Frictions and the Market Value of Inventory

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This study examines the shareholder wealth effects associated with carrying inventory. Results indicate investors positively value aggregate inventory holdings as well as its individual components (raw materials, work-in-process, and finished goods). The relation between excess returns and inventory varies significantly with product market and financing frictions. Concerning product market effects, we find that the value of raw materials increases with demand uncertainty and varies inversely with market share. Consistent with inventory providing increased benefits to less liquid suppliers, we observe a heightened market value of inventory for financially constrained firms. Overall, the results indicate that investors price the strategic advantages accompanying inventory.

Keywords: Inventories; market value; sales uncertainty; and financial strength

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I. Introduction

This paper examines the link between shareholder wealth and inventory policy. Our study is motivated by inventory management's critical role in supply chains because, as discussed by Anand, Anupindi, Bassok (2008), inventory mitigates various frictions in real product markets. Examples include 1) the provision of a hedge with respect to both fluctuations in input prices and production delays, 2) reducing stock-out risk attributable to uncertain customer demand, and 3) economies of scale in acquiring inputs through bulk rate discounts. In addition to product market imperfections, inventory can benefit financially constrained firms that are generally ill-prepared to react to demand shocks (Caglayan, Maioli, and Mateut (2012)). Despite these benefits, firms must seek to optimize inventory levels because of carrying costs. Such costs include insurance, storage, taxes, obsolescence due to an inability to sell, and the opportunity costs of funds invested in inventory (Holsenback and McGill (2007)).

Although the aforementioned tradeoffs are well documented in the literature and inventory comprises a significant proportion of corporate balance sheets, little is known about the relation between firm value and inventory policy. We seek to add to this literature by estimating the market value of inventory and by examining the variation in this value with respect to product market and financing frictions.

Our baseline results provide robust evidence of a positive and significant relation between excess returns and inventory. Estimates suggest the market values an additional $1 of inventory at $0.49. We also find positive and significant values for each inventory component (raw materials, work-in-process, and finished goods). These results are consistent with inventory's strategic benefits exceeding the accompanying costs.

Further findings suggest substantial cross-sectional variation in the market value of inventory. We proxy product market frictions with demand uncertainty, firm-level market power, and industry competition. Complementing Caglayan, Maioli, and Mateut's (2012) finding that firms facing less certain demand hold more inventory, we observe an increased value of raw materials inventory for suppliers facing less certain demand. However, the market value of the other components of inventory are unaffected by demand uncertainty. Also, we find that the value of raw materials inventory decreases significantly with market share, which is consistent with greater negotiating leverage reducing the incentives to buy in bulk to take advantage of quantity discounts. The value of inventory is insensitive to industry competition.

Concerning the influence of financing frictions, we generally observe that inventory does not increase with shareholder wealth for financially unconstrained firms. However, findings suggest a market value premium for inventory held by constrained firms. This premium is economically significant: an additional $1 in inventory held by a constrained firm (based on dividend payout) contributes an additional $0.39 to the market value of inventory. Statistical inferences are robust for multiple constraint measures. Overall, these findings are consistent with results showing that financially constrained firms hold more inventory (Caglayan, Maioli, and Mateut (2012)).

This study provides two important contributions to the literature. First, we shed new light on the firm value implications of carrying inventory by providing evidence consistent with the positive attributes of inventory. The present study is not the first to examine the effects of inventory on firm value. Using a portfolio sort approach, Chen, Frank, and Wu (2005) find reduced stock returns for firms with abnormally high inventory, normal returns for firms with abnormally low inventories, and excess returns for firms with slightly below average inventories.

They conclude that their evidence is consistent with the view that excess investment in inventory reduces shareholder wealth. In contrast, we focus on the relation between shareholder wealth and inventory for the *typical* firm, from which we observe a positive shareholder wealth-inventory relation. The studies also differ with respect to econometric method. Our valuation framework accounts for differences in risk across firms in the dependent variable (excess returns) and controls for various financial characteristics via the vector of independent variables. Subsequently, this approach allows for stronger statistical inferences concerning the relation between shareholder wealth and inventory, relative to the portfolio approach.

As a second contribution, we provide evidence on the conditional nature of the market value of inventory. These models allow us to link suppliers' motives in carrying inventory to shareholders' assessment of these motives. The observed variation in the value of inventory with respect to operating and financing frictions is consistent with strategic dimensions that motivate suppliers' inventory holdings.

II. Empirical Model

We estimate the market value of inventory using an adjusted version of the Faulkender and Wang (2006) valuation framework. Faulkender and Wang (2006) use the model to estimate the marginal value of cash and argue that the framework provides a strong empirical test for valuing changes in corporate policies.[1] The model uses annual excess stock returns as the dependent variable. The independent variables consist of unexpected changes in financial characteristics. Accounting for risk in the dependent variable and a well-specified set of controls allow us to estimate shareholders' capitalization of changes in inventory behavior. Data definitions are consistent with Faulkender and Wang (2006), although we control for other

[1] This methodology is used extensively in the corporate cash holdings literature. Also, Hill, Kelly, and Lockhart (2012) adopt specify a variant of the framework to value changes in trade credit policies.

factors that, left omitted, might bias our estimate of the market value of inventory. The baseline specification follows.

$$ExRet_{i,t} = \gamma_0 + \gamma_1 \frac{\Delta TotInv_{i,t}}{M_{i,t-1}} + \gamma_2 \frac{\Delta C_{i,t}}{M_{i,t-1}} + \gamma_3 \frac{\Delta E_{i,t}}{M_{i,t-1}} + \gamma_4 \frac{\Delta NA_{i,t}}{M_{i,t-1}} + \gamma_5 \frac{\Delta RD_{i,t}}{M_{i,t-1}} + \gamma_6 \frac{\Delta I_{i,t}}{M_{i,t-1}}$$
$$+ \gamma_7 \frac{\Delta D_{i,t}}{M_{i,t-1}} + \gamma_8 L_{i,t} + \gamma_9 \frac{NF_{i,t}}{M_{i,t-1}} + \gamma_{10} SalesG_{i,t} + \gamma_j TimeandIndEffects_{j,t}$$
$$+ \epsilon_{i,t}, \qquad (1)$$

where ΔX represents a change in X from year *t-1* to *t*.

The dependent variable is the firm's annual excess stock return ($ExRet_{i,t}$), defined as annual raw returns minus the benchmark return. Raw returns equal the sum of the change in market value of equity and dividends scaled by lagged market equity, using CRSP as the data source. We use Fama and French (1993) 5x5 size and book-to-market portfolio sorts (formed at the end of June in year *t)* to provide the benchmark returns.[2] The size sort uses the firm's market value of equity as of the end of June in year *t*, while the book-to-market sort uses the ratio of book value of equity at fiscal year-end in calendar year *t-1* and market equity at the end of December in calendar year *t-1*.

We account for changes in various financial characteristics to isolate the value implications arising from changes in inventory holdings. Following Faulkender and Wang (2006), Equation (1) accounts for changes in profitability, investment, and financing policy. Profitability is earnings before extraordinary items (*E*).[3] Non-inventory controls for investment

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[2]We thank Ken French for providing data on the book-to-market and size portfolio breakpoints and returns (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

[3]Compustat variable names and our calculations follow. The market value of equity, *MVE*, is number of shares (CSHPRI) multiplied by share price at fiscal year-end (PRCC_F). *Inv* is inventory (INVT). *FGI* is finished goods inventory (INVFG). *WIP* is work-in-process inventory (INVWIP). *RMI* is raw materials inventory (INVRM). *C* is cash and marketable securities (CHE). *E* is earnings before extraordinary items (IB) plus interest expense (XINT), deferred tax credits (TXDI), and investment tax credits (ITCI). *RD* is research and development expenditures

include research and development expense (*R&D*) and net assets (*NA*), calculated as total assets minus cash and inventory. Regressors for financial policy include cash (*C*), interest expense (*I*), dividends (*D*), market leverage (*L*), and net financing (*NF*). We also account for sales growth (*SalesG*) as it is likely correlated with both inventory and excess returns. The valuation framework also controls for time and industry effects. We define the latter using Fama and French (1997) industries.

The pertinent variable for the present study is $\Delta TotInv$, defined as the change in total inventory scaled by the lagged market value of equity.[4] This measure captures the effects of changes in inventory policy on shareholder wealth, all else constant. Since the annual raw return and $\Delta TotInv$ are scaled by the lagged market value of equity, γ_1 represents the market value of an additional $1 invested in inventory. That is, the coefficient estimate provides the equity markets' assessment of the net benefit from holding inventory. Although the strategic benefits accompanying inventory, including hedging (against input prices and stockouts) and economies of scale, lead to our expectation of a positive and significant relation between excess returns and ΔInv, inventory's marginal costs make it difficult to predict its economic value. Still, we expect the market value of inventory to be less than that of cash, due to inventory's carrying costs and uncertainty in sales and collection.

(XRD). *NA* is net assets, defined as total assets (AT) minus cash and inventory. *I* is interest expense. *D* is common dividends paid (DVC). *L* is market leverage, defined as long term debt (DLC) plus debt in current liabilities (DLTT) divided by the sum of market value of equity, long term debt, and debt in current liabilities. *NF* is net financing, calculated as equity issuance (SSTK) minus repurchases (PRSTKC) plus debt issuance (DLTIS) minus debt redemption (DLTR). *SalesG* is calculated as the percentage change in net sales (SALE). Like Faulkender and Wang (2006), we set the variables deferred tax credits (TXDI), investment tax credits (ITCI), and research and development expenditures (XRD) equal to zero if missing.

[4] For brevity, we suppress the scaling of the independent variables throughout the remainder of the paper. For example, ΔInv refers to $\frac{\Delta Inv_{i,t}}{MVE_{i,t\text{-}1}}$.

In separate regressions we estimate the market value of the individual components of inventory. These components include finished goods inventory (Δ*FGI*), work in process (Δ*WIP*), and raw materials (Δ*RMI*). Examining the components is an important robustness test because shareholders may ascribe different values to each inventory type; each component effects the supply chain in a different way. For example, raw materials inventory allows suppliers to hedge uncertain future input prices and supply shortages. Work-in-process inventory serves as a buffer between raw inputs and finished items, smoothing future production. Importantly, finished goods inventory allows suppliers to provide goods immediately to customers as well as to reduce stock-out risk attributable to uncertain demand.

In addition to establishing the relation between shareholder wealth and inventory, we also examine the conditional nature of the market value of inventory. Specifically, we condition inventory on proxies for imperfections in product markets and in obtaining financing. These tests allow us to determine whether suppliers' characteristics provide advantages in creating value from inventory policy.

With respect to product market influences, Caglayan, Maioli, and Mateut (2012) show that suppliers with less certain demand hold more inventory. Increasing inventory is a reasonable response to demand uncertainty because of reduced stock-out risk. With this rationale, we subsequently expect an increased market value of inventory for sellers facing less certain demand. We define demand uncertainty (*Sales_CV*) as the standard deviation of annual revenues divided by average revenue (i.e., coefficient of variation). Both statistics are calculated over a rolling five-year period prior to each sample year, similar to Hill, Kelly, and Highfield (2010). For example, the standard deviation and mean for 2006 are calculated over the period 2001-2005. Firm-year observations are included in the sample for a given year if the firm has at least three observations during the previous five-year period.

Other proxies for real product market effects include firm-level market power and industry concentration. These dimensions of product markets may influence the value of inventory by weakening the benefit of economies of scale in purchasing inputs. Firms with strong market power or those in concentrated industries may already realize discounts that generally accompany bulk orders from less powerful firms and/or firms in less competitive industries. We first measure firm-level market power using *MktShare*, defined as the firm's annual revenues scaled by total industry revenues earned in a given year. Next, we use indicator variables to differentiate between high and low market share firms. In one model, *HighMktShare_DV* equals 1 if the firm's market share exceeds the industry's median, 0 otherwise. We then redefine the variable based on the 75th percentile of the industry's distribution of market share. Our initial proxy for degree of industry competitiveness is the Herfindahl index (*HFI*), calculated as the sum of squared market shares in an industry for a given year. Greater values for HFI imply less competitive industries. Consistent with our approach for generating additional proxies of market share, we create dummy variables (*Concen_DV*) at the median and 75th percentile of *HFI*, which identify concentrated and competitive industries.

Financing frictions may also influence the value of inventory. Caglayan, Maioli, and Mateut (2012) find that financially constrained firms hold more inventory than otherwise comparable unconstrained firms. The authors rationalize this finding in that constrained suppliers will find it more difficult to hedge increases in input prices or alter production necessitated by demand shocks and mitigate uncertainty in input prices. Indeed, when facing these frictions constrained firms with low inventory holdings may choose to underinvest, while unconstrained firms can easily raise capital to manage these adverse conditions.

We measure financial constraint following research that examines the impact of financing frictions on the market values of cash and receivables (Faulkender and Wang (2006) and Hill, Kelly, and Lockhart (2012)). Specifically, we focus on the payout ratio, firm size, and debt ratings (bond and commercial paper). First, we classify this constraint using the payout ratio, defined as the sum of common dividends and repurchases divided by earnings. Larger dividend payouts suggest financial unconstraint because firms with high payouts have cash flows sufficient to service debt obligations and to finance investment (Fazzari, Hubbard, and Petersen (1988)). Also, dividends can be reduced to accumulate cash. We sort firms' annual payout ratios and assign to the constrained (unconstrained) group those firm-years whose ratios are less (greater) than or equal to the payout ratio of the firm at the 30^{th} (70^{th}) percentile of the payout ratio distribution for the given year. The second measure of financial constraint is firm size. Larger firms tend to be older with reduced informational asymmetries and enhanced access to public and private capital markets. Accordingly, after rank-ordering all firms by their sales at the end of the previous fiscal year, we classify firm-years with sales less (greater) than or equal to the sales in the bottom (top) three deciles of the annual size distribution as constrained (unconstrained).

The third and fourth financial constraint measures concern bond and commercial paper ratings, respectively. We assign firm-years with Compustat bond (commercial paper) ratings and positive debt levels to the unconstrained group, while observations without bond (commercial paper) ratings but with positive debt levels are categorized as constrained. The underlying intuition is that firms with bond and commercial paper ratings have superior access to debt at lower marginal transactions costs. Thus, rated firms should be less reliant on internal financing. Further, Faulkender and Wang (2006) mention that firms with rated commercial paper are considered among the least risky of publicly-traded firms. We create four dummy variables (*FC_DV*) denoting whether the firm-year observation is financially constrained with respect to each of the constraint criteria. The indicator variables equal 1 if the firm-year is classified as constrained, 0 otherwise.

We determine the marginal effect of financial constraint and operating conditions on the market value of inventory by including (in Equation (1)) interactions between the inventory variables and the aforementioned proxies. For example, to estimate the impact of financial constraint on the market value of total inventory, we estimate our valuation framework after adding *FC_DV* and the interaction *ΔTotInv* FC_DV*. Differentiating the expanded version of Equation (1) with respect to Δ*TotInv* shows that *FC_DV* represents the premium or discount associated with the value of inventory after conditioning on financial constraint. The remaining interactions provide similar economic inferences.

III. Sample and Summary Statistics

The initial sample includes Compustat firms, but we exclude firms in financial, services, and utility industries and drop observations with negative values for market value of equity, net assets, and dividends. Since Equation (1) specifies the change in variables, non-consecutive firm-year observations are lost. Missing accounting data further restricts sample size.[5] We winsorize the data at the 1% level for each variable in the valuation framework to mitigate the influence of outliers. The sample used for the baseline results consists of an unbalanced panel of 33,387 firm-year observations for 5,882 companies over the 1981-2006 period.

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[5] Following Faulkender and Wang (2006), we set deferred tax credits (TXDI), investment tax credits (ITCI), and research and development expenditures (XRD) equal to zero if missing.

Table I presents descriptive statistics for variables under analysis. The mean change in total inventory as a percentage of lagged market value of equity is quite small and is negatively signed. The negative coefficient suggests that the sample firms have reduced their inventories, which parallels contemporaneous improvements in inventory management techniques. Implying meaningful variation in inventory across and within the sample of firms, the standard deviation of *ΔTotInv* is roughly 8%. Similar to Faulkender and Wang (2006), we find that *ExRet* is positively skewed. The remaining variables are comparable in sign and magnitude to those reported by recent studies using variants of Equation (1) to value changes in working capital policies.

Table II presents Spearman correlation coefficients. We observe a direct and significant correlation between *ExRet* and *ΔTotInv*, as well as each inventory component. These associations provide preliminary support for shareholders valuing the benefits accompanying investments in inventory. The negative correlation between *ΔC* and inventory echoes results provided by Bates, Kahle, and Stulz (2009) that indicate the recent accumulation of corporate cash holdings is partially explained by reduced inventory holdings. Despite the significant associations between inventory and the control variables, none of the correlation coefficients have sufficient magnitude to warrant collinearity concerns.

IV. Results

4.1 The Market Value of Inventory: Baseline Results

Table III displays results after estimating versions of Equation (1) using pooled OLS with standard errors that are corrected for heteroskdasticity and firm-level clustering (Petersen (2009)). Results for the controls match expectations, as *ExRet* is directly (inversely) and significantly related to increased cash, earnings, net assets, research and development expenditures, dividends, and sales growth (interest expense and leverage). Consistent with numerous studies estimating the value of cash, the results suggest that shareholders value firm liquidity. The models explain over twenty percent of the variation in excess returns.

The germane parameter estimate is $\gamma_{1,}$ representing shareholders' valuation of an incremental $1 increase in inventory. Hence, the coefficient estimate on *ΔTotInv* (column 1) implies that the market value of an additional dollar in inventory equals $0.49, on average. The value of a marginal dollar of cash exceeds the market value of inventory, which is an intuitive result. The positive relation between excess returns and inventory is significant at all conventional levels (*t*-statistic = 10.60), despite that Equation (1) accounts for various financial characteristics that impact firm value. Findings in column 2 suggest shareholder wealth is significantly and directly related to each component of inventory.

The positive relation between equity values and inventory is consistent with shareholders recognizing the strategic benefits associated with inventory holdings. These findings may provide a market value explanation for the prevalence of inventory: Suppliers carry inventory because it enhances shareholder wealth. This inference is inconsistent with findings from Chen, Frank, and Wu (2005) showing lower returns for portfolios of firms holding abnormally greater inventory. The difference in results and inferences is attributable to our focus on typical corporate investment in inventory, while they examine a different question by focusing on extreme inventory behavior. Further, our econometric methodology provides a more rigorous test for inventory's value relevance.

4.2 *The Market Value of Inventory: Product Market Frictions*

Table IV shows variation in the market value of inventory with respect to demand uncertainty (*ΔTotInv*Sales_CV*). Space constraints limit our presentation of results for the full set of controls. Tabulated results indicate a direct and significant relation between *ExRet* and ΔTotInv and that less certain demand (*Sales_CV*) significantly reduces equity values. However, we find no evidence that shareholders ascribe additional value to increased inventory for firms facing greater demand uncertainty.

In column 2 we explore this issue further by interacting each component of inventory with *Sales_CV*. While the value of finished goods and work-in-process inventories are insensitive to sales variability, *ΔRMI*Sales_CV* is positively signed and significant at the 5% level (*t*-statistic = 2.15). This interaction implies that the value of the raw materials component of inventory is heightened for firms facing less certain demand. The coefficient estimate on the interaction implies ten percent increase in *Sales_CV* yields a $0.11 (1.052*0.10) increase in the value of an additional dollar held in raw materials.

The positive interaction between raw materials inventory and sales uncertainty is likely attributable to shareholders acknowledging that raw materials allow suppliers to reduce stock-outs. This inference is consistent with Caglayan, Maioli, and Mateut's (2012) finding that firms with less certain demand respond by holding more inventory. Coupling our result with their finding, we infer that shareholders view increased raw materials inventory as an optimal response for firms with increased sales variability. However, we note that this inference does not appear to generalize to the other inventory components; shareholders do not appear to differentiate the market value of the other inventory components based on sales variability.

We examine another aspect of product market frictions by estimating the influence of firm-level negotiating ability on the value of inventory (Table V). Each model suggests a positive relation between shareholder wealth and market share, as one would expect. We first measure negotiating ability with the continuous definition of market share (*MktShare*), observing a negative and significant (1% level) coefficient estimate for *ΔTotInv*MktShare*. This result implies a reduced market value of inventory for firms with improved negotiating ability (i.e., high market share firms). This inference is robust across alternative measures of market share. For example, an additional $1 in inventory is discounted by $0.30 for firms with market share exceeding the median in the industry-year (column 3). The estimated discount increases for firms in the 75^{th} percentile of industry-year market share. In the even-numbered columns we observe that the raw materials component is sensitive to firm-level market power. These findings are consistent with diminished benefits from economies of scale in purchases for high market share firms that likely already receive favorable pricing and credit terms.

Although we report that firm-level market power influences shareholders' valuation of inventory, we find no evidence of inventory's value being conditional on industry competition (Table VI). From results in Tables IV, V and VI, we conclude that product market frictions influence the value of inventory, but primarily via demand uncertainty and firm-level market power, via the raw materials component of inventory.

4.3 The Market Value of Inventory: Financial Constraints

Table VII presents estimates for the market value of inventory after conditioning on financial constraint. Sample sizes vary due to the construction of the constraint measures, including dividend payout, firm size, bond rating, and commercial paper rating. The variable *FC_DV* is set equal to 1 if the observation is financially constrained, 0 otherwise. Subsequently, the estimate for γ_1 represents the value of inventory for unconstrained buyers, while the coefficient on the interaction *ΔTotInv*FC_DV* provides the value differential for constrained firms.

Focusing first on the total inventory models (odd columns), we observe that the relation between excess returns and inventory for unconstrained firms is sensitive to the measurement of constraint. While the value of inventory is positive and statistically significant for companies with higher dividend payouts, results suggest investors do not value the inventory held by suppliers deemed unconstrained based on size and bond rating. Further, we find that increased inventory reduces equity values for suppliers with commercial paper ratings.

Alternatively, each of the *ΔTotInv*FC_DV* interactions is positively signed and statistically significant at the 1% level or stronger. These findings suggest equity holders assign a greater market value to the inventory held by financially constrained firms. Coefficient estimates for the interactions provide meaningful economic interpretations. For example, the value of an additional $1 in inventory is $0.85 (-0.075 + 0.921) for firms categorized as constrained base on size. The market value premium ranges from $0.39 (low dividend payout) to $1.05 (firms without a commercial paper rating).

Results in the even numbered columns examine the impact of financial constraint on each component of inventory. Ten of the twelve interactions are positively signed and significantly different from zero. This is notable given the inherent collinearity between the interactions that reduces the significance levels for the interactions. Our robust evidence of a value premium for constrained firms' use of inventory is consistent with unconstrained firms having financial advantages in combatting inflated input prices or demand shocks. In light of these adverse circumstances, constrained firms might otherwise underinvest in future purchases needed to meet customer demand. While Caglayan, Maioli, and Mateut's (2012) find that managers of constrained firms respond to financing constraints by holding more inventory, our results indicate that shareholders reward constrained suppliers for this practice. The economic significance of the inventory-financial constraint interactions is consistent with this view. For example, it is generally understood that only the most credit worthy and well-capitalized firms have commercial paper ratings. Correspondingly, we find that inventory reduces shareholder wealth for firms with rated paper.

V. Conclusion

Our study examines shareholder wealth implications attributable to carrying inventory on the balance sheet. The evidence indicates a direct and significant relation between excess returns and suppliers' inventories. Suggesting that the relation is robust, we find that each component of inventory increases the market value of risk-adjusted equities. The statistical significance of the excess returns-inventory relation is noteworthy as our valuation framework controls for other firm characteristics known to influence returns.

Further evidence suggests significant cross-sectional variation in the value of inventory. We observe that shareholders' reaction to inventory investment is influenced by product market imperfections, namely demand uncertainty and firm-level market power. The degree of industry competitiveness does not appear to significantly impact the excess returns-inventory relation. We also find strong evidence that the value of inventory increases significantly for financially constrained firms. Overall, these cross-effects suggest shareholders recognize frictions that encourage inventory .

The observed cross-sectional variation in the value of inventory has important implications for managers. Although a zero-based inventory strategy or an inventory minimization policy may be optimal for firms in a frictionless environment, a dose of pragmatism is in order when evaluating inventory policies. As supported by our results, suppliers deriving the greatest benefit from inventory have substantial demand uncertainty, weak capital market access, and limiting negotiating leverage. Accordingly, we infer that factors other than simply industry affiliation should be considered when benchmarking inventory policies. This implication may be helpful to managers when rationalizing their inventory policies to lenders and shareholders.

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Table I. Descriptive Statistics

Variables	*N*	*Mean*	*Median*	*StdDev*
$ExRet_{i,t}$	33,387	-0.007	-0.085	0.555
$\Delta TotInv_{i,t}$	33,387	-0.000	0.000	0.078
$\Delta FGI_{i,t}$	33,387	0.001	0.000	0.047
$\Delta WIP_{i,t}$	33,387	-0.001	0.000	0.028
$\Delta RMI_{i,t}$	33,387	-0.001	0.000	0.037
$\Delta C_{i,t}$	33,387	0.006	0.000	0.122
$\Delta E_{i,t}$	33,387	0.009	0.006	0.165
$\Delta NA_{i,t}$	33,387	0.031	0.018	0.326
$\Delta RD_{i,t}$	33,387	0.001	0.000	0.016
$\Delta I_{i,t}$	33,387	0.001	0.000	0.024
$\Delta D_{i,t}$	33,387	0.000	0.000	0.006
$L_{i,t}$	33,387	0.248	0.200	0.220
$NF_{i,t}$	33,387	0.038	0.001	0.193
$SalesG_{i,t}$	33,387	0.118	0.052	0.417

This table shows the sample characteristics of the 33,387 firm-year observations for 5882 unique firms from 1981 to 2006. Variables are reported in decimal form. ΔX represents the 1-year change in X, $X_t - X_{t-1}$. All differenced variables are scaled by lagged market value of equity. *ExRet* is excess return, where the Fama and French (1993) size and book-to-market portfolio matched returns comprise the benchmark portfolio. *TotInv* is total inventory. *FGI* represents finished goods inventory. *WIP* is work-in-process inventory. *RMI* represents raw materials inventory. *C* is cash and marketable securities. *E* is earnings, defined as earnings before extraordinary items. *NA* is net assets (total asset minus cash and total inventory). *RD* is research and development expenditures. *I* is interest expense. *D* is common dividends. *L* is the market leverage ratio. *NF* is net new financing. *SalesG* is the percentage change in sales.

Table II. Spearman Correlation Coefficients

	$\Delta TotInv_{i,t}$	$\Delta FGI_{i,t}$	$\Delta WIP_{i,t}$	$\Delta RMI_{i,t}$
$ExRet_{i,t}$	0.151***	0.084***	0.112***	0.119***
$\Delta C_{i,t}$	-0.091***	-0.067***	-0.052***	-0.056***
$\Delta E_{i,t}$	0.142***	0.083***	0.097***	0.124***
$\Delta NA_{i,t}$	0.370***	0.257***	0.230***	0.307***
$\Delta RD_{i,t}$	0.178***	0.130***	0.118***	0.151***
$\Delta I_{i,t}$	0.161***	0.137***	0.087***	0.118***
$\Delta D_{i,t}$	0.136***	0.113***	0.087***	0.107***
$L_{i,t}$	-0.041***	-0.006***	-0.049***	-0.055***
$NF_{i,t}$	0.223***	0.160***	0.133***	0.176***
$SalesG_{i,t}$	0.370***	0.256***	0.232***	0.316***

This table shows the Spearman correlation coefficients for the variables included in Equation (1). The sample consists of 33,387 firm-year observations for 5882 unique firms from 1981 to 2006. *ExRet* is excess return, where the Fama and French (1993) size and book-to-market portfolio matched returns comprise the benchmark portfolio. *ΔX* represents the 1-year change in *X* ($X_t - X_{t-1}$). Differenced variables are scaled by the lagged market value of equity. *TotInv* is total inventory. *FGI* represents finished goods inventory. *WIP* is work-in-process inventory. *RMI* represents raw materials inventory. *C* is cash and marketable securities. *E* is earnings, defined as earnings before extraordinary items. *NA* is net assets, calculated as total asset minus cash and inventory. *RD* is research and development expenditures. *I* is interest expense. *D* is common dividends. *L* is the market leverage ratio. *NF* is net new financing. *SalesG* is the percentage change in sales. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1% levels, respectively.

Table III. Market Value of Inventory

Independent Variables	(1)	(2)
$\Delta TotInv_{i,t}$	0.494***	
	[10.600]	
$\Delta FGI_{i,t}$		0.356***
		[4.766]
$\Delta WIP_{i,t}$		0.680***
		[5.567]
$\Delta RMI_{i,t}$		0.573***
		[6.018]
$\Delta C_{i,t}$	0.998***	0.997***
	[25.510]	[25.477]
$\Delta E_{i,t}$	0.684***	0.685***
	[24.160]	[24.189]
$\Delta NA_{i,t}$	0.305***	0.302***
	[14.640]	[14.512]
$\Delta RD_{i,t}$	0.554**	0.546**
	[2.555]	[2.523]
$\Delta I_{i,t}$	-3.200***	-3.178***
	[-13.919]	[-13.855]
$\Delta D_{i,t}$	1.037**	1.057**
	[2.085]	[2.120]
$L_{i,t}$	-0.557***	-0.556***
	[-39.066]	[-39.018]
$\Delta NF_{i,t}$	-0.009	-0.007
	[-0.267]	[-0.216]
$SalesG_{i,t}$	0.157***	0.157***
	[12.221]	[12.201]
Observations	33,387	33,387
R-squared	0.202	0.203

This table presents OLS regressions estimating the market value of inventory (Equation (1)). The full sample consists of 33,387 observations for 5,882 unique firms from 1981 to 2006. The dependent variable is excess return, where the Fama and French (1993) size and book-to-market portfolio matched returns comprise the benchmark index. ΔX represents the 1-year change in X ($X_t - X_{t-1}$). Differenced variables are scaled by the lagged market value of equity. *Inv* represents the component of inventory accounted for. *TotInv* is total inventory. *FGI* represents finished goods inventory. *WIP* is work-in-process inventory. *RMI* represents raw materials inventory. *C* is cash and marketable securities. *E* is earnings, defined as earnings before extraordinary items. *NA* is net assets, calculated as total asset minus cash. *RD* is research and development expenditures. *I* is interest expense. *D* is common dividends. *L* is the market leverage ratio. *NF* is net new financing. *SalesG* is the percentage change in sales. All models include indicator variables for time and industry affiliation (Fama-French (1997)). Unreported standard errors are robust to heteroskedasticity and cluster at the firm level. *T*-statistics appear in brackets. We suppress presentation of the intercepts. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1%, levels, respectively.

Table IV. Market Value of Inventory Conditional on Demand Uncertainty

Independent Variables	(1)	(2)
$\Delta TotInv_{i,t}$	0.499***	
	[6.992]	
$\Delta TotInv_{i,t}*Sales\_CV_{i,t}$	0.094	
	[0.419]	
$\Delta FGI_{i,t}$		0.392***
		[3.282]
$\Delta FGI_{i,t}*Sales\_CV_{i,t}$		-0.219
		[-0.533]
$\Delta WIP_{i,t}$		0.753***
		[3.881]
$\Delta WIP_{i,t}*Sales\_CV_{i,t}$		-0.161
		[-0.215]
$\Delta RMI_{i,t}$		0.399***
		[2.689]
$\Delta RMI_{i,t}*Sales\_CV_{i,t}$		1.052**
		[2.149]
$Sales\_CV_{i,t}$	-0.158***	-0.158***
	[-11.041]	[-11.033]
Full Set of Controls?	Yes	Yes
Observations	30,669	30,669
R-squared	0.205	0.206

This table presents OLS regressions estimating the market value of inventory (Equation (1)). The dependent variable is excess return, where the Fama and French (1993) size and book-to-market portfolio matched returns comprise the benchmark index. ΔX represents the 1-year change in X ($X_t - X_{t-1}$). Differenced variables are scaled by the lagged market value of equity. *TotInv* is total inventory. *FGI* represents finished goods inventory. *WIP* is work-in-process inventory. *RMI* represents raw materials inventory. *Sales_CV* is the coefficient of variation for firms' annual sales. Models account for other financial characteristics (as shown in Table III), as well as indicator variables for time and industry affiliation (Fama-French (1997)). Unreported standard errors are robust to heteroskedasticity and cluster at the firm level. *T*-statistics appear in brackets. We suppress presentation of the intercepts and results for the other controls. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1%, levels, respectively.

Table V. Market Value of Inventory Conditional on Market Share

Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta TotInv_{i,t}$	0.524***		0.639***		0.592***	
	[10.846]		[9.378]		[11.583]	
$\Delta TotInv_{i,t}*MktShare_{i,t}$	-4.808***					
	[-2.726]					
$\Delta TotInv_{i,t}*HighMktShare\_DV_{i,t}$			-0.300***		-0.524**	0.463***
			[-3.625]		[-5.546]	[5.531]
$\Delta FGI_{i,t}$		0.382***		0.591***		
		[4.914]		[5.164]		
$\Delta FGI_{i,t}*MktShare_{i,t}$		-3.614				
		[-1.166]				
$\Delta FGI_{i,t}*HighMktShare\_DV_{i,t}$				-0.485***		-0.537***
				[-3.457]		[-3.289]
$\Delta WIP_{i,t}$		0.710***		0.703***		0.796***
		[5.641]		[3.744]		[5.644]
$\Delta WIP_{i,t}*MktShare_{i,t}$		-1.888				
		[-0.803]				
$\Delta WIP_{i,t}*HighMktShare\_DV_{i,t}$				-0.002		-0.473*
				[-0.010]		[-1.815]
$\Delta RMI_{i,t}$		0.622***		0.703***		0.669***
		[6.399]		[5.371]		[6.416]
$\Delta RMI_{i,t}*MktShare_{i,t}$		-12.751***				
		[-3.088]				
$\Delta RMI_{i,t}*HighMktShare\_DV_{i,t}$				-0.306*		-0.660***
				[-1.660]		[-2.945]
$MktShare_{i,t}$	0.172***	0.141**				
	[2.842]	[2.270]				
$HighMktShare\_DV_{i,t}$			0.042***	0.042***	0.032***	0.032***
			[7.098]	[7.204]	[5.950]	[5.963]
Full Set of Controls?	Yes	Yes	Yes	Yes	Yes	Yes
HighMktShare_DV	n/a	n/a	Median	Median	75^{th} p-tile	75^{th} p-tile
Observations	33,387	33,387	33,387	33,387	33,387	33,387
R-squared	0.203	0.203	0.204	0.204	0.204	0.204

This table presents OLS regressions estimating the market value of inventory (Equation (1)). The dependent variable is excess return, where the Fama and French (1993) size and book-to-market portfolio matched returns comprise the benchmark index. ΔX represents the 1-year change in X ($X_t - X_{t-1}$). Differenced variables are scaled by the lagged market value of equity. *TotInv* is total inventory. *FGI* represents finished goods inventory. *WIP* is work-in-process inventory. *RMI* represents raw materials inventory. *MktShare* is the firm's annual reveunues divided by the total annual revenues earned in the firm's industry. In columns 3 and 4, *HighMktShare_DV* is an indicator variable set equal to one if the firm's market share exceeds the median market share in the firm's industry in a given year. For columns 5 and 6, *HighMktShare_DV* is an indicator variable set equal to one if the firm's market share exceeds the 75^{th} percentile of market share for the firm's industry in a given year. Models account for other financial characteristics (as shown in Table III), as well as indicator variables for time and industry affiliation (Fama-French (1997)). Unreported standard errors are robust to heteroskedasticity and cluster at the firm level. *T*-statistics appear in brackets. We suppress presentation of the intercepts and results for the other controls. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1%, levels, respectively.

Table VI. Market Value of Inventory Conditional on Industry Competition

Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta TotInv_{i,t}$	0.503***		0.517***		0.521***	
	[7.505]		[8.014]		[9.931]	
$\Delta TotInv_{i,t}*HFI_{Ind,t}$	-0.098					
	[-0.180]					
$\Delta TotInv_{i,t}*Concen\_DV_{Ind,t}$			-0.048		-0.112	
			[-0.570]		[-1.185]	
$\Delta FGI_{i,t}$		0.234**		0.358***		0.344***
		[2.229]		[3.490]		[4.088]
$\Delta FGI_{i,t}*HFI_{Ind,t}$		1.477*				
		[1.662]				
$\Delta FGI_{i,t}*Concen\_DV_{Ind,t}$				-0.007		0.052
				[-0.052]		[0.286]
$\Delta WIP_{i,t}$		0.808***		0.818***		0.778***
		[4.442]		[4.637]		[5.417]
$\Delta WIP_{i,t}*HFI_{Ind,t}$		-1.477				
		[-1.013]				
$\Delta WIP_{i,t}*Concen\_DV_{Ind,t}$				-0.273		-0.375
				[-1.148]		[-1.480]
$\Delta RMI_{i,t}$		0.725***		0.557***		0.621***
		[4.914]		[3.926]		[5.613]
$\Delta RMI_{i,t}* HFI_{Ind,t}$		-1.834				
		[-1.493]				
$\Delta RMI_{i,t}*Concen\_DV_{i,t}$				0.030		-0.200
				[0.161]		[-0.987]
$HFI_{Ind,t}$	-0.038	-0.044				
	[-0.599]	[-0.707]				
$Concen\_DV_{i,t}$			0.019**	0.020**	-0.007	-0.007
			[2.116]	[2.134]	[-0.612]	[-0.615]
Full Set of Controls?	Yes	Yes	Yes	Yes	Yes	Yes
Concen_DV	n/a	n/a	Median	Median	75^{th} p-tile	75^{th} p-tile
Observations	33,387	33,387	33,387	33,387	33,387	33,387
R-squared	0.202	0.203	0.203	0.203	0.202	0.203

This table presents OLS regressions estimating the market value of inventory (Equation (1)). The dependent variable is excess return, where the Fama and French (1993) size and book-to-market portfolio matched returns comprise the benchmark index. ΔX represents the 1-year change in X ($X_t - X_{t-1}$). Differenced variables are scaled by the lagged market value of equity. *TotInv* is total inventory. *FGI* represents finished goods inventory. *WIP* is work-in-process inventory. *RMI* represents raw materials inventory. *HFI* is the annual of sum of squared market shares across all firms in a given industry. In columns 3 and 4, *Concen_DV* is an indicator variable set equal to 1 if an industry's *HFI* exceeds the sample median annual *HFI*, 0 otherwise. For columns 5 and 6, *Concen_DV* is an indicator variable equals 1 if an industry's *HFI* exceeds the 75^{th} percentile of the sample's *HFI* in a given year, 0 otherwise. Models account for other financial characteristics (as shown in Table III), as well as indicator variables for time and industry affiliation (Fama-French (1997)). Unreported standard errors are robust to heteroskedasticity and cluster at the firm level. *T*-statistics appear in brackets. We suppress presentation of the intercepts and results for the other controls. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1%, levels, respectively.

Table VII. Market Value of Inventory Conditional on Financial Constraints

Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta TotInv_{i,t}$	0.229***		-0.075		-0.141		-0.571***	
	[2.987]		[-0.838]		[-1.221]		[-2.897]	
$\Delta TotInv_{i,t}*FC\_DV_{i,t}$	0.386***		0.921***		0.654***		1.050***	
	[4.171]		[7.275]		[5.485]		[5.318]	
$\Delta FGI_{i,t}$		0.107		-0.174		-0.143		-0.712**
		[0.901]		[-1.240]		[-0.720]		[-2.189]
$\Delta FGI_{i,t}*FC\_DV_{i,t}$		0.342**		0.878***		0.534**		1.066***
		[2.209]		[3.924]		[2.539]		[3.230]
$\Delta WIP_{i,t}$		0.608***		0.420**		-0.198		-0.607*
		[3.400]		[2.038]		[-0.798]		[-1.836]
$\Delta WIP_{i,t}*FC\_DV_{i,t}$		0.100		0.562*		0.869***		1.227***
		[0.410]		[1.716]		[3.131]		[3.485]
$\Delta RMI_{i,t}$		0.093		-0.346		-0.165		-0.119
		[0.582]		[-1.562]		[-0.625]		[-0.196]
$\Delta RMI_{i,t}*FC\_DV_{i,t}$		0.696***		1.311***		0.743***		0.671
		[3.417]		[4.569]		[2.666]		[1.098]
$FC\_DV_{i,t}$	0.011*	0.011	-0.040***	-0.040***	-0.041***	-0.041***	0.002	0.002
	[1.719]	[1.637]	[-4.557]	[-4.586]	[-6.277]	[-6.240]	[0.308]	[0.331]
Fixed Effects?	Time & Ind.	Time & Ind.	Time & Ind.	Time & Ind.	Time & Ind.	Time & Ind.	Time & Ind.	Time & Ind.
Full Set of Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constraint Measure	Payout	Payout	Size	Size	Bond Rating	Bond Rating	CP Rating	CP Rating
Observations	27,826	27,826	17,334	17,334	28,944	28,944	28,944	28,944
R-squared	0.198	0.198	0.186	0.186	0.214	0.214	0.213	0.213

This table presents OLS regressions estimating the market value of inventory (Equation (1)). The dependent variable is excess return, where the Fama and French (1993) size and book-to-market portfolio matched returns comprise the benchmark index. ΔX represents the 1-year change in X ($X_t - X_{t-1}$). Differenced variables are scaled by the lagged market value of equity. *TotInv* is total inventory. *FGI* represents finished goods inventory. *WIP* is work-in-process inventory. *RMI* represents raw materials inventory. *FC_DV* is an indicator variable set equal to 1 if the observation is considered financially constrained, 0 otherwise. Models account for other financial characteristics (as shown in Table III), as well as indicator variables for time and industry affiliation (Fama-French (1997)). Unreported standard errors are robust to heteroskedasticity and cluster at the firm level. *T*-statistics appear in brackets. We suppress presentation of the intercepts and results for the other controls. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1%, levels, respectively.