

**Customer Profitability Analysis and Market Valuation:
Differential Pricing and the Comparative Profitability of Major Customer Sales**

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ABSTRACT

In this study, I investigate whether inferences drawn from customer profitability analysis (CPA) are associated with the information set used by investors valuing firms' equity. This research question is motivated by the recent emergence of CPA as the most important aspect of strategic planning for managers (e.g., Foster and Young 1997). To the extent that managers use CPA in developing strategies to devote more (less) effort to more (less) profitable customer segments, information about differential profit margins across segments of customer revenues should be value relevant in efficient capital markets. Given that firms generally do not disclose customer profitability details, I use observed income statement data and SFAS 14/131 disclosures to estimate the differential profitability of firms' major customer sales and non-major customer sales. Using these estimates, I then test whether the association between share prices and major customer profitability is more (less) positive compared to the pricing of non-major customer profitability when major customer sales yield comparatively higher (lower) profit margins. Based on a sample of 20,527 firm-years disclosing major customer sales during 1980 – 2006, I find evidence consistent with the predictions. This study is the first to systematically examine the value relevance of customer-contributed components of income and adds to the literature bridging management accounting and capital markets research (e.g., Banker and Chen 2006; Hemmer and Labro 2008). Furthermore, my results have implications for i) management accounting research concerned with understanding the valuation consequences of CPA and its potential impact on future management behavior; ii) financial accounting research concerned

with the informativeness of disaggregated accounting information used by managers for resource allocation decisions; and 3) research interested in the financial effects of significant seller-buyer relationships.

I. INTRODUCTION

Over the past few decades, customer profitability analysis (CPA) has become one of the most important aspects of strategic planning for managers (Kaplan and Norton 1996; Foster et al. 1996; Foster and Young 1997; Blattberg et al. 2001). Consistent with the value-adding objectives of management accounting, CPA helps managers i) identify individual or small groups of customers that differentially drive overall profitability; and ii) develop strategies to ensure that these customers receive a commensurate level of attention from the organization (e.g., Horngren et al. 2008). However, despite this intuitive link between CPA and the extent to which *managers* differentially value customer segments, whether inferences drawn from CPA are associated with commensurate differential pricing by *investors* is an open empirical question. This study's purpose, therefore, is to investigate whether such an association exists between share prices and comparative profitability differences between two identifiable segments of customer revenues – major customer sales, identified per firms' SFAS 14/131 disclosures,¹ and sales to the remaining base of non-major customers (hereafter, non-major customer sales).

Distinguishing the profitability of major customer sales provides a rich empirical context for several reasons. First, prior research on the performance effects of significant seller-buyer relationships documents that major customers' substantial buying power has considerable influence with respect to suppliers' pricing strategies (e.g., volume discounts or price demands

¹ Statement of Financial Accounting Standards No. 14, *Financial Reporting for Segments of a Business Enterprise* (FASB 1976), defines major customers as individual customers constituting ten percent or more of a firm's total revenues. This standard was superseded by Statement of Financial Accounting Standards No. 131, *Disclosures About Segments of an Enterprise and Related Information* for fiscal years beginning December 15, 1997; however, the ten percent threshold pertaining to major customer disclosures was not changed. While this threshold represents the minimum for *required* disclosure, firms may *voluntarily* disclose major customer sales representing less than ten percent of total revenues. As such, the empirical analyses reported in this study are based on all disclosed major customer sales, irrespective of the ten percent threshold. Subsequent analyses (not reported) imposing the restriction that each major customer meets the ten percent minimum do not affect the results.

not available non-major customers) and their upstream (e.g., operations and product design) and downstream (marketing and customer service) activities (Kalwani and Narayandas 1995; Foster et al. 1996; Gosman et al. 2004). This differential influence with respect to firms' revenues and cost structures, however, does not necessarily imply that major customer sales are always less profitable than non-major customer sales. Kalwani and Narayandas (1995), for example, find that long-term relationships with major customers can result in operational efficiencies for the seller that yield abnormally higher returns on investment, consistent with the tenets of supply chain management. Based on this evidence, distinguishing the profitability of major customer sales is likely to result in an economically- and operationally-meaningful earnings disaggregation.

Second, SFAS 14/131 requires the disclosure of major customer sales because these sales "represent a significant concentration of risk," consistent with the FASB's objective of providing information that helps investors assess the amount, timing and uncertainty of a firm's future net cash flows. Moreover, Hemmer and Labro (2008) provide theoretical evidence linking the level of precision in firms' management accounting systems and firms' external disclosure requirements, suggesting that (at minimum) firms disclosing major customer sales per SFAS 14/131 have management accounting systems that distinguish these transactions from non-major customer sales.² Thus, while the grouping of customer revenues used internally by managers for CPA is not directly observable, I posit that the profitability of these sales is likely of importance to both managers and investors.

Finally, focusing on individual or small groups of customers that are vital to a firm's overall profitability is consistent with the popular Pareto (or '80/20') principle discussed in

² Such a distinction between major and non-major customers for managerial decision making is also consistent with the principles of key account management (KAM) discussed in the marketing literature (e.g., Homburg et al. 2002).

management accounting textbooks (e.g., Horngren et al. 2008). In the context of customer profitability analysis, application of this principle suggests that, for example, 80 percent of net income (or loss) is driven by 20 percent of customer revenues.³ Taking such a perspective allows managers to effectively allocate organizational resources to ensure that the effort devoted to such customers is comparable to their relative contributions to the bottom line. Thus, to the extent that managers behave rationally by directing more (less) attention toward serving major customers that contribute disproportionately more (less) favorably to income, analysis of major customer profitability should provide value-relevant information to investors about management behavior and the impact of major customer sales on future firm performance. As such, I use CPA to assess whether major customer sales yield relatively higher (lower) profit margins than non-major customer sales, and then test whether investors ascribe a corresponding relative premium (discount) to major customer profitability.

This research question is relevant to both managers and management accountants, since the former are concerned with understanding how their customer-focused strategies impact firm value, while the latter are charged with providing information that effectively directs managers' attention toward value-adding activities. This question is also important to management accounting researchers. Foster and Young (1997, 64), for example, define management accounting research as "the process of using rigorous methods to explain and/or predict: (1) how changes to an existing management accounting system will affect management actions, motivation and organizational functioning, and (2) how internal and external forces will affect management accounting system design and change." Thus, given the increased emphasis on CPA in firms' management accounting systems, a test of whether customer profitability

³ Note, however, that the '80/20' ratio is simply a rule of thumb describing a more general principle.

information has valuation consequences should provide insights that are consistent with these criteria.

Next, whether inferences drawn from CPA are value relevant for investors is also of interest to accounting standard setters, who are currently considering measures to revise the presentation of financial statements to provide disaggregated information about firms' underlying operations (Reilly 2007).⁴ Although the recommended changes do not explicitly call for reporting customer profitability data, this study nevertheless represents an examination of whether disaggregated accounting information used by managers for resource allocation decisions is value relevant. Furthermore, this study's inquiry is important to researchers interested in the informativeness or the economic consequences of firms' SFAS 14/131 disclosures. While there is extensive evidence in these areas with regard to *operating* segment disclosures (e.g., Botosan 1997; Botosan and Harris (2000); Chen and Zhang (2003); Ettrege et al. 2005), no study (to my knowledge) has systematically examined the informativeness or the economic consequences of firms' *customer* segment disclosures.

Since firms do not report disaggregated earnings by customer segment, I propose an informationally-parsimonious customer profitability analysis using SFAS 14/131 major customer disclosures and observable firm- and industry-level profitability metrics to estimate the profit margin on firms' major customer sales. Specifically, I consider a disclosing firm's overall profit margin (i.e., net income divided by total sales) to be a weighted average of the respective profit margins on its major customer sales and non-major customer sales. Next, I assume the profit margin on the firm's *non*-major customer sales is equal to the median overall profit margin

⁴ The Financial Statement Presentation project is a joint effort of the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB).

attained by the group of non-disclosing industry peers.⁵ The intuition here is that each dollar of revenue generated by non-disclosing firms constitutes non-major customer sales; thus, the median profit margin attained by these firms likely represents the typical profit margin on non-major customer sales for a given industry-year.⁶ Based on these observable constructs, the estimated profit margin on major customer sales can be deduced as a function of the customer sales mix and the extent to which a firm's overall profit margin deviates from the typical margin on non-major customer sales.⁷ This approach to CPA using financial statement data and disclosures is consistent with recent calls for empirical research in management accounting using publicly-available data to estimate firms' proprietary information (Zimmerman 2001; Hemmer and Labro 2008). Moreover, the disaggregation of income to reflect the differential profitability across customer segments is also consistent with recent calls to incorporate the nature of economic transactions in modeling earnings components (Kothari 2001, 151).

To test this study's research question, I use an empirical model derived from the Ohlson (1995) valuation framework, which expresses market value as a linear function of both equity book value and (aggregate) net income. Taking a perspective viewing the net income term as the product of total sales and the overall (weighted average) profit margin, I use observed customer sales data and corresponding profit margin estimates to distinguish the portion of income provided by firms' major customer sales. Specifically, I measure major customers' contribution

⁵ Analyses based on the industry mean (not reported) yield identical inferences.

⁶ Berger and Ofek (1995) make a similar assumption in estimating the market-to-book ratios of multi-segment firms from the median market-to-book ratios of single-segment firms.

⁷ The median profit margin attained by non-disclosing peers can also be considered as the expected overall profit margin for disclosing firms under a naïve assumption that all customers contribute equally to income. Using this perspective, one can interpret the profit margin on major customer sales as a function of sales mix and the extent to which actual profit margin deviates from 'expected' profit margin, attributing any such deviation to the impact of major customer sales.

to income as the product of major customer sales and the estimated profit margin on those sales. The remaining portion of income, therefore, represents the income provided by sales to firms' non-major customers. Given that these customer-centric components of income are derived from complementing proportions of total sales, the existence of differential pricing with respect to these components should be solely attributable to differential profit margins yielded by major customer and non-major customer sales. To specify the model in a manner that characterizes CPA, I allow for two conditions to exist comparing major customer profitability to non-major customer profitability – major customer sales yield either relatively higher or relatively lower profit margins vis-à-vis non-major customer sales. A relatively higher profit margin on major customer sales suggests that this segment of customer revenues drives overall profitability more efficiently and that increased relative sales (or effort devoted) to major customers will likely result in increased future profitability. Conversely, a relatively lower profit margin on major customer sales suggests a decrease in future profitability if managers concentrate more on this segment of revenues. Therefore, based on the market efficiency assumption, where information about *future* profitability is rapidly reflected in *contemporaneous* share prices, I predict a relatively more (less) positive association between share prices and major customer profitability vis-à-vis non-major customer profitability when sales to major customers yield comparatively higher (lower) profit margins.

Using an ordinary least squares regression on a sample of 20,527 firm-year observations disclosing major customer sales during 1980-2006, I find evidence consistent with the predictions. Specifically, after controlling for equity book values, the percentage of sales concentration to major customers, and the portion of income provided by non-major customer sales, I find a significantly more (less) positive association between share prices and major

customer profitability – i.e., compared to the analogous association for non-major customer profitability – when major customer sales yield relatively higher (lower) profit margins. Interpretation of the model coefficients suggests that market participants recognize and commensurately price profitability differences across customer segments, consistent with the management accounting perspective that customer profitability analysis is value relevant. Furthermore, prior research suggests that beneficial significant seller-buyer relationships are associated with unrecorded organizational capital intangible assets (Lev 2001; Gosman et al. 2004). Therefore, my finding of a relative premium (discount) ascribed to the relatively higher (lower) profit margins on major customer sales suggests the existence of an unrecorded positive (negative) intangible asset by virtue of a significant seller-buyer relationship that generates more (less) income per dollar of revenue than the firm’s relationships with its base of non-major customers.

These findings have several implications for accounting research. First, this study’s test of whether customer profitability analysis is value relevant links the forward-looking perspective of management accounting information with the forward-looking assumptions underlying capital market efficiency. For instance, if managers are expected to behave rationally with respect to inferences drawn from CPA, my findings are consistent with investors pricing CPA *in anticipation of* managers’ customer-focused strategies. Thus, bridging these seemingly disparate streams of accounting research points to the potential for developing and testing hypotheses about whether observed future profitability outcomes or manager (agent) behavior are consistent with shareholder (principal) expectations.⁸ Second, this study addresses a void in the management accounting literature that generally investigates cost management topics

⁸ The use of publicly-available data (e.g., share prices) to make predictions about the nature (and use) of management accounting information for decision-making is also posited by Hemmer and Labro (2008).

(Shields 1997; Foster and Young 1997). Foster and Young (1997), for example, note that customer profitability supplanted cost management as the top priority facing general managers, yet customer profitability remains a relatively unexplored area of accounting research.

Third, this study departs from extant accounting research examining whether market participants price accounting information reported *externally* by managers, focusing instead on the association between share prices and customer profitability analysis – one of the most important sources of *internally-reported* accounting information used by strategic decision makers (Foster and Young 1997). As such, my findings point to the importance of considering differential customer profitability in understanding the information set used by investors valuing firms' equity.

Finally, the growing emphasis on supply chain management (SCM) – where large buyers (i.e., major customers) are foregoing adversarial relationships with *many* suppliers in favor of establishing collaborative relationships with *fewer* suppliers (e.g., Chen et al. 2004; Choi and Krause 2005; Ulaga and Eggert 2006) – presents challenges for researchers interested in understanding the implications of significant seller-buyer relationships on financial performance and firm values, particularly since firms are not required to disclose the nature of their supply chain relationships beyond the extent of major customer sales.⁹ This study contributes to the body of research that uses SFAS 14/131 major customer disclosures and financial statement data to examine the financial effects of significant supply chain relationships (e.g., Gosman et al. 2004; Lanier et al. 2008) by providing an approach to measure and assess the valuation implications of firms' supply-chain-related activities.

⁹ Firms meeting the criteria to be identified by their suppliers (sellers) as major customers are *not* required to disclose this information in their *own* financial statements.

The remainder of this paper is organized as follows. Section II develops the hypotheses. Section III describes the sample selection and the procedures used to estimate the profitability of major customer sales. Section IV describes the empirical model. Section V presents results from testing the main hypotheses and provides additional analyses examining the association between customer profitability analysis and share returns. Section VI concludes.

II. HYPOTHESIS DEVELOPMENT

Central to the CPA discussed in most management accounting textbooks is the implicit assumption that understanding customer profitability is value relevant for managers. That is, consistent with the integral role of management accounting in “formulating and implementing the organization’s strategy (IMA 2008),” CPA helps customer-focused managers develop strategies to ensure that customers contributing sizably to overall profitability and, therefore, firm value, receive a level of attention from the organization that is commensurate with the customers’ relative contribution to net income. This forward-looking perspective suggests managers concerned with achieving the organization’s objectives – i.e., to increase profits and shareholder value – will devote relatively more (less) effort to segments of customer revenues that yield relatively higher (lower) profit margins compared to all other customers.

Although empirical evidence of an association between CPA and firms’ market valuation is absent from the literature, the forward-looking assumptions underlying capital market efficiency suggest the relevance of CPA to market participants concerned with assessing firm value. To the extent that investors can assess differential profit margins across segments of customer revenues, CPA should provide insights about value-relevant future management strategy and firm profitability that are not reflected in aggregate net income. That is, I expect

investors to ascribe a relative premium (discount) to a segment of customer revenues that yields a relatively higher (lower) profit margin compared to all other sales. However, to the extent that investors ignore CPA or assume that each dollar of revenue contributes evenly to net income, no differential price association should exist between components of income reflecting differential customer profitability.

To examine whether such an association exists between share prices and CPA, this study focuses on the profitability of firms' major customer sales relative to the profitability of non-major customer sales. This sales-centric customer grouping increases the likelihood of detecting an association between CPA and share prices (if one exists) because CPA is of increased importance to managers when an individual or small group of customers is vital to overall profitability (Horngren et al. 2008). Thus, the profitability of major customer sales is likely to elicit predictable and economically-meaningful resource allocation strategies by managers, thereby providing relevant contemporaneous information to investors.

The above assumptions lead to the following testable hypotheses, stated in alternative form:

H₁: Compared to the pricing of non-major customer profitability, the association between share prices and major customer profitability is more positive when major customer sales yield relatively higher profit margins, *ceteris paribus*.

H₂: Compared to the pricing of non-major customer profitability, the association between share prices and major customer profitability is less positive when major customer sales yield relatively lower profit margins, *ceteris paribus*.

III. SAMPLE SELECTION AND ESTIMATING THE PROFITABILITY OF MAJOR CUSTOMER SALES

Sample Selection

Table 1 describes the sample selection process. The initial sample includes 28,499 firm-year observations identified on the *Compustat* database disclosing major customer sales during 1980 – 2006. This sample period reflects the duration of SFAS 14/131 major customer segment data available on Compustat and corresponds roughly with the period marking the emergence of CPA as an integral tool for corporate strategy (Kaplan and Norton 1996). Since the CPA used in this study requires grouping firms’ revenues into major customer and non-major customer segments, I eliminate 234 observations in which 100 percent of total revenues are attributable to major customers. Next, to mitigate the potential adverse effects of data errors and outliers in the estimation of major customer profitability, I eliminate 3,352 observations with absolute profit margins exceeding 100 percent.¹⁰ Finally, I eliminate 4,386 observations with missing, resulting in a final sample of 20,527 firm-years (6,048 unique firms) from 395 industries (4-digit SIC).

Table 2 presents descriptive statistics for the temporal distribution of sample firms, and reveals a marked increase in the number of firms disclosing major customers in the late 1990s. This increase is likely due to growth in the number of firms reported on Compustat during the sample period and/or increased emphasis on the disclosure of major customer sales once SFAS 131 became effective. However, this increase is also consistent with the recent trend of large buyers consolidating their base of suppliers documented in the marketing and supply-chain literatures (e.g., Ulaga and Eggert 2006).

Table 3 describes the distribution of sample firms by industry group, and reveals that manufacturing firms constitute about 60 percent of the sample. The concentration of firm-years in the manufacturing group is not surprising, given the role of manufacturing firms as suppliers in larger supply chains. Additionally, service firms (e.g., prepackaged software) and mining

¹⁰ Results from the main analyses are not sensitive to the inclusion of these observations.

firms (e.g., oil and gas) comprise 17 percent and 9.6 percent of the sample, respectively. All remaining industry groups each make up less than 5 percent of the sample.

Table 4 presents descriptive statistics for selected firm characteristics, where all continuous metrics are winsorized at the upper and lower 2 percentiles of their respective distributions. Because the firms in my main sample are restricted to those disclosing major customer sales, their characteristics are not likely representative of the general population of Compustat firms during the sample period. Thus, I also provide descriptive statistics (mean and median) for the sample of 67,736 non-disclosing peer firm-years (non-disclosing sample) drawn from each industry-year corresponding with the main sample.¹¹ The mean (median) market capitalization for the main sample is \$532 (\$47) million.¹² The mean (median) market value for the non-disclosing sample is \$938 (\$73) million. Thus, firms disclosing major customers are, on average, about half the size of their non-disclosing industry peers. Next, the mean (median) level of sales for the main sample is \$385 (\$54) million; the median level of sales concentration is 37 percent to about 2 major customers. Non-disclosing firms, on the other hand, report mean (median) sales of \$856 (\$92) million. This disparity in revenues across samples is not surprising, however, given the inverse relation between the level of sales and the likelihood that sales to an individual customer meet the minimum threshold for required disclosure.¹³

¹¹ For comparability, I screen the sample of non-disclosing firm-years to eliminate observations with extreme profit margins as described above and winsorize continuous metrics at the upper and lower 2 percentiles. Between-sample differences in mean and median characteristics described in Table 4 are statistically significant at conventional levels (not reported).

¹² Sensitivity analyses find that the exclusion of observations in the upper tail of the distribution does not affect inferences from testing the main hypotheses.

¹³ It is possible, however, that some firms in the non-disclosing sample have a relatively high degree of sales concentration that is unobservable. For instance, a firm with three large customers, each constituting 9% of total sales, is not required to disclose major customer sales per SFAS 14/131, despite having 27% of its revenues concentrated among three customers; whereas, a firm with one customer constituting 10% of revenues is required to disclose this fact per SFAS 14/131. The potential (and unavoidable) misclassification of firms in the former case is

The mean (median) ratio of SG&A expenses to sales for the main sample is 32.1 (25.2) percent and 30.6 (25.0) percent for the non-disclosing sample. On its face, this finding suggests that the presence of major customers has only a modest impact on firms' cost structures compared to their non-disclosing peers; however, this comparison should be interpreted with caution, as it does not consider the potential off-setting effects of more profitable or less profitable major customer relationships, respectively, on firms' revenue and cost structures.¹⁴ The mean (median) net income before extraordinary items for the main sample is \$14.1 (\$0.5) million, with 40 percent of firms reporting losses. This compares to \$37.7 (1.7) million of income for the non-disclosing sample, with only 32 percent of firms reporting losses. Finally, the mean (median) profit margin on total sales is -4.5 (1.7) percent for the main sample and -1.6 (2.8) percent for the non-disclosing sample, suggesting that firms disclosing major customer sales generally underperform relative to their non-disclosing industry peers. This finding is consistent with evidence reported by Lanier et al. (2008), who find that upstream supplier firms in concentrated supply chains yield lower average returns on assets and profit margins vis-à-vis their 'non-supplier' industry peers.

Estimating the Profitability of Major Customer Sales

Model Derivation

To estimate the profitability of major customer sales, I consider income contributed by total sales (X_t^{TOT}) in period t , as the sum of the respective income contributions from major customer sales (X_t^{MC}) and non-major customer sales (X_t^{NMC}) period t :

likely to induce noise in the estimation of major customer profitability (discussed below); however, this noise biases *against* constructing estimates of major customer profitability that are price relevant.

¹⁴ Descriptive statistics for the sub-samples in which major customer sales are estimated to be relatively more profitable or less profitable are tabulated below.

$$X_t^{TOT} = X_t^{MC} + X_t^{NMC} \quad (1)$$

Taking a perspective viewing X_t as overall profit margin (π) times total sales (S_t^{TOT}) in period t , I propose the following expression of πS_t^{TOT} that allows for differential profit margins, μ and ν , on major customer sales (S_t^{MC}) and non-major customer sales (S_t^{NMC}), respectively:

$$\begin{aligned} \pi S_t^{TOT} &= \mu S_t^{MC} + \nu S_t^{NMC} \\ &= \mu m_t S_t^{TOT} + \nu (1 - m_t) S_t^{TOT} \end{aligned} \quad (2)$$

where m_t denotes the proportion of S_t^{TOT} attributable to major customer sales during period t and is constrained to fall within the range (0,1).

Factoring S_t^{TOT} out of Equation (2), I interpret overall profit margin as the weighted average of the profit margins on major customer sales and non-major customer sales, that is:

$$\pi = \mu m_t + \nu (1 - m_t) \quad (3)$$

Rearranging the terms in Equation (3), therefore, allows μ to be expressed as a function of the relative sales mix between major and non-major customer segments and the extent to which overall profit margin deviates from the profit margin on non-major customer sales, as follows:

$$\mu = \frac{\pi - \nu(1 - m_t)}{m_t} \quad (4)$$

Empirical Estimation

Using observed firm- and industry-level metrics, I use the following model to estimate the profit margin major customer sales ($\hat{\mu}_{it}$) for each sample firm-year:

$$\hat{\mu}_{it} = \frac{\hat{\pi}_{it} - \hat{\nu}_{it}(1 - m_{it})}{m_{it}} \quad (5)$$

where the subscripts i and t denote firm and year, respectively; $\hat{\pi}$ is the observed profit margin on total sales, measured as net income before extraordinary items (#18) divided by total sales (#12); m is the proportion of sales to major customers, measured as the level of major customer sales per firms' SFAS 14/131 disclosures divided by total sales; and $\hat{\nu}$ is a proxy for the unobservable profit margin on firms' non-major customer sales, measured as the median profit margin on total sales for the sample of non-disclosing firms in firm i 's industry (4-digit SIC) during year t . As discussed above, use of this proxy is based on the premise that each dollar of revenue generated by non-disclosing firms constitutes non-major customer sales; thus, the median observation from this sample likely reflects the typical profit margin on non-major customer sales for industry members. Taken together, Equation (5) presents the profit margin on major customer sales as a function of the observed sales mix and the extent to which the firm's observed overall profit margin deviates from the typical profit margin on non-major customer sales for industry members.

Table 5 presents results from estimating Equation (5) and the ensuing customer profitability analysis to determine whether firms' major customer sales yield relatively higher or relatively lower profit margins vis-à-vis their non-major customer sales. Panel A shows that the mean (median) $\hat{\mu}$ for the sample is -20 (0) percent compared to the mean (median) $\hat{\nu}$ of 2 (3) percent. The comparative mean and median profit margins across customer segments are significant at the 0.001 level based on a parametric t-test and non-parametric signed rank test, respectively, and suggest that major customer sales are generally less profitable than non-major customer sales, and that (on average) the negative performance consequences of having major customers is quite severe. Panels B and C show descriptive statistics for instances in which $\hat{\mu} > \hat{\nu}$ (9,066 firm-years) and $\hat{\mu} < \hat{\nu}$ (11,461 firm-years), respectively. The average differential

between $\hat{\mu}$ and $\hat{\nu}$ for the firm-years in Panel B is 30 percent – i.e., when major customer sales are relatively more profitable, a dollar of revenue from major customer sales contributes (on average) 30 cents more income than a dollar of non-major sales. Conversely, the average differential for firm-years in Panel C is -64 percent. These results suggest that the consequences of having major customers are both *statistically* and *economically* significant for sample firms.

Sub-sample Characteristics

Table 6 Panel A (Panel B) presents descriptive statistics for the 9,066 (11,461) firm-years in which major customer sales yield comparatively higher (lower) profit margins. While the extent of sales concentration to and the number of major customers is almost identical across samples, firms with comparatively more profitable major customer sales have higher valuations, generate higher revenues and are more profitable than firms with comparatively less profitable major customer sales.¹⁵ Specifically, for the firms in Panel A, the mean (median) market capitalization is \$850 (\$118) million, the mean (median) level of sales is \$507 (\$85) million and the mean overall profit margin is 10 (7) percent, with only 5 percent of firms reporting losses. On the other hand, firms in Panel B have a mean (median) market capitalization of \$281 (\$23) million, generate mean (median) sales revenue of \$288 (\$36) million and yield a mean (median) overall profit margin of -16 (-6) percent, with 68 percent of firms reporting losses.¹⁶

Moreover, the mean (median) ratio of SG&A expenses to sales for firms in Panel A is 25.4 (21.7) percent compared to 37.4 (29.0) percent for firms in Panel B, consistent with prior

¹⁵ Comparisons reported in Table 6 are all statistically significant at conventional levels (not reported).

¹⁶ Given the breadth of my sample period, the characteristics of firms in Panel B suggest that many of them are young, small firms that are more likely to be in a weak position with respect to their major customers. While the literature is replete with evidence that young, small firms are less profitable than their larger, more mature peers, there is no a priori reason to suspect that customer profitability is more or less relevant for these firms than the firms in Panel A.

research examining the revenue and cost consequences significant seller-buyer relationships. Specifically, Kalwani and Narayandas (1995) document that firms in long-term relationships with major customers can increase profits by differentially reducing SG&A expenses, while maintaining a level of sales growth consistent with industry peers. Conversely, Gosman et al. (2004) suggest that dominant major customers can use their buying power to demand price discounts and/or shift certain SG&A requirements to their upstream supply-chain partners.

IV. EMPIRICAL MODEL

This study's purpose is to examine whether inferences drawn from CPA are associated with differential customer segment pricing by market participants. To test this research question, I estimate the following cross sectional regression:

$$MV_{it} = \sum_{Y=1980}^{2006} \gamma_{0Y} YR_{Yit} + \gamma_1 BV_{it} + \gamma_2 PCT_{it}^{MC} + \gamma_3 NI_{it}^{MC} * HIGH_{it} + \gamma_4 NI_{it}^{MC} * LOW_{it} + \gamma_5 NI_{it}^{NMC} + \omega_{it} \quad (6)$$

where MV is share price at fiscal year end (#199);¹⁷ BV is ending book value of equity (#60); PCT^{MC} is the proportion of total revenues attributable to major customer sales (defined in the previous section) included to control for the concentration of risk attributable to major customer sales; NI^{MC} is net income provided by major customer sales, measured as the estimated profit margin on major customer sales ($\hat{\mu}_{it}$), defined in the previous section, times the level of major customer sales; $HIGH$ (LOW) is an indicator variable coded 1 when major customer sales yield comparatively higher (lower) profit margins vis-à-vis non-major customer sales, and zero

¹⁷ Inferences from the empirical analyses using share price measured three months after fiscal year end are unchanged.

otherwise; NI^{NMC} is the remaining portion of income provided by non-major customer sales; and YR_y is an indicator variable coded 1 (0 otherwise) if the observation is from fiscal year Y , included to control for mean calendar time-specific effects.¹⁸ All continuous right-hand side variables, except PCT^{MC} , are deflated by number of shares outstanding (#25). The subscripts i and t denote firm and years, respectively.

One can also consider Equation (6) as derived from the Ohlson (1995) valuation framework viewing market value as a linear function of book values and net income, where the latter term is disaggregated to distinguish the portion contributed by major customer sales under two mutually-exclusive conditions, while PCT^{MC} reflects ‘other information’ – i.e., risk. Thus, consistent with evidence documented in the value relevance literature,¹⁹ I predict the coefficients on BV , the conditional components of net income provided by major customer sales, $NI^{MC} * HIGH$ and $NI^{MC} * LOW$, respectively, and NI^{NMC} to be positive. I predict the coefficient on PCT^{MC} to be negative, consistent the negative association between risk and firm value documented in the literature.

H_1 (H_2) predicts that the coefficient on $NI^{MC} * HIGH$ ($NI^{MC} * LOW$) is more (less) positive than the coefficient on NI^{NMC} ; however, to provide a more intuitive interpretation of the coefficients and the expected differences, I re-express the model in Equation (6) to reveal the underlying structure of the model in terms of sales and comparative profit margins, as follows:

$$MV_{it} = \sum_{Y=1980}^{2006} \gamma_{0Y} YR_{Yit} + \gamma_1 BV_{it} + \gamma_2 PCT_{it}^{MC} + \gamma_3 (\hat{\mu}_{it} * PCT_{it}^{MC} * S_{it}^{TOT}) * HIGH_{it}$$

¹⁸ I also estimate the model, excluding YR_y , separately for each year permitting all coefficients to vary across years. I discuss results from the annual regressions in the sensitivity analyses (see next section).

¹⁹ See Holthausen and Watts (2001) and Barth et al. (2001) for recent reviews of this literature.

$$+\gamma_4(\hat{\mu}_{it} * PCT_{it}^{MC} * S_{it}^{TOT}) * LOW_{it} + \gamma_5(\hat{\nu}_{it} * PCT_{it}^{NMC} * S_{it}^{TOT}) + \omega_{it} \quad (7)$$

where S^{TOT} is total sales and PCT^{NMC} is remaining portion of sales to non-major customers, measured as $1 - PCT^{MC}$. Interpretation of the expression in Equation (7) reveals that, by holding constant the relative sales mix between major customer and non-major customer segments, differential price multiples ascribed to major customer profitability vis-à-vis non-major customer profitability are solely attributable to comparative differences in profit margins yielded by segment-specific revenues. Furthermore, a more (less) positive value of γ_3 (γ_4) vis-à-vis γ_5 suggests that markets recognize the comparatively more (less) favorable rate at which major customer sales contribute to overall profitability and that, for a given level of S^{TOT} , the increase in PCT^{MC} necessary to generate an additional dollar of *major customer* profitability would result in an increase (decrease) to *overall* profitability.

Finally, prior research suggests that findings in support of the hypotheses can also be interpreted as evidence consistent with the existence of a positive (negative) organizational capital intangible asset – not reflected in book value of equity – by virtue of a significant customer relationship that yields abnormally higher (lower) rents compared to the firm’s other relationships.²⁰ Specifically, Gosman et al. (2004) define organizational capital as “business processes, organizational structures or strategies that complement the use of tangible assets in the firm.” Thus, one can consider a firm to hold a competitive advantage (disadvantage) when its

²⁰ Barth et al. (1998) posit a similar interpretation in testing the association between firms’ unrecorded brand values and share prices.

major customer sales are disproportionately more (less) profitable vis-à-vis the remaining portion of revenues.²¹

V. RESULTS

Main Tests

Table 7 presents descriptive statistics for the regression variables based on the full sample of 20,527 firm-year observations, where all variables are winsorized at the upper and lower 2 percentiles of their respective distributions. The mean (median) share price for the sample is 11.35 (6.25), while the mean (median) book value of equity per share is 5.51 (3.47). Thus, despite the findings reported in Table 2 suggesting that firms disclosing major customer sales underperform compared to their non-disclosing industry peers, the firms in my sample nevertheless yield sizeable market-to-book ratios. The mean (median) net income per share provided by major customer sales is -0.02 (0.00), while the mean (median) net income per share provided by non-major customer sales is 0.29 (0.08). The mean (median) proportion of sales to sample firms' major customers is 37 (31) percent. The indicator variables reflecting whether major customer sales yield comparatively higher (lower) profit margins equal one for 44 (56) percent of the sample. These findings are consistent with inferences drawn from Table 2.

Table 8 presents summary statistics from estimating Equation (6) using a pooled ordinary least squares (OLS) regression. The test statistics for all coefficients are heteroscedasticity-consistent and are adjusted for residual correlation among observations for the same firm. As expected, the coefficients on BV , $NI^{MC} * HIGH$, $NI^{MC} * LOW$ and NI^{NMC} are all positive and statistically significant ($p < 0.001$), while the coefficient on PCT^{MC} is negative and statistically

²¹ This interpretation is also corroborated by the results reported in Table 4. Specifically, a firm's ability to differentially reduce SG&A expenditures by virtue of a beneficial major customer relationship is consistent with the definition of organizational capital.

significant ($p < 0.06$), suggesting that market participants discount the “concentration of risk” associated with major customer sales. Consistent with H_1 (H_2), the coefficient on $NI^{MC} * HIGH$ ($NI^{MC} * LOW$) is significantly more (less) positive than the coefficient on NI^{NMC} at the 0.001 level based on F-test results. These findings suggests that, on average, market participants, price major customer profitability at a relative premium (discount) of \$3.42 (\$2.12) per dollar of income when sales to major customers yield comparatively higher (lower) profit margins than non-major customer sales, even after controlling for equity book values and the “concentration of risk” associated with major customer sales. These findings also support the interpretation of the market premium (discount) ascribed to $NI^{MC} * HIGH$ ($NI^{MC} * LOW$) as reflecting an unrecorded positive (negative) intangible assets, incremental to the market pricing of the firm’s reported book value of equity.²²

Interpretation of the results using the Ohlson (1995) valuation framework suggests that CPA is incrementally value relevant beyond a profitability analysis that assumes each dollar of revenue contributes evenly to net income, consistent with value relevance of CPA posited in management accounting textbooks.²³ Thus, given managers’ increased emphasis on customer profitability analysis for strategic resource allocation decisions (Foster and Young 1997), this interpretation further suggests that the use of *customer* segment disclosures to assess major customer profitability captures value relevant information that parallels the FASB’s stated

²² This interpretation is also consistent with nomenclature in the marketing literature that considers customers to be ‘valuable assets’ to the firm (e.g., Blattberg et al. 2001).

²³ For comparative purposes, I estimate the empirical model following the Ohlson framework using a measure of aggregate net income, which implicitly makes no distinction between major customer and non-major customer profitability. The coefficient on aggregate net income is 3.28 ($p < 0.001$) and the model adjusted R-square is 0.525 (not tabulated).

objectives for *operating* segment disclosures under SFAS 14/131.²⁴ Furthermore, given that NI^{MC} reflects the (estimated) portion of income contributed by major customer sales, these results suggest that, when considering the differential profitability of firms' major customers, SFAS 14/131 major customer disclosures are incrementally value relevant *beyond* the FASB's rationale for requiring the disclosure of major customer sales per SFAS 14/131.

Sensitivity Analyses

As previously noted, the distribution of market values for firms in my sample suggests primarily smaller firms; however, a number of considerably large firms are concentrated in the upper tail of the distribution. Despite winsorizing the dependent variable at the upper and lower 2 percentiles, these observations may still bias the coefficients in favor of the hypotheses. To examine whether my results are sensitive to these extreme observations, I re-estimate Equation (6) excluding observations in the upper 10 percentile of the distribution of MV . In untabulated results, I find evidence consistent with the main hypotheses for the subsample of 18,475 firm-year observations.

Next, given that I test the hypotheses using a pooled cross-section of firms over a 27-year estimation period, I estimate Equation (6), excluding the year dummies, separately for each year assess the potential impact of cross-sectional and time-series dependence on my results. Results (not tabulated) based on the annual regressions for the full sample and for the sample excluding extreme values of MV support the main hypotheses at conventional levels of significance.

VI. CONCLUSION

²⁴ Specifically, under the 'management approach' described by SFAS 131, firms are required to report disaggregated segment information that reflects information used for management decision making. However, despite the growing emphasis on customer focus due to increased competition, accounting standards do not explicitly call for the disclosure of customer profitability.

Motivated by the emergence of customer profitability analysis as one of the most important aspects of strategic planning for managers concerned with increasing firm value, this paper investigates whether inferences drawn from assessing profitability differences across customer segments are relevant for *external* decision makers (investors) concerned with *assessing* firm value. Because firms generally do not reveal their proprietary customer profitability reports, I use an informationally-parsimonious approach based on observed income statement data and SFAS 14/131 disclosures to assess the comparative profit margins yielded by firms' major customer sales and non-major customer sales, and then test whether share prices are more (less) positively associated with major customer profitability when major customer sales yield comparatively higher (lower) profit margins. The premise for these predictions is based on the forward-looking nature of management accounting, which influences management strategy, and the forward-looking assumptions underlying efficient capital markets. Consistent with my predictions, I find evidence suggesting that customer profitability analysis is value relevant, thereby adding to the literature bridging management accounting and capital markets (e.g., Banker and Chen 2006; Hemmer and Labro 2008).

Despite finding evidence supporting my predictions about the association between share prices and customer profitability analysis, this study is subject to several limitations. First, the empirical context focusing on the profitability of major customer sales restricts the sample to firms disclosing major customer sales per SFAS 14/131. As noted earlier, these firms are generally smaller and less profitable when compared to the typical *Compustat* firms, and are largely concentrated in manufacturing industries. Absent a mechanism to estimate customer profitability along other dimensions (e.g., by frequency of customer transactions or relationship duration), inferences about the value relevance of customer profitability analysis be generalized

across all firms. However, I posit that firms disclosing major customer sales likely have stronger incentives to conduct customer profitability analysis internally, therefore increasing the likelihood that my sample reflects an empirical setting in which the income contributions from a particular segment of customer revenues is important to *both* internal and external decision makers.

Furthermore, given my objective to use an informationally-parsimonious approach to assess the profitability of major customer sales, the procedure I use does not incorporate firm- and customer-specific factors – e.g., relative bargaining power, industry concentration, relationship duration, etc. (Porter 1980; Kelly and Gosman 2000; Callahan et al. 2004; Lanier et al. 2008) – that likely impact the extent to which major customer sales contribute differentially to overall firm profitability. A potential area for future research is to extend this study’s approach by incorporating these factors to refine the estimation of major customer profitability. Conversely, future research can also investigate the impact of major customer profitability on bargaining power and relationship duration.

This study contributes to several streams of accounting research, including those concerned with management accounting, value relevance, unrecorded intangible assets and the accounting implications of significant seller-buyer relationships. Furthermore, the use of SFAS 14/131 disclosures to assess the economic consequences of firms supply-chain relationships points to the rich potential for cross-disciplinary research bridging accounting, marketing and operations management.

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Table 1
Sample Selection Procedures to Test the Association between Share Prices and
Major Customer Profitability

Firm-years available on Compustat disclosing major customer sales during 1980-2006	28,499
Firm-years in which sales to major customers constitute 100 percent of annual revenues	(234)
Firm-years with absolute profit margins exceeding 100 percent	(3,352)
Firm-years with missing data to conduct main analyses	<u>(4,386)</u>
Final sample	<u>20,527</u>
Unique firms	6,048
Number of industries (4-digit SIC)	395

Table 2
Distribution by Year for Sample of 20,527 Firms Disclosing Major Customer Sales
during 1980 – 2006

<i>Year</i>	<i>Firms</i>
1980	440
1981	572
1982	622
1983	708
1984	713
1985	652
1986	630
1987	638
1988	571
1989	509
1990	486
1991	429
1992	425
1993	387
1994	343
1995	328
1996	268
1997	160
1998	66
1999	1,386
2000	1,635
2001	1,549
2002	1,569
2003	1,317
2004	1,552
2005	1,467
2006	1,105
Total	20,527

Table 3
Industry Classification for 20,527 Firm-Years Disclosing Major Customer Sales During 1980 – 2006

<i>SIC Range</i>	<i>Industry Group</i>	<i>Frequency in Sample</i>	
		#	%
0111 - 0999	Agriculture, Forestry and Fishing	113	0.6
1011 - 1499	Mining	1,973	9.6
1521 - 1799	Construction	207	1.0
2011 - 3999	Manufacturing	12,352	60.2
4011 - 4999	Transportation, Communication, Electric, Gas and Sanitary Services	803	3.9
5000 - 5199	Wholesale Trade	857	4.2
5211 - 5999	Retail Trade	206	1.0
6000 - 6799	Finance, Insurance and Real Estate	406	2.0
7000 - 8999	Services	3,520	17.1
	Other	90	0.4
	Total	20,257	100.0

Table 4
Selected Firm Characteristics for Final Sample of Firm-Years Disclosing Major Customer Sales and for Sample of Non-Disclosing Industry Peers during the Sample Period 1980-2006

<i>Firm Characteristic</i>	<i>Main Sample (n = 20,527)</i>					<i>Non-Disclosing Industry Peers (n=67,736)</i>	
	<i>Mean</i>	<i>Standard Deviation</i>	<i>25th Percentile</i>	<i>Median</i>	<i>75th Percentile</i>	<i>Mean</i>	<i>Median</i>
Market capitalization (\$)	532.4	1488.3	10.1	47.0	264.2	938.3	72.8
Net Sales (\$)	385.0	980.2	14.9	54.2	224.3	856.0	91.8
Number of major customers	1.9	1.0	1.0	2.0	3.0	0.0	0.0
Sales concentration to major customers (%)	36.6	22.8	17.2	31.0	50.8	0.0	0.0
SG&A ratio (%)	32.1	24.5	14.3	25.2	42.6	30.6	25.0
Income before extraordinary items (\$)	14.0	62.6	-1.7	0.5	7.2	37.7	1.7
Overall profit margin (%)	-4.5	22.3	-8.7	1.7	6.8	-1.6	2.8
Firms reporting losses (%)	40.2	49.0	0.0	0.0	100.0	31.9	0.0

Tabulated amounts are based on data for year *t*. Dollar (\$) amounts are in millions. The main sample consists of 20,527 firm-years pertaining to 6,048 unique firms based on the sample screening described in Table 1. The sample of non-disclosing industry peers includes all firm-years not disclosing major customer sales from the same industry (4-digit SIC) as the disclosing firms, subject to the same screening criteria for extreme profit margins. Overall profit margin is measured as income before extraordinary items (#18) divided by net sales (#12); SG&A ratio is measured as SG&A expenses (#189), divided by net sales; Major customer sales are disclosed per firms' SFAS 14/131 major customer disclosures, and the percentage of sales concentration to major customers is measured as major customer sales divided by net sales. All continuous variables are winsorized at the upper and lower 2 percentiles of their respective distributions.

Table 5
Analysis of Mean and Median Differences^a Between Estimated Profit Margins on Major Customer Sales and Non-Major Customer Sales for Sample of 20,527 Firm-Years during the Sample Period 1980 – 2006

Panel A: Full sample (n = 20,527)

<u>Means</u>			<u>Medians</u>		
$\hat{\mu}$	$\hat{\nu}$	<i>Difference</i> (p-value)	$\hat{\mu}$	$\hat{\nu}$	<i>Difference</i> (p-value)
-0.20	0.02	-0.18 (0.001)	0.00	0.03	-0.03 (0.001)

Panel B: Firm-years in which $\hat{\mu} > \hat{\nu}$ (n=9,066)

<u>Means</u>			<u>Medians</u>		
$\hat{\mu}$	$\hat{\nu}$	<i>Difference</i>	$\hat{\mu}$	$\hat{\nu}$	<i>Difference</i>
0.31	0.01	0.30	0.21	0.02	0.19

Panel C: Firm-years in which $\hat{\mu} < \hat{\nu}$ (n = 11,461)

<u>Means</u>			<u>Medians</u>		
$\hat{\mu}$	$\hat{\nu}$	<i>Difference</i>	$\hat{\mu}$	$\hat{\nu}$	<i>Difference</i>
-0.61	0.03	-0.64	-0.27	0.03	-0.30

^ap-values for differences in means and medians based on parametric t-tests and non-parametric signed rank tests, respectively.

Estimates of $\hat{\mu}_{it}$, the profit margin on major customer sales, are based on the following equation:

$$\hat{\mu}_{it} = \frac{\hat{\pi}_{it} - \hat{\nu}_{it} * (1 - m_{it})}{m_{it}}$$

Where $\hat{\pi}$ is the observed profit margin on total sales, measured as described in Table 2; m is the proportion of sales concentrated to major customers per firms' SFAS 14/131 disclosures; $\hat{\nu}$ is a proxy for the profit margin on non-major customer sales, measured as the median profit margin on total sales for all non-disclosing industry peers (at the 4-digit SIC level) during the year. This model is based on the assumption that the profit margin on total sales is the weighted-average of the respective profit margins on major customer sales and non-major customer sales. The industry-level proxy for the profit margin on non-major customer sales is based on the perspective that 100 percent of revenues for non-disclosing firms constitute non-major customer sales, and the assumption that the median value for non-disclosing firms represents the typical profit margin on non-major customer sales for industry members.

Table 6
Group Characteristics for Main Sample Based on Whether Major Customer Sales Yield Comparatively Higher or Lower Profit Margins vis-à-vis Non-Major Customer Sales

Panel A: Firms with Comparatively More Profitable Major Customer Sales (n = 9,066)

<i>Firm</i> <u>Characteristic</u>	<u>Mean</u>	<u>Standard</u> <u>Deviation</u>	<u>25th</u> <u>Percentile</u>	<u>Median</u>	<u>75th</u> <u>Percentile</u>
Market capitalization (\$)	850.3	1890.2	23.6	117.7	586.8
Net Sales (\$)	507.2	1122.0	26.3	85.2	354.5
Number of major customers	1.9	1.0	1.0	2.0	3.0
Sales concentration to major customers (%)	36.3	22.9	17.0	30.0	50.0
SG&A ratio	25.4	16.9	12.8	21.7	34.1
Income before extraordinary items (\$)	36.7	77.7	1.3	5.9	27.0
Overall profit margin (%)	9.6	8.5	4.0	7.4	13.4
Firms reporting losses (%)	4.6	21.0	0.0	0.0	0.0

(continued on next page)

Table 6 (continued)**Panel B: Firms with Comparatively Less Profitable Major Customer Sales (n = 11,461)**

<i>Firm</i> <u>Characteristic</u>	<u>Mean</u>	<u>Standard</u> <u>Deviation</u>	<u>25th</u> <u>Percentile</u>	<u>Median</u>	<u>75th</u> <u>Percentile</u>
Market capitalization (\$)	280.9	999.0	6.0	23.5	117.3
Net Sales (\$)	288.4	10.3	10.3	36.4	147.4
Number of major customers	1.9	1.0	1.0	2.0	3.0
Sales concentration to major customers (%)	36.9	22.8	17.7	31.3	51.0
SG&A ratio	37.4	28.1	15.9	29.0	51.7
Income before extraordinary items (\$)	-3.9	39.1	-6.5	-1.0	0.3
Overall profit margin (%)	15.7	23.5	-24.3	-5.9	0.9
<u>Firms reporting losses (%)</u>	<u>68.3</u>	<u>0.0</u>	<u>0.0</u>	<u>100.0</u>	<u>100.0</u>

Classification of firms into Panel A (Panel B) is based on whether major customer sales yield comparatively higher (lower) profit margins vis-à-vis non-major customer sales using the procedure described in Table 3. All variables are measured as defined in Table 2.

Table 7
Descriptive Statistics for Regression Variables to Test Whether Inferences Drawn from Customer Profitability Analysis (CPA) are Associated with Share Prices for the Sample of 20,527 Firm-Years Disclosing Major Customer Sales during the Sample Period 1980 – 2006

<i>Variable</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>25th Percentile</i>	<i>Median</i>	<i>75th Percentile</i>
<i>MV</i>	11.35	13.27	2.00	6.25	15.75
<i>BV</i>	5.51	6.35	0.94	3.47	7.66
<i>PCT^{MC}</i>	0.37	0.23	0.17	0.31	0.51
<i>NI^{MC}</i>	-0.02	1.18	-0.37	0.00	0.47
<i>HIGH</i>	0.44	0.50	0.00	0.00	1.00
<i>LOW</i>	0.56	0.50	0.00	1.00	1.00
<i>NI^{NMC}</i>	0.29	0.75	0.00	0.08	0.35

MV is share price at fiscal year end (#199); *BV* is ending book value of equity (#60), deflated by number of shares outstanding (#25); *PCT^{MC}* is the observed proportion of total revenues attributable to major customer sales disclosed in firms' SFAS 14/131 disclosures; *NI^{MC}* is income before extraordinary items provided by major customer sales, measured as the estimated profit margin on major customer sales (defined in Table 3) times the level of major customer sales, deflated by number of shares outstanding; *HIGH* and *LOW* are indicator variables coded 1 (0 otherwise) when major customer sales yield comparatively higher or lower profit margins, respectively, vis-à-vis non-major customer sales. *NI^{NMC}* is the remaining portion of income provided by non-major customer sales, deflated by number of shares outstanding. All continuous variables, except *PCT^{MC}*, are winsorized at the upper and lower 2 percentiles of their respective distributions.

Table 8
Results from Cross-Sectional Ordinary Least Squares Regression Model to Test the
Whether Inferences Drawn from Customer Profitability Analysis (CPA) are
Associated with Share Prices for the Sample of 20,527 Firm-Years
Disclosing Major Customer Sales during the Sample Period
1980 – 2006

$$\text{Model: } MV_{it} = \sum_{Y=1980}^{2006} \gamma_{0Y} YR_{Yit} + \gamma_1 BV_{it} + \gamma_2 PCT_{it}^{MC} + \gamma_3 NI_{it}^{MC} * HIGH_{it} + \gamma_4 NI_{it}^{MC} * LOW_{it} + \gamma_5 NI_{it}^{NMC} + \omega_{it}$$

$$H_1: \gamma_3 > \gamma_5$$

$$H_2: \gamma_4 < \gamma_5$$

<i>Variable</i>	<i>Predicted Sign</i>	<i>Parameter Estimate</i>	<i>t-statistic</i>
Intercept	n/a	--	--
<i>BV</i>	+	0.83	25.76***
<i>PCT</i> ^{MC}	-	-0.86	-1.89*
<i>NI</i> ^{MC} * <i>HIGH</i>	+	6.85	15.84***
<i>NI</i> ^{MC} * <i>LOW</i>	+	1.31	25.90***
<i>NI</i> ^{NMC}	+	3.43	10.61***

Adjusted R²: 0.553

	<i>F- statistic (p-value)</i>
Test of H ₁	148.03 (0.001)
Test of H ₂	101.85 (0.001)

*** and * denote statistical significance at the 0.001 and 0.1 levels, respectively. Test statistics are based on heteroscedasticity-consistent standard errors adjusted for residual correlation among observations for the same firm. *YR* is an indicator variable coded 1 (0 otherwise) if the observation is from year *Y*; and the subscripts *i* and *t* denote firm and year respectively. All other variables are as defined in the previous table. Coefficient estimates for the year dummies are suppressed.