

# Evaluation of COVID-19 Related Measures using Ordered Logistic Regression Analysis based on a Survey of Tourism-Related Offices in the Nishimikawa Region, Aichi Prefecture

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## 1 ABSTRACT

COVID-19 has had an unprecedented impact on the tourism industry. The Go To Travel (overnight travel discount and regional common coupons campaign), which was implemented in Japan from July 2020 to stimulate demand in the tourism industry, was canceled at the end of 2020 because of the spread of infection again. Repeated outbreaks of infection and state of emergencies highlight the difficulty in balancing human health and economic activities during the COVID-19 pandemic. This study aims to clarify the economic impacts of the pandemic and evaluate the implementation of related economic support measures on the tourism industry. Based on a questionnaire survey of tourism-related offices in the Nishimikawa Region of Aichi Prefecture, it examines the economic impacts on the sales amount of tourism-related industry, evaluated the effects of the Subsidy Program for Sustaining Businesses (SPSB) and Go To Travel (by the national government) and Coupon Campaigns for shopping and restaurants (by municipalities) using ordered logistic regression analysis. The findings show that the impact of COVID-19 on business office sales is most severe for the accommodation industry, with a 62% decrease at the time of the survey compared to 2019. In addition, SPSB and Go To Travel campaigns are relatively highly evaluated by accommodation and tourism service offices, while Coupon Campaigns for shopping and restaurant coupon campaigns are relatively more effective in the restaurant and retail offices. In addition, the results show that the larger the offices annual sales, the more effective the Coupon Campaigns, indicating that since consumers use premium coupons to purchase goods and services that are more expensive than usual, the effect of policy implementation would be biased toward business offices that provide relatively expensive goods and services

Keywords: policy effectiveness, economic impacts, questionnaire survey, tourism industry, COVID-19

## 2 INTRODUCTION

Though the mobility restriction measures for individuals have been effective in temporarily reducing the number of coronavirus positive cases, they have seriously impacted the economy, particularly the tourism industry. Japan has experienced six waves of coronavirus infection spread, and it is now in the midst of its seventh (MHLW, 2022). According to the Japan Tourism Agency's Statistical Survey on Overnight travel, the number of overnight travelers in Japan decreased by 44% in 2020 and 46% in 2021 compared to 2019 (Japan Tourism Agency, 2022). Consequently, tourism-related industries such as tourism services, restaurants, and retail (especially the accommodation sector), have experienced serious financial difficulties. Furthermore, a number of small- and medium-sized enterprises (hereinafter SMEs) have been forced to close their offices or are bankrupt due to serious business deterioration (MIYAKAWA et al., 2021).

Consequently, the government implemented a "Subsidy Program for Sustaining Businesses (hereinafter SPSB)" with an annual budget 5.5 trillion yen as the source of funds (METI, 2020). In addition, after the lifting of the first state of emergency, the government conducted "Go To Travel," a travel and tourism promotion campaign by subsidizing expenses of overnight travel and shopping to stimulate the demand of domestic tourism (Japan Tourism Agency, 2020). However, the campaign was canceled due to an outbreak of infections at the end of 2020.

Various studies have assessed the economic impact of COVID-19 (KHALID et al., 2021, YAGASAKI et al., 2021, HANAFIAH et al., 2021) and the effectiveness of related measures. A study evaluating the short- and medium-run effects of the infection prevention and economic policies showed that the business suspension request in the state of emergency decreased firm sales by 10% points, whereas the business continuation subsidy helped firms survival prospects by 19% points (KAWAGUCHI et al., 2021). In addition, Hoshi et al. (2021) revealed the relationship between a firm's creditworthiness and its likelihood of applying for subsidies. They found that firms with low credit scores before the COVID-19 pandemic were more likely to apply for and receive the subsidies offered by the Japanese government in 2020. This is related to the size of the company—larger companies with good financial condition can sustain their operations without applying

for subsidies, while smaller and less creditworthy companies are more likely to apply for subsidies. Furthermore, while the Go To Travel campaign is considered effective in attracting visitors from distant regions (MATSUURA et al., 2022), Tamura et al (2022) highlight how the travel stimulus measures have resulted in an increase in the number of infections. With the unprecedented long-term effects of the pandemic, policy implementation that cannot be referred to by previous experience will be optimized through iterative evaluation and feedback, which requires supporting evidence in all the processes of policy assessment. Therefore, a questionnaire survey is an effective method for providing objective and visual data of actual situations for developing and evaluating economic support measures.

This paper aims to determine the actual situation of economic impacts and policy effectiveness in COVID-19, based on a questionnaire survey of tourism related offices in the Nishimikawa Region of Aichi Prefecture. It has several sections. (1) It summarizes the impact of COVID-19 on Japan's tourism industry with changes in overnight travelers, the declaration of a state of emergency, and the economic support measures, providing policy-relevant data that will be employed in the analysis of this study. (2) It describes the summary and basic statistical analysis of a survey of tourism-related offices, showing differences in the impact on business sales and the policy evaluation by sector. (3) The relationship between business offices' evaluation points for policy implementation (dependent variable) and the type of business, size, and impacts of COVID-19 (independent variable) are analyzed using ordered logistic regression to conduct a comprehensive evaluation of policy effectiveness and discussion of policy implications.

### 3 COVID-19 IMPACTS ON TOURISM INDUSTRY AND RELATED MESURES

#### 3.1 COVID-19 impacts on the tourism industry in Japan

Figure 1 shows the number of positive cases of coronavirus and the change rate of overnight travelers compared to 2019. In addition, it highlights the timing of COVID-19 related measures implemented in Japan. After the first case of infection reported on January 16, 2020, it faced the first wave of outbreaks from the end of March to May 2020. Subsequently, the first state of emergency was declared on April 7, 2020 to restrict people from going out, gathering, and holding events. Due to the refraining from nonessential outings and movements, overnight Japanese tourists decreased by 79% and foreign tourists by 98% by May 2020 compared to May 2019. Furthermore, subsequent trends indicate that the first state of emergency had the most severe impact on the tourism industry. Presumably, people were more anxious about the risk of infection in the early stages of the pandemic which affects their economic activities and livelihoods. (MIYAKI, 2021).

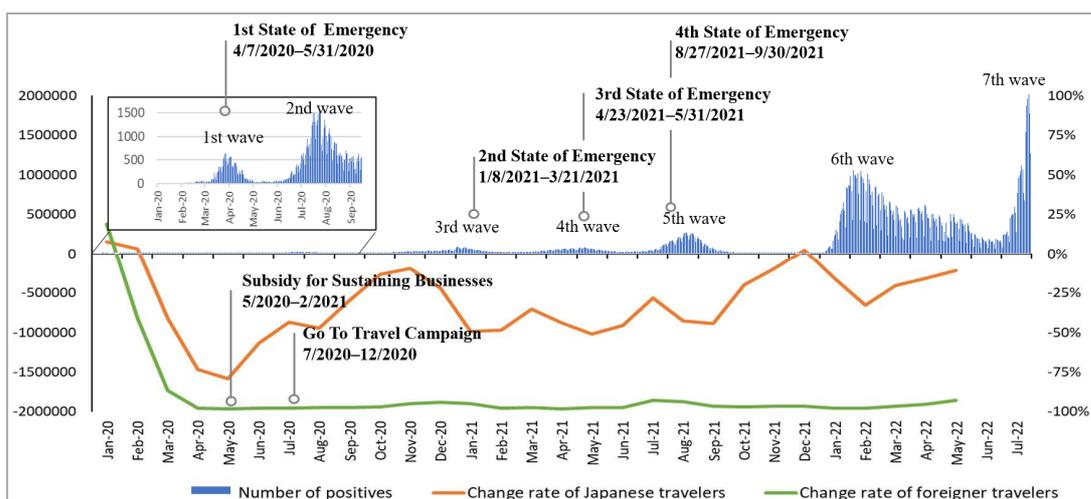


Fig. 1: Number of infections and the Change rate of Overnight Travelers compared to 2019

#### 3.2 Measures to support the operation of business offices

The state of emergency restricted people from nonessential outings and called for business enterprises in certain areas, such as restaurants, movie theaters, department stores, and theme parks, to cooperate in shortened hours operation or closures. To support those SMEs and sole proprietors whose sales have decreased due to such restrictive measures, the government launched various economic support programs to

facilitate the continuation or revitalization of their businesses. Table 1 shows the main measures implemented in 2020 and 2021. (1) The most versatile subsidy program was the SPSB. It targeted SMEs and sole proprietors whose monthly sales decreased by over 50% compared to the same month in 2019, without limitations on the way of using the subsidy. The subsidy amount was set in two categories, with a maximum of 2 million yen for SMEs and 1 million yen for sole proprietors. Consequently, the same amount of subsidy is applied to all businesses in the same category, irrespective of the size of the business. (2) The government also provided Rent Subsidy for Business to reduce the burden of land and building rent costs of offices that were facing a decrease in sales due to the state of emergency. (3) Another subsidy program is the Employment Adjustment Subsidy, which partially subsidizes the employer's payment of timeoff benefits to employees during the period of closures. (4) The government established various loan programs for SMEs and sole proprietors. For example, it lent up to 300 million yen without interest to business offices whose sales had declined by 20% or more, and at a lower interest rate to business offices whose sales had declined by 15%. In addition, for business offices whose sales had declined by 5% or more, it subsidized the guarantee fee for the loan. Furthermore, the government provided profitability improvement support, such as creating profitability improvement plans and subsequent regular monitoring.

Measures	Implementation period	Details
(1) Subsidy Program for Sustaining Businesses (SPSB)	May-1, 2020 –Feb-15, 2021	-Target small and medium-sized enterprises (SMEs) and sole proprietors whose sales decreased by more than 50% compared to 2019. -Subsidy amounts: for SMEs: Up to 2 million yen; for sole proprietors: Up to 1 million yen
(2) Rent Subsidy for Business	Jul-14, 2020 –Feb-15, 2021	-Target Medium-sized enterprises with capital of less than 1 billion yen, SMEs and sole proprietors, whose sales decreased by more than 50% or sales in any three consecutive months have decreased by more than 30% compared to 2019. - Subsidy amounts: follows a particular calculation method, for companies: up to 1 million yen; for sole proprietors: Up to 0.5 million yen
(3) Employment Adjustment Subsidy	Apr-1, 2020 –Sep-20, 2022	-It is a subsidy that partially subsidizes the employer's payment of time-off benefits to employees. -A company whose sale is decreased by more than 5% compared to 2019. - Subsidy amounts: follows a particular calculation method, for SMEs: Up to 2/3 of the time-off benefits, for others: Up to 1/2 of the time-off benefits
(4) Loans for Cash Management	Apr-1, 2020 –To present	-Provide interest-free or low-interest loans -Provide guarantee fee assistance -Provide profitability improvement support, such as profitability improvement plan and regular monitoring

Table 1: Main measures to support the operations of business offices in 2020 and 2021

### 3.3 Measures for individuals to stimulate tourism demand and consumption

Table 2 shows the measures for stimulating tourism and consumption by the national, prefectural, and municipal government. The Japan Tourism Agency supported the continuation of employment and business of the tourism industry and implemented the Go To Travel campaign in July 2020 to stimulate the tourism demand. The government subsidized travel expenses to promote domestic travel and formulated the New Travel Etiquette for accommodation facilities and travelers to ensure infection prevention.

In addition, prefectural governments implemented tourism promotion campaigns and issued premium coupons. Aichi Prefecture implemented the LOVE Aichi Campaign to subsidize a portion of travel expenses, and the Aichi Travel e-Money Campaign, which rewards a portion of travel expenses as shopping points. As cross-prefectural travel was restricted to prevent the spread of the infection, these measures were designed to stimulate travel within the prefecture by limiting users to Aichi Prefecture residents only.

Implementation Entities	Measures	Period	Details
Nation	Go To Travel Campaign	Jul-22, 2020 –Dec-28, 2020	- Discounts 30% of travel expenses, up to 14000 for overnight travel and 7000 for 1 day travel. - Travelers and accommodations should follow the New Travel Etiquette, which is a set of infection prevention manual.
	Regional common coupons	Jul-22, 2020 –Dec-28, 2020	- Coupons associated with the Go To Travel Campaign. - Coupons amount: 15% of travel expenses
Aichi	LOVE Aichi Campaign	Intermittently conducted four times, from Jul-20, 2020.	- In 2020 and 2021, the campaign only targeted travellers from Aichi prefecture. - Discounts 50% of travel expenses, up to 10000 for overnight travel and 5000 for 1 day travel.
	Aichi Travel e-Money Campaign		- Returns up to 7,000 yen worth of points per person per trip
Municipalities in Aichi	Premium Coupons for Shopping or restaurant	from Jul 2020, depends on each municipality	- The shopping or restaurant coupons worth 6,000 to 10,000 yen are available for 5,000 yen. And the premium amount varies from each municipality.

Table 2: Major measures by individuals to stimulate tourism or consumption

Municipalities are issuing premium gift coupons subsidized by the national government to promote local economies that have been severely impacted by the pandemic. These can be used in exchange for goods and services above the purchase amount of the coupon, and the premium rates of the savings amount vary between municipalities.

#### 4 QUESTIONNAIRE SURVEY OF NISHIMIKAWA REGION

A questionnaire survey was conducted among tourism-related business offices in the Nishimikawa Region of Aichi Prefecture to determine the actual impact on the tourism industry and the effects of the policy implementation.

##### 4.1 Survey area

Aichi Prefecture is known as Japan’s manufacturing prefecture. In recent years, Aichi Prefecture has strived to promote tourism by taking advantage of regional resources, launching the “Aichi Tourism Strategy 2016–2020” and the “Aichi Tourism Strategy 2021–2023,” expanding divisions in charge of tourism, developing tourism plans, and establishing regional tourism associations. However, since 2020, the number of tourists has decreased significantly, and efforts to revitalize the tourism industry have become a part of the tourism strategy. As shown in Figure 2, Nishimikawa region runs through the center of Aichi Prefecture and consists of 10 municipalities. Major tourist resources include Aichi Plateau National Park, Mikawa Bay National Park, Hongu Mountain Prefectural Natural Park, and the hometown of Tokugawa Ieyasu. Tourist facilities such as amusement parks, camping facilities, tourist farms, and fishing are scattered around the area, with natural and historical cultural resources attracting visitors from nearby regions.

##### 4.2 Overview of the survey

Table 3 provides an overview of the questionnaire survey. There are various definitions of tourism-related business offices; however, for the purposes of this study, they were defined as travel services, accommodation, restaurants, and retail businesses that are recognized as contributing to the promotion of regional tourism. The Nishimikawa Wide-area Tourism Promotion Committee opened a tourism information website “Nishimikawa Gurutto Navi” in 2016 to promote wide-area tourism through interregional cooperation. This survey covers all business offices registered on this website, excluding facilities with free admission, such as natural parks, temples, and other free tourist spots.

Items	Details
Survey period	November 29, 2021 - December 19, 2021
Survey Target	A total of 751 survey forms were distributed to the offices of accommodations, restaurants, retail stores, and tourism service etc. which are listed on the ‘Nishi-Mikawa
Survey method	Distribution and collection by post
Questionnaire contents	Basic information of business offices (8 questions) Measures for preventing the spread of infection (1 question) Impact on business activities and sales (3 question) Effect of COVID-19 related measures (2 question) Expected support measures in the future (1 question) Free description (1 question)

Table 3: Overview of the questionnaire survey

##### 4.3 Result of survey

###### 4.3.1 Collection number of the questionnaires

Among the 824 questionnaires distributed, 751 were received by the offices, and 73 were returned for nonresponse. The 73 nonresponses included 53 cases of “closure” or “with unknown operation status,” 11 cases of “address unknown” and 1 case of “business open only during the summer.” Therefore, further investigation is required to determine whether the closure or unknown operation status of these 53 offices is due to the impact of COVID-19.

A total of 212 questionnaires were collected, with a response rate of 28.2%. Since it includes the public facilities which are ineligible for subsidy programs and were temporarily closed under the direction of the local government during the state of emergency, this study excludes them from the analysis. Accordingly, the final number of responses for analysis is 179, with 23.8% of distributed number.

Figure 3 shows the number of questionnaires distributed and collected by business type. The offices of restaurant sector had the highest number (80), followed by retail (38), accommodation (33), the tourism service (18), and others (10). Here the tourism service sector includes the offices that operate tourist spots such as amusement parks, theme parks, tourist farms, camping spots, clam digging spots, and fishing spots, etc. In addition, the others include offices that predominantly engaged in the manufacture and sale of handicrafts and souvenirs.

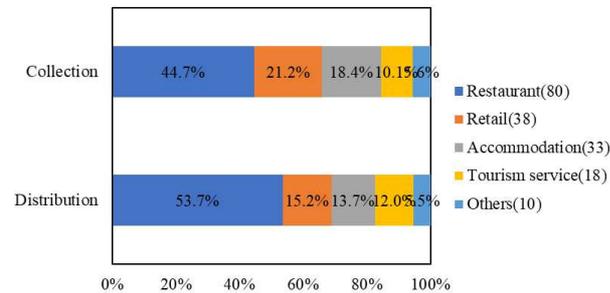


Fig.3: Percentage of Questionnaires Distributed and Collected by Business Type (n = 179)

Figure 4 (a) shows the number of employees by business type. The vertical axis indicates the number of responses by sector. In all sectors, small-scale offices with 1–4 employees accounted for the largest proportion, totaling 105 (58.7%). The restaurant and retail sectors have a relatively large number of small-scale offices, while the tourism service, accommodation, and others have a certain percentage of offices with 20 or more employees. Figure 4 (b) shows the annual sales amount in 2019 before the COVID-19 pandemic. Offices with sales between 10 and 30 million yen had the highest number of responses, accounting for 56 (31.3%), followed by those with sales of 5–10 million yen (30 [16.8%]), 30–50 million yen (25 [14.0%]), and under 5 million yen (18[10.1%]). The number of offices with the sales amount under 50 million yen accounted for 72% of the total.

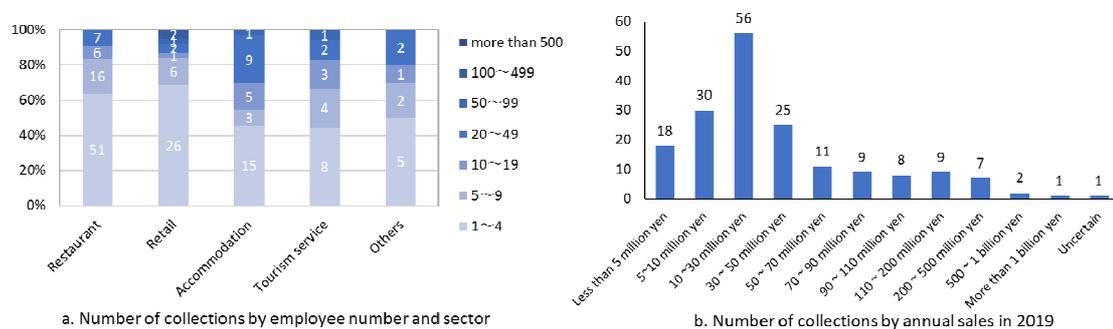


Fig. 4: Number of Collections by Employee Number (a) and Annual Sales in 2019 (b; n = 179)

#### 4.3.2 Impact on sales amount and business operation

Respondents were requested to set the percentage of quarterly sales in 2020 and 2021, assuming that the quarterly sales amount in the period in 2019 was 100%. Figure 5 shows the average decrease rate in quarterly sales amount in 2020 and 2021 compared to 2019. The vertical bar shows the decreased rate in each business type, while the line graph indicates the average level of total sectors. The accommodation sector has been the most seriously affected, with sales decreasing 66% in the first quarter (April–June) of 2020, when the first state of emergency was declared. The sales recovered in the second half of 2020 with the implementation of Go To Travel; however, they began to decline again in 2021 and down 62% at the time of the survey.

The tourism service sector declined significantly in the first quarter of FY2020 and has subsequently recovered above the overall average level. Presumably, many neighborhood tourists are visiting them since tourist service business offices, such as theme parks, tourist farms, camping and fishing, are mainly outdoor spots where the risk of infection is relatively low. Regarding the restaurant and retail sector, a decrease in sales was observed for the entire COVID-19 period; however, there was no significant change in the period of infection spread or the period of Go To Travel.

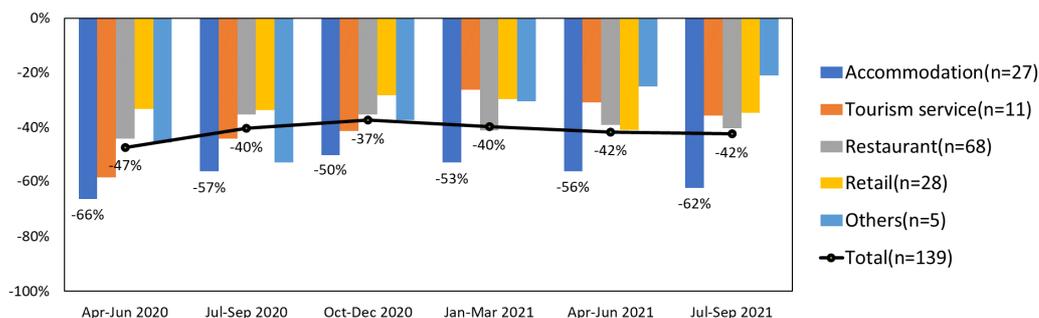


Fig. 5: Economic impacts on the business offices by business type (n = 139)

The survey investigated the impacts on business activities, such as closure and difficulty in bearing fixed costs, by classifying the impacts into five levels: “very severe (5 points),” “somewhat severe (4 points),” “undecided (3 points),” “not very severe (2 points),” and “not severe at all (1 point).” Figure 6 highlights the results of the impact on business activities. No significant differences were found in the number of responses at each level.

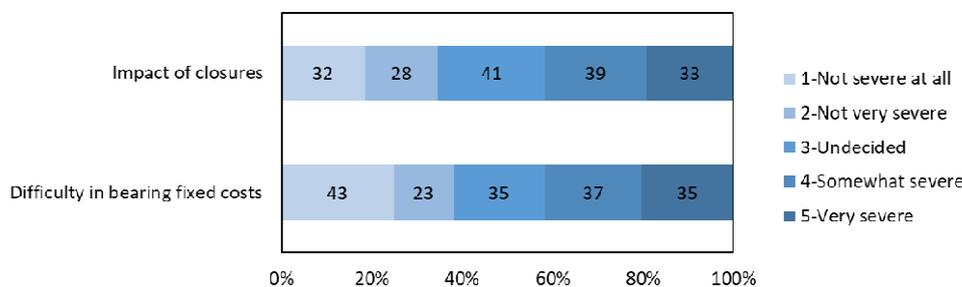


Fig. 6: Number of Respondents at Each Level of Impact (n = 173)

#### 4.3.3 Evaluation of policy effectiveness by business offices

To measure the effectiveness of the government’s economic support measures, each business office who applied to the measures was asked to rate the measures they applied on a 5-point scale of “very effective (5 points),” “somewhat effective (4 points),” “undecided (3 points),” “somewhat ineffective (2 points),” and “completely ineffective (1 point)” regarding their effectiveness in maintaining or recovering business activities. On the other hand, if the offices have not applied for the measures, answer "no application". Figure 7 shows the number of respondents with application for the measures by each evaluation point and without application. Compared with other subsidies, the largest number of offices applied the SPSB, accounting for approximately half of the total. Furthermore, the evaluation points were relatively high, accounting for 90% of the applied offices.

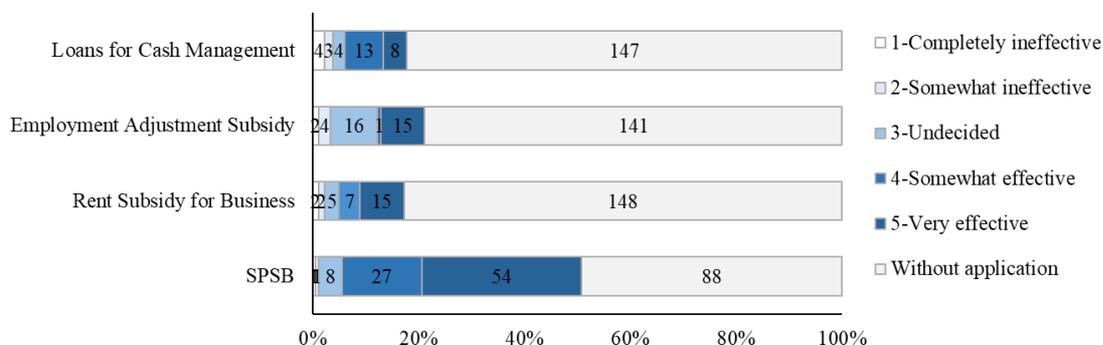


Fig. 7: Number of Respondents by Evaluation Points for Applications and Without Application for the Measures (n = 179)

For the tourism and consumption stimulation campaigns, respondents were also requested to rate the campaigns on a 5-point scale in the same way. Figure 8 shows the average rating points for tourism and consumption stimulation campaigns by business type, and the line graph shows the overall average level. It is evident from the line graph that the shopping and restaurant coupon campaigns conducted by

municipalities were rated the highest, while the prefectural LOVE Aichi Campaign and Aichi Travel e-Money Campaign were rated comparatively low. By industry, Go To Travel was comparatively highly effective in the accommodation sector, and shopping and restaurant coupons by the municipalities were effective in the restaurant and retail industries.

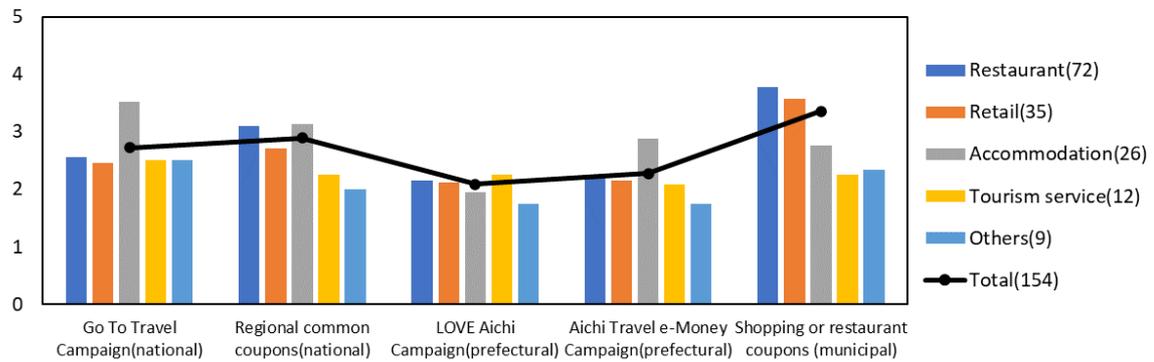


Fig. 8: Average Rating Points for Tourism and Consumption Stimulation Campaigns by Business Type (n = 154)

## 5 ORDERED LOGISTIC REGRESSION ANALYSIS OF COVID-19 RELATED MEASURES

### 5.1 Overview of variables

We qualitatively and quantitatively extracted the business attributes (such as business type, employee number, annual sales amount, etc.) and the value of impacts by COVID-19 (such as change rate of sales, impact of closure, difficulty of paying fixed cost, etc.) and measures related factors (such as with/without subsidy application, premium rate of coupons by municipality) which are assumed to affect the evaluation points of COVID-19 related measures, to quantitatively analyze the influence factor of measures. Since the evaluation points of measure effectiveness by business offices (dependent variable) are on an ordinal scale and the independent variables also include categorical data (ordinal and nominal scales), we used ordinal logistic regression analysis to estimate the contribution and significance probability of each factor and added a systematic discussion of the results.

This study analyzes the effectiveness of SPSB, a subsidy program that received the highest number of points in the survey, the main tourism stimulation campaign GoTo Travel, and the travel, shopping, and restaurant coupon campaigns by municipalities, which is highest rated by business offices.

Type	Variables	Description of variables	Obs	Mean	Std. dev.	Min	Max	
Independent variables	rest	Business types (Figure3)	Restaurant	80	-	-	-	-
	retail		Retail	38	-	-	-	-
	accm		Accommodation	33	-	-	-	-
	tous		Tourism service	17	-	-	-	-
	others		Others	10	-	-	-	-
	emp		Number of employee (Figure4)	178	12.7	33.4	2.5	299.5
	sale2019	Annual sales of 2019 (million yen, Figur4)	175	62.3	126.0	2.5	1000	
	cr_sale	Average change rate of sales during COVID-19 (% , Figure5)	139	-41.5	24.4	-91.7	56.7	
Dependent variables	imp_cost	Difficulty in bearing fixed costs (Figure6)	173	3.0	1.5	1	5	
	imp_cls	Impact of closures (Figure6)	173	3.1	1.4	1	5	
	app_SPSB	With/Without application of SPSB (1/0, Figure7)	178	0.5	0.5	0	1	
	prm_r_Coup	Premium rate of coupon_municipality (% , Table2)	178	131.6	52.3	20	200	
	p_SPSB	Evaluation points of SPSB by offices (Figure7)	91	4.5	0.8	1	5	
	p_GoTo	Evaluation points of GoTo by offices (Figure8)	132	2.7	1.5	1	5	
	P_Coup	Evaluation points of coupon_municipality by offices (Figure8)	141	2.9	1.4	1	5	

Table 4: Basic statistics of variables

Table 4 shows the basic statistics of the variables used in the analysis. Values that required specific calculations to be incorporated as independent variables are presented here. (1) Since, the number of employees and annual sales of 2019 was asked in several ranks in the questionnaire survey, as shown in Figure 4, the average of the beginning and ending values for each rank was used in the analysis as an

independent value. However, for the last rank, the values written in the questionnaire were used as is. (2) For the value of the average sales change rate during the COVID-19 period, the average of the change rate for the periods of 2020 and 2021 shown in Figure 8 was calculated for each business office. (3) For the value of the premium rate of coupon issued by the municipality, we adopted the premium rate of coupons for the municipality in which each office is located.

Considering that using all the independent variables listed in Table 4 simultaneously, in addition to multicollinearity, often cannot provide enough combinations between categories for analysis, we used the forward stepwise method to select variables with p-value = 0.05 as the criterion. Stata/SE 17.0 (Lightstone Corp.) was used for the analysis.

## 5.2 Results of ordered logistic regression analysis

The odds ratio estimated for each independent variable category indicates the odds of moving into the next highest policy rating point category for a one-unit change in the independent variable, or for the base category. That is, a category with an odds ratio above 1.0 indicates a higher policy rating point compared to the base category.

Table 5 shows the results of the analysis with the SPSB effectiveness evaluation points as the dependent variable. The tourism service sector has the highest contribution to the SPSB compared to the base category of retail trade, followed by the accommodation and restaurant sectors. In addition, there is a significant relationship with the category of number of employees (emp), indicating that offices with a larger number of employees are evaluated lower in the effectiveness of SPSB from the offices. This finding aligns with the study conducted Hoshi et al (2021) which states why the lower creditworthy companies with smaller size are more likely to apply for subsidies. Furthermore, compared to offices where there was absolutely no impact of the closure on business activities (base category of imp\_cls), those that were impacted provided a lower evaluation of the policy's effectiveness. Therefore, even with the support of the businesses sustaining subsidy, they were forced to close their businesses due to the spread of pandemic. Compared to offices that had no impact on bearing fixed cost burdens (base category of imp\_cost), those that had such an impact evaluated the policy more positively, indicating that they utilized the subsidies to cover fixed costs for operating their business, such as rent and labor costs.

Variables		p_SPSB as dependent variable						
		Odds ratio	Std. err.	z	P	95% conf. interval		
Business type	retail	1 (base)						
	rest	5.87 *	4.67	2.23	0.026	1.235	27.904	
	accm	55.64 *	64.76	3.45	0.001	5.682	544.751	
	tous	137.82 *	226.23	3.00	0.003	5.522	3,439.749	
	others	3.90	5.10	1.04	0.299	0.299	50.747	
emp		0.95 *	0.25	-2.13	0.033	0.899	0.996	
cr sale		1.03	0.02	1.88	0.06	0.999	1.060	
imp_cls	1	1 (base)						
	2	0.02 *	0.03	-3.01	0.003	0.002	0.270	
	3	0.36	0.41	-0.89	0.375	0.039	3.398	
	4	0.07 *	0.08	-2.44	0.015	0.009	0.597	
	5	0.06 *	0.07	-2.49	0.013	0.006	0.543	
imp_cost	1	1 (base)						
	2	22.28 *	26.51	2.61	0.009	2.163	229.406	
	3	38.97 *	47.04	3.03	0.002	3.658	415.166	
	4	13.14 *	13.41	2.52	0.012	1.777	97.146	
	5	21.87 *	23.63	2.85	0.004	2.629	181.884	
/cut1		4.55	1.52			-7.536	-1.573	
/cut2		3.83	1.34			-6.448	-1.203	
/cut3		2.00	1.20			-4.350	0.355	
/cut4		0.40	1.20			-1.944	2.752	
Log likelihood						-64.857176		
Pseudo R2						0.1928		
n						80		

Table 5: Analysis results of p\_SPSB as dependent variable. Reference categories \*\*: significant at the 1% level, \*: significant at the 5% level

Table 6 shows the analysis results of effectiveness of Go To Travel and coupon campaigns implemented by municipalities.

Regarding the results of Go To Travel, no significance was found with the other categories except for the business type. Compared to the base category of accommodation, the odds ratios for the other sectors were smaller than one, indicating that the evaluation points for the effectiveness of Go To Travel are relatively negative for the offices of the other sectors.

Regarding the results of the coupon campaign, the contribution of restaurants and retail business offices to the campaign evaluation is higher than that of accommodations. In addition, although the results are not significant with the number of employees, they were significant with the annual sales in 2019 (sale2019), with the larger sales offices evaluating the campaign more positively. This indicates that customers typically use discount coupons to spend at offices with higher prices than usual. Furthermore, change rate of sales in COVID-19 pandemic (cr\_sale) results with an odds ratio greater than one. This demonstrates that the smaller the impacts in sales of business offices, the higher the evaluation points of the campaign tended to be, which infers that the implementation of the campaign positively affects the sales recovery. Finally, significance was also found with the coupon premium rate (prm\_r\_Coup), with a 1% increase in the premium rate resulting in a 1.011 times increase in the probability of shifting the evaluation points to the next higher stage of the campaign.

Variables		p_GoTo as dependent variable					P_Coup as dependent variable						
		Odds ratio	Std. err.	z	P	95% conf. interval		Odds ratio	Std. err.	z	P	95% conf. interval	
Business type	accm	1.000	(base)					1.000	(base)				
	rest	0.311 *	0.16	-2.29	0.022	0.114	0.844	7.752 **	4.045	3.93	0.000	2.788	21.554
	retail	0.239 *	0.15	-2.35	0.019	0.073	0.789	5.054 **	3.090	2.65	0.008	1.525	16.752
	tous	0.226 *	0.17	-2.03	0.042	0.054	0.950	0.216	0.195	-1.7	0.089	0.037	1.264
	others	0.343	0.32	-1.14	0.255	0.055	2.161	0.189	0.177	-1.78	0.075	0.030	1.180
emp		0.997	0.01	-0.32	0.747	0.981	1.014	0.988	0.009	-1.31	0.190	0.969	1.006
sale2019		1.002	0.00	1.02	0.308	0.998	1.005	1.005 *	0.002	2.09	0.037	1.000	1.009
cr_sale		1.004	0.01	0.5	0.619	0.988	1.021	1.022 **	0.008	2.67	0.008	1.006	1.038
app_SPSB	0	1.000	(base)					1.000	(base)				
	1	1.230	0.47	0.55	0.584	0.586	2.582	3.576 **	1.380	3.3	0.001	1.679	7.619
prm_r_Coup		-	-	-	-	-	-	1.011 **	0.004	3.07	0.002	1.004	1.018
/cut1		-1.940	0.69			-3.299	-0.581	0.184	0.757		-2.242	-1.299	1.667
/cut2		-1.133	0.68			-2.473	0.207	1.108	0.754		-1.341	-0.370	2.586
/cut3		-0.394	0.68			-1.718	0.930	2.584	0.787		0.025	1.042	4.126
/cut4		0.991	0.68			-0.341	2.323	4.601	0.858		1.839	2.919	6.282
Log likelihood							-162.13764					-156.80106	
Pseudo R2							0.0316					0.1658	
n							106					123	

Table 6: Analysis Results of p\_GoTo and p\_Coup as dependent variables. Reference categories \*\*: significant at the 1% level, \*: significant at the 5% level

### 5.3 Discussion

The results of the analysis show the following policy findings.

(1) The larger the number of employees, the lower the policy effectiveness of the SPSB was evaluated. As shown in Table 1, SMEs were granted up to 2 million yen and sole proprietors were granted the up to 1 million yen regardless of the size of offices. Accordingly, while the relatively small offices can utilize the subsidy as funds to improve the business conditions of the offices affected by the pandemic, for SME offices, the amount may be insufficient to sustain the business activities that were severely impacted by COVID-19. In addition, since the subsidies were targeted at offices with a 50% or more decrease in sales without limiting the use of the subsidies, the small business office and sole proprietors may receive more income by applying for the subsidy without an effort to restore business that impacted by COVID-19. This indicates the importance of including further requirements in the subsidy program, such as the size of business offices and the impact level of COVID-19 on business activities.

(2) Regarding Go To Travel, the accommodation offices evaluated the policy higher than other sectors, showing that it was comparatively effective in recovering the economic impact on the accommodation industry in the Nishimikawa region. However, a comparison of the change in Japanese overnight travelers in Figure 1 and the decrease in accommodation offices' sales in Figure 5 shows that during the Go To Travel period, a -10% decrease in Japanese overnight travelers in Figure 1, while the decrease in sales of accommodation in Figure 5 is -50%. Therefore, the subsidized overnight travel expenses by Go To Travel lead people to travel

to popular tourist sites or regions with a flourishing tourism industry, and compared to such areas, the effect of stimulating tourism by the campaign is not relatively significant in the Nishimikawa region.

(3) The results indicate that the municipal coupon campaign was effective in revitalizing the local economy. However, business offices with higher annual sales had higher evaluation points for the campaign. This indicates that a higher amount of spending is possible than the purchase price of the coupon, and tended to be spent at stores providing relatively higher-priced goods and services. In addition, the offices located in municipalities that issue coupons with higher premium rates were more highly evaluated in the campaign. However, increasing the premium rate does not necessarily result in more effective measures. The higher the premium rate, the more consumers tended to purchase expensive goods and services that they could not normally consume, which may have caused a bias in the effectiveness of the campaign. This indicates the importance of complementary measures to support small local restaurants, souvenir stores, and stores, for example, by offering rewards for using coupons at small offices.

## 6 CONCLUSION

This study examined the economic impact of the COVID-19 pandemic based on the results of a questionnaire survey of tourism-related offices in the Nishimikawa Region of Aichi Prefecture. In addition, it statistically analyzed the policy effects of the measures such as the government subsidy program SPSB, GoTo Travel campaign for tourism stimulation, and municipal premium coupon campaigns, using ordinal logistic regression analysis. The results show that the impact of COVID-19 on business office sales is most severe for the accommodation offices, with a 62% decrease at the time of the survey compared to 2019 (much lower than the national average level). SPSB and Go To campaigns are relatively highly evaluated by accommodation and tourism service offices, while shopping and restaurant coupon campaigns are relatively more effective in the restaurant and retail offices. In addition, the results show that the larger the offices' annual sales, the more effective the campaign, indicating that customers typically use discount coupons to spend at business offices with higher prices than usual and it is required the complementary measures to support small local restaurants, souvenir stores, and stores.

This is an empirical study to clarify the actual economic impact and policy effects to provide evidence-based knowledge for economic revitalization measures. As a limitation of this study, policy effects were analyzed on the basis of evaluation points from the perspective of business offices, which may potentially include subjective factors of respondents. Therefore, while further investigation is required to determine how the subsidy program actually had an effect on business continuity and sales recovery, the findings of this study are considered to provide evidence on the actual status of policy implementation based on the supply-side perspective. Furthermore, continuous observation is required as the spread of COVID-19 and its impact on economic activity remains ongoing.

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