta Purchase_t$		0.0545	0.1810	0.1435	0.0859	0.0957
ROA_t	0.0978		0.2078	0.1417	0.1565	0.2176
$\Delta Sales\_Q4_t$	0.1809	0.2884		0.3361	0.2265	0.2340
ΔINV_t	0.1587	0.2042	0.3188		0.1396	0.2098
ΔPPE_t	0.1071	0.2747	0.3201	0.2610		0.2523
$TACC_t$	0.1106	0.2871	0.2870	0.2509	0.3463	

Table 2.6: Correlations between ΔPurchase and Future Financial Variables

This table shows the correlations between ΔPurchase and future financial variables. ΔPurchase is the annual change in purchase obligations due within one year. ΔSales is the annual change in sales. ΔINV is the annual change in inventories. ΔPPE is the annual change in property, plant and equipment. ROA is operating income after depreciation. TACC is ΔWC+ΔNCO+ΔFIN, where ΔWC is the change in non-cash working capital, ΔNCO is the change in net non-current operating assets and ΔFIN is the change in net financial assets. Each of these variables is deflated by average total assets. Spearman (Pearson) correlations are presented below (above) the main diagonal. All correlations in this table are significant at one percent level.

	$\Delta Purchase_t$	ROA_{t+1}	$\Delta Sales_{t+1}$	ΔINV_{t+1}	ΔPPE_{t+1}	$TACC_{t+1}$
$\Delta Purchase_t$		0.0690	0.1515	0.1080	0.1305	0.0923
ROA_{t+1}	0.1120		0.3013	0.1572	0.1921	0.3344
$\Delta Sales_{t+1}$	0.1705	0.3926		0.4472	0.2766	0.2835
ΔINV_{t+1}	0.1202	0.2282	0.4098		0.1773	0.2419
ΔPPE_{t+1}	0.1621	0.3023	0.4094	0.3282		0.3275
$TACC_{t+1}$	0.1148	0.3231	0.3719	0.3111	0.4226	

Table 2.7: ΔPurchase and Future Performance

This table presents future operating performance for portfolios of our sample firms formed on ΔPurchase. ΔPurchase is the annual change in purchase obligations due within one year. ROA is operating income after depreciation. ΔSales is the annual change in sales. Each of these variables is scaled by average total assets. Each year, firms are ranked into deciles based on ΔPurchase. By construction, P1 contains firms with the lowest ΔPurchase, and P10 contains firms with the highest ΔPurchase. Correlation coefficients presented in the bottom row indicate the correlation coefficient between the column of mean $\Delta Purchase_t$ and the corresponding column.

ΔPurchase Ranking	#Obs.	Mean $\Delta Purchase_t$	Mean $\Delta Sales_{t+1}$	Mean ΔROA_{t+1}
P1 (lowest)	643	-0.0593	0.0269	-0.0191
P2	644	-0.0150	0.0634	-0.0085
P3	645	-0.0048	0.0682	-0.0063
P4	644	-0.0008	0.0777	-0.0061
P5	646	0.0011	0.0587	-0.0055
P6	643	0.0044	0.0805	-0.0069
P7	644	0.0103	0.0770	-0.0049
P8	645	0.0202	0.0914	-0.0034
P9	644	0.0402	0.1231	-0.0015
P10 (highest)	646	0.1189	0.1506	0.0002
Correlation Coefficient		1.0000	0.9605	0.8480

Table 2.8: ΔPurchase and Future Sales

This table shows the results of multivariate regressions using one-year-ahead change in sales ($\Delta Sales_{t+1}$) as a dependent variable, and $\Delta Purchase_t$ as an independent variable. ΔSales is the annual change in sales. ΔPurchase is the annual change in purchase obligations due within one year. ΔSales_Q4 is the annual change in the fourth-quarter sales. ΔINV is the annual change in inventories. ΔPPE is the annual change in property, plant and equipment. TACC is total accruals (ΔWC+ΔNCO+ΔFIN). ΔSales, ΔPurchase, ΔSales_Q4, ΔINV, ΔPPE and TACC are scaled by average total assets. Year and industry dummies are included in the regressions, and coefficients and t-statistics in the parentheses are based on the White standard errors clustered by year and industry.

Dependent Variable	Independent Variables						Adjusted R^2
	Intercept	$\Delta Purchase_t$	$\Delta Sales\_Q4_t$	$TACC_t$	ΔINV_t	ΔPPE_t	
$\Delta Sales_{t+1}$	0.0271 (2.06)	0.5804 (13.42)					0.0651
$\Delta Sales_{t+1}$	0.0029 (0.33)	0.2826 (5.07)	1.5464 (19.24)				0.2279
$\Delta Sales_{t+1}$	-0.0019 (-0.20)	0.2619 (4.88)	1.4618 (20.71)	0.0451 (4.04)	0.1723 (1.02)	0.1392 (3.59)	0.2315

Table 2.9: ΔPurchase and Future ROA

Panel A shows the results of multivariate regressions using one-year-ahead ROA (ROA_{t+1}) as a dependent variable, and contemporaneous ROA (ROA_t) and $\Delta Purchase_t$ as independent variables. Panel B shows the results of multivariate regressions using one-year-ahead change in ROA (ΔROA_{t+1}) as a dependent variable, and $\Delta Purchase_t$ as an independent variable. ROA is operating income after depreciation. ΔPurchase is the annual change in purchase obligations due within one year. ΔSales_Q4 is the annual change in the fourth-quarter sales. ΔINV is the annual change in inventories. ΔPPE is the annual change in property, plant and equipment. TACC is total accruals (ΔWC+ΔNCO+ΔFIN). ROA, ΔPurchase, ΔSales_Q4, ΔINV, ΔPPE and TACC are scaled by average total assets. Year and industry dummies are included in the regressions, and coefficients and t-statistics in the parentheses are based on the White standard errors clustered by year and industry.

Panel A: $\Delta Purchase_t$ and ROA_{t+1}

Dependent Variable	Independent Variables							Adjusted R^2
	Intercept	ROA_t	$\Delta Purchase_t$	$\Delta Sales\_Q4_t$	$TACC_t$	ΔINV_t	ΔPPE_t	
ROA_{t+1}	-0.0038 (-0.95)	0.9383 (60.93)	0.0636 (7.43)					0.7738
ROA_{t+1}	-0.0047 (-1.25)	0.9314 (70.71)	0.0463 (8.93)	0.0934 (2.68)				0.7748
ROA_{t+1}	-0.0015 (-0.46)	0.9399 (67.95)	0.0584 (7.02)	0.1447 (3.83)	-0.0122 (-1.59)	-0.1055 (-2.21)	-0.1368 (-5.95)	0.7779

Panel B: $\Delta Purchase_t$ and ΔROA_{t+1}

Dependent Variable	Independent Variables						Adjusted R^2
	Intercept	$\Delta Purchase_t$	$\Delta Sales\_Q4_t$	$TACC_t$	ΔINV_t	ΔPPE_t	
ΔROA_{t+1}	-0.0089 -2.22	0.0578 (5.46)					0.02341
ΔROA_{t+1}	-0.0099 (-2.79)	0.0456 (8.08)	0.0630 (1.64)				0.02542
ΔROA_{t+1}	-0.0058 (-1.99)	0.0602 (6.83)	0.1266 (3.18)	-0.0226 (-3.40)	-0.1154 (-2.36)	-0.1417 (-6.36)	0.04225

Table 2.10: ΔPurchase and DuPont Components of Future ROA

Panel A shows the results of multivariate regressions using one-year-ahead change in profit margin (ΔPM_{t+1}) as a dependent variable, and $\Delta Purchase_t$ as an independent variable. Panel B shows the results of multivariate regressions using one-year-ahead change in asset turnover (ΔATO_{t+1}) as a dependent variable, and $\Delta Purchase_t$ as an independent variable. PM is operating income after depreciation divided by sales. ATO is sales divided by average total assets. ΔPM is the annual change in profit margin (PM). ΔATO is the annual change in asset turnover (ATO). ΔPurchase is the annual change in purchase obligations due within one year. ΔSales_Q4 is the annual change in the fourth-quarter sales. ΔINV is the annual change in inventories. ΔPPE is the annual change in property, plant and equipment. TACC is total accruals (ΔWC+ΔNCO+ΔFIN). ΔPurchase, ΔSales_Q4, ΔINV, ΔPPE and TACC are scaled by average total assets. Year and industry dummies are included in the regressions, and coefficients and t-statistics in the parentheses are based on the White standard errors clustered by year and industry.

Panel A: ΔPurchase and Future Profit Margin

Dependent Variable	Independent Variables						Adjusted R^2
	Intercept	$\Delta Purchase_t$	$\Delta Sales\_Q4_t$	$TACC_t$	ΔINV_t	ΔPPE_t	
ΔPM_{t+1}	0.0394 (0.94)	0.1918 (0.94)					0.0025
ΔPM_{t+1}	0.0349 (0.97)	0.1386 (0.90)	0.2704 (0.78)				0.0026
ΔPM_{t+1}	0.0306 (0.89)	0.0883 (0.79)	0.0818 (0.58)	0.4304 (1.01)	-0.0136 (-0.15)	-0.2279 (-1.38)	0.0029

Panel B: ΔPurchase and Future Asset Turnover

Dependent Variable	Independent Variables						Adjusted R^2
	Intercept	$\Delta Purchase_t$	$\Delta Sales\_Q4_t$	$TACC_t$	ΔINV_t	ΔPPE_t	
ΔATO_{t+1}	0.0222 (1.82)	0.0599 (3.79)					0.0228
ΔATO_{t+1}	0.0227 (1.93)	0.0668 (3.04)	-0.0361 (-0.49)				0.0229
ΔATO_{t+1}	0.0337 (3.13)	0.1199 (5.08)	0.1737 (2.19)	-0.1675 (-9.59)	-0.3444 (-3.42)	-0.2659 (-3.53)	0.0555

Table 2.11: ΔPurchase and Future Asset Growth

This table shows future asset growth for portfolios of our sample firms formed on ΔPurchase. ΔPurchase is the annual change in purchase obligations due within one year. ΔINV is the annual change in inventories. ΔPPE is the annual change in property, plant and equipment. TACC is the sum of the change in non-cash working capital (ΔWC), the change in net non-current operating assets (ΔNCO) and the change in net financial assets (ΔFIN). Each of these variables is scaled by average total assets. Each year, firms are ranked into deciles based on ΔPurchase. By construction, P1 contains firms with the lowest ΔPurchase, and P10 contains firms with the highest ΔPurchase. Correlation coefficients presented in the bottom row indicate the correlation coefficient between the column of mean $\Delta Purchase_t$ and the corresponding column.

ΔPurchase Ranking	#Obs.	Mean $\Delta Purchase_t$	Mean ΔINV_{t+1}	Mean ΔPPE_{t+1}	Mean $TACC_{t+1}$
P1 (lowest)	643	-0.0593	0.0003	0.0113	-0.0189
P2	644	-0.0150	0.0035	0.0126	-0.0065
P3	645	-0.0048	0.0061	0.0120	-0.0004
P4	644	-0.0008	0.0059	0.0117	-0.0036
P5	646	0.0011	0.0037	0.0156	-0.0030
P6	643	0.0044	0.0072	0.0182	0.0188
P7	644	0.0103	0.0064	0.0134	0.0073
P8	645	0.0202	0.0075	0.0241	-0.0023
P9	644	0.0402	0.0136	0.0298	0.0297
P10 (highest)	646	0.1189	0.0144	0.0486	0.0424
Correlation Coefficient		1.0000	0.9097	0.9265	0.8960

Table 2.12: ΔPurchase and Future Asset Growth – Multivariate Regressions

Panel A shows the results of multivariate regressions using one-year-ahead change in inventory (ΔINV_{t+1}) as a dependent variable, and $\Delta Purchase_t$ as an independent variable. Panel B shows the results of multivariate regressions using one-year-ahead change in fixed assets (ΔPPE_{t+1}) as a dependent variable, and $\Delta Purchase_t$ as an independent variable. Panel C shows the results of multivariate regressions using one-year-ahead total accruals ($TACC_{t+1}$) as a dependent variable, and $\Delta Purchase_t$ as an independent variable. ΔPurchase is the annual change in purchase obligations due within one year. ΔSales_Q4 is the annual change in the fourth-quarter sales. ΔINV is the annual change in inventories. ΔPPE is the annual change in property, plant and equipment. TACC is total accruals (ΔWC+ΔNCO+ΔFIN). ΔPurchase, ΔSales_Q4, ΔINV, ΔPPE and TACC are scaled by average total assets. Year and industry dummies are included in the regressions, and coefficients and t-statistics in the parentheses are based on the White standard errors clustered by year and industry.

Panel A: ΔPurchase and Future Inventory

Dependent Variable	Independent Variables						Adjusted R^2
	Intercept	$\Delta Purchase_t$	$\Delta Sales\_Q4_t$	$TACC_t$	ΔINV_t	ΔPPE_t	
ΔINV_{t+1}	-0.0045 (-1.05)	0.0744 (8.54)					0.0555
ΔINV_{t+1}	-0.0064 (-1.57)	0.0519 (4.86)	0.1170 (8.30)				0.0827
ΔINV_{t+1}	-0.0068 (-1.67)	0.0477 (4.14)	0.1020 (8.83)	0.0114 (9.45)	0.0499 (1.41)	0.0028 (0.38)	0.0861

Panel B: ΔPurchase and Future Fixed Assets

Dependent Variable	Independent Variables						Adjusted R^2
	Intercept	$\Delta Purchase_t$	$\Delta Sales\_Q4_t$	$TACC_t$	ΔINV_t	ΔPPE_t	
ΔPPE_{t+1}	0.0088 (0.93)	0.1898 (3.91)					0.1594
ΔPPE_{t+1}	0.0061 (0.66)	0.1557 (3.19)	0.1771 (12.55)				0.1722
ΔPPE_{t+1}	-0.0021 (-0.19)	0.1413 (3.10)	0.0977 (8.76)	0.0403 (17.12)	-0.0844 (-1.97)	0.3045 (10.45)	0.2187

Table 2.12 (Continued)

Panel C: ΔPurchase and Future Accruals

Dependent Variable	Independent Variables						Adjusted R^2
	Intercept	$\Delta Purchase_t$	$\Delta Sales\_Q4_t$	$TACC_t$	ΔINV_t	ΔPPE_t	
$TACC_{t+1}$	-0.04370 (-1.42)	0.2735 (3.63)					0.0746
$TACC_{t+1}$	-0.0519 (-1.80)	0.1702 (2.22)	0.5273 (6.66)				0.1001
$TACC_{t+1}$	-0.0570 (-1.90)	0.1559 (2.11)	0.4611 (6.04)	0.0473 (2.67)	0.0133 (0.67)	0.1628 (4.05)	0.1047

Table 3.1: Construction of Test Samples

In Chapter 3, we construct two test samples based on the sample used in Chapter 2. For the empirical analysis in Section 3.3 where we examine the stock price response to ΔPurchase, we eliminate (1) firm-years for which stock price and return data are unavailable from the CRSP, (2) firm-years where 10-K filings occur more than 120 days after fiscal year end, and (3) firm-years with a stock price less than $1. For the analysis in Section 3.4 where we examine the time-series pattern of forecast errors, we eliminate firm-years without I/B/E/S coverage.

Panel A: Construction of Test Sample for Section 3.3

Sample Formation Procedures	Number of Firm-Years
Test Sample in Chapter 2	6,444
Less:	
Firm-years for which stock price and return data are unavailable from the CRSP	209
Firm-years where 10-K filings occur more than 120 days after fiscal year end	44
Firm-years with a stock price less than $1	54
Test Sample in Section 3.3	6,137

Panel B: Construction of Test Sample for Section 3.4

Sample Formation Procedures	Number of Firm-Years
Test Sample in Chapter 2	6,444
Less:	
Firm-years without I/B/E/S coverage	2,213
Test Sample in Section 3.4	4,231

Table 3.2: Investor Reaction to ΔPurchase

This table shows stock price reaction to the information in purchase obligations at the 10-K filing dates. FAR_t is the size-adjusted return measured over the three-day 10-K filing window. ΔPurchase is the annual change in purchase obligations due within one year. ΔSales_Q4 is the annual change in the fourth-quarter sales. ΔINV is the annual change in total inventories. ΔPPE is the annual change in property, plant and equipment. TACC is total accruals (ΔWC+ΔNCO+ΔFIN). ΔPurchase, ΔSales_Q4, ΔINV, ΔPPE and TACC are scaled by average total assets. BM is the book value of common equity divided by the market value of common equity at fiscal year end. MOM is the six-month stock return prior to the filing date of a 10-K. Year and industry dummies are included in the regressions, and coefficients and t-statistics in the parentheses are based on the White standard errors clustered by year and industry.

Dependent Variable	Independent Variables								Adjusted R^2
	Intercept	$\Delta Purchase_t$	$\Delta Sales\_Q4_t$	$TACC_t$	ΔINV_t	ΔPPE_t	BM_t	MOM_t	
FPR_t	0.0033	-0.0093					0.0072	-0.0293	0.0111
	(2.62)	(-0.72)					(4.69)	(-1.48)	
FPR_t	0.0025	-0.0125	0.0267				0.0077	-0.0298	0.0120
	(1.96)	(-0.93)	(2.21)				(5.09)	(-1.55)	
FPR_t	0.0030	-0.0117	0.0375	-0.0028	-0.0378	-0.0116	0.0075	-0.0305	0.0128
	(2.15)	(-0.86)	(2.55)	(-0.47)	(-1.70)	(-0.78)	(5.01)	(-1.52)	

Table 3.3: Value-Relevance of ΔPurchase

This table shows the results of multivariate regressions using contemporaneous annual stock return (SAR_t) as a dependent variable, and $\Delta Purchase_t$ as an independent variable. SAR_t is the size-adjusted return measured over a period of 252 trading days prior to the filing date of a 10-K. ΔPurchase is the annual change in purchase obligations due within one year. ΔSales_Q4 is the annual change in the fourth-quarter sales. ΔINV is the annual change in total inventories. ΔPPE is the annual change in property, plant and equipment. TACC is total accruals (ΔWC+ΔNCO+ΔFIN). ROA is operating income after depreciation. ΔPurchase, ΔSales_Q4, ΔINV, ΔPPE, TACC and ROA are scaled by average total assets. ΔROA is the annual change in ROA. Year and industry dummies are included in the regressions, and coefficients and t-statistics in the parentheses are based on the White standard errors clustered by year and industry.

Dependent Variable	Independent Variables								Adjusted R^2
	Intercept	ROA_t	ΔROA_t	$\Delta Purchase_t$	$\Delta Sales\_Q4_t$	$TACC_t$	ΔINV_t	ΔPPE_t	
SAR_t	-0.0213	0.3074	1.7946	0.7473					0.1307
	(-1.14)	(8.10)	(7.77)	(4.42)					
SAR_t	-0.0442	0.2159	1.4910	0.4515	1.6474				0.1617
	(-2.72)	(5.39)	(7.16)	(2.86)	(8.29)				
SAR_t	-0.0348	0.2340	1.4415	0.5047	1.8887	0.0252	-0.9848	-0.4004	0.1669
	(-2.38)	(7.08)	(7.42)	(2.87)	(8.27)	(0.54)	(-4.00)	(-2.20)	

Table 3.4: ΔPurchase and Future Stock Returns

This table shows the results of multivariate regressions using one-year-ahead annual stock return (SAR_{t+1}) as a dependent variable, and $\Delta Purchase_t$ as an independent variable. SAR_{t+1} is the size-adjusted return measured over a period of 252 trading days following the three-day 10-K filing window. ΔPurchase is the annual change in purchase obligations due within one year. ΔSales_Q4 is the annual change in the fourth-quarter sales. ΔINV is the annual change in total inventories. ΔPPE is the annual change in property, plant and equipment. TACC is total accruals (ΔWC+ΔNCO+ΔFIN). ΔPurchase, ΔSales_Q4, ΔINV, ΔPPE and TACC are deflated by average total assets. BM is the book value of common equity divided by the market value of common equity at fiscal year end. MOM is the six-month stock return prior to the filing date of a 10-K. Year and industry dummies are included in the regressions, and coefficients and t-statistics in the parentheses are based on the White standard errors clustered by year and industry.

Dependent Variable	Independent Variables								Adjusted R^2
	Intercept	$\Delta Purchase_t$	$\Delta Sales\_Q4_t$	$TACC_t$	ΔINV_t	ΔPPE_t	BM_t	MOM_t	
SAR_{t+1}	0.0178 (0.75)	0.3250 (2.79)					0.0136 (0.96)	-0.0532 (-0.76)	0.0266
SAR_{t+1}	0.0177 (0.75)	0.2821 (2.53)	0.1073 (0.91)				0.0144 (0.98)	-0.0579 (-0.73)	0.0266
SAR_{t+1}	0.0181 (0.72)	0.2986 (2.55)	0.1104 (0.94)	0.0139 (0.37)	0.0165 (0.74)	-0.1338 (-1.17)	0.0153 (1.07)	-0.0602 (-0.75)	0.0272

Table 3.5: Future Stock Returns to Portfolios Formed on ΔPurchase

This table shows average one-year-ahead stock returns for portfolios formed on ΔPurchase. Each year, firms are ranked into deciles based on ΔPurchase. By construction, P1 contains firms with the lowest ΔPurchase, and P10 contains firms with the highest ΔPurchase. One-year-ahead stock returns are measured over a period of 252 trading days following the three-day 10-K windows. The size-adjusted (size-B/M-adjusted) return is calculated by deducting the value-weighted average return for all firms in the same size-matched (size-B/M-matched) portfolio. ΔPurchase is defined as the annual change in purchase obligations due within one year.

ΔPurchase Ranking	# Obs.	Raw Return	Size-Adjusted Return	Size-B/M-Adjusted Return
P1 (lowest)	613	-0.1028	-0.0350	-0.0370
P2	614	-0.0736	-0.0184	-0.0203
P3	613	-0.0929	-0.0241	-0.0224
P4	614	-0.0786	-0.0168	-0.0131
P5	614	-0.0369	-0.0024	-0.0068
P6	613	-0.0256	0.0039	0.0066
P7	614	-0.0106	0.0181	0.0219
P8	614	-0.0316	0.0117	0.0100
P9	613	-0.0329	0.0104	0.0141
P10 (highest)	615	0.0018	0.0349	0.0304
Hedge Return (P10-P1)		0.1046	0.0699	0.0674
t-statistics		(2.68)	(2.53)	(2.51)

Table 3.6: Regression of Forecast Errors on ΔPurchase and Other Firm Characteristics

Following Richardson, Teoh and Wysocki (2004), we sort analysts' forecasts into twelve groups by 30-day blocks. Forecasts made less than 30 days prior to the announcement of one-year-ahead earnings are grouped in Month-1, forecasts between 30- and 60-day lags in Month-2, and so on up to Month-12. For each Month group, we estimate the following regression model, and report the estimated coefficients on $\Delta Purchase_t$ in this table.

$$(\text{Forecast Error})_{t+1} = \beta_0 + \beta_1 \Delta Purchase_t + \beta_2 SIZE_t + \beta_3 (BM)_t + \beta_4 Profit_{t+1} + \varepsilon_{t+1}$$

Forecast error is the actual one-year-ahead earnings per share minus the median forecast of earnings per share scaled by the stock price at the beginning of the year. ΔPurchase is the annual change in purchase obligations due within one year, divided by average total assets. SIZE is the logarithm of market value of common equity (prcc_f × csho) at fiscal year end, BM is the book value of equity divided by the market value of equity at fiscal year end, and Profit is a dummy variable which equals 1 if actual earnings are positive, and equal to 0 otherwise. We eliminate forecast errors greater than 10% of stock price in order to remove the influence of extreme outliers.

Group by Month	Month-12	Month-11	Month-10	Month-9	Month-8	Month-7
Coefficient on ΔPurchase	0.0261	0.0283	0.0208	0.0174	0.0022	0.0036
t-statistics	(2.58)	(3.66)	(2.57)	(2.41)	(0.53)	(0.82)
Group by Month	**Month-6**	**Month-5**	**Month-4**	**Month-3**	**Month-2**	**Month-1**
Coefficient on ΔPurchase	0.0079	0.0048	0.0046	0.0038	0.0016	0.0012
t-statistics	(1.37)	(1.06)	(0.96)	(0.97)	(0.53)	(0.27)

Appendix 2: Figures

Figure 1.1: Tabular Format Required by the SEC

Contractual Obligations	Payments Due by Period				
	Total	Less than 1 year	1-3 Years	3-5Years	More than 5 Years
Long-Term Debt Obligations					
Capital Lease Obligations					
Operating Lease Obligations					
Purchase Obligations					
Other Long-Term Liabilities Reflected on the Company's Balance Sheet under GAAP					
Total					

Figure 1.2: Disclosure of Filing Status and Public Float on the First Page of a 10-K Filing

Panel A: Dell Inc.'s 10-K Filing for Fiscal Year 2007

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer", "accelerated filer", and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check One):

Large accelerated filer ☑ Accelerated filer ☐
Non-accelerated filer ☐ (do not check if smaller reporting Company) Smaller reporting company ☐

Approximate aggregate market value of the registrant's common stock held by non-affiliates as of August 3, 2007, based upon the closing price reported for such date on The NASDAQ Stock Market $54.0 billion

Panel B: General Electric Co.'s 10-K Filing for Fiscal Year 2007

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer", "accelerated filer", and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check One):

Large accelerated filer ☑ Accelerated filer ☐
Non-accelerated filer ☐ (do not check if smaller reporting Company) Smaller reporting company ☐

The aggregate market value of the outstanding common equity of the registrant as of the last business day of the registrant's most recently completed second fiscal quarter was $392.2 billion. Affiliates of the Company beneficially own, in the aggregate, less than one-tenth of one percent of such shares.

Panel C: Exxon Mobil Corp.'s 10-K Filing for Fiscal Year 2007

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer," and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ✓ Accelerated filer ____
Non-accelerated filer ____ Smaller reporting company ___

The aggregate market value of the voting stock held by non-affiliates of the registrant on June 29, 2007, the last business day of the registrant's most recently completed second fiscal quarter, based on the closing price on that date of $83.88 on the New York Stock Exchange composite tape, was in excess of $465 billion.

Figure 1.3: Prudential Financial Inc.'s Contractual Obligations as of December 31, 2007

	Estimated Payments Due by Period				
	Total	Less than 1 Year	1 -3 Years	3 – 5 Years	More than 5 Years
			(in millions)		
Short-term and long-term debt obligations (1)	$43,237	$16,652	$2,353	$ 4,034	$20,198
Operating lease obligations (2)	754	164	252	170	168
Purchase obligations:					
Commitments to purchase or fund investments (3)	10,638	10,638	—	—	—
Commercial mortgage loan commitments (4)	2,937	970	1,770	197	—
Other liabilities:					
Insurance liabilities (5)	1,094,676	48,561	71,619	68,801	905,695
Other (6)	18,712	17,896	816	—	—
Total	$11,170,954	$694,881	$776,810	$773,202	$926,061

(3) We have commitments to purchase or fund investments, some of which are contingent upon events or circumstances not under our control, including those at the discretion of our counterparties. The timing of the fulfillment of certain of these commitments cannot be estimated, therefore the settlement of these obligations are reflected in estimated payments due in less than one year. Commitments to purchase or fund investments include $7.435 billion that we anticipate will be funded from the assets of our separate accounts.

(4) Loan commitments of our commercial mortgage operations, which are legally binding commitments to extend credit to a counterparty, have been reflected in the contractual obligations table above principally based on the expiration date of the commitment; however, it is possible these loan commitments could be funded prior to their expiration. In certain circumstances the counterparty may also extend the date of the expiration in exchange for a fee.

Figure 1.4: Snapshot of Purchase Obligations Dataset

CIK(1)	RDate(2)	FYE(3)	FYEAR(4)	Table(5)	Unit(6)	Total	W_O(7)	O_T(7)	T_F(7)	A_F(7)
20	20040401	20040103	2003	1	T	7,801	7,025	776	0	0
20	20050331	20050101	2004	1	T	9,267	8,928	393	0	0
20	20060323	20051231	2005	1	T	8,717	8,166	551	0	0
20	20070309	20061230	2006	1	T	10,664	10,018	646	0	0
20	20080312	20071229	2007	1	T	19,769	18,842	927	0	0
20	20090313	20090103	2008	1	T	22,175	21,404	771	0	0
20	20100315	20100202	2009	1	T	15,311	12,912	2,399	0	0
1800	20040225	20031231	2003	1	M	2,402	2,295	66	27	14
1800	20050302	20041231	2004	1	M	1,707	1,571	121	11	4
1800	20060222	20051231	2005	1	M	1,454	1,311	99	32	12
1800	20070223	20061231	2006	1	M	2,751	2,574	130	36	11
1800	20080219	20071231	2007	1	M	3,551	3,194	283	67	7
1800	20090220	20081231	2008	1	M	4,627	4,328	258	32	9
1800	20100219	20091231	2009	1	M	3,307	3,118	159	23	7
2034	20030926	20030630	2003	1	T	23,193	22,358	835	0	0
2034	20040910	20040630	2004	1	T	7,823	7,823	0	0	0
2034	20050912	20050630	2005	1	T	24,303	24,303	0	0	0
2034	20060912	20060630	2006	1	T	58,137	58,137	0	0	0
2034	20070910	20070630	2007	1	T	71,891	67,611	4,280	0	0
2034	20080950	20080630	2008	1	T	79,168	79,168	0	0	0
2034	20090911	20090630	2009	1	T	48,807	48,807	0	0	0

(1) CIK (Central Index Key): company identifier used by the SEC

(2) RDate: 10-K filing date

(3) FYE: actual fiscal year end date

(4) FYEAR: Compustat fiscal year

(5) We find more than 40 variations in the column headings of contractual obligations table with respect to when the payments are due. Table equals 1 if the company uses exactly the same column headings as in the tabular format in Figure 1. For each variation in the column headings, we assign a different value.

(6) Unit: T if dollar amounts are in thousands, M if dollar amount are in millions

(7) W_O denotes the dollar amount of payments due within one year. O_T denotes the dollar amount of payments due after one year but before three years. T_F denotes the dollar amount of payments due after three years but before five years. A_F denotes the dollar amount of payments due after five years.

Figure 1.5: Examples of Contractual Obligations Disclosure

Panel A: Verizon Communications Inc.'s Contractual Obligations as of December 31, 2007

	Payments Due By Period (dollars in millions)				
Contractual Obligations	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Long-Term Debt	$ 30,455	$ 2,518	$ 5,781	$ 6,891	$ 15,265
Capital Lease Obligations	312	46	93	71	102
Total Long-Term Debt, Including Current Maturities	30,767	2,564	5,874	6,962	15,367
Interest on Long-Term Debt	21,116	1,897	3,350	2,622	13,247
Operating Leases	7,001	1,489	2,292	1,253	1,967
Purchase Obligations*	844	613	188	33	10
Income Tax Audit Settlements	233	233	–	–	–
Other Long-Term Liabilities	4,190	2,020	2,170	–	–
Total contractual obligations	$ 64,151	$ 8,816	$ 13,874	$ 10,870	$ 30,591

* We have several commitments primarily to purchase network services, equipment and software from a variety of suppliers totaling $844 million. Of this total amount, $613 million, $137 million, $51 million, $28 million, $5 million and $10 million are expected to be purchased in 2008, 2009, 2010, 2011, 2012 and thereafter, respectively.

Figure 1.5 (Continued)

Panel B: Kellogg Company's Contractual Obligations as of December 31, 2007

Contractual Obligations	Payments Due By Period						
(millions)	Total	2008	2009	2010	2011	2012	beyond
Long-term debt:							
Principal	$3,751	$466	$2	$1	$1,429	$751	$1,102
Interest	2,504	221	215	215	167	170	1,516
Capital leases	8	1	1	1	1	1	3
Operating leases	730	159	137	112	83	56	183
Purchase obligations*	612	477	91	34	4	4	2
Uncertain tax positions	36	36	—	—	—	—	—
Other long-term Liabilities	592	117	76	71	79	60	189
Total	$8,233	$1,477	$522	$434	$1,763	$1,042	$2,995

* Purchase obligations consist primarily of fixed commitments under various co-marketing agreements and to a lesser extent, of service agreements, and contracts for future delivery of commodities, packaging materials, and equipment. The amounts presented in the table do not include items already recorded in accounts payable or other current liabilities at year-end 2007, nor does the table reflect cash flows we are likely to incur based on our plans, but are not obligated to incur. Therefore, it should be noted that the exclusion of these items from the table could be a limitation in assessing our total future cash flows under contracts.

Figure 2.1: Time-Series Properties of Financial Variables Based on ΔPurchase

This figure shows the time-series properties of financial variables using a constant sample of 901 firms (3,604 firm-years). Each panel provides the mean value of the corresponding financial variable for firm-years in the top and bottom deciles of ΔPurchase, adjusted by the mean value of the variable for all the firm-years in the constant sample. Lowest ΔPurchase portfolio consists of 360 firm-years in the bottom decile of ΔPurchase, and highest ΔPurchase portfolio consists of 364 firm-years in the top decile of ΔPurchase. Year 0 is the year in which firms are ranked into deciles based on ΔPurchase.

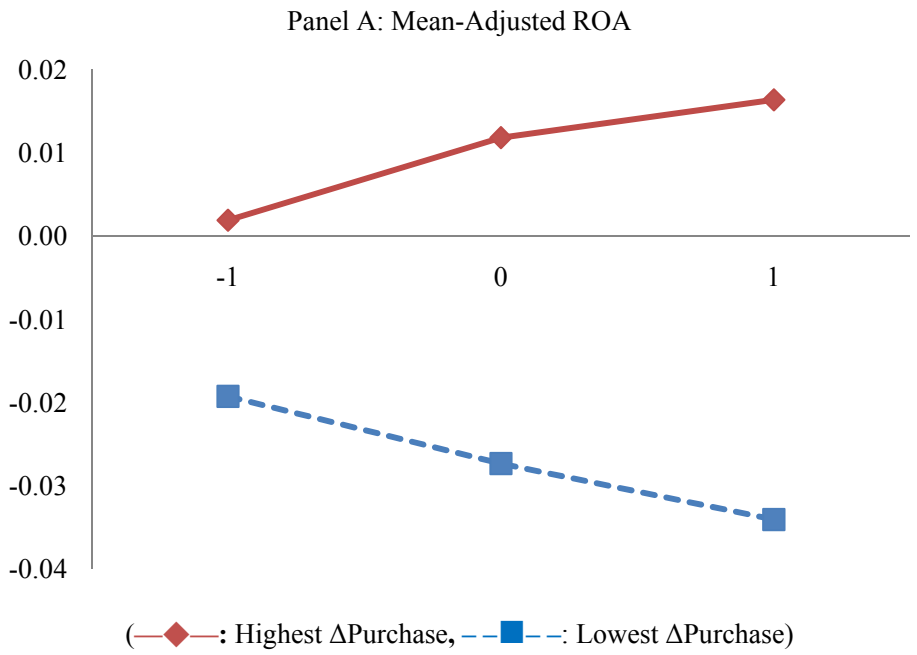
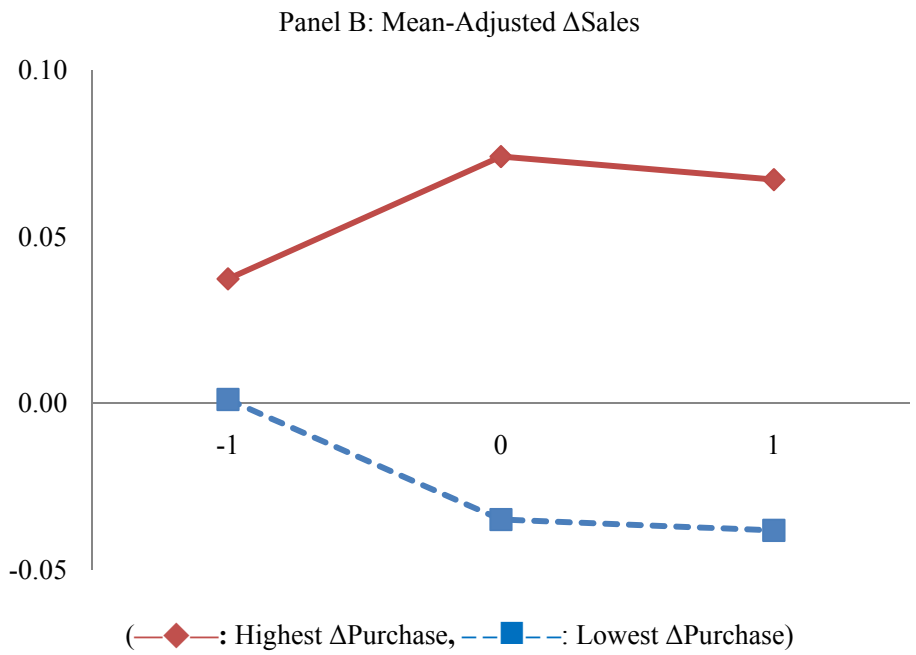


Figure 2.1 (Continued)



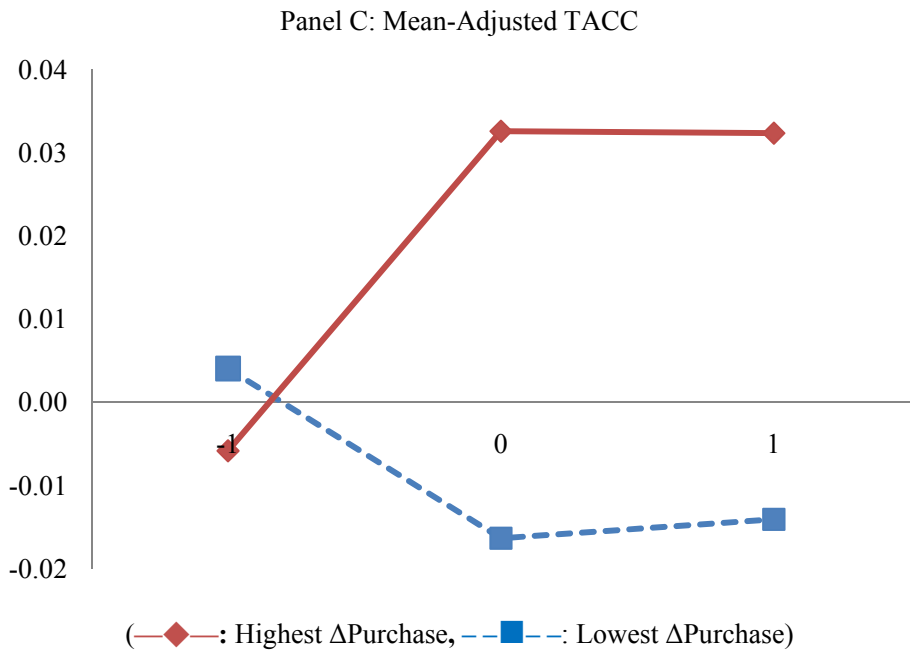
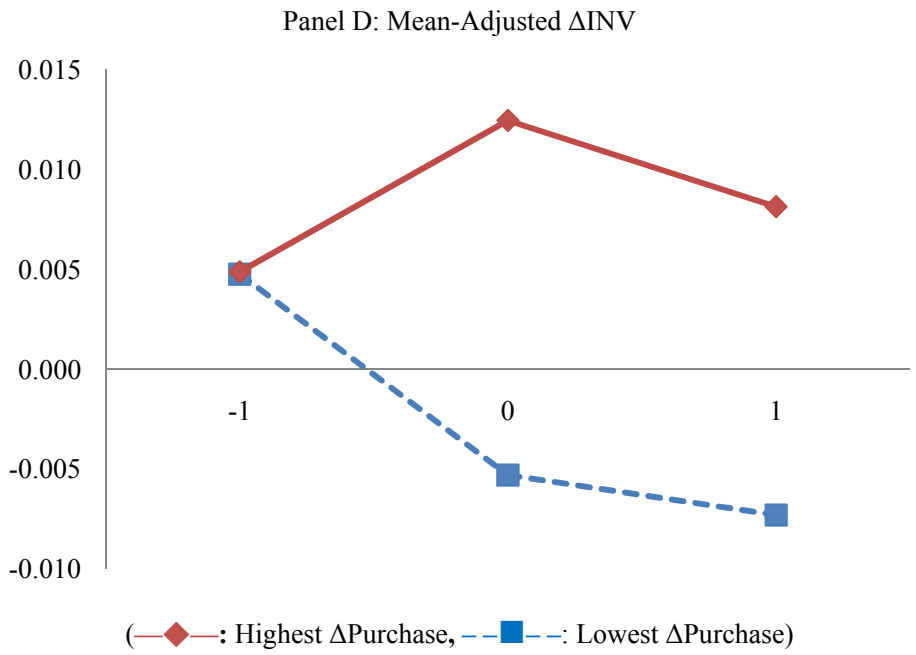


Figure 2.1 (Continued)



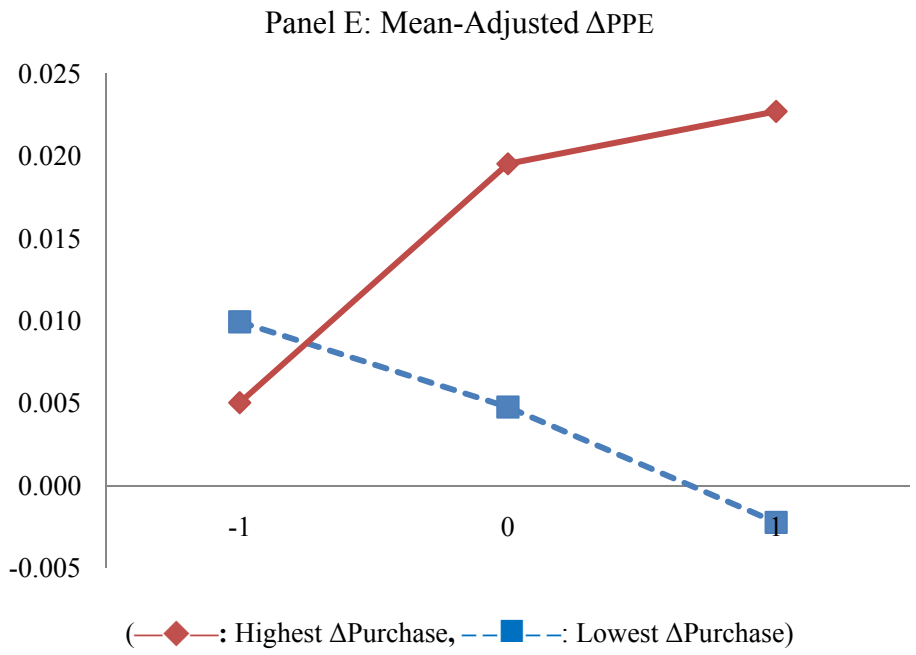


Figure 3.1: Grouping of Analyst Forecasts

Following Richardson, Teoh and Wysocki (2004), we sort analysts' forecasts into twelve groups by 30-day blocks in order to track analyst forecast revisions leading up to the announcement of one-year-ahead earnings. Earnings forecasts made less than 30 days prior to the announcement of one-year-ahead earnings are grouped in Month-1, earnings forecasts between 30- and 60-day lags in Month-2, and so on up to Month-12. Because one-year-ahead earnings are announced on the last day of Month-1, we assume that earnings for the most recent fiscal year are announced on the first day of Month-12. We also assume that a 10-K for the most recent fiscal year is filed with the SEC on the last day of Month-12 because the average number of calendar days between the announcement of annual earnings and the filing of a 10-K is 28.9 for firm-years in the test sample.

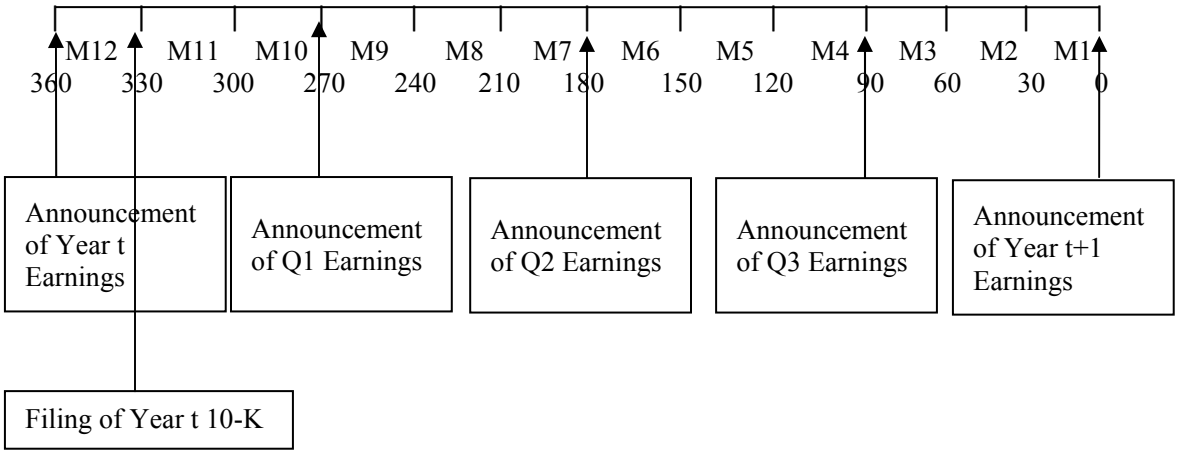


Figure 3.2: Time-Series Pattern of Average Forecast Errors

Following Richardson et al. (2004), we sort analysts' forecasts into twelve groups by 30-day blocks in order to track analyst forecast revisions leading up to the announcement of one-year-ahead earnings. Forecasts made less than 30 days prior to the announcement of one-year-ahead earnings are grouped in Month-1, forecasts between 30- and 60-day lags in Month-2, and so on up to Month-12. For each Month group, we calculate a mean forecast error for two groups of sample firms: one group consists of firms in the top decile of ΔPurchase, and the other group consists of firms in the bottom decile of ΔPurchase. The calculated mean forecast errors are plotted in this figure.