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# Duty-free shopping & expenditure behavior of Japanese travelers

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#### Abstract:

This study examines the shopping behavior of Japanese tourists at international airports, in particular, the correlation between attitudes toward shopping at airports and expenditure behavior. Based on quantitative research, three dimensions—hedonic, utilitarian, and luxury are observed as consumer attitudes. Using these three dimensions, this study undertakes multiple regression analysis of spending on the entire shopping and luxury brand products at airports, revealing correlations between, on one hand, the hedonic and luxury dimensions, and on the other, overall spending on shopping, as well as between luxury dimensions and expenditure on luxury brands. Since this study focusses on shopping behavior among Japanese travelers visiting foreign countries, the findings can provide strategic suggestions for international airport management that targets Japanese travelers in the future.

## Keywords

Airport shopping behavior, hedonic shopping behavior, luxury shopping behavior, expenditure behavior, duty free

## (1) Introduction

Shopping is considered the oldest and most important element of tourism. For many travelers, tourism is not complete without spending some time at shops, commercial areas, and local markets (Hudman and Hawkins, 1989; Keown, 1989).

Therefore, as Chung (2015) is mentioned, the shopping behavior at the airport, shopping behavior in the street and shopping malls are not necessarily the same, to understand the shopping behavior at the airport while traveling, extremely important for the retail strategy. However, as noted by Freathy and O'Connell (1999) and Geuensa et al. (2004), there are not enough studies on travelers' shopping behavior at airports.

Nevertheless, the travel retail sector of the luxury brand market (Boston Consulting Group (BCG), 2014) has been growing rapidly and drawing attention—the market size of the global luxury market in 2012 was 1.8 trillion dollars and between 2012 and 2014, the market grew 13% per year on average (Reuters, 2012). In terms of purchases made in luxury brand travel retail, if we take Louis Vuitton as an example, the amount of money Japanese travelers spend overseas is said to account for more than 10% of worldwide sales (Saito, 2008). Therefore, it is quite plausible that the impact of Japanese travelers who purchase luxury brand products overseas is behind the growth of the travel retail sector of luxury brands.

Given this context, this study focuses on shopping behavior in the commercial areas at international airport terminals, which is a major travel retail distribution channel.

In particular, the study aims to explain the effect of Japanese travelers' attitudes toward shopping behavior in duty-free shop areas at international airport terminals (hereafter "duty-free shop area") at the time of traveling overseas on overall shopping in the duty-free shop area as well as the expenditure behavior in shopping for luxury brand products.

In addition to academic contributions. this study practical has business implications for the further growth of luxury brands under the travel retail sector and for managing the commercial areas at airports in the future (Graham, 2010). Currently, airport management is faced with the need to focus on commercial facilities-or non-aviation facilities-as much as aviation facilities owing to such reasons as airport privatization, pressure to reduce the aviation system usage fee due to intensified competition, the introduction of regulations on airport usage fees, and intensified competition between hub airports.

There are three major academic

contributions of this study, as follows. First, this study contributes to the limited research on shopping behavior in airport commercial areas. Second, this study contributes to research on the shopping behavior of Japanese travelers; previous studies on the shopping behavior of Japanese travelers have been limited to particular travel destinations. Third, this study proposes a construct, known as the luxury new dimension, as an attitude toward shopping behavior in airport duty-free shop areas and usefulness examines its through а quantitative survey.

The rest of this paper is structured as follows. First, in Section 2, to review previous studies on travelers' shopping behavior and consumption experience as well as studies on the construct of luxury brands. Section 3 provides an overview of a quantitative survey conducted among Japanese people who have traveled overseas and Section 4 develops hypotheses and the verification procedure. Based on the survey results, in Section 5, to examine the correlation between the attitude toward shopping behavior in airport duty-free shopping areas when traveling overseas and expenditure behavior for overall shopping and for luxury brand products. Finally, to discuss implications for business in Section 6, the conclusion.

# (2) Literature review

# 1. Studies on travelers' shopping behavior

Studies on the shopping behavior of travelers can be divided into three major categories: shopping behavior in the commercial areas at airports (Crawford and Melewar, 2003; Geuensa et al., 2004), shopping behavior during in-flight sales (Huang and Kuai, 2006; Doong et al., 2012), and shopping behavior in travel destinations (Lundberg, 1976; Hudman and Hawkins, 1989; Keown, 1989; Heung and Qu, 1998; Freathy and O'Connell, 1999; Mak et al.,1999; Rosenbaum and Spears, 2005, 2006a, 2006b; Rosenbaum, 2007; Kim and Agrusa, 2008). This section reviews previous studies on shopping behavior in the commercial areas at airports and the shopping behavior of Japanese people in travel destinations.

Geuensa et al. (2004) conducted a quantitative survey among Belgian travelers on shopping behavior in airport commercial areas and showed that there are two types of motives-functional shopping shopping motive related to airport facilities and experiential shopping motive related to airport atmosphere—and classified shoppers at airports into three types. Crawford and Melewar (2003) showed that there is impulsive shopping behavior related to situations of psychological stressand relaxation during the departure process in the commercial areas of international airports, and discussed its importance and the business implications thereof for airport commercial areas.

Studies on shopping behavior in travel destinations indicate that the shopping behavior of Japanese travelers differs from that of Westerners and other Asians (Mak et al., 1999; Rosenbaum and Spears, 2005, 2006a, 2006b; Rosenbaum, 2007). Rosenbaum and Spears (2005) revealed that Japanese travelers' per capita budget to travel to Hawaii was 1,416 US dollars while North American travelers' per capita budget was 644 US dollars. Likewise, Kim and Agrusa (2008)showed that the entertainment and shopping expenditure of Japanese people traveling to Hawaii doubled compared to that of US travelers. In addition, Keown (1989) demonstrated that, in terms of shopping, Japanese travelers spent 30% on themselves, and 70% on others, of which 25%was on family, 20% on friends, 15% on co-workers, and 10% on others. Furthermore, (2007)Rosenbaum presented the demographic differences in Japanese travelers' shopping behavior, revealing that Japanese women primarily purchase luxury fashion items, such as bags, leather goods, shoes, and clothing. He further showed that the majority of female Japanese travelers luxury brand products purchase for themselves while purchasing less expensive brand products and local mementos as souvenirs for other people.

As mentioned in the introduction, there is no previous study on shopping behavior in the commercial areas at international airport terminals at the time of traveling overseas focusing on the characteristics of travelers. Japanese Therefore, this study focuses on the shopping behavior of Japanese travelers in airport duty-free shop areas at the time of traveling overseas.

# 2. Studies on consumption experience

In contrast to consumer behavior studies with an information-processing approach that views consumers as taking rational actions to optimally meet their goals and objectives, since around 1980, there have been increasing discussions on consumer behavior studies based on the experiment-based or interpretation-based approach, which is centered on hedonic consumption studies premised on purchase decisions accompanied by consumption experience, such as usage and emotions, like joy.

Holbrook and Hirschman (1982)

proposed the 3Fs (fantasy, feeling, and fun) in consumption experience and conducted a consumer behavior study that emphasized hedonic consumption and consumption experience. Hedonic attitudes are based more on affective gratification derived from sensory attributes. Utilitarian attitude are more instrumental and concerned with the expectations of consequences, are based on assessment of functional attributes, are more concerned with practical usefulness or benefits. The premise that consumer attitudes are inherently bidimensional is the basis for the hedonic and utilitarian conceptualization used by Batra and Ahtola (1991). These two dimensions are related, yet distinct.

Since then, studies have evolved on attitude, shopping motives, and shopping value to fulfil such a hedonic and utilitarian nature for consumers and, along the way, measurement scales have been developed (Batra and Ahtola, 1991; Babin et al., 1994; Spangenberg et al., 1997; Arnold and Reynolds, 2003; Voss et al., 2003).

Based on Babin et al. (1994), Arnold and Reynolds (2003) considered only hedonic motives behind shopping and categorized them into six dimensions in an exploratory manner. Inoue (2007) empirically compared hedonic motives by retail format (e.g., shopping districts  $\mathbf{at}$ train stations. convenience stores, supermarkets, and department stores) and explored the correlation by using the dimensions of hedonic motives behind shopping in each type of retailer as explanatory variables with expenditure behavior as the dependent variable.

Meanwhile, as items in a consumer attitude measurement scale, Spangenberg et al. (1997) presented 24 items, including 12 for hedonic value and 12 for utilitarian value. Subsequently, Voss et al. (2003) aggregated the scale items by Spangenberg et al. (1997), presented 10 items consisting of 5 items for hedonic scale and 5 items for utilitarian scale, and examined their validity.

we expand In this study, the discussion by using Spangenberg et al. (1997) and Voss et al. (2003) as previous studies in this field. adopting their attitude measurement scale and referring to the research framework of Babin et al. (1994), Arnold and Reynolds (2003), and Inoue (2007).

# 3. Construct studies on luxury brands

There is no consistent and clear definition in academia of the term "luxury brand" (Vickers and Renand, 2003). Phau and Prendergast (2000) defined a luxury brand as that which has exclusivity and established identity along with name recognition, quality, and strong customer loyalty. Dubois et al. (2001) regarded luxury brand items as that which is more than expensive beautiful and necessary, extravagant goods with historical background and uniqueness. Jackson and Haid (2002) defined a luxury brand as a status symbol or subject for longing, and something that people believe provides perceived status when owned, making them want to purchase it even at a premium to the functional utility value of the product itself. Doyle and Stern (2006) and Sicard (2006) positioned luxury brands as the ultimate version of product lines under all general criteria. such as rarity, high price. functionality, creativity, attention to detail, trend, quality, and imagination.

In this study, we explain the attitude toward shopping behavior in airport duty-free shopping areas by referring to previous studies in this field and adding the sense of high quality (High), sense of exclusivity (Exclusivity), sense of luxury (Luxury), latest trend (Latest trends), status (Status), sense of superiority (Superiority) and extraordinariness (Unusual) to the attitude measurement scale items by Spangenberg et al. (1997) and Voss et al. (2003).

## (3) Survey overview

### 1. Objective of the survey

we examine the correlation between the attitude toward shopping behavior in airport duty-free shop areas at the time of traveling abroad and the amount of money spent on shopping (overall) as well as the amount of money spent on purchasing luxury brand products compared to street-front stores and

Armani	Céline		
Yves Saint-Laurent	Christian Dior		
Valentino	Tiffany & Co.		
Van Cleef & Arpels	Tod's		
Etro	Tom Ford		
Emanuel Ungaro	Dolce & Gabbana		
Emilio Pucci	Burberry		
Hermès	Bally		
Cartier	Harry Winston		
Gucci	Hugo Boss		
Christian Louboutin	FENDI		
Chloé	Prada		
Salvatore Ferragamo	Bvlgari		
Givenchy	Bottega Veneta		
Chanel	Missoni		
Chopard	Moncler		
Giorgio Armani	Louis Vuitton		
Jil Sander	Loewe		
Stella McCartney			

#### Table 1. Luxury brands included in the survey (37 Brands)

department stores.

The luxury brands included in this survey are the 37 brands<sup>1</sup> shown in Table 1.

They are designated in four categories, namely, "clothing and accessories," "jewelry andwatches,""leather products," and "cosmetics and perfumes," based on the categorization by Okonkwo (2009)

#### 2. Overview of the survey method

The survey took place in the field from June 5–9, 2014. It was conducted by the method of two-phase online survey. As a preliminary survey, individuals who had

<sup>&</sup>lt;sup>1</sup> The 37 brands included are those mentioned at the time of a preliminary survey, which was conducted for the purpose of extracting respondents for this study, and are luxury brands respondents purchased in a duty-free shop area at an international airport. The response results are as shown in Appendix Table 1.

boarded an international flight <sup>2</sup> and purchased a luxury brand product in an airport duty-free shop area in the past 3 years were extracted from a sample of 6,925 consumer panel members registered at the survey company. Ultimately, 442 samples were obtained as survey subjects after excluding the samples that answered the same answer to all the questions or the samples with extremely short response time. The sample configuration is as follows: male = 57.7%, female = 42.3%; those in their teens = 0.2%, 20s = 8.4%, 30s = 19.7%, 40s = 25.3%, 50s = 23.3%, 60s or older = 23.1%; reason for travel being business = 18%, sightseeing = 77%, and private = 5% (e.g., visiting relatives and acquaintances).

From these samples, we used a 7-point measurement scale to obtain responses to questions on attitude toward shopping behavior in airport duty-free shop areas, shopping expenditure in the same areas, and shopping expenditure on luxury brand products.

# (4) Hypotheses and verification procedure1. Establishing hypotheses

Next, considering the analyses of previous studies, we propose survey hypotheses. It seems that a correlation between hedonic motives behind shopping and shopping expenditure, as shown by Inoue (2007) based on Arnold and Reynolds (2003) and Babin et al. (1994), has a similar effect on shopping expenditure behavior in the commercial areas at international airports' international terminals. Therefore, I establish the following hypothesis. Hypothesis 1: The hedonic nature of the attitude toward shopping behavior in airport duty-free shop areas has a positive effect on overall shopping expenditure behavior in airport duty-free shop areas.

Consumers tend to prefer brands that are akin to their own self-concept and the same can be said about the attitude toward shopping behavior, which is part of own self-concept. Therefore, based on studies of the luxury brand construct (Phau and Prendergast, 2000; Dubois et al., 2001; Jackson and Haid, 2002; Vickers and Renand, 2003; Doyle and Stern, 2006; Sicard, 2006), I assume there is a correlation between luxury and shopping expenditure and establish the following two hypotheses.

Hypothesis 2: The luxury nature of the attitude toward shopping behavior in airport duty-free shop areas has a positive effect on the overall shopping expenditure behavior in airport duty-free shop areas.

Hypothesis 3: The luxury nature of the attitude toward shopping behavior in airport duty-free shop areas has a positive effect on expenditure behavior for luxury brand products in airport duty-free shop areas.

I create models to test the hypotheses, as shown in Figure 1. Test Model A is used to test Hypotheses 1 and 2 and Test Model B is used to test Hypothesis 3.

#### 2. Procedure to test hypotheses

As a preparation for testing these hypotheses, I first take into account previous studies on the construct of luxury brands based on Voss et al. (2003). Then, we specify items to measure attitude toward shopping behavior in airport duty-free shop areas (a total of 21 items, including 7 items each for the hedonic nature and utilitarian nature based on Spangenberg et al. (1997) and Voss

<sup>&</sup>lt;sup>2</sup> The routes used by the respondents of this study are as shown in Appendix Table 2. Note that when there is more than one route, the response is based on the last route used.



Figure 1. Models to test the hypotheses

Source: Compiled by author.

et al. (2003) and 7 items related to the luxury nature newly presented in this study).

Next, we conduct a quantitative survey by using a 7-point scale in which 1 = "Not at all applicable," 2 = "Not applicable," 3 = "Somewhat not applicable," 4 = "Neither," 5 = "Somewhat applicable," 6 = "Applicable," and 7 = "Quite applicable." Then, we perform an exploratory factor analysis on the survey results.

Thereafter, in order to use the extracted factors as explanatory variables and examine their correlation with shopping expenditure behavior, we take two types of shopping expenditure behavior in airport duty-free shop areas as dependent variables and conduct multiple regression analysis to explain each correlation. The two types of shopping expenditure behavior are from responses obtained on the 7-point scale for (1) overall shopping expenditure behavior, that is, "the amount of money spent on shopping in airport duty-free shop areas (after going through the departure or arrival process) is higher than usual shopping at the tourist destination.," and (2) the shopping

expenditure on luxury brand products, that is, "the amount of money spent on purchasing luxury brand products per shopping trip is higher in airport duty-free shop areas (after going through the departure or arrival process) than at a department store or street-front store of the tourist destination.".

#### (5) Analysis results

# 1. Factor analysis on attitude toward shopping behavior in airport duty-free

First, we performed a factor analysis with promax rotation by using the maximum likelihood method to extract factors from the 7-point scale responses to the 21 items on the attitude toward shopping behavior in the airport duty-free-shop area, which yielded the pattern matrix shown in Table 2. After excluding two items<sup>3</sup> with insufficient factor loading, we ultimately extracted a 19-item 3-

 $<sup>^3</sup>$  "Amusing" (0.179) and "Unusual" (0.393) were excluded as items with insufficient factor loading.

	aica		
<b>X7</b>	Factor 1	Factor 2	Factor 3
variable	(Utilitarian)	(Luxury)	(Hedonic)
Useful	0.7190	0.0205	0.0528
Practical	0.7752	-0.0959	0.0820
Necessary	0.7380	0.0040	0.0755
Functional	0.8367	0.1398	-0.1260
Helpful	0.8833	-0.0072	0.0218
Efficient	0.7591	0.0105	0.0804
Effective	0.6685	0.1097	0.1506
Exciting	-0.0182	0.2065	0.7069
Delightful	0.1789	0.1241	0.6781
Fun	0.1981	0.0966	0.6196
Thrilling	0.0787	0.2660	0.4540
Enjoyable	0.1245	0.0427	0.7271
Cheerful	0.0221	0.1777	0.7083
High	-0.0101	0.6661	0.2645
Exclusivity	-0.0168	0.7838	0.1829
Luxury	-0.0248	0.8300	0.1399
Latest trends	0.2689	0.6487	-0.0181
Status	0.0482	0.9126	-0.0702
Superiority	-0.0229	0.8082	0.0148
	Factor Correlation	n	
Factor 1 (Utilitarian)	_	0.5219	0.6162
Factor 2 (Luxury)	0.5219	—	0.6479
Factor 3 (Hedonic)	0.6162	0.6479	—
	Internal Consister	ncy	
Cronbach's $\alpha$ coefficient	0.9306	0.9412	0.9078
	Contribution		
Contribution (%)	52.65	8.99	3.46
Cumulative contribution (%)	52.65	61.64	65.10

Table 2. Factor analysis on the attitude toward shopping behavior in the airport duty-free shop
0700

factor structure<sup>4</sup>, as shown in Table 2 based on the interpretability of decaying eigenvalues (11.4070, 2.2054, 1.2754, 0.9932, 0.5435, 0.4823, etc.) and factors.

The first factor, which is composed of seven items related to utilitarian nature, was

named the "utilitarian factor." The second factor, composed of six items related to the sense of luxury and superiority, was named the "luxury factor." The third factor, composed of six items related to the hedonic nature, was named the "hedonic factor."

 $Cronbach's \ \alpha \ coefficient \ was \ calculated \\ for \ each \ factor \ based \ on \ the \ results \ of \ the \\ above \ factor \ analysis \ to \ examine \ internal \\$ 

<sup>&</sup>lt;sup>4</sup> The correlation matrix for the items (variables) is as shown in Appendix Table 5.

consistency; each factor turned out to be sufficient, as follows: the first factor's  $\alpha = 0.9306$ , the second factor's 0.9412, and the third factor's  $\alpha = 0.9078$ .

# 2. Multiple regression analysis using shopping expenditure in airport duty-free as the dependent variable (Hypotheses 1 and 2)

The dependent variable is shopping expenditure behavior in the airport duty-free shop area, which is based on the results of the responses to the question of whether the amount of money spent on shopping in the airport duty-free shop area is higher than usual shopping. We took three factors extracted from the factor analysis on the attitude toward shopping behavior in the airport duty-free shop area as explanatory variables and performed a multiple regression analysis. The results are shown in Table 3 below. The second factor, Luxury Nature (partial regression coefficient = 0.305, p < 0.01), and the third factor, Hedonic Nature (partial regression coefficient = 0.221, p < 0.05), turned out to be significant (degree of freedom-adjusted coefficient of determination = 0.415).

Based on these results, we verified that shopping expenditure behavior in airport duty-free shop areas and attitude toward shopping behavior in airport duty-free shop areas have a significant correlation with both the hedonic factor and the luxury factor.

area as the dependent variable $(n = 442)$							
Variable	Partial Regression Standard		D-V-lue	Ciarra : fi a a ra a a			
variable	Coefficient	Error	P-value	Significance			
Factor 1 (Utilitarian ) 0.1310		0.0815	0.1088				
Factor 2 (Luxury )	0.3055	0.0855	0.0004	**			
Factor 3 (Hedonic)	0.2211	0.0976	0.0240	*			

4.6222

Table 3. Multiple regression a	analysis using shoppinę	s expenditure in the	airport duty-free shop
ar	ea as the dependent va	riable (n = $442$ )	

Note: Adjusted R: 0.415; \* p < 0.05 \*\* p < 0.01)

Constant term

The analysis results on this correlation are as shown in Figure 2. The partial regression coefficient for the path that goes from Hedonic Nature to the overall amount of money spent on shopping in airport duty-free shop areas was 0.221 and statistically significant at the 5% level in Test Model A. Likewise, the partial regression coefficient for the path that goes from Luxury Nature to the overall amount of money spent on shopping in airport duty-free shop areas was 0.305 and statistically significant at the 1% level. Therefore, Hypotheses 1 and 2 were empirically supported.

0.0000

0.0577

\*\*

# 3. Multiple regression analysis using shopping expenditure on luxury brand products in airport duty-free as the dependent variable (Hypotheses 3)

Next, we used as the dependent variable expenditure behavior on shopping for luxury brand products in airport duty-free shop areas, which is based on the results of the responses to the question of whether the amount of money spent on



Figure 2. Analysis results on Test Model A Source: Compiled by author.

purchasing luxury brand products per shopping trip is higher in the airport duty-free shop than when purchasing them at a department store or street-front store. Then, we performed a multiple regression analysis with three factors extracted from the factor analysis on the attitude toward shopping behavior in airport duty-free shop areas as explanatory variables.

The results are shown in Table 4 below. Only the second factor, Luxury Nature (partial regression coefficient = 0.298, p < 0.01), turned out to be significant (degree of freedom-adjusted coefficient of determination = 0.286). Based on these

results, we verified there is a significant correlation between expenditure behavior in shopping for luxury brand products in airport duty-free shop areas and the luxury nature in the attitude toward shopping behavior in airport duty-free shop areas. The analysis results on this correlation are shown in Figure 3.

The partial regression coefficient for the path that goes from Luxury Nature to the amount of money spent on shopping for luxury brand products in airport duty-free shop areas was 0.298 and statistically significant at the 1% level in Test Model B. Therefore, Hypothesis 3 was empirically

Table 4. Multiple regression analysis using shopping expenditure on luxury brand products i	in
the airport duty-free shop area as the dependent variable ( $n = 442$ )	

Variable	Partial Regression Coefficient	Standard Error	P-Value	Significance
Factor 1 (Utilitarian)	0.1525	0.0901	0.0912	
Factor 2 (Luxury)	0.2983	0.0945	0.0017	**
Factor 3 (Hedonic)	0.0316	0.1079	0.7697	
Constant term	4.3009	0.0637	0.0000	**

Note: Adjusted R: 0.286; \*\* p <0.01)





Source: Compiled by author.

supported.

(6) Conclusion

This study examined the correlation between Japanese travelers' attitudes toward shopping behavior in airport duty-free shop areas—the commercial areas of international airports—at the time of traveling overseas and overall shopping behavior in airport duty-free shop areas, as well as expenditure behavior for luxury brand shopping.

We were able to achieve the objective of the study and confirmed that the hedonic nature and luxury nature in attitudes toward shopping in airport duty-free shop areas have positive effects on overall expenditure behavior in these areas (Hypotheses 1 and 2); we also confirmed that the luxury nature in attitudes toward shopping in airport duty-free shop areas has a positive effect on expenditure behavior for luxury brand shopping (Hypothesis 3).

Next, we discuss the implications of these academic contributions from a business perspective. Based on the analysis results observed in this study, we present the business implications from two perspectives.

First, this study confirmed the effect of the luxury nature, composed of the sense of high quality, exclusivity, status, and superiority, on the overall amount of money spent on shopping in airport duty-free shop areas. From this, I was able to demonstrate that as airport management is faced with the need to focus on commercial facilities, non-aviation facilities. or under an difficult increasingly competitive environment, it would be effective to strengthen travelers' attitudes in relation to the luxury nature of airport commercial areas.

Second, the study confirmed that

commercial areas at international airport terminals are effective distribution channels for luxury brand companies. This result suggests it would be effective for luxury brand companies (Nagasawa and 2012) Fukunaga. whose distribution policies are limited to stores, such as corporate stores and department stores where it is traditionally easy to manage brand image, to utilize commercial areas at international airport terminals as well.

Finally, we briefly describe the limitations and challenges of this study. First, the discussion is based on the results of a survey among Japanese travelers. As shown in previous studies, the shopping behavior of Japanese travelers differs from that of western and other Asian travelers. Therefore, it is probably necessary to undertake an international comparison with western and Asian travelers before generalizing the results. In addition to the above, also with respect to considerations of gender and age, these are left for the future research.

Second, it is necessary to consider the effect of variables. such as international routes and use of discount airlines (i.e., low-cost carriers) on the relationship between variables reviewed in this study, including the utilitarian, hedonic, and luxury dimensions, and the price variable for duty-free purchases, differences by the airport being used as a purchase location, as well as the impact of duty-free shops in a city. We leave these as future research tasks.

Third, in this study, the subjects are only samples who purchased a luxury brand product in an international airport duty-free shop area. Therefore, the subjects who have not bought the luxury brand products at an international airport duty-free shop area but bought them at street-front stores or department stores are excluded This leads to some bias. In this regard, it must be considered as a limitation of this study.

Fourth, this study examined the relationship with perceived expenditure. So verification has not been performed with respect to the relationship with the actual spending, it will be research challenges of the future.

Furthermore, since this study is limited to the shopping behavior of Japanese travelers in duty-free shop areas at international airport terminals when traveling, another limitation is that this study does not consider the relationship of shopping in duty-free shop areas at international airport terminals in Japan, such as those at Haneda, Narita, Kansai, and Chubu, to the attitude that foreigners visiting Japan have toward shopping. We believe that discussing the relationship between attitude toward shopping at international airport terminals in Japan and shopping behavior among foreigners visiting Japan would provide suggestions about the source of competitive advantage for Japan's international airport management in the future.

At the end, with respect to statistical analysis, there is a limitation to this study. In this study, first, exploratory factor analysis (EFA) was performed, after which, multiple regression analysis was performed. As the results of EFA, factor correlations are high as shown in Table 2. From these perspectives, it may be appropriate to SEM is performed. Such statistical analysis limits are also challenges left in the future.

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# Appendix

Appendix Table 1	. Brands Purchased in	the Airport Duty-Free	Shop Area $(n = 442, MA)$
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Brand names	Count	%	Brand names	Count	%
Armani	33	7.5	Céline	32	7.2
Yves Saint-Laurent	54	12.2	Christian Dior	99	22.4
Valentino	23	5.2	Tiffany & Co.	39	8.8
Van Cleef & Arpels	10	2.3	Tod's	14	3.2
Etro	18	4.1	Tom Ford	<b>5</b>	1.1
Emanuel Ungaro	8	1.8	Dolce & Gabbana	19	4.3
Emilio Pucci	9	2.0	Burberry	65	14.7
Hermès	85	19.2	Bally	21	4.8
Cartier	41	9.3	Harry Winston	3	0.7
Gucci	78	17.6	Hugo Boss	14	3.2
Christian Louboutin	<b>5</b>	1.1	FENDI	25	5.7
Chloé	24	5.4	Prada	47	10.6
Salvatore	29	6.6	Bvlgari	55	12.4
Ferragamo					
Givenchy	25	5.7	Bottega Veneta	9	2.0
Chanel	129	29.2	Missoni	<b>5</b>	1.1
Chopard	8	1.8	Moncler	7	1.6
Giorgio Armani	11	2.5	Louis Vuitton	65	14.7
Jil Sander	7	1.6	Loewe	23	5.2
Stella McCartney	5	1.1			

# Appendix Table 2. Routes Used (n = 442, SA)

		Count	%
1	Asia	220	49.8
2	Middle East	<b>5</b>	1.1
3	Russia	0	0.0
4	Europe	95	21.5
<b>5</b>	Africa	3	0.7
6	North America	<b>74</b>	16.7
7	South America	9	2.0
8	Other Region	36	8.1

Question	When you consider shopping in the airport duty-free shop area, please choose one of the following items.		Over all	Not at all applicable	Not applicable	Somewhat not applicable	Neither	Somewhat applicable	Applicable	Quite Applicable
	Tonowing items.	%	100	0.7	2.5	3.8	19.7	42.5	26.2	4.5
1	Useful	count	442	3	11	17	87	188	116	20
0	D	%	100	0.7	2.5	8.1	37.6	33.9	15.4	1.8
2	Practical	count	442	3	11	36	166	150	68	8
0	N	%	100	1.1	2.9	9	30.3	31.9	18.1	6.6
ð	necessary	count	442	<b>5</b>	13	40	134	141	80	29
4	F. (* 1	%	100	0.9	1.1	9	42.8	30.3	12.9	2.9
4	Functional	count	442	4	5	40	189	134	57	13
-	TT 1 C 1	%	100	0.7	2.3	4.1	31.2	40.3	17.4	4.1
б	Helpful	count	442	3	10	18	138	178	77	18
0		%	100	0.7	2.5	5	35.1	33.5	19.5	3.8
6	Efficient	count	442	3	11	22	155	148	86	17
_	D.00	%	100	0.9	2.3	7.7	41.9	29	15.2	3.2
7	Effective	count	442	4	10	34	185	128	67	14
0	<b>D</b>	%	100	1.8	4.8	11.8	35.7	26.5	15.6	3.8
8	Exciting	count	442	8	21	52	158	117	69	17
0	D 1: 1 . 6 1	%	100	0.7	2.5	7	35.1	33.9	16.7	4.1
9	Delightful	count	442	3	11	31	155	150	74	18
		%	100	0.7	3.2	8.8	35.5	31.7	17	3.2
10	Fun	count	442	3	14	39	157	140	75	14
		%	100	4.1	6.6	20.1	46.4	14.9	6.3	1.6
11	Thrilling	count	442	18	29	89	205	66	28	7
		%	100	0.5	2.7	7.5	25.1	38.9	19.2	6.1
12	Enjoyable	count	442	2	12	33	111	172	85	27
		%	100	61	11 1	197	46.6	10.4	48	14
13	Amusing	count	442	27	49	87	206	46	21	6
		%	100	16	38	10.4	33.3	30.8	14.9	52
14	Cheerful	count	442	7	17	46	147	136	66	23
		%	100	0.5	32	7.5	28.5	33 7	21.5	52
15	High	count	442	2	14	33	126	149	95	23
		%	100	11	34	93	32.6	30.1	17.2	6.3
16	exclusivity	count	442	5	15	41	144	133	76	28
		%	100	0.9	29	88	31.4	32.4	19	4.5
17	Luxury	count	442	4	13	39	139	143	84	20
		%	100	0.9	36	88	39.1	30.3	14	32
18	Latest trends	count	442	4	16	39	173	134	62	14
		%	100	2	43	93	41.2	25.3	14.3	3.6
19	Status	count	442	9	19	41	182	112	63	16
		%	100	29	52	95	48	18.8	12	3.6
20	superiority	count	100	13	0. <u>2</u> 93	42	-10 	83	53	16
		%	100	18	2.9	63	296	34.4	17.6	7.2
21	unusual	count	100	8	13	28	191	152	78	32
		count	444	0	10	20	101	102	10	52
Question	А	%	100	1.6	7	9.5	21.7	36.4	17.2	6.6
		count	442	7	31	42	96	161	76	29
Question	В	%	100	3.2	9.7	11.8	28.1	27.4	16.3	3.6
		count	442	14	43	52	124	121	72	16

# Appendix Table 3. Simple Tabulation (n = 442)

Question A: The amount of money spent in the airport duty-free shop area is higher than that spent in usual shopping at the tourist destination.

Question B: In terms of purchasing luxury brand products, the amount of money spent per shopping trip is higher when purchasing in the airport duty-free shop area than when purchasing at a department store or street-front store of the tourist destination.

Question	When you consider shopping in the airport duty-free shop area, please choose one of the following items.	Meas	surement Scale	1 = Not at all appli applicable, 4 = Neith	cable, 2 = Not applicab her, 5 = Somewhat app 7 = Quite applicable	le, $3 = \text{Some}$ licable, $6 = 4$	ewhat not Applicable,
		(7-po	<u>Int scale</u>	IIhissedisuss	Standard Dariation	Minimum	Manimu
1	I I and al	n 449	Mean	Unbiased variance	Standard Deviation	Minimum	
1	Disetui	442	4.977	1.129	1.062	1	1
2	Practical	442	4.00	1.06	1.03	1	1
3	Necessary	442	4.695	1.464	1.21	1	7
4	Functional	442	4.509	1.044	1.022	1	7
5	Helpful	442	4.767	1.073	1.036	1	7
6	Efficient	442	4.719	1.155	1.075	1	7
7	Effective	442	4.538	1.143	1.069	1	7
8	Exciting	442	4.425	1.528	1.236	1	7
9	Delightful	442	4.656	1.179	1.086	1	7
10	Fun	442	4.579	1.224	1.106	1	7
11	Thrilling	442	3.869	1.361	1.167	1	7
12	Enjoyable	442	4.814	1.272	1.128	1	7
13	Amusing	442	3.638	1.479	1.216	1	7
14	Cheerful	442	4.534	1.492	1.221	1	7
15	High	442	4.771	1.315	1.147	1	7
16	Exclusivity	442	4.64	1.483	1.218	1	7
17	Luxury	442	4.665	1.339	1.157	1	7
18	Latest trends	442	4.491	1.226	1.107	1	7
19	Status	442	4.407	1.435	1.198	1	7
20	Superiority	442	4.249	1.503	1.226	1	7
21	Unusual	442	4.738	1.505	1.227	1	7
			Measure	ement of the depender	nt variables		
Qu	uestion A	442	4.622	1.778	1.333	1	7
Qu	lestion B	442	4.301	1.957	1.399	1	7

# Appendix Table 4. Descriptive Statistics (n = 442)

Question A: The amount of money spent in the airport duty-free shop area is higher than that spent in usual shopping at the tourist destination.

Question B: In terms of purchasing luxury brand products, the amount of money spent per shopping trip is higher when purchasing in the airport duty-free shop area than when purchasing at a department store or street-front store of the tourist destination.

Appe	endix Table 5	Corre	lation	Matrix	X																	
		1	2	3	4	5	9	7	8	6	10	11	12	13	14	15	16	17	18	19	20 2	5
H	Useful																					
0	Practical	0.627																				
က	Necessary	0.577	0.639	•																		
4	Functional	0.606	0.611	0.713																		
5	Helpful	0.681	0.678	0.719	0.749																	
9	Efficient	0.68	0.615	0.612	0.676	0.709	•															
7	Effective	0.61	0.658	0.59	0.662	0.753	0.706															
$\infty$	Exciting	0.385	0.416	0.467	0.417	0.496	0.447	0.559														
6	Delightful	0.524	0.516	0.567	0.54	0.592	0.594	0.652	0.783	•												
10	Fun	0.515	0.494	0.505	0.505	0.563	0.541	0.622	0.657	0.736												
11	Thrilling	0.181	0.328	0.33	0.37	0.339	0.274	0.371	0.479	0.394	0.509											
12	Enjoyable	0.526	0.451	0.503	0.466	0.522	0.539	0.591	0.665	0.735	0.723	0.374	•									
13	Amusing	0.048	0.226	0.154	0.223	0.147	0.118	0.232	0.335	0.258	0.276	0.521	0.199									
14	Cheerful	0.444	0.453	0.479	0.445	0.505	0.5	0.556	0.719	0.724	0.677	0.474	0.711	0.318								
15	High	0.455	0.331	0.432	0.467	0.451	0.467	0.478	0.605	0.651	0.596	0.388	0.635	0.219 (	7.99.0							
16	Exclusivity	0.439	0.373	0.425	0.448	0.467	0.441	0.538	0.658	0.654	0.579	0.402	0.582	0.23 (	0.674 0	0.805						
17	Luxury	0.444	0.33	0.421	0.448	0.459	0.422	0.533	0.629	0.655	0.588	0.376	0.576	0.194 (	0.642 0	0.812 0.	.874					
18	Latest trends	0.464	0.461	0.447	0.53	0.533	0.511	0.577	0.563	0.567	0.593	0.47	0.531	0.336 (	0.528 0	0.667 0.	.686 0	.697				
19	Status	0.367	0.331	0.4	0.451	0.419	0.431	0.524	0.576	0.579	0.53	0.463	0.499	0.323	0.55 0	0.695 0	.76 0	.781 0	.736			
20	Superiority	0.292	0.306	0.357	0.415	0.332	0.365	0.45	0.563	0.548	0.497	0.475	0.46	0.359 (	).496 (	0.62 0.	.675 0	.684 0	0 869.0	.823		
21	Unusual	0.397	0.344	0.407	0.423	0.412	0.412	0.456	0.576	0.586	0.568	0.342	0.579	0.164	0.59 (	0.61 0.	.603 0	.622 0	.498 0	.571 0.	573 -	.

# Consequences of Emphasizing Feasibility during Budget-Making

Process\*

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# Abstract

Whether favorable or unfavorable, budget variance, that is, the difference between budgeted performance and actual performance, may result in the inefficient use of resources within a firm. When an organizational unit within a firm incurs a favorable variance, this may seem to be a beneficial situation at the micro-level; however, the firm allocates the unit additional resources that could have been allocated to other units. Alternatively, when a unit incurs an unfavorable variance, the unit likely has idle capacity that does not create value but rather involves wasteful costs. Accordingly, when budget variance occurs, firms face the risk of incurring some kinds of losses. This paper demonstrates that when an owner asks a manager to prepare feasible budgets for avoiding losses due to budget variance, the owner must decrease both the ceilings for the bonus paid to, and target set for the manager.

#### Keywords

budgeting, budgetary slack, bonus cap, cost of difference, moral hazard

# (1) Introduction

This paper shows that budgets are set loosely when owners require that managers prepare feasible budgets by adopting a principalagent model. Also, this paper notes that owners do not pay bonuses to a manager if his or her performance far exceeds expected targets even though the performance is measured on the basis of budget attainment level.

In many firms, owners communicate budget guidelines to managers and budget drafts are authorized after budget negotiations. Budget guidelines are just rough plans that are

\*I thank two anonymous referees as well as the workshop participants at the 41st JCAA Annual Meeting and Tokyo Keizai University. I also thank the financial supports from JCAA and Tokyo Keizai University. then turned into precise drafts through budget negotiations. This paper models such a budgetmaking process, in which budget guidelines are viewed as representing the distribution of expected profit and managers make effort to narrow the distribution.<sup>1</sup>

Ito (2013) notes that to improve business ability, top management should ask every member of an organization their mission and the way to accomplish it during the planning phase. Building upon this idea, this paper shows that an authorized budget is set loosely if an owner emphasizes the key point stated in Ito (2013).

<sup>&</sup>lt;sup>1</sup> This paper refers to Chen et al. (2010) for modeling such a budget-making process.

This result parallels Ozawa (2010), which notes that a budget is set below the expected value of performance if inter-departmental coordination is emphasized. However, this paper shows that a budget is set loosely when inter-departmental coordination is not considered, and the budget is not set below the expected value of performance.

Although this paper considers participative budgeting, the focus of this paper is different from other related agency studies (e.g., Heinle et al., 2014). In their models, an agent privately observes a signal and then he reports it to a principal. Since the agent has an incentive to make a false report, these previous studies need incentive compatibility constraints to avoid such a false report. In contrast, this paper analyzes the setting that an owner communicates budget guidelines and a manager makes effort to prepare feasible budgets during a budget-making process, in which the manager has no incentive to make a false report.

Rather, this paper is a moral hazard model since the manager makes effort to prepare a feasible budget. In this regard, this paper parallels Balakrishnan (1991, 1992) and Demski and Sappington (1987). These studies analyze the setting that an agent has an opportunity to acquire information to increase the probability of high performance before operations, and the incentive that a principal gives an agent to acquire such information. However, in the setting of this paper, when a manager makes effort to prepare a feasible budget, the probability of high performance is decreased because the distribution of expected profit is narrowed.

While the preparation of feasible budgets reduces the likelihood of high performance, it may still be beneficial to firms to pursue such a strategy, as it can reduce losses that are incurred from differences between budgeted performance and actual performance. For example, on the one hand, Sharp Corporation reported heavy losses in 2011 due to unused capacity at its Sakai factory. Utilization of capacity at this factory, which was launched in 2009 and is one of the world's largest factories, fell to around 30% in the April-June guarter of 2011 (Nikkei Sangyo Shimbun, August 3, 2012). Since actual volume did not attain planned volume despite having set an aggressive target, the firms incurred losses because some of employees and facilities were idle. On the other hand, Suntory Beverage and Foods temporarily halted operations since demand for a certain beverage outstripped its supply and Suntory had to modify its production schedule to ensure a steady supply (Nikkei MJ, April 22, 2015). In this case, since the actual volume overwhelmed the planned amount despite conservative target setting, the firm incurred an opportunity loss because some of employees and facilities were idle until it acquired enough resources to deliver a steady supply.

In summary, regardless of whether it is favorable or unfavorable, budget variance increases the risk for losses due to idle capacity. To avoid such losses, firms should prepare feasible budgets, even though doing so decreases the possibility of high performance. For example, Subaru, whose car sales in the United States has been strong, decided to increase its manufacturing capacity with careful attention to an oversupply (Toyo Keizai Online [http://toyokeizai.net/articles/-/69095], May 10, 2015). In this case, preparing a feasible budget led to robust performance.

In addition, in many firms, some portion

of bonuses to managers are based on their budget achievement. When budgets are formulated in the way noted above, managers have less opportunity to receive bonuses and they do not necessarily narrow the distribution. To encourage managers to do so, firms must adopt a bonus cap, placing a ceiling on bonuses to managers whose performance far exceeds their budget.

The remainder of this paper is organized as follows. Section 2 explains the model of this paper. Section 3 shows the results of both symmetric and asymmetric information cases and Section 4 discusses the results of the analysis. Finally, Section 5 concludes this paper.

## (2) Model

This paper considers a budget-making process in which a risk-neutral owner acting as a principal (she), and a risk-neutral profit center manager acting as an agent (he) negotiate on a forthcoming budget. Also, the manager is effortaverse and has no wealth to acquire a firm.

In the budget-making process, a target profit for each profit center is decided based on the firm-wide aspired profit. Hereafter, various kinds of budgets are formulated to realize each target profit, and resources are allocated to each profit center. As stated in the Introduction, regardless of whether it is favorable or unfavorable, the difference between a profit center's actual profit and its target profit is assumed to cause some kinds of idle losses. This paper notates actual profit as x, target profit as h, and the cost of difference, the cost stemming from the difference between the target profit and the actual one, as  $\alpha |h - x|$  ( $\alpha > 0$ ), where the coefficient of the cost of difference  $\alpha$  indicates the degree to which the owner recognizes the difference as a loss and decreases the utility of the owner.

Before the budget-making process, the owner communicates budget guidelines to the profit centers. Budget guidelines typically provide only general direction, and this paper chooses to use the distribution of an expected profit,  $x \sim U[m - d_p, m + d_p]$ , as the main principles in these budget guidelines. This means that although the owner sets a mean target profit m, the guideline has a range from  $m - d_p$  to  $m + d_p$  based on a set of past profits. Also, this paper assumes that the expected profit is uniformly distributed and both m and  $d_p$  are common knowledge.

To decrease the cost of difference, the owner must make a plan that narrows the distribution and reduces business risk (hereafter, risk reduction plan). The owner, however, has scarce time and information and must ask the manager to make the risk reduction plan during the budget-making process. The manager's effort to make the risk reduction plan is assumed to be unobservable by the owner. With the risk reduction plan, the distribution is estimated to be  $[m - d_f, m + d_f]$   $(d_p > d_f)$ ; without it, the distribution remains  $[m - d_p, m + d_p]$ .

The owner decides the target profit h in the distribution and pays a bonus calculated using the amount of favorable variance. A favorable variance arises when  $h \le x \le m + d_i$   $(i = \{p, f\})$ , and the average favorable variance is  $(m + d_i - h)/2$ , since the distribution is uniform. Let the bonus coefficient be denoted as  $\beta$  $(0 \le \beta < 1)$  and the average bonus as  $\beta(m + d_i - h)/2$ . The probability of a favorable variance is  $(m + d_i - h)/2d_i$  and the expected bonus is  $\beta(m + d_i - h)^2/4d_i$ . Since firms usually cannot pay negative bonuses or decrease fixed salaries when managers incur unfavorable variances, this paper assumes that the bonus payment to the manager is zero when unfavorable variance occurs.<sup>2</sup>

The manager incurs the effort costs of making the risk reduction plan and working in the mid-term. Let the effort costs of making the risk reduction plan and working in the mid-term be denoted as  $c_1$  ( $c_1 = \{0, \hat{c}_1\}, \hat{c}_1 = \gamma/d_f, \gamma > 0$ ) and  $c_2$  ( $c_2 = \{0, \tilde{c}_2\}, \tilde{c}_2 = [c_2^{min}, c_2^{max}], c_2^{min} > 0, c_2^{max} = \delta^{(d_f+\epsilon)}, \epsilon > 0, c_2^{min} < \delta^{\epsilon}),$  respectively, and  $c_1 + c_2 = c$ . When  $c_j = 0$  ( $j = \{1,2\}$ ) it means that the manager does not incur any effort costs. The distribution remains  $[m - d_p, m + d_p]$  when  $c_1 = 0$ , and the actual profit is inevitably  $\lim_{\epsilon \to 0} m - d_i + \epsilon$  when  $c_2 = 0$ . Thus when  $c_1 = 0$  since the probability of a

0. Thus, when  $c_2 = 0$ , since the probability of a favorable variance is approaching nil, the expected bonus is assumed to be zero for simplicity. In addition, during the budget-making process,  $\hat{c}_1$  is certain and a positive constant, and  $\tilde{c}_2$  is a random variable. As a result, c is also a random variable,  $c \sim N(\bar{c}, \sigma^2)$ , and is assumed to be common knowledge.

In addition to bonuses based on performance, employees are paid fixed salaries determined independently of their performance. According to the 2012 survey on work conditions by the Ministry of Health, Labour and Welfare (Shuro Joken Sogo Chosa), fixed salaries are mainly based on the "substance of work" and the "skill of work accomplishment" that indicate an effort cost. During the budget-making process, such an effort cost is uncertain. Accordingly, this paper assumes that the fixed salary *S* is equal to the expected value of the effort cost  $\bar{c}$ .<sup>3</sup> Firms have funding constraints and must set a ceiling on payments to employees. So, let this cap be denoted as  $P^{max}$  and, for analytical ease, it is assumed that  $\bar{c} \leq P^{max}$ .

This paper focuses on the budget-making process, and the utility of each player is shown by the expected utility at the beginning of a period. The owner's utility is equal to the residual amount remaining after subtracting the expected cost of difference, the fixed salary and the expected bonus from the expected firm-wide profit, which can be shown as  $E(x - \alpha | h - \alpha)$  $|x| - [S + \beta(m + d_i - h)^2/4d_i]$ . Conversely, the manager's utility is the residual amount remaining after subtracting the effort cost from the fixed salary and the expected bonus. As noted above, the effort cost is uncertain and the manager is also risk neutral. Hence, he evaluates his effort cost as  $\bar{c}$  and his utility is  $[S + \beta(m + d_i - h)^2/4d_i] - \bar{c}$ . Given the assumption on the fixed salary and the effort cost,  $S = \bar{c}$ , the utility formula is simplified as  $\beta(m+d_i-h)^2/4d_i$ . In addition, his reservation utility is assumed to be zero.

The timeline of the events in this model is as follows:

- 1. Owner and manager observe past profits.
- 2. Owner communicates budget guidelines.
- 3. Owner decides bonus coefficient and target profit.
- 4. Manager makes risk reduction plan and works.
- 5. Profit is realized. Owner and manager acquire payoffs, respectively.

# (3) Results

 $<sup>^2\,</sup>$  Since this assumption makes limited-liability constraints satisfied, they are omitted in the following analysis.

<sup>&</sup>lt;sup>3</sup> Although this assumption is surely based on the actual

data, it may not be generally accepted. However, the main results of this paper are constant whether the fixed salary is more than the expected effort cost or not. Moreover, to economize space, this paper adopts such an assumption.

#### 1. No Hidden Action

This subsection, as a benchmark, shows the result when the owner can observe the manager's action without any costs. In this case, the manager always makes a risk reduction plan and the distribution is  $[m - d_f, m + d_f]$ . The problem that the owner solves is as follows.

 $\operatorname{Problem}^{\operatorname{FB}}$ 

$$\max_{\beta,h} \mathbb{E}(x-\alpha|h-x|) - \left[S + \frac{\beta(m+d_f-h)^2}{4d_f}\right]$$

subject to

$$\frac{\beta (m+d_f-h)^2}{4d_f} \ge 0 \qquad \qquad \text{IR}$$

Constraint IR (individual rationality) means that the owner must set the expected utility of the manager at a level greater than the reservation utility. Subsequently, the solution to this problem is as follows.

**Lemma**. Suppose that the distribution is uniform,  $x \sim U[m - d_f, m + d_f]$ . When the owner can observe the manager's action, the target profit is the mean of the distribution,  $h^{FB} = m$ , and the bonus coefficient is zero,  $\beta^{FB} = 0$ .

## (Proof)

Since IR is satisfied with an equation, the objective function is determined as follows. Note that  $S = \bar{c}$  and  $h \in [m - d_f, m + d_f]$ .

$$E(x - \alpha |h - x|) - \bar{c}$$
  
=  $\int_{m-d_f}^{m+d_f} \frac{x - \alpha |h - x|}{(m + d_f) - (m - d_f)} dx - \bar{c}$   
=  $m - \frac{\alpha [(m - h)^2 + d_f^2]}{2d_f} - \bar{c}$ 

Let the target profit and the bonus coefficient be denoted as  $h^{FB}$  and  $\beta^{FB}$ , respectively.

Since the above function is maximized at h = m,  $h^{FB} = m$ . In this case, the left-hand side of IR is  $\beta d_f/4$ . However, since the owner can zero out it, we arrive at  $\beta^{FB} = 0$ .

The above problem is equivalent to a minimization problem of the expected cost of difference. In addition,  $\alpha[(m-h)^2 + d_f^2]/2d_f$ shown in the objective function is the expected cost of difference. It is minimized at h = m and the minimized cost of difference is  $\alpha d_f/2$ .

#### 2. Optimal Set Budget under Moral Hazard

In this subsection, the result is shown for the case in which the owner cannot observe the manager's actions. In this scenario, in addition to IR, the following incentive compatibility constraints are needed.

$$S + \frac{\beta (m + d_f - h)^2}{4d_f} - \bar{c}$$
IC1
$$\geq S + \frac{\beta (m + d_p - h)^2}{4d_p} - \bar{c}$$

$$S + \frac{\beta (m + d_f - h)^2}{4d_f} - \bar{c} \geq S - \hat{c}_1$$
IC2

$$S + \frac{\beta (m + d_f - h)^2}{4d_f} - \bar{c} \ge S \qquad \text{IC3}$$

The left-hand sides of the constraints IC1, IC2, and IC3 show the manager's expected utility when he selects the action the owner prefers. The right-hand side of each constraint shows the manager's expected utility for the following situations: when he does not make a risk reduction plan but works hard in the mid-term (IC1); he makes a risk reduction plan but does not work hard in the mid-term (IC2); and he does not both make a risk reduction plan and work hard in the mid-term.

Having an elaborate plan makes it easier to achieve a desired goal. Similarly, when the manager makes a risk reduction plan, the effort cost of executing operations  $c_2$  is thought to be smaller. Since the risk-neutral manager recognizes the random variable  $\tilde{c}_2$  as its mean, we can indicate the mean of  $\tilde{c}_2$  when  $c_1 = \hat{c}_1$  and the one when  $c_1 = 0$  as  $\overline{c}_2^1$  and  $\overline{c}_2^0$ , respectively  $(\overline{c}_2^1 < \overline{c}_2^0)$ . Then, the combined effort cost when the manager both makes a risk reduction plan and works hard in the mid-term is  $\hat{c}_1 + \overline{c}_2^1$ , and the effort cost when he only works hard in the mid-term is  $\overline{c}_2^0$ . For ease of analysis, suppose  $\hat{c}_1 + \overline{c}_2^1 = \overline{c}_2^0 = c$ . As a result, the effort costs shown on both sides of IC1 are identical.<sup>4</sup> Regarding the incentive compatibility constraints, the following result is obtained.

**Proposition 1.** When IC1, IC2, and IC3 are satisfied, the target profit does not exist in the distribution after the creation of a risk reduction plan.

#### (Proof)

Given the assumption  $\hat{c}_1 > 0$ , when IC3 is satisfied, IC2 is satisfied with a strict sign of inequality. Also, when it is assumed that  $\bar{c} > 0$ , the bonus coefficient must be  $\beta > 0$  to satisfy IC3. As a result, IC1 is rewritten as follows,  $\Delta d = d_p - d_f$ ,

$$(m+d_f-h)(m-d_f-h) \ge d_f \Delta d$$

Since  $d_p > 0$  and  $d_f > 0$ , this means that

 $d_f \Delta d > 0$  and the left-hand side of the above inequality must be strictly positive. Accordingly, the target profit must satisfy any one of the following conditions.

- 1.  $m + d_f h > 0$  and  $m d_f h > 0$
- 2.  $m + d_f h < 0$  and  $m d_f h < 0$

When the first condition is satisfied, the target profit must be set to strictly less than the lower limit of the distribution since  $m - d_f > h$ . However, when the second condition is satisfied, the target profit must be set to strictly more than the upper limit of the distribution since  $m + d_f < h$ . Thus, when IC1, IC2, and IC3 are all satisfied, the bonus coefficient is positive, and the target profit is not set in the distribution after the creation of a risk reduction plan.

When the owner seeks to satisfy all of the incentive compatibility constraints, she cannot set the target profit in  $[m - d_f, m + d_f]$ . The manager can expect the above situation and does not make a risk reduction plan. Thus, he would make a dummy plan and just report it. Then, the manager engages in a budget game in which he seeks to maximize his own bonus and minimize the required target by proposing unrealistic numbers during the budget-making process.

However, if the distribution remains  $[m - d_p, m + d_p]$  and the target profit is not set in  $[m - d_f, m + d_f]$ , the cost of difference may increase. Since the owner can expect such a situation, she must take measures to induce the manager to make a feasible risk reduction plan.

<sup>&</sup>lt;sup>4</sup> The following numerical example explains this situation. Assume that  $c_1 = \{0,1\}$ ,  $\tilde{c}_2 = [1,3]$  when  $c_1 = 1$ , and  $\tilde{c}_2 = [1,5]$  when  $c_1 = 0$ . Then,  $\overline{c}_2 = 2$  when  $c_1 = 1$  and

 $<sup>\</sup>overline{c}_2 = 3$  when  $c_1 = 0$ . Thus, in each case, the combined effort cost is  $\overline{c} = c_1 + \overline{c}_2 = 3$ .

If the manager makes a feasible risk reduction plan, the upper limit of the distribution decreases. Accordingly, if the actual profit is in the range of  $(m + d_f, m + d_p]$ , it is highly probable that the manager do not make a risk reduction plan. The owner pays no bonus to the manager when the actual profit falls within  $(m + d_f, m + d_p]$  to motivate him to make the risk reduction plan. However, if  $h = m + d_p$ , the manager is not adequately motivated to attain a budget. Hence, the owner must manipulate the bonus coefficient as follows,

$$\begin{cases} \beta > 0, \text{ if } h \le x \le m + d_f \\ \beta = 0, \quad otherwise \end{cases},$$

and IC1 turns out as follows.

$$\frac{\beta (m+d_f-h)^2}{4d_f} \ge \frac{\beta (m+d_f-h)^2}{4d_p} \quad \text{IC1'}$$

Then, the problem the owner solves is as follows.

Problem<sup>SB</sup>

$$\max_{\beta,h} \mathbb{E}(x-\alpha|h-x|) - \left[S + \frac{\beta(m+d_f-h)^2}{4d_f}\right]$$

subject to

$$\frac{\beta (m+d_f-h)^2}{4d_f} \ge 0 \qquad \qquad \text{IR}$$

$$\frac{\beta(m+d_f-h)^2}{4d_f} \ge \frac{\beta(m+d_f-h)^2}{4d_p} \quad \text{IC1}'$$

$$\frac{\beta(m+d_f-h)^2}{4d_f} \ge \bar{c} \qquad \text{IC3}$$

Thus, the solution to this problem is as follows.

**Proposition 2.** Suppose that the distribution is uniform,  $x \sim U[m - d_f, m + d_f]$ . When the owner cannot observe the manager's action, the target profit is  $h^{SB} = m$ , and the bonus coefficient is  $\beta^{SB} = 4\bar{c}/d_f$ , if and only if  $4\bar{c} < d_f$ .

#### (Proof)

Given the assumption  $\overline{c} > 0$ , when IC3 is satisfied, IR is satisfied with a strict sign of inequality. In addition, under the assumption  $d_f < d_p$ , IC1' is also satisfied with a strict sign of inequality. As a result, IC3 is satisfied with a sign of equality. Solving it for h, we find that

$$h = m + d_f \pm \sqrt{\frac{4d_f \overline{c}}{\beta}}.$$

Note that if  $h = m + d_f + \sqrt{4d_f \overline{c}/\beta}$ , IC3 is not

satisfied due to the assumption of the bonus coefficient,  $0 \le \beta < 1$ . Accordingly, let the target profit in the case of asymmetric information be denoted as  $h^{SB}$ ,

$$h^{SB} = m + d_f - \sqrt{\frac{4d_f\overline{c}}{\beta}}.$$

Substituting it into the objective function, the new objective function is as follows,

$$\max_{\beta} m - \alpha \left[ \frac{2\overline{c}}{\beta} - \sqrt{\frac{4d_f\overline{c}}{\beta}} + d_f \right] - 2\overline{c}.$$

Let the solution be denoted as  $\beta^{SB}$ . By first order condition,

$$\beta^{SB} = \frac{4\overline{c}}{d_f}.$$

Substituting it into  $h^{SB}$ , we have

$$h^{SB} = m.$$

Given the assumption of the bonus coefficient and IC3,  $0 < \beta < 1$ , this means  $0 < 4\bar{c}/d_f < 1$ . Thus, the above solutions for  $\beta^{SB}$  and  $h^{SB}$  are derived if and only if  $4\bar{c} < d_f$ .

The cost of difference expected at the beginning of a period is  $\alpha [(m-h)^2 + d_f^2]/2d_f$ and is specified by  $\alpha$  (the degree to which the owner recognizes the cost of difference as a loss). h (target profit), and m and  $d_f$  (mean and deviation of the distribution, respectively, after the creation of a risk reduction plan). Since  $\alpha$  and m are exogenous variables, the owner seeks to minimize the cost of difference by manipulating h and  $d_f$ . Whether there is symmetric information or asymmetric information, both the distribution and the cost of difference are not changed. Accordingly, the target profit is the mean of the distribution in each case. However, since it is practically impossible to eliminate uncertainty, which means  $d_f = 0$ , the lower limit of the distribution must be  $4\bar{c} < d_f$ .

By the assumption  $\hat{c}_1 = \gamma/d_f$ , as  $d_f$  is approaching zero, the effort cost of making a risk reduction plan  $\hat{c}_1$  is exponentially increasing. Also, if  $d_f$  could be close to zero, the uncertainty on the effort cost in the mid-term  $\tilde{c}_2$ would not be dispelled. Furthermore, by the assumption  $c_2^{max} = \delta^{(d_f + \epsilon)}$ , even though  $d_f$  is approaching zero,  $c_2^{max}$  is only gradually decreasing. In sum, as  $d_f$  is decreasing,  $\hat{c}_1$  is increasing but  $\tilde{c}_2$  is difficult to decrease, and  $\bar{c}$  is increasing. Therefore,  $d_f$  depends on  $\bar{c}$  as stated in Proposition 2, and we find that  $4\bar{c} < d_f$ . In the case of symmetric information, the lower limit of  $d_f$  is the level at which  $S = \bar{c}$ and  $\bar{c} \leq P^{max}$  are satisfied.

The reason why the lower limit of  $d_f$  is strictly more than  $4\bar{c}$  is that the owner must pay a bonus to the manager in the case of asymmetric information. As  $d_f$  decreases, the range in which the bonus coefficient  $\beta$  is positive is narrowing and the bonus base for the manager is decreasing. This means that the manager must decrease his own expected utility by making a risk reduction plan that involves both an increase in effort cost and a decrease in his expected bonus. To reward the manager for increasing effort cost, the owner must pay the manager a bonus that exceeds the acquired profit by setting  $\beta > 1$ . This does not pay the owner, and she sets the lower limit of  $d_f$  as  $4\bar{c} < d_f$ .

The expected bonus for the manager in the case of asymmetric information is equivalent to information rent under moral hazard and the owner encounters a trade-off between decreasing the cost of difference and increasing the manager's bonus. Avoiding the diseconomy of decreasing the owner's payoff by increasing the manager's bonus exceeds the increase of her payoff by decreasing the cost of difference; the lower limit of  $d_f$  is needed.

As a result, the manager's bonus base is secured and the target profit is equal to the mean of the distribution. This means that the owner prefers a budget that easily causes favorable variances or gives the manager information rent. Agency theory has highlighted asymmetric information and opportunistic agent(s) as the reason that a principal must leave information rent (e.g. Antle and Eppen, 1985). In addition to the above factors, the analysis of this paper reveals that the reduction in the cost of difference causes information rent and the owner desires it.

### (4) Discussion

This paper shows that the owner desires feasible budgets by adding the cost of difference into her utility function. Moreover, from the analysis of the previous section, we have the following result: if the owner seeks to decrease the cost of difference, (1) the bonus paid to the manager should be capped, and (2) the target set for the manager should be loosed. This section examines the above two points.

#### 1. Rationality of Bonus Cap

A bonus cap, sometimes referred to as a bonus scheme (e.g., Healy, 1985), has been criticized in some studies (e.g., Hope and Fraser, 2003). Also, some other studies have advocated a liner incentive scheme (e.g., Jensen, 2001, pp. 98-99; Stewart, 1991, pp. 233-241). To be sure, managers strive to maximize their profits if a liner incentive scheme is adopted and this is seemingly favorable. However, managers take the risk to proceed with their operations in an infeasible direction if such a scheme is adopted, and their strategy is unfavorable in terms of minimizing the cost of difference. In fact, some firms pursuing profit maximization decline in earnings due to over-investment. For example, Sumitomo Corporation, which rapidly expanded its natural resources businesses, was then required to book huge impairment losses because the capital invested in the businesses was deemed irrecoverable (Nihon Keizai Shimbun, September 30, 2014). Also, Mitsubishi Motors decided to cease its factory operations in the U.S. and aggregate its production capacity in its Okazaki factory. It was reported that this decision would make the Okazaki factory operate at nearly 100% capacity (Nihon Keizai Shimbun, August 21, 2015), which makes this nothing less than effort to decrease the cost of difference, so-called idle capacity.

However, as stated in the interpretation of Proposition 1, if the owner sets a cap on the bonus paid to the manager, he is not motivated to maximize profit. As criticized by Hope and Fraser (2003) and Jensen (2001), the bonus cap carries the risk of causing dysfunctional behavior from having employees not earn profit that exceeds the upper limit of bonus bases. Although the bonus cap helps avoid the problem caused by over-investment or out-of-production capital, it creates opportunity costs, that is, the profit lost by the bonus cap. In sum, the choice of whether to set a bonus cap mirrors the tradeoff when deciding whether to pursue profit maximization or avoid the cost of difference.

However, paying attention to the cost of difference has the advantage of decreasing the cost of capital in addition to avoiding over-investment. Public companies listed in Japan are required to disclose earnings forecasts, and Muramiva (2005) noted that accurate forecasts contribute to a decrease in the cost of capital. Also, since such forecasts are based on budgets (Yanagi, 2011, pp.72-88), ordering the manager to make a risk reduction plan during a budgetmaking process and motivating him not to attain excessive favorable variance by using a bonus cap improves the accuracy of disclosed forecasts, which then contributes to decreasing the cost of capital. In the setting of this paper, if a budget is formulated around the upper limit of the expected profit distribution and the earnings forecast is disclosed based on the budget, it is inevitable that the forecast gets revised downward. For example, Sony lowered its forecast for 2014 several times, which was accompanied by a fall in its stock price. It was noted that Sony's top management required ideal goals even though Sony's division managers submitted sequantitative plans (Nikkei Sangvo cure Shimbun, November 5, 2013).

In addition, several firms set a ceiling on

executives' bonuses, and it has been said that executives in such firms conduct earnings management so that the estimated profit is intentionally lowered to the ceiling when the profit is expected to exceed it (e.g., Healy, 1985). If such firms do not set a ceiling on managers' bonuses, executives would conduct reckless earnings management because managers pursue high profit to maximize their own bonuses. However, executives do not prefer this type of earnings management due to concerns about backlash against future earnings. Accordingly, executives must guide managers not to yield profit to such a degree when executives conduct earnings management. Thus, a bonus cap that does not pay a bonus for excessive favorable variance helps prevent the reckless earnings management.

It has generally been thought that the reason why firms set a ceiling on bonuses is a funding constraint. In addition to such a constraint, this paper shows that a bonus cap can help a firm avoid losses caused by over-investment, prevent an increase in the cost of capital following the revision of earnings forecasts, and prevent reckless earnings management.

## 2. Rationality of Budgetary Slack

As stated in the interpretation of Proposition 2, the owner aims to set the profit target at a level that the manager easily attains. In this subsection, we examine the effectiveness of such a target in terms of tightness. It has been suggested that a tight target is challenging but attainable (e.g., Anthony and Govindarajan 2007, p.391). Merchant and Manzoni (1989), surveying the profit center managers on the exante subjective probability of attaining their targets, conclude that the target they can achieve with a probability of more than 50% is rational. Also, Anthony and Govindarajan (2007) support this conclusion concerning the tightness of the target. Now, turning to Proposition 2, since the target is set at the mean of the expected profit distribution, the probability of target achievement is 50%. Therefore, this indicates the validity of Proposition 2 although we cannot simply compare Merchant and Manzoni (1989) and this paper.

Furthermore, if the owner does not regard the cost of difference as a loss, she would hike a target to the upper limit of the distribution to minimize the bonus paid to the manager. In other words, depending on whether the cost of difference is regarded as a loss, the tightness of the target is subjective. Even though the portion that the target is lowered from the upper limit of the distribution is not changed, one person may view the target as tight, whereas another may not, or may view it as including budgetary slack. For example, even if executives set a tight target, rational stockholders who adequately spread risk would likewise not deem it as tight. The same holds for conglomerates the higher people advance in hierarchy, the more they do not regard the cost of difference as a loss, but rather view a target as including budgetary slack because the risks they face are dispersed. Budgetary slack is contingent on some kinds of subjective judgement (Kosuga, 1997, pp.196-198). This paper shows that the degree to which the cost of difference is regarded as a loss is one such subjective factor.

Budgetary slack has been thought of as the portion that managers intentionally lower budgets from attainable levels to maximize their own bonuses. When a target is set as stated in Proposition 2, a manager can acquire his bonus. Accordingly, the budget formulated as stated in Proposition 2 might be viewed as one that includes budgetary slack. However, this kind of budgetary slack is not the portion a manager intentionally lowers but the one an owner purposefully accepts. The reason why the owner accepts budgetary slack is that she expects the decrease in the cost of difference to restore firm management. In other words, budgetary slack is considered to act as an essential part of managing a firm.<sup>5</sup> Although there have already been several studies showing the advantages of budgetary slack (e.g., Dunk, 1995), this paper shows that budgetary slack contributes to a reduction in the cost of difference, which is a benefit of budgetary slack that has not been mentioned in previous studies.

# (5) Conclusion

This paper examines the features of a budget-making process where the owner seeks to formulate a feasible budget. Also, this paper notes that a bonus cap and a certain level of budgetary slack are needed when the bonus is based on the degree of budget attainment.

Both bonus caps and budgetary slack have been criticized as causing a loss to firms. In contrast, this paper reveals that bonus caps and budgetary slack have the benefit of decreasing the costs of difference in some areas such as idle capacity, acquisition of additional resources, increase in the cost of capital, and excessive earnings management that are caused by the difference between budgeted performance and actual performance.

Empirical research on the results derived from the analysis of this paper should be conducted in future research. Some cases stated in this paper can be seen as only representing relevant cases in which firms understated the cost of difference. There must be other firms that pay attention to the cost of difference and some such firms must achieve better performance than others. To understand the overall trends, it is necessary to verify the characteristics on financial statements depending on whether a firm recognizes the impact of the cost of difference.

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<sup>&</sup>lt;sup>5</sup> Such budgetary slack is equivalent to the well-functioning budgetary slack noted in Ri et al (2012).

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