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Hidden in the Average: When Cost Stickiness Varies with Economic Growth

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Abstract

Cost stickiness is usually summarized by an average response to changes in sales. That average can conceal whether firms respond differently to the same sales decline when the surrounding economy is strong or weak. We examine this possibility using non-financial firms listed in Vietnam during 2015–2025, where selling and administrative expenses are reported separately. Selling expense provides the central puzzle. It appears approximately symmetric in the canonical average specification, yet its decline elasticity varies systematically with real gross domestic product (GDP) growth. Selling expense falls less with declining sales in stronger-growth years, and this pattern persists across alternative sample treatments, fixed effects, inflation adjustments and small-cluster inference. Exact common-sample tests indicate that the result is not simply a ranking of selling versus administrative responses. Instead, the evidence is consistent with macroeconomic conditions changing the information carried by a firm-specific sales decline about the persistence of demand. This distinction helps explain why prior studies can obtain different growth–cost–asymmetry relations across settings and shows why a weak average stickiness coefficient need not imply economically symmetric adjustment across states.

Keywords: cost stickiness; asymmetric cost behavior; macroeconomic growth; selling expense; administrative expense; Vietnam

JEL classification: M41; E32.

1 Introduction

Cost stickiness is usually summarized by comparing how strongly costs respond when sales rise with how strongly they respond when sales fall. That comparison is typically averaged across years. Yet the same firm-specific sales decline can carry different economic information in a strong economy than in a weak one. A decline that looks temporary when aggregate activity is expanding may justify retaining resources that would be costly to rebuild, whereas the same decline during weaker growth may provide stronger evidence of persistent contraction. Averaging these responses can therefore make an economically state-dependent adjustment process look approximately symmetric. This paper examines that possibility.

Research on asymmetric cost behavior has progressively moved from asking whether costs are sticky to asking which conditions alter managers' decisions to retain or remove committed resources. Product-market competition changes cost retention, particularly when managers are optimistic about future demand (Li and Zheng 2017). Risk-taking incentives are associated with faster selling, general and administrative (SG&A) reductions when sales fall (Li *et al.* 2021). Strategic alignment with major customers is associated with greater supplier cost stickiness, consistent with relationship-specific resources being retained during downturns (Chiang *et al.* 2025). Most recently, Ntounis and Vlismas (2026) show that financial distress reduces asymmetric cost behavior by changing the cost of idle capacity, financing pressure and managers' expectations about future sales. Together, these findings make cost asymmetry a conditional outcome of resource decisions rather than an invariant firm characteristic.

Macroeconomic growth is one such conditioning state, but the empirical record no longer points in one direction. Anderson *et al.* (2003) report a negative interaction between gross domestic product (GDP) growth and the decline slope for United States SG&A. Ibrahim (2015) report stronger stickiness in Egyptian prosperity, and Xu and Sim (2017) find greater stickiness at higher growth rates among Chinese manufacturers. In contrast, the recent extended United States specification in Ntounis and Vlismas (2026) reports a positive GDP interaction after conditioning on successive sales declines, resource intensity, free cash flow and financial distress. These estimates are not directly comparable because the samples, periods and conditioning sets differ. Their divergence nevertheless reopens an assumption that is often left implicit: GDP growth need not carry invariant information about the persistence of a firm-specific demand decline across institutional and historical settings.

The adjustment-cost mechanism provides a way to study that latent information without claiming to observe managers' expectations directly. If a sales decline is viewed as temporary, removing capacity can create severance, termination, reorganization and later rebuilding costs; retaining resources can then be less costly than reducing them immediately (Hamermesh and Pfann 1996; Banker *et al.* 2013). Prior sales changes and customer information leave observable traces in subsequent cost decisions that are consistent with changes in expected demand persistence (Banker *et al.* 2014b; Agarwal and Agarwal 2024). Macroeconomic growth can provide another observable state in which the informational content of a firm-specific sales decline changes. Under this interpretation, the empirical question is not whether GDP growth is a direct measure of managerial

expectations, but whether the decline elasticity varies systematically with the macroeconomic state.

The sample contains non-financial firms listed on the Ho Chi Minh City and Hanoi stock exchanges from 2015 to 2025. SG&A remains the primary outcome so that the canonical model can be replicated before the components are examined. Selling expense provides the clearest empirical contrast. Its average asymmetry is weak and unstable across alternative sample treatments, but the growth-conditioned decline response is consistently negative once year effects are included. The apparent ranking across SG&A, selling and administrative expenses becomes much smaller when all three outcomes are estimated on the exact same firm-years. What remains is therefore not a claim that one component is inherently more sticky than another. It is the difference between what an unconditional average suggests and what becomes visible when the decline response is allowed to vary with the macroeconomic state.

This evidence contributes to the literature in two related ways. First, it adds a recent emerging-market observation to a literature in which the sign of the GDP-conditioned decline response differs across settings. The Vietnamese result is consistent with the original information interpretation in Anderson *et al.* (2003), but differs from the positive GDP interaction in the more heavily conditioned United States specification of Ntounis and Vlismas (2026). The comparison suggests a boundary condition rather than a horse race: the mapping from aggregate growth to resource retention can depend on the economic and empirical environment. Second, the paper distinguishes an unconditional average from a state-conditioned estimand. In a different accounting application, Banker *et al.* (2020) show that compressing asymmetric operating relations into a restrictive empirical form can change inference. The present results make a related point for cost behavior: pooling decline responses across economic states can yield a weak average even when the conditional response is systematic. This distinction is increasingly testable at the component level because Vietnam requires separate selling and administrative expense captions under Circular 200/2014/TT-BTC (Ministry of Finance of Vietnam 2014), while the Financial Accounting Standards Board’s expense-disaggregation amendments will make selling-expense disclosures broadly available to United States public business entities (Financial Accounting Standards Board 2024).

2 Background

2.1 Costs of adjusting resources and asymmetric cost behavior

Traditional proportional cost models relate cost to activity. The theory of dynamic factor demand adds the costs of changing resources: hiring, firing, installation, removal, contract termination and rebuilding can generate cash costs, disruption and losses of firm-specific knowledge (Hamermesh and Pfann 1996). When adjustment is costly, firms choose between removing unused resources and retaining them for future activity. Cross-country evidence using employment protection legislation links higher costs of adjusting labor to greater cost stickiness (Banker *et al.* 2013). Reviews of cost-management research place decisions to adjust resources at the center of asymmetric cost behavior (Banker and Byzalov 2014; Banker *et al.* 2018).

Anderson *et al.* (2003) translate that resource decision into an accounting prediction. Sales growth can require additional resources. A sales decline creates a choice between removing resources and carrying unused capacity. Expected recovery in demand raises the future cost of removal because the firm may have to reacquire the same resources. Subsequent evidence shows that the choice is sensitive to the firm’s economic environment and managerial constraints. Competition is associated with greater stickiness when managers are optimistic about future demand (Li and Zheng 2017); risk-taking incentives are associated with faster SG&A reductions during sales declines (Li *et al.* 2021); and strategic alignment with customers is associated with greater supplier cost stickiness (Chiang *et al.* 2025). Financial distress moves the decision in the opposite direction by increasing the cost of idle resources and reducing managers’ willingness or ability to retain them (Ntounis and Vlismas 2026). These findings complement evidence on earnings targets, governance and prior sales changes (Kama and Weiss 2013; Chen *et al.* 2012; Banker *et al.* 2014b).

Reported cost categories are observable traces of those resource decisions rather than the decisions themselves. SG&A pools resources associated with selling and administration, and each reported component can itself combine labor, contracts, distribution capacity and other commitments. Evidence on the long-term orientation of research and development (R&D), advertising and other SG&A components also shows that the economic content of SG&A is not homogeneous (Tseng 2020). An aggregate coefficient can therefore remain informative about the adjustment-cost mechanism while obscuring variation across states or resource bundles. Separate component estimates provide additional traces, but comparisons across components also require attention to sample composition because positivity and cost-to-sales screens need not retain the same firm-years.

The canonical model predicts a smaller cost decrease for a sales decline than the cost increase associated with an equivalent sales rise (Anderson *et al.* 2003). The estimated degree of asymmetry varies with employment protection, core versus ancillary activities, organization capital, national culture and financing conditions (Banker *et al.* 2013; Balakrishnan and Gruca 2008; Venieris *et al.* 2015; Kitching *et al.* 2016; Ntounis and Vlismas 2026). Vietnamese studies also report asymmetry in selling and administrative expenses and in SG&A (Hong and Thao 2021; Hong and Trang 2026). The same adjustment-cost mechanism implies that, on average, cost elasticity should be lower when sales decline than when an equal-magnitude sales increase occurs (H1).

2.2 Macroeconomic growth and the information in a sales decline

Adjustment costs make the persistence of a sales decline relevant to resource retention. A decline that reverses quickly raises the cost of removing and then reacquiring resources; a persistent decline raises the cost of carrying unused capacity. Prior sales changes are associated with opposing patterns of subsequent cost asymmetry, consistent with changes in the expected persistence of sales (Banker *et al.* 2014b). Demand uncertainty also affects firms’ choices about capacity and cost structure (Banker *et al.* 2014a). Customer relationships and information can likewise alter resource retention during downturns (Agarwal and Agarwal 2024; Chiang *et al.* 2025).

Anderson *et al.* (2003) condition the decline response on aggregate economic growth. A firm-specific sales decline during stronger aggregate growth occurs alongside higher economy-wide activity than the same decline during weaker growth. If stronger aggregate activity makes the decline less informative about a persistent contraction in demand, the expected cost of removing and later rebuilding resources rises relative to retaining them. Product-market evidence provides a parallel implication: competition increases stickiness when managers are optimistic about future demand but not when they are pessimistic (Li and Zheng 2017). Other economy-wide conditions also covary with asymmetric cost behavior. Political uncertainty around national elections is associated with greater stickiness (Lee *et al.* 2020), whereas economic policy uncertainty is associated with lower stickiness (Jin and Wu 2021). Li *et al.* (2024) report different cost responses across firm, industry and macro uncertainty, and Pham *et al.* (2026) find lower cost stickiness when macroeconomic uncertainty is higher in Vietnam.

Evidence on economic growth itself is mixed across empirical settings. The original United States GDP interaction in Anderson *et al.* (2003) is negative. Ibrahim (2015) report sticky SG&A during Egyptian prosperity and anti-sticky SG&A during recession, while Xu and Sim (2017) find greater stickiness at higher growth rates among Chinese manufacturers using a broader operating-cost measure. By contrast, Ntounis and Vlismas (2026) report a positive GDP interaction in an extended United States model that simultaneously conditions the decline slope on successive sales decreases, employee and asset intensity, free cash flow and financial distress. The difference in sign does not identify which setting provides a universal relation; it indicates that the empirical mapping from aggregate growth to resource adjustment is not invariant across samples and conditioning sets.

The present directional prediction follows the information interpretation of Anderson *et al.* (2003) rather than assuming that this mapping must hold universally. In the Vietnamese setting, stronger real GDP growth is expected to make a firm-specific sales decline less informative about a persistent demand contraction, increasing the relative cost of removing resources that may soon be needed again. The elasticity during sales declines should therefore decrease as real GDP growth rises (H2). The component analysis is not assigned an *ex ante* ranking between selling and administrative expenses; it asks whether the state-conditioned relation carried by aggregate SG&A is also visible in the separately reported categories.

3 Research design

3.1 Sample and variable construction

The unit of analysis is the firm-year. The analysis uses an annual firm-level accounting panel, and the analysis-ready panel used for all reported estimates is supplied in the anonymized replication package. The starting sample contains 5,906 observations from 558 non-financial firms listed on the Ho Chi Minh Stock Exchange or the Hanoi Stock Exchange during 2015–2025. Eighteen firm-years have total assets but lack data on revenue or operating expenses. Table 1 describes the resulting 5,888 firm-years with revenue, SG&A, selling expense, administrative expense and total assets.

Estimation samples are smaller because log changes require positive current and lagged values in consecutive years; the growth-conditioned specification also requires one additional lag of sales. Annual real GDP growth and average consumer price index (CPI) inflation come from the National Statistics Office of Viet Nam’s *Statistical Yearbook of Viet Nam 2025* (National Statistics Office of Viet Nam 2026).

For each cost measure, the dependent variable is the annual log change in cost,

$$\Delta \ln Cost_{it} = \ln \left(\frac{Cost_{it}}{Cost_{i,t-1}} \right), \quad (1)$$

and the activity variable is the annual log change in sales,

$$\Delta \ln Sales_{it} = \ln \left(\frac{Sales_{it}}{Sales_{i,t-1}} \right). \quad (2)$$

D_{it} equals one when sales decline. In the growth-conditioned specification, $PriorDecline_{it}$ equals one when sales declined in the preceding year, $GDPGrowth_t$ is annual real GDP growth in percentage points, and $AssetIntensity_{it} = \ln(TotalAssets_{it}/Sales_{it})$. The extended specification in Anderson *et al.* (2003) also includes employee intensity; consistent employee counts are not available across the panel. The primary estimates retain the raw observations that satisfy the screens in the canonical specification (Anderson *et al.* 2003), including a ratio of cost to sales at or below one in the two years used to construct each cost change. Trimming and winsorization enter the sensitivity analyses.

The screens are applied separately to each cost measure. The baseline specification contains 5,266 firm-years for SG&A, 4,295 for selling expense and 5,256 for administrative expense. The growth-conditioned specification contains 4,709, 3,843 and 4,700 firm-years, respectively.

Table 1: Descriptive statistics

Variable	N	Mean	Standard deviation	P25	Median	P75
Revenue	5,888	3905.788	14661.352	264.087	763.065	2238.190
SG&A	5,888	320.655	1387.661	19.016	54.854	165.560
Selling expense	5,888	205.693	1129.008	0.880	14.512	74.801
Administrative expense	5,888	114.962	354.816	12.283	30.443	79.148
Total assets	5,888	4190.137	13198.728	280.670	792.376	2387.008

Notes: Monetary variables are reported in billions of Vietnamese dong. Table 1 uses 5,888 firm-years for non-financial firms listed on the Ho Chi Minh Stock Exchange or the Hanoi Stock Exchange with non-missing revenue, SG&A, selling expense, administrative expense and total assets. P25 and P75 denote the 25th and 75th percentiles. Estimation samples are smaller because lag, positivity and sample restrictions are applied subsequently.

3.2 Empirical design

Cost elasticity is allowed to differ between periods of rising and falling sales. Following Anderson *et al.* (2003), the baseline relation is:

$$\Delta \ln Cost_{it} = \beta_0 + \beta_1 \Delta \ln Sales_{it} + \beta_2 D_{it} \Delta \ln Sales_{it} + \varepsilon_{it}. \quad (3)$$

When sales increase, $D_{it} = 0$ and β_1 gives the elasticity of cost with respect to sales. When sales decline, the elasticity is $\beta_1 + \beta_2$. Hence, β_2 measures the change in elasticity associated with the direction of the sales change; negative values indicate a lower cost elasticity when sales fall than when sales rise.

GDP growth enters the slope observed when sales decline, while prior sales decline and asset intensity remain in the extended specification:

$$\begin{aligned} \Delta \ln Cost_{it} = & \beta_0 + \beta_1 \Delta \ln Sales_{it} + \beta_2 D_{it} \Delta \ln Sales_{it} \\ & + \beta_3 D_{it} \Delta \ln Sales_{it} \times PriorDecline_{it} + \beta_4 D_{it} \Delta \ln Sales_{it} \times GDPGrowth_t \\ & + \beta_5 D_{it} \Delta \ln Sales_{it} \times AssetIntensity_{it} + \varepsilon_{it}. \end{aligned} \quad (4)$$

The coefficient β_4 captures how the elasticity during sales declines varies with GDP growth. Because $D_{it} \Delta \ln Sales_{it}$ is negative when sales fall, $\beta_4 < 0$ means that a given percentage decline in sales is associated with a smaller predicted reduction in cost as GDP growth rises. Firms provide variation in the size of sales declines within each year, while GDP growth varies across years; the interaction combines these two sources of variation.

A recent extended implementation by Ntounis and Vlismas (2026) also places GDP growth in the decline slope, alongside successive sales declines, employee and asset intensity, free cash flow and financial distress. The present specification retains the terms that can be constructed consistently across the Vietnamese panel. Employee counts are not consistently available, and financial distress is not introduced because it is not the construct under study. The difference in conditioning sets is therefore treated as part of the empirical context when the GDP coefficients are compared across studies rather than as evidence that the coefficients are directly commensurable.

SG&A provides the primary estimates. The equations are also estimated for selling and administrative expenses to examine whether the relation observed for aggregate SG&A is visible in the separately reported categories. Because the screens are applied separately to each cost measure, component magnitudes are reported first on their cost-specific samples and then on exact common samples. The common-sample analysis also estimates paired coefficient contrasts so that differences between component coefficients are not attributed mechanically to different firm-year composition. Each equation is estimated in pooled form and with fixed effects for industry, year, and each combination of industry and year. For the growth-conditioned specification, fitted asymmetry at the observed values in 2020, 2022 and 2025 translates the coefficients into predicted cost responses at those growth rates, with prior decline set to zero and asset intensity set to its sample median.

The main standard errors are clustered by firm. The growth-conditioned estimates also report covariance estimates with clustering by year and by firm and year. GDP growth is observed for nine years in this specification, so the model with year fixed effects is accompanied by a bootstrap- t

under the restricted null, with clusters defined by year and Rademacher weights (Cameron *et al.* 2008; Roodman *et al.* 2019).

Sensitivity analyses vary the limit on the ratio of cost to sales and the treatment of the tails, omit each year in turn, omit 2020–2021 jointly, replace GDP growth with CPI inflation, include GDP growth and CPI inflation together, and reconstruct the accounting variables after CPI deflation.

Use of generative AI. During manuscript preparation, the authors used OpenAI ChatGPT (GPT-5.6 Sol) for editorial restructuring and code assistance. All data transformations, model specifications, estimates, tables, citations and AI-assisted code were reviewed, executed and verified by the authors, who take responsibility for the final manuscript and empirical results.

4 Results

4.1 What does the average asymmetry coefficient show?

Table 2 reports the two elasticities implied by the baseline specification. For SG&A, the estimated elasticity is 0.387 (standard error = 0.040) when sales increase and 0.330 when sales decline. The difference between the two slopes is -0.057 (standard error = 0.045). The point estimate has the predicted sign, but the uncertainty around it is of similar magnitude.

Table 2: Average asymmetric cost adjustment

Cost	N	Up slope	SE	Asymmetry β_2	SE	Down slope
<i>Panel A: SG&A</i>						
SG&A	5,266	0.387***	(0.040)	-0.057	(0.045)	0.330
<i>Panel B: Selling and administrative expenses</i>						
Selling	4,295	0.634***	(0.095)	-0.014	(0.118)	0.620
Administrative	5,256	0.326***	(0.039)	-0.078*	(0.047)	0.249

Notes: SG&A denotes selling, general and administrative expenses. Each row uses the raw sample for that cost measure. Positive values, availability in consecutive years and a ratio of cost to sales at or below one are required separately for SG&A, selling expense and administrative expense, so N differs across rows. Trimming and winsorization appear in the sensitivity analysis. Standard errors are clustered by firm. ***, ** and * denote 1%, 5% and 10% significance.

The components do not display the same average pattern. Administrative expense has $\beta_2 = -0.078$ (standard error = 0.047), while selling expense has $\beta_2 = -0.014$ (standard error = 0.118). Appendix Table 7 varies the cost-to-sales boundary and the treatment of the tails. SG&A and administrative expense remain negative in all 54 specifications, with median coefficients of -0.052 and -0.076. Selling expense is negative in only 18 of 54 specifications and has a median coefficient of 0.026. Under an average-cost interpretation alone, selling expense therefore provides little stable evidence of asymmetric adjustment.

4.2 What changes when the decline response is conditioned on GDP growth?

Table 3 allows the elasticity during sales declines to vary with annual real GDP growth. Across the four fixed-effects structures, the SG&A interaction ranges from -0.036 to -0.028. The specification with year fixed effects gives -0.032 (standard error = 0.020). Because GDP growth varies over only nine years in the estimation sample, the corresponding restricted-null bootstrap clusters by year; its p-value is 0.162.

Table 3: GDP interaction under alternative fixed effects

Cost	Pooled	Year	Industry	Industry×year	Wild p
SG&A	-0.036* (0.019)	-0.032 (0.020)	-0.036* (0.019)	-0.028 (0.021)	0.162
Selling	-0.072*** (0.024)	-0.062** (0.025)	-0.072*** (0.024)	-0.058** (0.026)	0.053
Administrative	-0.033* (0.019)	-0.028 (0.021)	-0.033* (0.019)	-0.025 (0.022)	0.248

Notes: GDP denotes gross domestic product; SG&A denotes selling, general and administrative expenses. Entries in the four model columns are the coefficient on $D_t \Delta \ln Sales_t \times GDPGrowth_t$, followed by standard errors clustered by firm in parentheses. The raw sample requires positive values in consecutive years and a ratio of cost to sales at or below one for the relevant cost measure. The models include the contemporaneous change in sales and interactions with the current decline indicator, the prior decline indicator and asset intensity. FE denotes fixed effects. Fixed effects for year and industry absorb level differences; fixed effects for each combination of industry and year absorb differences at that level. The final column reports the p-value from a bootstrap- t under the restricted null for the specification with year fixed effects, with clusters defined by year and all 512 assignments of Rademacher signs. ***, ** and * denote conventional 1%, 5% and 10% significance using standard errors clustered by firm.

Selling expense changes the empirical picture most visibly. Its GDP interaction lies between -0.072 and -0.058 across the four fixed-effects specifications. With year fixed effects, the estimate is -0.062 (standard error = 0.025), and the restricted-null bootstrap p-value is 0.053. Administrative expense remains negative but smaller on its cost-specific sample; the year-fixed-effects estimate is -0.028 (standard error = 0.021), with a bootstrap p-value of 0.248. Since the interaction multiplies a negative sales change, a negative coefficient implies a smaller predicted reduction in cost for the same sales decline as GDP growth rises.

The contrast with the average selling-expense result is substantial. The average coefficient is close to zero and unstable across sample treatments, whereas the GDP interaction has the same negative sign across the main fixed-effects specifications. The data are therefore more consistent with selling resources being adjusted differently across macroeconomic states than with a single, stable average degree of selling-cost stickiness.

4.3 Does the component pattern survive an exact common sample?

The cost-specific samples differ because each outcome must be positive in consecutive years and satisfy its own cost-to-sales screen. Appendix Table 11 therefore repeats the component comparisons on identical firm-years. For H1, the common sample contains 4,277 observations. The average coefficients are -0.075 for SG&A, 0.022 for selling expense and -0.126 for administrative expense. Selling expense remains the component for which the average asymmetry is least visible.

For the growth-conditioned model, the exact common sample contains 3,826 firm-years. With

year fixed effects, the GDP interactions are -0.046 for SG&A, -0.051 for selling expense and -0.044 for administrative expense. The paired selling-minus-SG&A contrast is -0.004 (standard error = 0.023), and the selling-minus-administrative contrast is -0.007 (standard error = 0.030). The larger selling coefficient observed in the cost-specific samples therefore should not be interpreted as evidence that selling resources are intrinsically more sensitive to GDP growth. The common-sample result supports a different inference: the negative growth-conditioned relation is present across the reported cost categories, while the average selling-expense coefficient is the one that most clearly fails to summarize that state dependence.

4.4 Sensitivity to sample construction and individual years

Table 4 varies the upper limit on the ratio of cost to sales and the treatment of the distributional tails. With year fixed effects, every one of the 54 specifications produces a negative GDP interaction for each cost measure. The median coefficients are -0.027 for SG&A, -0.060 for selling expense and -0.026 for administrative expense. Among the selling-expense specifications, 28 have firm-clustered $p < 0.05$ and 42 have $p < 0.10$.

Table 4: GDP interaction across sample treatments

Cost	Pooled			Year fixed effects		
	Median	Negative	$p < .05$	Median	Negative	$p < .05$
SG&A	-0.032	54/54	36/54	-0.027	54/54	18/54
Selling	-0.072	54/54	51/54	-0.060	54/54	28/54
Administrative	-0.030	54/54	29/54	-0.026	54/54	14/54

Notes: GDP denotes gross domestic product; SG&A denotes selling, general and administrative expenses. Each panel summarizes 54 specifications that combine six boundaries for the ratio of cost to sales with nine ways of treating the tails (raw; trim or winsorize at 0.5%, 1%, 2.5% and 5%). Standard errors are clustered by firm.

Selling expense provides the clearest contrast between the two estimands. Its baseline asymmetry coefficient is negative in only 18 of 54 sample treatments, whereas its GDP interaction is negative in all 54 treatments with year fixed effects. The sensitivity grid therefore separates instability in the average difference between upward and downward elasticities from stability in the sign of the GDP-conditioned slope.

The sign also survives the annual exclusions. Appendix Table 8 reports selling-expense estimates from -0.067 to -0.033 when each of the nine years is omitted in turn. Appendix Table 10 removes 2020 and 2021 together; under the 99th-percentile cost-to-sales limit and 1 percent winsorization, the interaction is -0.133 (standard error = 0.061, $p = 0.029$).

4.5 Is the GDP relation a general-price effect?

Table 5 separates the GDP interaction from annual inflation and from nominal price changes in the accounting variables. With year fixed effects, the 99th-percentile cost-to-sales limit and 1 percent winsorization, the selling-expense GDP interaction is -0.053 (standard error = 0.029). Replacing

GDP growth with CPI inflation gives a CPI interaction of 0.051 (standard error = 0.098). When both variables enter the model, the GDP coefficient is -0.084 (standard error = 0.032) and the CPI coefficient is 0.231 (standard error = 0.108).

Table 5: Interactions with GDP growth and CPI inflation

Cost	GDP only	CPI only	GDP in joint	CPI in joint	CPI-deflated GDP
SG&A	-0.034**	-0.046	-0.039**	0.039	-0.031**
Selling	-0.053*	0.051	-0.084***	0.231**	-0.050*
Administrative	-0.027*	-0.027	-0.032*	0.042	-0.024

Notes: GDP denotes gross domestic product; SG&A denotes selling, general and administrative expenses. Entries are coefficients on the interaction of GDP growth or CPI inflation with the change in sales when sales decline. The sample uses the 99th-percentile limit on the ratio of cost to sales, winsorization at 1%, fixed effects for year and standard errors clustered by firm. The final column uses sales, costs and assets after CPI deflation before the log changes are constructed. ***, ** and * denote 1%, 5% and 10% significance.

Deflating sales, costs and assets by the CPI leaves the selling-expense GDP interaction negative at -0.050 (standard error = 0.028, $p = 0.075$) with year fixed effects. The corresponding SG&A and administrative-expense coefficients are also negative. The GDP interaction therefore retains its sign after a common price component is removed, while the CPI interaction does not reproduce the same sign pattern.

Table 6 translates the joint GDP-and-CPI specification into fitted asymmetry at the observed macroeconomic values in three years. For selling expense, fitted asymmetry is 0.076 (standard error = 0.145) at the 2020 values, -0.411 (standard error = 0.164) at the 2022 values and -0.333 (standard error = 0.150) at the 2025 values, with prior decline set to zero and asset intensity at its sample median. SG&A and administrative expense move in the same direction with smaller magnitudes in this specification. These are evaluations of one fitted model at different observed macroeconomic values, not separate year-specific coefficient estimates.

Table 6: Estimated asymmetry at observed GDP and CPI values

Cost	2020 (GDP 2.9%)	2022 (GDP 8.5%)	2025 (GDP 8.0%)
SG&A	0.087	-0.136*	-0.110*
Selling	0.076	-0.411**	-0.333**
Administrative	0.015	-0.170**	-0.147**

Notes: GDP denotes gross domestic product; CPI denotes consumer price index; SG&A denotes selling, general and administrative expenses. Estimated asymmetry in the current period from the model containing both GDP growth and CPI inflation, with fixed effects for year. Values are evaluated at GDP growth and CPI inflation for the indicated year, with prior decline set to zero and asset intensity at the sample median. Negative values indicate sticky downward adjustment. ***, ** and * denote 1%, 5% and 10% significance using standard errors clustered by firm.

5 Discussion

5.1 *Economic growth as a context-dependent conditioning variable*

The growth results add a different pattern to an empirical literature that is no longer uniform. Anderson *et al.* (2003) report a negative GDP interaction for United States SG&A, and evidence from Egypt and China is also consistent with greater stickiness in stronger-growth states (Ibrahim 2015; Xu and Sim 2017). In contrast, Ntounis and Vlismas (2026) report positive GDP interactions in their extended United States specifications for both SG&A and operating expenses. Their model conditions simultaneously on successive sales declines, resource intensity, free cash flow and financial distress. The Vietnamese interaction is negative throughout the year-fixed-effects sensitivity grid. Thus, the present result agrees in sign with the original growth prediction in Anderson *et al.* (2003) but differs from the most recent United States evidence in this literature.

That divergence is economically informative even though it is not a controlled cross-country comparison. The studies differ in period, institutional setting, sample composition, cost measure and conditioning variables. GDP growth is also a macroeconomic trace rather than the latent expectation that motivates resource retention. A given growth rate can carry different information about the persistence of a firm-specific sales decline when financing conditions, competitive pressure, sectoral composition or the recent macroeconomic history differ. Recent evidence that competition, strategic alignment and financial distress alter resource-retention decisions reinforces this interpretation (Li and Zheng 2017; Chiang *et al.* 2025; Ntounis and Vlismas 2026). The sign difference therefore suggests a boundary on the empirical mapping from GDP growth to cost asymmetry rather than a reason to treat either setting as revealing a universal coefficient.

Selling expense then exposes a second distinction within the Vietnamese setting. Its average asymmetry is close to zero and changes sign across alternative sample treatments, while the GDP-conditioned coefficient is negative across the sensitivity grid. A near-zero average coefficient therefore does not imply that selling resources respond symmetrically to sales changes in every economic state. It can also arise when the decline response changes with observable conditions and those state-specific responses are pooled. In a different accounting context, Banker *et al.* (2020) show that empirical inference can change when asymmetric operating relations are compressed into a restrictive specification. The present evidence is consistent with an analogous estimand problem: the unconditional average and the state-conditioned slope summarize different observable implications of the same resource-adjustment mechanism.

5.2 *What does component reporting add?*

Separate selling and administrative expenses provide an additional measurement mapping from the latent resource-adjustment mechanism to observable accounting outcomes. The cost-specific estimates initially suggest a substantially larger GDP interaction for selling expense than for SG&A or administrative expense. The exact common-sample analysis narrows those differences sharply. On the same 3,826 firm-years, all three GDP interactions are close to -0.05, and the paired coefficient

contrasts are small. Sample composition therefore explains part of the apparent component ranking.

That common-sample result changes, rather than removes, the contribution of disaggregation. The relevant component finding is not that selling expense is uniquely sensitive to GDP growth. It is that the average selling-expense coefficient is approximately symmetric while the growth-conditioned coefficient remains negative on the same common sample. Component reporting therefore identifies where the difference between an unconditional and a state-conditioned estimand is most visible. This distinction would be lost if only the aggregate SG&A coefficient were inspected.

Prior evidence documents differences in cost asymmetry across core and ancillary activities and across reported expense categories (Balakrishnan and Gruca 2008; Hong and Thao 2021). Research on the long-term orientation of R&D, advertising and other SG&A components likewise treats SG&A as a bundle of economically distinct resource expenditures rather than a homogeneous input (Tseng 2020). The present pattern is consistent with that broader view of resource heterogeneity without requiring selling and administrative expenses to have different GDP sensitivities. Each reported category still combines several underlying resources, so the accounting captions should be interpreted as traces of resource adjustment rather than direct observations of particular managerial actions.

5.3 Interpreting GDP growth as an observable state

Real GDP growth and CPI inflation need not carry the same information about the persistence of a firm’s demand. GDP growth captures variation in aggregate real activity, whereas CPI inflation captures changes in the general price level. Under the resource-adjustment mechanism, a sales decline observed during stronger aggregate growth can be less informative about a persistent contraction than the same decline observed during weaker growth. Retaining resources can then be less costly than removing them and later rebuilding capacity.

The CPI tests are consistent with that distinction. The selling-expense interaction with GDP growth remains negative when GDP growth and CPI inflation enter jointly, and it remains negative after sales, costs and assets are deflated by CPI. The interaction with CPI inflation has the opposite sign in the corresponding specifications. These patterns do not identify managers’ expectations directly, but a pure general-price explanation is less consistent with the observed traces.

GDP growth remains a coarse observable state rather than a direct measure of the latent mechanism. Demand expectations, financing conditions and the opportunity cost of unused capacity are not observed in the panel, and each can affect resource adjustment. Prior sales changes and customer information are associated with subsequent cost decisions (Banker *et al.* 2014b; Agarwal and Agarwal 2024); product-market competition and strategic alignment alter the incentives to retain committed resources (Li and Zheng 2017; Chiang *et al.* 2025); and financing pressure can either facilitate or restrict resource retention (Cheng *et al.* 2018; Ntounis and Vlismas 2026). The evidence is therefore consistent with a growth-conditioned decline response without assigning that relation to one uniquely observed managerial channel.

5.4 Reporting implications and future research

The component result is timely because the reporting environment is changing. Circular 200 has provided separately reported selling and administrative expenses in Vietnam throughout the sample period (Ministry of Finance of Vietnam 2014). Financial Accounting Standards Board Accounting Standards Update 2024-03 will require public business entities to disclose total selling expenses and, in annual periods, their definition of selling expenses (Financial Accounting Standards Board 2024). Cost-behavior research will therefore have broader access to a component that the canonical United States design could not study systematically at the same scale.

The Vietnamese evidence gives one prior for that future work. More disaggregated data need not overturn the aggregate GDP relation; on an exact common sample, the three GDP coefficients are similar. What disaggregation can change is the interpretation of an average coefficient. A component can appear approximately symmetric on average while still displaying systematic variation across economic states. Future research can test whether this pattern appears after selling-expense disclosures become broadly available in the United States and whether differences in firms' definitions of selling expense affect cross-firm comparability.

The growth-conditioned specification uses GDP growth observed in nine years between 2017 and 2025 after the required lags. Longer time series can assess whether the relation persists across additional expansions and slowdowns. Data on demand forecasts, order backlogs, headcount, distribution commitments, capacity utilization and credit availability could also distinguish among the latent channels that may generate the observed state dependence.

6 Conclusion

The main empirical contrast is between two ways of summarizing the same cost-adjustment process. For selling expense, average asymmetry is close to zero and unstable across sample treatments, yet the interaction between a sales decline, the sales change and GDP growth is negative throughout the year-fixed-effects sensitivity grid. On an exact common sample, the selling GDP interaction remains negative and is similar in magnitude to the SG&A and administrative interactions. The evidence therefore does not indicate that selling expense is uniquely more growth-sensitive. It indicates that an average coefficient can conceal systematic variation in the decline response across economic states.

The macroeconomic result also extends a literature in which resource retention has been shown to vary with competition, incentives, supply-chain relationships and financial distress (Li and Zheng 2017; Li *et al.* 2021; Chiang *et al.* 2025; Ntounis and Vlismas 2026). The negative Vietnamese GDP interaction agrees with the original prediction in Anderson *et al.* (2003) but differs from the positive GDP interaction reported in the recent, more heavily conditioned United States specification of Ntounis and Vlismas (2026). Because the designs and settings differ, this contrast does not identify a universal sign. It instead suggests that GDP growth has context-dependent informational content for the persistence of firm-specific demand and for managers' resource-adjustment choices.

This distinction changes how a weak average cost-stickiness estimate can be read. A coefficient near zero is consistent with symmetric adjustment, but it is also consistent with state-dependent responses that average toward zero. The Vietnamese accounting setting makes that possibility visible at the component level because selling and administrative expenses are separately reported. As selling-expense disclosures become more widely available under new reporting requirements, the same distinction between average and state-conditioned cost behavior can be examined in other markets and under alternative financing, competitive and demand conditions.

A Supplementary sensitivity and inference analyses

Table 7: H1 estimates across sample treatments

Cost	Min	Median	Max	Negative	$p < .05$	$p < .10$
SG&A	-0.081	-0.052	-0.009	54/54	3/54	13/54
Selling	-0.045	0.026	0.133	18/54	0/54	0/54
Administrative	-0.143	-0.076	-0.028	54/54	12/54	28/54

Notes: SG&A denotes selling, general and administrative expenses. Each row summarizes 54 specifications for H1. They combine six boundaries for the ratio of cost to sales with nine ways of treating the tails (raw; trim or winsorize at 0.5%, 1%, 2.5% and 5%). The focal coefficient is β_2 on $D_t \Delta \ln Sales_t$. Standard errors are clustered by firm.

Table 8: Growth-conditioned estimates after omitting one year at a time

Cost	Min	Max	Median	Negative	$p < .10$
SG&A	-0.039	-0.025	-0.035	9/9	9/9
Selling	-0.067	-0.033	-0.053	9/9	5/9
Administrative	-0.033	-0.019	-0.027	9/9	4/9

Notes: GDP denotes gross domestic product; SG&A denotes selling, general and administrative expenses. The table reports the GDP interaction from specifications with the 99th-percentile limit on the ratio of cost to sales, winsorization at 1% and fixed effects for year. Each estimate omits one year. Standard errors are clustered by firm.

Table 9: Covariance estimates for the pooled growth-conditioned model

Cost	Firm cluster		Year cluster		Two-way cluster	
	β_{GDP}	SE	β_{GDP}	SE	β_{GDP}	SE
SG&A	-0.036*	(0.019)	-0.036**	(0.014)	-0.036**	(0.015)
Selling	-0.072***	(0.024)	-0.072***	(0.018)	-0.072***	(0.017)
Administrative	-0.033*	(0.019)	-0.033**	(0.015)	-0.033**	(0.016)

Notes: GDP denotes gross domestic product; SG&A denotes selling, general and administrative expenses. The table uses the raw pooled specification for H2. The columns report covariance estimates with clustering by firm, by year and by firm and year. Table 3 reports the specifications with fixed effects and the bootstrap under the restricted null with clusters defined by year.

Table 10: Excluding 2020 and 2021

Cost	Full sample	Exclude 2020–2021
SG&A	-0.034** (0.016)	-0.065** (0.029)
Selling	-0.053* (0.029)	-0.133** (0.061)
Administrative	-0.027* (0.016)	-0.043 (0.029)

Notes: GDP denotes gross domestic product; SG&A denotes selling, general and administrative expenses. The table reports the GDP interaction from specifications with the 99th-percentile limit on the ratio of cost to sales, winsorization at 1% and fixed effects for year. Standard errors are clustered by firm. The second column omits 2020 and 2021.

Table 11: Component estimates on exact common samples

Cost or contrast	Coefficient	SE	Wild p	N	Firms	Years
<i>Average asymmetry</i>						
SG&A	-0.075	(0.061)		4,277	484	10
Selling	0.022	(0.123)		4,277	484	10
Administrative	-0.126**	(0.061)		4,277	484	10
<i>GDP interaction</i>						
SG&A	-0.046***	(0.016)	0.078	3,826	478	9
Selling	-0.051*	(0.030)	0.131	3,826	478	9
Administrative	-0.044**	(0.019)	0.158	3,826	478	9
<i>Paired GDP-coefficient contrasts</i>						
Selling – SG&A	-0.004	(0.023)	0.715	3,826	478	9
Selling – Administrative	-0.007	(0.030)	0.596	3,826	478	9

Notes: SG&A denotes selling, general and administrative expenses. The average-asymmetry panel restricts all three cost equations to the same 4,277 firm-years that satisfy the baseline screens for SG&A, selling expense and administrative expense. The GDP-interaction panel restricts all three equations to the same 3,826 firm-years and includes year fixed effects. The paired contrasts are obtained by regressing the difference between the two log-cost changes on the same design matrix, so their coefficients equal the difference between the corresponding GDP-interaction coefficients while their standard errors account for within-observation covariance. Conventional standard errors are clustered by firm. Wild p reports the restricted-null bootstrap- t p-value with clusters defined by year and all 512 Rademacher sign assignments. ***, ** and * denote 1%, 5% and 10% significance using firm-clustered standard errors.

Data availability

An anonymized replication package containing the analysis-ready annual firm panel with anonymized firm identifiers and the annual gross domestic product growth and consumer price index series is available from the corresponding author on reasonable request and can be provided to the journal for peer review. The original upstream accounting source files are not redistributed in the submission package.

Code availability

The Python code required to reproduce the reported analyses and tables is available from the corresponding author on reasonable request and can be provided to the journal for peer review.

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