STICKY SELLING, GENERAL, AND ADMINISTRATIVE COST BEHAVIOR AND ITS CHANGES IN JAPAN

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ABSTRACT

This study examines whether Japanese firms' selling, general, and administrative costs are sticky. We also investigate the determinants of cost stickiness in Japan and test whether Japanese managers changed their cost behavior after the stock market collapse in 1990. We find that similar to US firms, Japanese firms also demonstrate sticky selling, general, and administrative cost behavior; however, the stickiness of selling, general, and administrative costs in Japan is less likely to be adjusted due to temporary changes in their performance. We also find that there is a significant decrease in the magnitude of stickiness in Japan after the asset bubble burst, showing that Japanese managers adjusted their cost behavior in the post-bubble era.

JEL: M40

KEYWORDS: Cost behavior, Japanese firms

INTRODUCTION

T he traditional cost behavior hypothesis assumes that costs are proportional to activity levels; costs are described as fixed or variable relating to changes in activity volume and the relationship between costs and volume is symmetric for volume decreases and for volume increases (Noreen, 1991). However, using a US sample of firms, recent studies have found that selling, general, and administrative (SG&A) costs are sticky. In other words, the magnitude of changes in SG&A costs when revenues increase is higher than the magnitude when revenues decrease (Anderson, et al, 2003).

The phenomenon of sticky costs is consistent with the argument that managers tend to deliberately adjust resources in response to changes in volume. When sales decrease, managers may purposely postpone reductions to committed resources until they are more certain about the permanence of a decline in demand. They also tend to maintain unutilized resources to avoid personal consequences of expenditure reduction. In addition, there may be a time lag between the decision to reduce committed resources and the realization of the cost reduction (Anderson, et al, 2003).

In this study, we first examine whether Japanese firms have similar sticky cost behavior to their U.S. counterparts. By investigating whether costs change at the same rate when activity rises versus when they decrease, we are able to measure the stickiness of SG&A costs for Japanese firms. Secondly, we investigate the determinants of cost stickiness in Japan. Finally, we test whether Japanese managers changed their sticky cost behavior after the stock market collapse in 1990.

It is important to study the cost behavior of Japanese firms for a number of reasons. First, the Japanese capital market is important to understand since Japan is the second largest economy. To correctly understand the cost behavior of firms on this market can help investors interpret the financial reports and forecast their operating and stock performance accurately. Second, our results can be seen as an extension of US studies. If we fail to document the sticky cost behavior of Japanese firms, the generalization of US findings will be doubtful. Third, by documenting the distinct characteristics of sticky cost behavior of Japanese firms, we are adding value to the comparative studies of cost behavior

between US and Japan. Importantly, we also examine the change of Japanese managers' cost behavior after the bubble burst in 1990, therefore, adding value to the Japanese structural change literature.

We find that similar to US firms; Japanese firms also demonstrate sticky SG&A cost behavior. For our sample of firms between 1975 and 2000, SG&A costs increased on average 0.59% per 1% increase in sales but fell only 0.45% per 1% decrease in sales. We find that Japanese SG&A costs are less sticky when revenue also declined in the preceding period and SG&A costs are stickier if managers predict the revenue of next year will increase. We also find that the higher the economic growth and asset intensity of the firms, the stickier the SG&A costs. Most importantly, we document a significant decrease in the magnitude of stickiness in Japan after the asset bubble burst. In the pre-1991 period, the SG&A costs increased on average 0.58% per 1% increase in sales but fell 0.24% per 1% decrease in sales. However, in the post-bubble era, SG&A costs decreased 0.50% per 1% decrease in sales. SG&A costs are much less sticky in the post-bubble era, showing that Japanese managers adjusted their cost behavior after the bubble burst.

We also examine the SG&A cost behavior among different industries and find that all manufacturing, merchandising, and service firms demonstrate the cost stickiness. Interestingly, merchandising firms illustrate very strong stickiness before the asset bubble burst in 1990; after the bubble burst, service firms demonstrate more flexibility (less stickiness) in SG&A costs.

The rest of the paper is organized as follows. The next section reviews the background literature and discusses the hypotheses. The third section describes the sample and our research design. The empirical results are presented in the forth section. The final section concludes the study.

LITERATURE REVIEW AND HYPOTHESIS

Firms exhibit sticky selling, general, and administrative (SG&A) cost behavior because managers deliberately adjust the resources in response to changes in sales volume (Anderson, et al. 2003). Revenue increases usually result in cost increases. However, when revenues decrease, managers may be hesitant to reduce assets, numbers of employees or other SG&A costs. Two reasons can explain this managers' behavior. First, agency theory predicts that managers tend to make decisions in order to maximize their own interest rather than firms' interest (Jensen & Meckling, 1976). Thus, managers may want to retain these unutilized resources to avoid personal consequences due to downsizing.

Another reason for managers' reluctance to reduce the SG&A costs when firms face declining revenues is that managers are not sure about the future demands. Managers may retain excess capacity if they believe that the revenue reduction is temporary. They will purposely delay reductions to committed resources until it is evident that the decline is a permanent one.

Japanese corporate governance mechanisms are quite different from those in the US (Prowse, 1990, 1992). Agency problems are mitigated in Japanese firms. Japanese financial institutions hold significant debt and equity of firms and are therefore able to maintain effective control of the behavior of managers of these firms. In addition, for keiretsu-affiliated firms, managers' behaviors are monitored and influenced by the large shareholders of the keiretsu firms. Thus, these two mechanisms mitigate the agency problem for Japanese firms in comparison to their US counterparts and may therefore reduce the stickiness of SG&A costs.

On the other hand, it was said that Japanese managers tended to focus more on long-term measures, such as market share, rather than short-term measures (Porter, 1992). Temporary reductions in sales were less likely to influence their long-term goals. They might have ignored those revenue fluctuations as "noise", thus making the cost behavior stickier. In addition, lifetime employment is common and it is unusual in

Japan for firms to lay off employees (McAlinn, 1996). This distinct feature of Japan's labor market is likely to enhance the cost stickiness. Therefore, our first hypothesis is:
H1: the relative magnitude of an increase in SG&A costs when sales increase is greater than the relative magnitude of a decrease in SG&A costs when sales decrease.

There is lagged effect on cost stickiness. Managers facing revenue decreases may wait to make sure the downsizing will be permanent before making decisions to reduce committed resources. There is also a time lag required in order to dispose of excess capacity. The stickiness observed in one period may be counteracted by reductions to committed resources in subsequent periods (Anderson et al, 2003). Therefore, our second hypothesis is:

 H2: Stickiness of SG&A costs in Japanese firms reverses in the subsequent periods.

Managers are likely to consider revenue declines as more permanent if the previous year's revenue also declined. The increased probability of a permanent decline may motivate managers to reduce committed resources, resulting in less cost stickiness. Therefore, we hypothesize that:

H3a: Japanese SG&A costs will be less sticky when revenue also declined in the preceding period.

Managers are more likely to hold excess capacity in economic growth periods. In addition, facing the shortage of labor in periods of economic growth, managers may become more hesitant to scale down labor resources when sale revenues are down temporarily. Therefore, we hypothesize H3b: Japanese SG&A costs will be more sticky, the higher the economic growth.

When firms rely more on assets to generate sale revenues, SG&A costs may become more sticky. Therefore, we hypothesis that:

H3c: Japanese SG&A costs will be more sticky, the higher the asset intensity of the firms.

When managers make the decision to release excess capacity, future revenue predictions is one of the important factors to be considered. When managers predict that next year's sales will increase, they may hold excess capacity even though the firm may suffer temporary declines, therefore making SG&A costs stickier. As a result, we hypothesize that:

H3d: Japanese SG&A costs will be more sticky if managers predict the revenue of next year will increase.

Japanese corporate governance is experiencing gradual institutional changes. More than ten years of recession has forced Japanese managers to change their decision making process. When revenues decreased in the early years of the recession, firms started to accumulate excess capacity because of managers' long-term focus and mutually supportive environment. When revenue increased, firms would use the excess capacity rather than obtain more resources. Therefore, the percentage increase of SG&A costs will become relatively lower for an increase in sales revenue.

On the other hand, as the recession continued, managers would be faced with the pressure to reduce this excess capacity; otherwise, the firms may not survive. In addition, driving down costs may also allow managers to lower sales price thus helping their firm increase market share for their products. Therefore, when revenues decrease, managers may no longer hold the excess capacity as before. The magnitude of decrease in SG&A costs will become larger when sales decrease. Consequently, the magnitude of the two changes would converge and reduce cost stickiness.

In 1992, the R&D expenditures of Japanese firms were significantly cut for the first time after continuous growth since the end of World War II (Nakai, 1994 and Swinbanks, 1994). Even in three prior recessions (1973-74, 1980-82, and 1985-86), Japanese firms had increased their R&D expenditures by 20 to 50 percent (Mande, 2000). The significant cut of R&D expenditures in 1992 implies that Japanese managers may start to change their cost behaviors after the bubble burst.

Flexibility is becoming one of the most important goals firms pursue in order to meet the intensive competitiveness of the business environment (Buckley and Casson, 1998). Using contingent workers and outsourcing are increasing firms' flexibility in meeting demand fluctuations and in controlling downsizing (Hansen and Mowen, 2003). Therefore, as firms use more contingent workers and conduct more and more outsourcing, stickiness of costs becomes less.

The mindset of top management has been changing. Before the bubble, financial institution had strong governance. However, skyrocketing share prices changed the condition drastically. Every company rushed to issue shares and brought down its debt ratio. For example, the debt ratio (defined as the percentage of debt with interest / (debt with interest + equity capital)) has decreased from 0.7173 in 1993 to 0.5230 in 2008 (calculated by Financial Statistics of Japan by MOF Policy Research Institute.). Thus, Japanese companies began to focus on short-term performance for many shareholders more than ever. In addition, mutual stockholding was dissolved gradually from the middle of the 1990s. After the bubble burst, Japanese companies' mentality and behavior became more similar to their U.S. counterparts. Sakurai (2009) shows that corporate strategies that place value on shareholders came in the 1990s. This change could be one of the main factors that led to the significant declines of the SG&cost stickiness in the post bubble era.

In addition, structural changes in the Japanese labor market might also influence the firms' cost stickiness behavior. After the bubble economy burst in 1990, a need to reduce personnel in order to maintain Japanese companies' global competitiveness became a clear issue. Most companies solved this problem by either transferring their redundant employees to affiliated companies or encouraged early retirement. The unemployment rate started increasing, especially among the middle aged and elderly groups, which signaled the collapse of the lifetime employment system (Watanabe and Sato, 2000, and McAlinn, 1996). Japanese managers started to find way to reduce excess personnel capacity. Therefore, our fourth hypothesis is:

H4: Japanese SG&A costs are less sticky in the post bubble years than prior years.

SAMPLES AND METHODOLOGY

The sample firms cover all the available Japanese industrial companies from the PACAP database from 1975 to 2000. The data items are annual data including sales (items name: INC1) and Selling & Administrative Expenses (SG&A) (items name: INC4). The data is deleted for missing observations of either SG&A costs or sales in the current and previous year and if SG&A costs are greater than sales. We also eliminate those extreme observations where the value of any variables is in the upper or lower 0.5% of its distribution (Chen and Dixon, 1972). The total number of remaining observations is 35,510 firm-years for 1802 firms.

Panel A of Table 1 describes the sample size, average revenue and SG&A costs, and the percentage of SG&A costs of revenue by years and Panel B of Table 1 describes those by industry. The mean value of revenue is 139,644 million yen and the mean value of SG&A costs is 19,320 million yen. The average percentage of SG&A costs of revenue is 16.29%.

Table 1: Summary of Japanese Firms' Annual Revenue and SG&A Costs from 1975 to 2000

Panel A: Sample Size and Average Revenue, SG&A Costs and Percentage By Calendar Year

Year	Sample Size	Revenue (million yen)	SG&A Costs (million yen)	Percentage of SG&A Costs of Revenue
1975	8	72,382	7,685	0.191
1976	1,145	90,573	9,842	0.1414
1977	1,210	99,067	10,649	0.138
1978	1,225	103,206	11,562	0.1401
1979	1,237	108,445	12,463	0.1396
1980	1,245	116,533	13,301	0.136
1981	1,264	131,209	14,349	0.1357
1982	1,305	138,505	15,517	0.1415
1983	1,335	136,436	15,985	0.1465
1984	1,357	136,821	16,470	0.1481
1985	1,385	141,147	16,946	0.1487
1986	1,379	138,233	16,977	0.1537
1987	1,307	127,002	17,464	0.1626
1988	1,303	139,817	19,003	0.1634
1989	1,425	144,610	20,112	0.1611
1990	1,473	149,904	21,821	0.1634
1991	1,509	159,616	23,193	0.1646
1992	1,564	159,747	23,728	0.1716
1993	1,605	158,588	24,403	0.181
1994	1,614	144,992	22,947	0.1864
1995	1,634	147,796	23,438	0.1853
1996	1,644	156,505	24,199	0.1834
1997	1,660	160,150	24,436	0.1805
1998	1,638	158,934	24,605	0.184
1999	1,602	147,449	23,768	0.1882
2000	1,437	148,196	22,967	0.1797
Total	35,510	139,644	19,320	0.1629

Panel B: Sample Size and Average Revenue, SG&A Costs and Percentage By Industry Classification

Industry classification	Sample Size	Revenue (million yen)	SG&A costs (million yen)	Percentage of SG&A costs of Revenue
Agriculture And Forestry	18	30,640	8,164	0.2641
Fishery	142	240,428	23,057	0.0895
Mining	199	95,460	6,864	0.1114
Construction	3,154	166,240	12,713	0.0815
Foods	2,050	131,107	28,044	0.2345
Textiles	1,533	82,388	14,185	0.1603
Pulp And Paper	645	114,044	15,082	0.1203
Chemicals	3,919	101,893	24,276	0.2413
Petroleum	265	709,627	50,034	0.0967
Rubber	397	96,500	18,460	0.1648
Glass And Ceramics	999	84,488	15,308	0.1766
Iron And Steel	1,042	233,623	23,066	0.1014
Nonferrous Metals	855	137,037	12,010	0.0947
Metal Products	962	53,440	7,777	0.1327
Machinery	3,050	55,966	8,778	0.1618
Electric Machinery	3,985	111,348	19,762	0.1731
Transportation Equipment	2,595	203,181	19,487	0.099
Precision Equipment	713	77,331	14,890	0.1814
Other Manufacturing	1,125	94,528	16,642	0.2112
Wholesale	2,079	281,724	13,104	0.0897
Retail	1,948	181,391	42,417	0.2793
Financial (Except Banks,Securities And Insurance)	317	156,078	40,814	0.3529
Real Estate	536	90,303	7,707	0.1126
Land Transportation	398	159,149	5,799	0.0519
Shipping	521	91,445	4,916	0.0773
Air Transportation	123	309,714	58,298	0.1732
Warehousing And Wharfing	410	36,628	2,919	0.0759
Electric Power And Gas	361	637,918	115,972	0.2545
Services	1,169	47,544	10,191	0.206
Total	35,510	139,644	19,320	0.1629

Panel A shows the sample size, average revenue, selling, general, and administrative costs (SG&A) and the percentage of SG&A costs of revenue by calendar year. Panel B shows the sample size, average revenue, selling, general, and administrative costs (SG&A) and the percentage of SG&A costs of revenue by industry classification.

Table 2 provides information about the frequency of firm-periods when revenue decreased and firm-periods when SG&A costs decreased. Revenue of 33.23% of the firm-periods in the sample and SG&A costs of 29.22% of the firm-periods decreased. The average revenue decrease is 7.41% and the average SG&A costs decrease is 6.07%.

Table 2: Periodic Fluctuations in Revenue and SG&A Costs from 1975 to 2000

	Percentage of firm-years with negative change from previous period	Mean percentage decrease across periods	Standard deviation of percentage decreases across periods	Min of percentage decrease across periods	Max of percentage decrease across periods
Sales revenue	33.23%	7.41%	6.47%	0.00%	33.49%
SG&A costs	29.22%	6.07%	5.41%	0.00%	29.99%

Note: This table shows the statistics of periodic fluctuations in revenue and selling, general, and administrative costs from 1975 to 2000.

We use the following model developed by Anderson et al. (2003) to examine cost stickiness. Decrease_Dummy takes the value of 1 when sales revenue decreases between period t-1 and t, and 0 otherwise. The coefficient β_1 measures the percentage change in SG&A costs with a 1% increase in sales revenue. The sum of the coefficients, $\beta_1 + \beta_2$ measures the percentage change in SG&A costs with a 1% decrease in sales revenue. If our first hypothesis is correct, β_1 should greater than zero and β_2 should significantly less than zero.

Model I:
$$\text{Log} [\text{SG\&A}_t / \text{SG\&A}_{t-1}] = \beta_0 + \beta_1 * \text{Log} [\text{Sales}_t / \text{Sales}_{t-1}] + \beta_2 * \text{Decrease\_Dummy}_t * \text{Log} [\text{Sales}_t / \text{Sales}_{t-1}] + \varepsilon_t \tag{1}$$

To test the second hypothesis, we add two more variables on the right hand side of the above equation to represent the lagged reversal of cost stickiness. The coefficient, β_4, measures the reversing effect of a revenue decrease in the preceding period on cost stickiness. We predict that β_4 is positive.

Model II :
$$\text{Log} [\text{SG\&A}_t / \text{SG\&A}_{t-1}] = \beta_0 + \beta_1 * \text{Log} [\text{Sales}_t / \text{Sales}_{t-1}] + \beta_2 * \text{Decrease\_Dummy}_t * \text{Log} [\text{Sales}_t / \text{Sales}_{t-1}] + \beta_3 * \text{Log} [\text{Sales}_{t-1} / \text{Sales}_{t-2}] + \beta_4 * \text{Decrease\_Dummy}_{t-1} * \text{Log} [\text{Sales}_{t-1} / \text{Sales}_{t-2}] + \varepsilon_t \tag{2}$$

To test the third and fourth hypothesis, we use the following model (Model III):

$$\text{Log} [\text{SG\&A}_t / \text{SG\&A}_{t-1}] = \beta_0 + \beta_1 \text{Log} [\text{Sales}_t / \text{Sales}_{t-1}] +$$
$$+\beta_2 * \text{Decrease\_Dummy}_t * \text{Log} [\text{Sales}_t / \text{Sales}_{t-1}]$$
$$+\beta_3 * \text{Decrease\_Dummy}_t * \text{Log} [\text{Sales}_t / \text{Sales}_{t-1}] * \text{PostBubble\_Dummy}_t$$
$$+\beta_4 * \text{Decrease\_Dummy}_t * \text{Log} [\text{Sales}_t / \text{Sales}_{t-1}] * \text{Decrease\_Dummy}_{t-1}$$
$$+\beta_5 * \text{Decrease\_Dummy}_t * \text{Log} [\text{Sales}_t / \text{Sales}_{t-1}] * \text{Growth}_t$$
$$+\beta_6 * \text{Decrease\_Dummy}_t * \text{Log} [\text{Sales}_t / \text{Sales}_{t-1}] * \text{Log} [\text{Assets}_t / \text{Sales}_t]$$
$$+\beta_7 * \text{Decrease\_Dummy}_t * \text{Log} [\text{Sales}_t / \text{Sales}_{t-1}] * \text{Increase\_Dummy}_{t+1} + \varepsilon_t \tag{3}$$

PostBubble_Dummy$_t$ equals 1 in the observations from calendar year 1992 and later, 0 otherwise. Decrease_Dummy$_{t-1}$ equals 1 if sales decreased from the preceding year, 0 otherwise. Growth is the percentage change in real Japanese GDP and Log [Assets$_t$ / Sales$_t$] is used to measure asset intensity. We assume that the actual direction of revenue change is highly correlated with that of the predicted change. Therefore, Increase_Dummy$_{t+1}$ is equal to 1 if actual revenues increased, 0 otherwise. We hypothesize that β_3, β_4 are positive and β_5, β_6, β_7 are negative.

TESTS AND RESULTS

The results of estimating Model I are presented in Table 3. The estimated value of β_1= 0.5935 indicates that selling, general, and administrative (SG&A) costs increased 0.59% per 1% increase in sales. The β_2 (-0.1393) is significantly less than zero (t = -9.12), demonstrating that similar to US firms, Japanese firms also demonstrate sticky SG&A cost behavior. The combined value of $\beta_1 + \beta_2$ = 0.4542 indicates that SG&A costs decreased only 0.45% per 1% decrease in sales.

Table 3: Results of Regression Changes in SG&A on Changes in Sales of One-Year Periods

	Model I	Model II
β_0	0.0201	0.0163
	(30.13)	(20.04)
β_1	0.5935***	0.5482***
	(75.93)	(66.8)
β_2	-0.1393***	-0.1296***
	(-9.12)	(-8.16)
β_3		0.13***
		(16.88)
β_4		0.037**
		(2.06)
Adj. R^2	0.388	0.4231
N	35,510	33,698

Notes: 1. This table shows the regression estimates of the equation: Log [SG&A t / SG&A t-1] = β0 + β1* Log [Sales t / Sales t-1] + β2 * Decrease_Dummy t * Log [Sales t / Sales t-1] (Model I) and the equation: Log [SG&A t / SG&A t-1] = β0 + β1* Log [Sales t / Sales t-1] + β2 *Decrease_Dummy t * Log [Sales t / Sales t-1] + β3 *Log [Sales t-1 / Sales t-2] + β4 * Decrease_Dummy t-1 * Log [Sales t-1 / Sales t-2] (Model II). The first figure in each cell is the regression coefficient. The second figure in each cell is the t-statistic.
 2. ***, **, and * indicate significance at 1, 5, and 10 percent levels respectively.

Table 3 also presents the results of estimating Model II. The significance and estimated values of β_1 (0.5482) and β_2 (-0.1296) are similar to those results for Model I. The β_3 (0.13) indicates the lagged effect to SG&A costs for changes in sales. The β_4 (0.037) is positive and significant, showing that SG&A cost stickiness reverses in the subsequent periods. The percentage reversal in the U.S. is more than 50% (Anderson et al, 2003); however, the percentage reversal in Japan is less than 30%. In addition, similar to Anderson et al (2003), we also performed multi-period tests by believing that the stickiness decreasing with the length of the aggregated period. The results are reported in Table 4. We found that β_2 decreases as the aggregated period increases. However, the extent of the decrease is much less than that found in US firms by Anderson et al (2003). Both results from Model II in Table 3 and Table 4 demonstrate that Japanese managers are reluctant to adjust their excess capacity. This is consistent with their long-term perspective and the lifetime employment system.

Table 4: Results of Regression Changes in SG&A on Changes in Sales of Multiple Year Periods

	One year period	Two year period	Three year period	Four year period
β_0	0.0201	0.0416	0.0595	0.0734
	(30.13)	(29.06)	(26.49)	(22.74)
β_1	0.5935***	0.6493***	0.6924***	0.7346***
	(75.93)	(72.1)	(68.02)	(62.92)
β_2	-0.1393***	-0.1141***	-0.1004***	-0.0865***
	(-9.12)	(-5.59)	(-3.95)	(-2.90)
Adj. R^2	0.388	0.4864	0.532	0.5918
N	35,510	16,817	10,967	8,115

Notes: 1. This table shows the regression estimates for multiple year periods of the equation: Log [SG&A t / SG&A t-i] = β0 + β1 Log [Sales t / Sales t-i] + β2 * Decrease_Dummy t * Log [Sales t / Sales t-i]. The first figure in each cell is the regression coefficient. The second figure in each cell is the t-statistic. 2. ***, **, and * indicate significance at 1, 5, and 10 percent levels respectively.

Table 5 provides evidence on the factors that influence SG&A cost stickiness. The coefficient $\beta_4 = 0.1276$ in Model III is significant and positive, showing that managers would consider the revenue decrease more permanent if revenue in the successive year also decreased. Therefore, they are more willing to reduce their excess capacities.

The coefficients β_5 and β_6 in Model III are not significant. This may be due to the long-term perspectives of Japanese managers who are not willing to adjust their SG&A cost based on temporary economic changes and their asset intensity.

The coefficient of $\beta_7 = -0.0431$ is significant and negative indicating that Japanese managers are less willing to adjust their unutilized resources if they think that revenue will be recovered next year. This finding supports our hypothesis H3d.

The coefficients β_1 is significant and positive and has similar magnitude to Model I and Model II. The coefficients β_2 is negative and significant and the magnitude of $\beta_2 = -0.3411$ is much greater than that in Model I and Model II, indicating that pre-1991, Japanese firms do demonstrate greater SG&A cost stickiness. Prior to 1991, SG&A costs increased 0.58% per 1% increase in sales but fell only 0.24% per 1% decrease in sales. The coefficient of the dummy variable for the post bubble era ($\beta_3 = 0.2638$) is significant and positive indicating that Japanese managers did adjust their SG&A cost behavior during the post-bubble era. The SG&A cost stickiness becomes much less in the post-bubble era ($\beta_2 + \beta_3 = -0.0773$).

Table 5: Results of the Determinants of Cost Stickiness

	Aggregated sample	Manufacturing firms	Merchandising firms	Service firms
β_0	0.0219	0.0228	0.0157	0.0199
	(31.52)	(28.86)	(9.61)	(8.44)
β_1	0.5818***	0.5713***	0.7027***	0.5527***
	(70.63)	(59.97)	(35.03)	(23.20)
β_2	-0.3411***	-0.3178***	-0.7013***	-0.2633**
	(-8.56)	(-7.32)	(-5.37)	(-2.00)
β_3	0.2638***	0.2699***	0.3461***	0.2508*
	(7.46)	(7.19)	(2.74)	(1.92)
β_4	0.1276***	0.1111***	0.2097***	0.2009***
	(7.01)	(5.55)	(3.97)	(3.20)
β_5	0.0075	0.0109	0.0496**	-0.0178
	(0.85)	(1.14)	(2.00)	(-0.59)
β_6	-0.0221	0.004	0.0852	-0.1266***
	(-1.27)	(0.16)	(1.26)	(-3.73)
β_7	-0.0431**	-0.0410*	-0.1070	-0.0578
	(-2.20)	(-1.90)	(-1.47)	(-0.91)
Adj. R^2	0.3988	0.4029	0.5529	0.2925
N	32240	25216	3574	3450

Notes:1. This table shows the regression estimates of the equation: Log [SG&A $_t$ / SG&A $_{t-1}$] = β_0 + β_1 Log [Sales $_t$ / Sales $_{t-1}$] +β_2 *Decrease_Dummy$_t$ * Log [Sales $_t$ / Sales $_{t-1}$] +β_3 *Decrease_Dummy$_t$ * Log [Sales $_t$ / Sales $_{t-1}$] *PostBubble_ Dummy $_t$+ β_4 *Decrease_Dummy$_t$ * Log [Sales $_t$ / Sales $_{t-1}$] * Decrease_Dummy $_{t-1}$+ β_5 *Decrease_Dummy$_t$ * Log [Sales $_t$ / Sales $_{t-1}$] * Growth$_t$+ β_6*Decrease_Dummy$_t$ * Log [Sales $_t$ / Sales $_{t-1}$] * Log [Assets $_t$ / Sales $_t$] + β_7*Decrease_Dummy$_t$ * Log [Sales $_t$ / Sales $_{t-1}$]*Increase_Dummy $_{t+1}$+ ε_t
2. The first figure in each cell is the regression coefficient. The second figure in each cell is the t-statistic.
   3. ***, **, and * indicate significance at 1, 5, and 10 percent levels respectively.

The results show that Japanese managers' attitude is changing in the post-bubble era. If they think sales will be decreasing, they strive to cut SG&A cost to increase profits that they have promised their shareholders. If they think sales will increase, they maintain or increase SG&A cost to make much more profit. This is definitely different from their behavior during the bubble economy.

Industries may demonstrate different patterns of sticky behavior. Table 5 also shows the regression results for manufacturing, merchandising, and service firms. All industry groups show SG&A cost

stickiness. Interestingly, merchandising firms demonstrate very strong stickiness before the asset bubble burst in 1990. The SG&A costs of merchandising firms increase 0.70% per 1% increase in sales but do not decrease almost at all when sales decrease. After the asset bubble burst, service firms show they have much flexibility in managing SG&A costs. The SG&A costs of service firms increase 0.55% per 1% increase in sales and fall 0.54% per 1% decrease in sales in the post-bubble era.

CONCLUSIONS

This study investigates whether Japanese firms demonstrate sticky selling, general, and administrative (SG&A) cost behavior. The study also examines the determinants of cost stickiness in Japan and tests whether Japanese managers changed their cost behavior after the asset bubble burst in 1990. We examine all the non-financial firms included in the PACAP database using methodology developed in Anderson et al. (2003).

We find that similar to those of U.S. counterparts, SG&A costs in Japan also demonstrate sticky behavior. However, we find that the stickiness of SG&A costs in Japan is less likely to be adjusted due to temporary changes in firm performance. This may indicate that some characteristics distinct to Japan, such as a long-term perspective and lifetime employment system, may influence Japanese managers' decision on adjusting their SG&A costs. Most importantly, we find that in the pre-bubble period, SG&A costs of Japanese firms are very sticky; however, in the post bubble era, the stickiness of SG&A costs in Japan declined significantly. This provides evidence that Japanese managers adjusted their cost behavior after the bubble burst. We also examine the SG&A cost stickiness for manufacturing, merchandising, and service firms and find that they all demonstrate cost stickiness. Before the asset bubble burst, manufacturing firms show very strong cost stickiness and after the bubble burst, service firms demonstrate much flexibility in managing SG&A costs.

Although all Japanese manufacturing, merchandising, and service firms demonstrate cost stickiness, the level of stickiness is different. Caution should be used to apply the stickiness concept to different industries. Future research can investigate the additional quantitative factors that influence the cost stickiness in each Japanese industry to better understand cost behavior.

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