Hitotsubashi-RIETI International Workshop on Real Estate Market, Productivity, and Prices

"Satisfaction, Loyalty and Productivity:
A Case of Beauty Salon"

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Outline of Today's Talk

- Purpose of this study
- Introduction (Overview of Japan's economy and beauty industry)
- Related researches about customer satisfaction and quality of service
- About a Hair salon and the Data set
- Model and Empirical Results
- Conclusion and Limitation of this research


What do hair salon and hairdressers provide customers? Do you like what features of hairdressers?
Appearance
-Hair style
-Make up
-Fashion
Skill / Productivity
-Speed
-Good Design
-Good Finishing
Communication skill
-Conversation
-Counseling
One answer is that they provide services and create customer satisfaction.
If customers were satisfied with the hair dresser, they will revisit the salon.

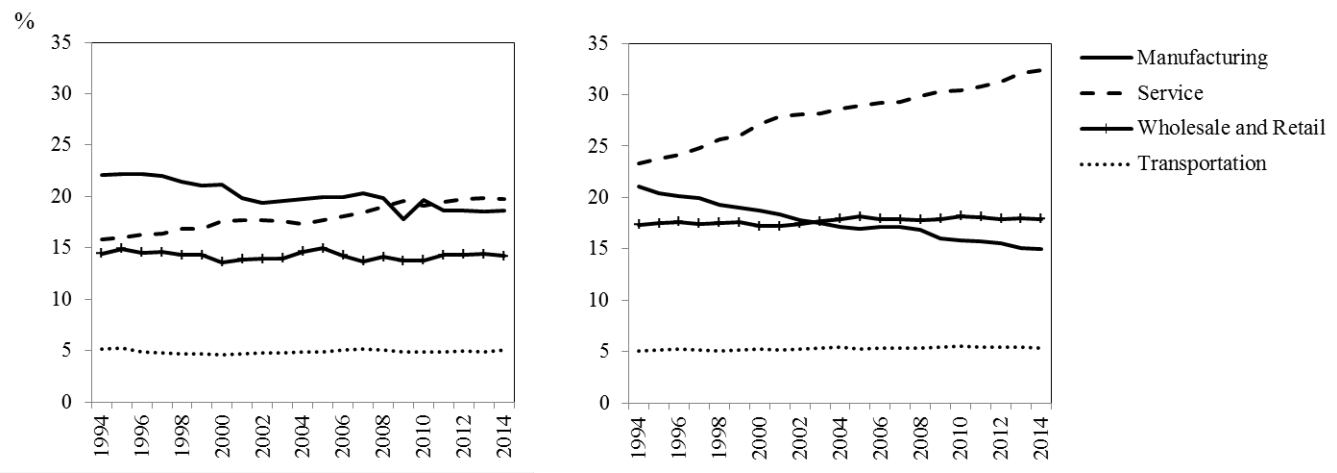
Object and Purpose of This Study

- Find impact factors of demand (satisfaction) function.
- Find reasons of customer's loyalty or life time value gain.
- measure the effects of skill of hair dressers and the environment of hair salon on customers' satisfactions.

- We challenged to reproduce the experience space of customers at hair salon to investigate what causes them to come back to hairsalon.

Overview of Japan's Economy (1)

Service industry's share of GDP and employees are not small compared with manufacturing industry.

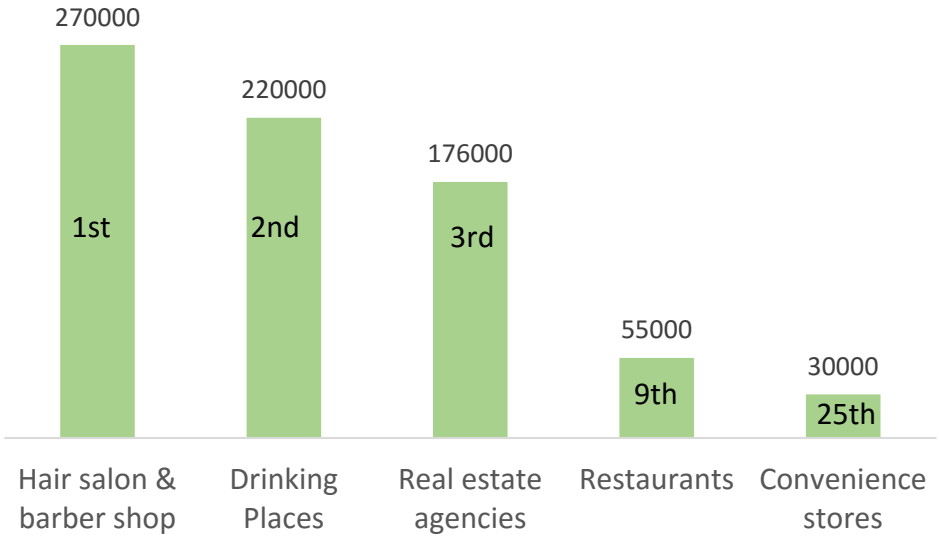


Source: "National Accounts" supplied by the Cabinet Office
--The narrow definition's service industry includes EATING AND DRINKING PLACES, HEALTH CARE AND WELFARE , EDUCATION, COMPOUND SERVICES and PERSONAL SERVISES.

As evident from these figures, overall economic activity can no longer be explained simply in terms of the manufacturing industry. The service sector is extremely important due to its presence in the overall economy and magnitude.

Overview of Japan's Economy (2)

The number of establishments



Establishments which have four or less employees account for over 95%.

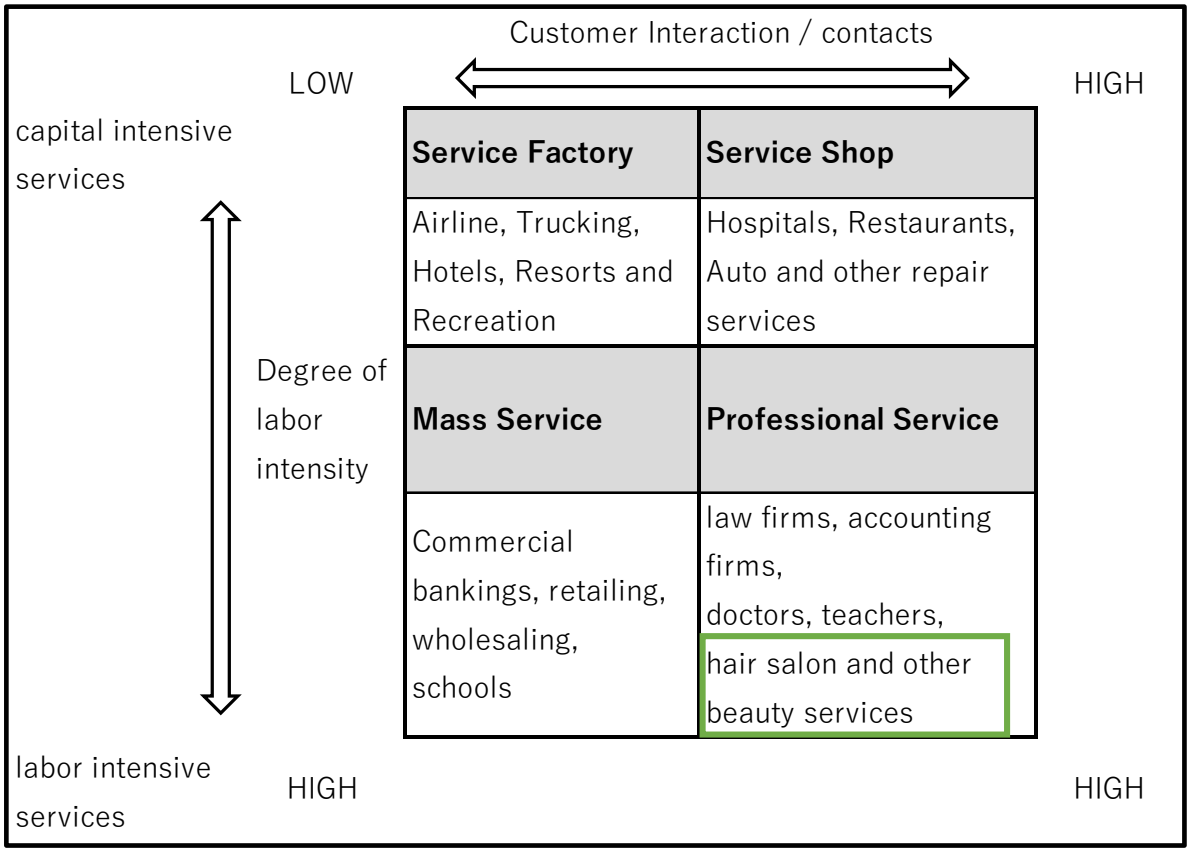
Establishments, sales and number of employees by scale of employees

	Establishments		Sales (milion yen)		Number of employees	
Number of employees	Barber shop	Hair salon	Barber Shop	Hair Salon	Barber Shop	Hair Salon
1-4 persons	89400	125809	345067	659225	162109	212480
5-9 persons	2938	12057	73187	375147	17646	75882
10-19 persons	286	3040	14870	225915	3436	38321
20-29 persons	32	349	3243	41823	774	8037
30-49 persons	22	154	4920	34041	844	5609
50 persons and more	8	78	5452	34978	884	8563
Total	92686	141487	446739	1371129	185693	348892

* The hair salon that we used in the empirical analysis is located in 10-19 persons' segment.

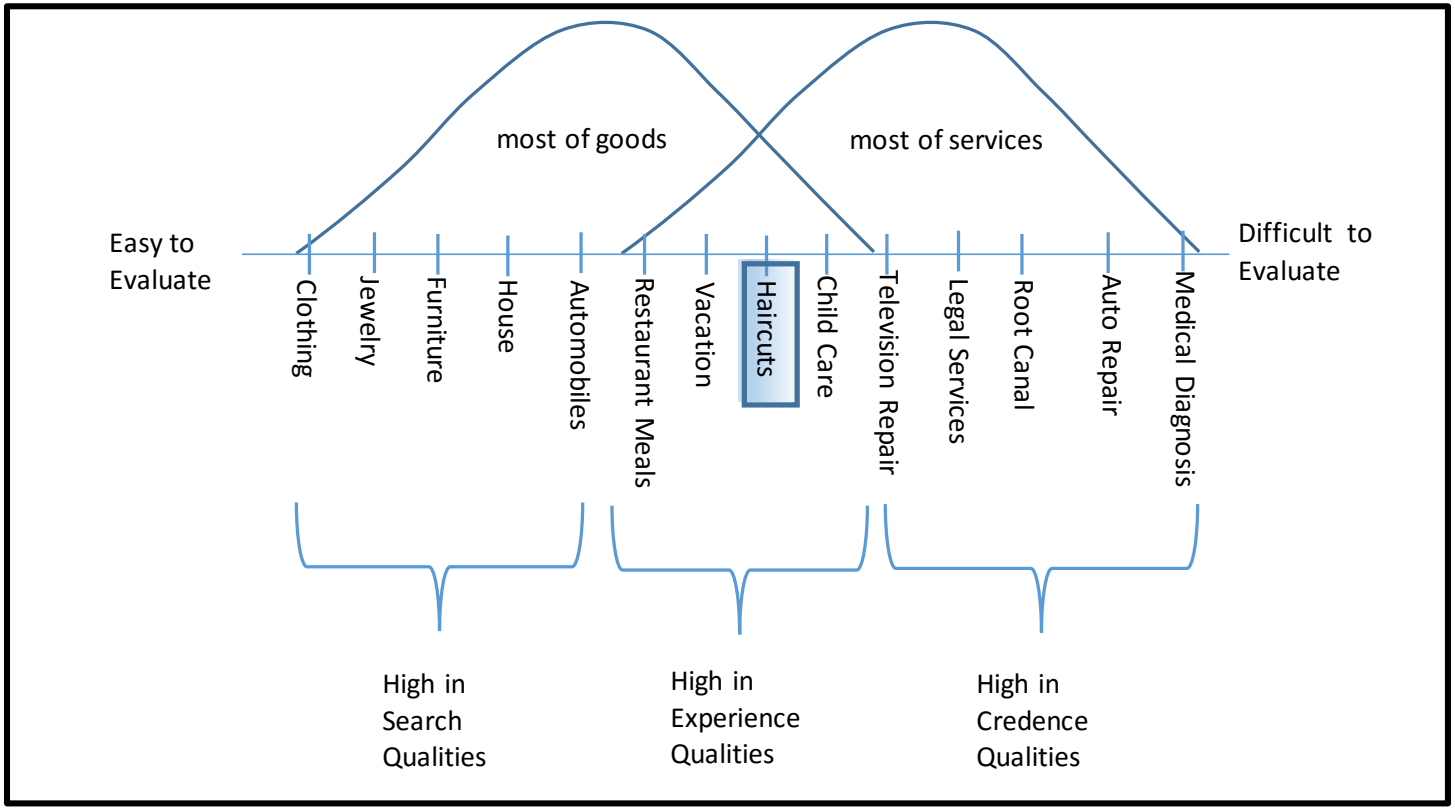
Source: "Economic Census for Business Activity," by METI (2012)

Classification of Service Industries



Schmenner (1986) breaks service industry down into four patterns by using the degree of labor intensity and the customer interactions. The labor intensity denotes that the ratio of labor cost against value-added. The customer interaction means that the frequency of service providers' contact to customers during the services.

Difficulties of Quality Evaluations for Goods and Services



Zeithaml (1981) indicates the evaluation processes of qualities are differ between consumer goods and services by using the three attributes. Goods and Services are allocated high in search qualities, high in experience qual. and high in credence qual. along a continuum of evaluation ranging from easy evaluation to difficult evaluation

- As discussion above, marketing and management researchers have recognized hair salon (personal services) as conducive business to study.
- On the other hand, in economics research, hair salon and barber shop are cited as example of industry which have very simple structure. For example, it is regarded that consumers decide a shop by whether the shop is proximity or not.
- Grönroos (1988) defined the quality of services as the technical aspect ("what" service is provided) and the functional aspect ("how" the service is provided).

  Technical quality: "professionalism and skill"

  Functional quality: "attitudes and behavior",

  "accessibility and flexibility," "reliability and

  trustworthiness," "recovery and reputation"

Stress Factors in Hair salon

Distance between hairdressers

scissors and razor near the face

If the hair salon understands the value and preferences of functional quality for each customer and then they can provide comfortable environment, it will lead to raise of customer loyalty and to get service differentiation from other hair salons.

Shampoo in the unnatural posture

the line of sight of the others,
the conversation with the first meeting people

About the hair salon (1)

- Opened in Osaka city, Japan since July 23rd, 2003. We collect the data from 2003 to 2010 (2048 working days).
- 16500 customers visit during the period.
- Female customers account for about 90%.
- They have seven hairdressers and four assistant staffs.
- 10chairs with mirror and 6 shampoo chairs.
- Open hour: Tue-Fri 11am – 8pm, Sat, Sun & holidays 10am-7pm.
- Main services are Hair cut, hair coloring and permanent wave.
- The three services' share of total number of treatments are 87%, also the three services yield 90% of the total sales.
- The hair salon has sold around 90.0milion yen annually from 2004 to 2009.

id	age	distance	visit date	date	hairdersser	services	price	discount	total payment
1	21	13.80874	2003/7/23	Wed	2	COLOR	5500	2750	2750
1	21	13.80874	2003/7/23	Wed	2	CUT	4000	2000	2000
1	22	13.80874	2003/12/29	Mon	2	SHAMPOO	500	250	250
1	22	13.80874	2003/12/29	Mon	2	SET	2000	1000	1000
1	22	13.80874	2004/5/15	Sat	2	COLOR	5250	2625	2625
1	22	13.80874	2004/5/15	Sat	2	CUT	4200	2100	2100
1	22	13.80874	2004/7/10	Sat	2	CUT	4200	2100	2100
1	22	13.80874	2004/7/10	Sat	2	COLOR	5250	2625	2625
2	24	5.6	2003/7/23	Wed	3	COLOR	6000	3000	3000
2	24	5.6	2003/7/23	Wed	3	CUT	4000	2000	2000
2	24	5.6	2003/7/23	Wed	3	hair_goods	2500	0	2500
2	24	5.6	2003/8/3	Sun	3	SET	4000	1200	2800
2	24	5.6	2003/9/9	Tue	3	CUT	4000	1200	2800
2	24	5.6	2003/9/9	Tue	3	COLOR	6000	1800	4200
2	24	5.6	2003/10/31	Fri	3	COLOR	6000	1800	4200
2	24	5.6	2003/10/31	Fri	3	CUT	4500	1350	3150
2	24	5.6	2003/12/27	Sat	3	CUT	4000	1200	2800
2	24	5.6	2003/12/27	Sat	3	COLOR	6000	1800	4200
2	24	5.6	2004/2/14	Sat	3	COLOR	6000	1800	4200
2	24	5.6	2004/2/14	Sat	3	CUT	4000	1200	2800
2	24	5.6	2004/3/27	Sat	3	COLOR	6000	1800	4200
2	24	5.6	2004/3/27	Sat	3	SET	1000	300	700
2	24	5.6	2004/5/18	Tue	3	CUT	4200	1260	2940
2	24	5.6	2004/5/18	Tue	3	COLOR	6300	1890	4410
2	24	5.6	2004/5/29	Sat	3	SET	3675	1102	2573
2	24	5.6	2004/6/17	Thu	3	Exte	7875	0	7875
2	24	5.6	2004/7/18	Sun	3	COLOR	6300	1890	4410
2	24	5.6	2004/7/18	Sun	3	CUT	4200	1260	2940

About the hair salon (2)

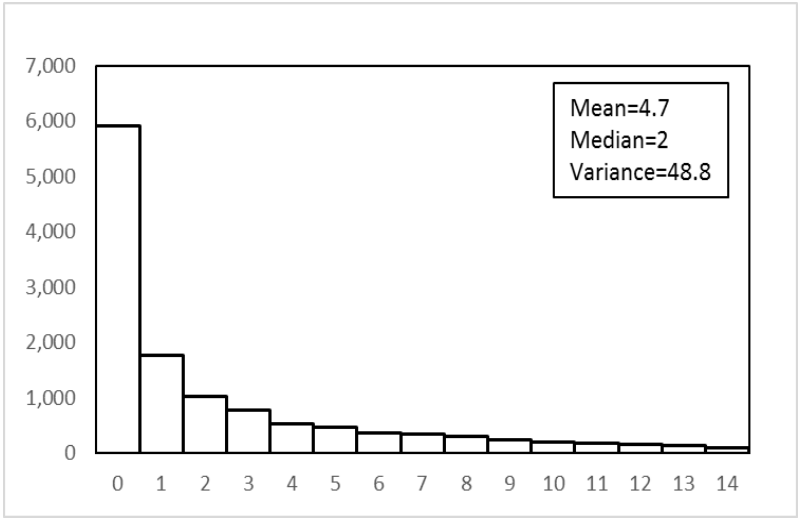
Summary statistics of customer's age

Year	Number of Customer	Mean	Median	Std. Dev.	Min	Max
2003	2,114	26.4	25	7.7	11	77
2004	3,100	26.3	25	7.8	12	75
2005	2,558	26.7	25	7.4	11	75
2006	1,767	27.0	26	7.2	11	75
2007	1,951	27.4	26	7.4	10	77
2008	1,877	27.1	26	7.1	13	75
2009	1,156	27.2	26	7.6	10	74
2010	348	25.9	25	6.9	12	65
Total	14,871	---	---	---	---	---

Summary statistics of distance

# of Customer	Mean	Std. Dev.	Median	75percentiles	95percentiles	min.	max.
12,799	14.6	48.0	7.3	12.5	33.1	0.98	1264

Histogram of number of revisits



Number of non-revisit customers account for 44.3% of sum of customers.

About the hair salon (3)

Number of Customers and the Average Customer Spend by segments

Customer Segmentation	total visit times	# of customers (Share)	average customer spend
non revisit customer	1 time	5903 (44.3%)	¥7,710
regular customer	2-4 times	3560 (26.7%)	¥8,068
loyal customer	5-10 times	2216 (16.6%)	¥8,924
super loyal customer	11 and more	1645 (12.3%)	¥9,460
Total		13,324	¥8,223

The customers who visited at the hair salon 4 or less accounts 71%. As the number of total visits increases, the average customer spends are getting higher. We might say the loyalty is growing.

Duration and Average Customer Spend by kinds of services

duration of non revisit (day)	Obs.	mean	median	std.dev.
Hair Cut	15,531	86.0	61	107.9
Hair Coloring & Cut	17,686	86.8	69	85.7
Parmanet Wave & Cut	7,304	89.4	64	99.8
average customer spend (yen)	Obs.	mean	median	std.dev.
Hair Cut	19,096	4380.6	3780	1769.4
Hair Coloring & Cut	22,540	11281.1	10920	2973.7
Parmanet Wave & Cut	10,101	11585.6	10950	3626.3

Among the three combination of services, intervals of revisiting are similar. On the other hand, the average customer spends of hair cut is only about one-third of other two combinations.

Empirical Model (1)

- Our main research concern is the customer's revisit behavior.
- We have excess zeros (non-revisit and no-purchase) observation, that is, both revisit and repurchase outcomes are bounded.
- Most famous censored dependent variable model is a Tobit model, it assumes that the decision of revisit the hair salon and how much purchase in the next visit are explained by same factors.
- Cragg (1971) allows us to specify the separate equations for revisit and consumption behavior.
- The hurdle model concerns that the unbounded outcomes are over jump a hurdle. The double hurdle can be expressed by combination of probit and tobit estimator such as

$$d_i^* = z_i'\gamma + \varepsilon_{1,i}\ , y_i^{**} = x_i'\beta + \varepsilon_{2,i}$$

$$\begin{pmatrix}\varepsilon_{1,i}\\ \varepsilon_{2,i}\end{pmatrix} \sim N\left[\begin{pmatrix}0\\0\end{pmatrix}, \begin{pmatrix}1 & 0\\ 0 & \sigma^2\end{pmatrix}\right]$$

, where $z_i\gamma + \varepsilon_{1,i}$ and $x_i\beta + \varepsilon_{2,i}$ represent the perticipation equation and the quantity equation.

The first hurdle is defined by the latent variable d_i^*,

$$d_i = 1 \; if \; d_i^* > 0$$
$$d_i = 0 \; if \; d_i^* \leq 0.$$

The second hurdle is given by

$$y_i^* = max(\, y_i^{**}, 0),$$

consequently, outcome variable y_i is defined as $y_i = d_i y_i^*$.

The hurdle model's log-likelihood function is

$$\log(L)$$
$$= \sum_{y_i=0} \left[log \left\{ 1 - \Phi \left(z_i\gamma, \frac{x_i\beta}{\sigma} \right) \right\} \right] + \sum_{y_i>0} \left[log \left\{ \Phi(z_i\gamma) + \frac{1}{\sigma} \phi \left(\frac{y_i - x_i\beta}{\sigma} \right) \right\} \right].$$

We adopt two outcomes, first one is total amount of purchase of each customer by each day (hereafter, total payment), another is cumulative sum of total payment divide by cumulative sum of number of visit for each customer by each day (hereafter, average payment).

Data Description

variable name	Description	expected sign	label
age	age of customers on the last visit day	+ or -	
age^2/1000	(age*age/1000)	+ or -	
gender	customer's gender, male=0 and female=1	+ or -	
distance	distance between customer's residence and the hair salon	-	
discount rate	(each service' price/total amount of payment)*100	+ or -	
appointment (dummy vars)	When customers make an appointment with a specific hairdresser=1, otherwise=0	+	Loyalty
hair product (dummy vars)	purchasing hair product =1, otherwise=0	+	
hair cut (dummy vars)	taken hair cut=1, otherwise=0	+ or -	
hair color with hair cut (dummy vars)	taken hair color with hair cut=1, otherwise=0	+ or -	
permanent wave with hair cut (dummy vars)	taken permanent wave with hair cut=1, otherwise=0	+ or -	
hair cut, color and permanent wave (dummy vars)	purchase hair product=1, otherwise=0	+ or -	
hair salon's congestion	# of customers (daily)/90 percentile of # of customers (yearly)	+ or -	Functional Quality
hairdresser's congestion	count # of customers for each hairdresser, daily based data	+ or -	
hairdresser's fatigue	log of (ith customer/total # of customer) for each hairdresser,	-	
skill / capacity of hairdressers	estimate 90percentile of # of customers for each hairdresser, annual based data	+	Technical Quality
hairdressers_1-11 (dummy vars)	hairdressers in charge for the last visit	+ or -	
spring_dummy	March, April and May=1, otherwise=0	+ or -	
summer_dummy	June, July and August=1, otherwise=0	+ or -	
fall_dummy	September, October and November=1, otherwise=0	+ or -	
winter_dummy	December, January and February=1, otherwise=0	+ or -	

Notes: We specially focus on the shaded areas' results.

Estimation Results (selected variables)

variables	total payment		average payment		expected sign	Label
	consumption	participation	consumption	participation		
appointment	1,190.713***	1.647***	490.900***	1.325***	+	Loyalty
	(205.906)	(0.029)	(182.247)	(0.017)		
hair product	1,556.871***	0.068**	1,503.096***	0.146***	+	
	(59.139)	(0.031)	(30.915)	(0.024)		
hair salon's congestion	434.795***	-0.251***	176.284***	-0.126***	+ or -	Functional Quality
	(114.539)	(0.058)	(56.523)	(0.042)		
hair dresser's congestion	0.044	0.006***	0.779	0.003**	-	
	(3.672)	(0.002)	(1.804)	(0.001)		
hair dresser's fatigue	-158.626***	-0.075***	-91.484***	-0.067***	-	
	(32.129)	0.003*	(16.172)	(0.013)		
skill/capacity of hairdressers	67.012***	0.003*	35.499***	0.007***	+	Technical Quality
	(5.950)	(0.002)	(2.969)	(0.001)		

Findings (1)

- The customer who makes an appointment with their favorite hairdresser will come back to the salon and purchase more than the customer who does not.
- The coefficients of hair products are significantly positive. The customer who has higher loyalty will revisit with higher probability and they will spend more money in the next visit.
- “hair salon’s congestion” are significantly negative in the participation regressions, it suggests that the salon's impression is impulsive, then it discourage willingness of customer’s revisit.
- On the contrary, the purchase models have positive coefficients of hair salon’s congestion. It indicates that the customers who revisit multiple time prefer the active salon.

Findings (2)

- hairdresser’s congestion are insignificant in the purchase regressions and significantly positive in the revisit probability regressions.

- “hairdresser's fatigue” is examined by log of the receipt number of each hairdresser. We assume when the receipt number is larger, the hairdresser is probably getting tired.

- We found the coefficients are significantly negative. The variable may capture of hairdressers’ conditions, feeling and some atmosphere. It may be memorable for customers.

Findings (3)

- We control the time variant skill/experiences of hairdressers by “hairdresser’s skill and capacity”.
- The hairdresser's capacity variable is proxy for each hairdresser's skill or productivity year by year.
- We observe the positive coefficients of hairdressers’ skill in all models. We can say the skill or productivity of hairdressers contribute to raise the probability of revisit, total amount of sales and the loyalty.

Conclusion and Limitation of this study (1)

- In this study, we challenged to reproduce the experience space of customers at hair salon by using the customer behavioral variables, loyalty data, the hairdresser’s skill and hair salon’s atmosphere or environment in addition to demographic variables.
- These new adopted variables influence the customer's attitude toward the revisiting behavior and purchase decisions at the salon.
- We found that customer’s purchase behaviors are more sensitive against the salon's atmosphere, congestion, and hairdressers' skills.

Conclusion and Limitation of this study (2)

- This research was conducted in one hair salon in Japan, thus may not be generalizable to other hair salons. Therefore, more salons need to be investigated.

- It is also suggested that other related factors of service quality such as internal marketing, detailed hairdresser's quality and skill, peer review among workers must be helpful to measure their productivity and quality.