What are the Driving Forces
for Arts and Culture Related Activities in Japan?

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Abstract

Purpose of this paper is to grasp the demand structure of Japanese people for arts and culture related activities and examine if the demand structure has been changed or not in terms of individual arts, drama and dance, and music appreciation behaviors. Data used in this study is microdata from the Survey on Time Use and Leisure Activities, a periodical large scale sample survey conducted every five years by the Statistics Bureau, Ministry of Internal Affairs and Communications since 1976. By applying logistic regression analysis to pooled microdata from 1986, 1991, 1996, 2001 and 2006 surveys, we examined if there exist age, period, and birth cohort effects in arts and culture related activities in Japan from 1981 to 2006. In contrast to our hypothesis that an increase of governmental subsidies to arts and culture related field should be reflected in period effect, we could not obtain supporting results except concert hall visit and classical music appreciation but our results indicated that educational background plays an significant role to explain if they are theater-goers or museum-goers or not.

Keywords : Survey on Time Use and Leisure Activities, Microdata, APC Analysis, Nominal Logistic Regression Analysis

1. Introduction

It has been pointed out that, during the recovery and developing process from the ruin of the World War II, Japanese people have achieved advanced life in terms of material but might have lost the affluent and rich mind of which they have fostered for a long time. Reflecting this widely shared understanding, not only the central government but also local governments of Japan have been putting much and more emphasis on arts and culture related policies than developing social infrastructures such as road networks , dams and airports. A lot of arts and culture related facilities such as concert halls and art museums have been constructed almost everywhere in Japan. However, there have been few studies which attempt to evaluate the effects of those arts and culture related policies. In other words, a question whether the construction of many concert halls and art museums have contributed to an increase in the number of concert-goers or museum-goers or not has never been answered.

In this paper, we try to answer the question by using time-series data from the Survey on Time Use and Leisure Activities, a periodical large scale sample survey conducted every five years by the Statistics Bureau, Ministry of Internal Affairs and Communications since 1976.

2. Data

The data we use are the Survey on Time Use and Leisure Activities which has been conducted by the Ministry of Internal Affairs and Communications (MIC) every five years since 1976. According to the Statistics Bureau of the MIC, the Survey on Time Use and Leisure Activities aims to obtain comprehensive data on daily patterns of time allocation and on leisure activities. This survey provides statistics that are not obtainable from other surveys, all of which focus almost exclusively on economic aspects of living. These statistics make it possible to observe the lifestyles of various groups and preferences for certain activities over others, and to improve the interpretation and the understanding of various social and economic phenomena. This survey also provides important background information on economic conditions.

The sample is selected through a two-stage stratified sampling method, with the primary sampling unit being the enumeration district (ED) of the Population Census, and the secondary sampling unit being the household. First, the whole country is divided into the regions of 47 prefectures, and a total of 6,700 sample EDs are selected in those regions. In the selected EDs, around 80,000 households are selected from lists of households prepared by enumerators before the survey. All persons aged 10 and over in the sample households are asked to respond to the survey. The number of these respondents totals around 200,000. Foreigners living in Japan are included in the survey. Enumerators deliver the questionnaires to each household to be surveyed, collect the completed questionnaires, and interview the households if necessary. The questionnaires are completed by household members 10 years old and over, or by the head of the household, as well as by answering questions from the enumerators.

The topics covered by the 2006 Survey are as follows.

1) Time use over a single day
2) Participation in leisure activities during the past year
3) Frequency of participation in leisure activities during the past year

For time use during a single day, two questionnaires are used: Questionnaire A adopts a pre-coding method, while Questionnaire B is designed to elucidate time use in more detail (diary method or after-coding method). Questionnaire A is used for around 6,350 of 6,700 EDs, and Questionnaire B for the remaining 350 EDs.

Several characteristics of individuals and households are also identified. To obtain data on time use for each day, schedules for recording time use for each quarter hour are distributed to the respondents. The schedules completed by respondents are collected by the enumerators, along with other questionnaires on participation in leisure activities.

3. Method

In order to identify the effect of public spending focusing on arts and culture, we think Age-Period-Cohort (APC) analysis is useful. According to Yang et al. [3], APC analysis distinguishes three types of time-related variation in the phenomena of interest: age effect or variation over time periods that affect all groups of certain age; period effects or variation over time periods that affect all age groups simultaneously; and cohort effects, or changes across groups of individuals who experience an initial event such as birth in the same year or years. Our hypothesis was that the accumulated public spending toward arts and culture related facilities should increase the number of people who visit arts and culture related institutions such as art museums, theaters, and concert halls, and that this effect would be grasped by period effect. However, when we tried to conduct APC analysis, we confronted the well-known "identification problem." We were not able to estimate the unique set of true separate effects because of the exact linear

relationship among age, period and birth cohort; period = age + cohort.

Many studies have been conducted to solve this problem and "Intrinsic Estimator" developed by Yang et al. [3] is considered to have solved the identification problem.

In our study, since we are fortunately given the opportunity to analyze microdata from the Survey on Time Use and Leisure Activities which cover every five years from 1986 to 2006, we applied logistic regression model by using the framework of APC analysis instead of applying APC analysis to aggregated table data made from the microdata..

The model we adapted is described as follows:

Participation in art and culture related activity

= constant + age + period + birth cohort + sex + household income

+ educational background + working status + city size

where all variables are dummy variables.

Independent variables included in the logistic regressions are as shown in table 1 and dependent variables are art museum visit and art appreciation, theater and music hall visit and drama, entertainment and dance appreciation, concert hall visit and classical music appreciation, and hall visit and popular music appreciation.

We also conducted a series of logistic regression analysis using 2006 micro data to verify if there exist regional effects or not.

4. Results

Table 1 summarizes the results of logistic regression analysis and shows period effect in accordance with our hypothesis can be seen only in concert hall visit and classical music appreciation. Coefficients for year 1991—this is the year when Japanese enjoyed the bubble economy just before burst—show high values compared to coefficients for year 1986 and year 1996.

As to age effect, a tendency to visit museum, theater and hall and appreciate art, drama, classical music and popular music as respondents get older is observed. Coefficients for age 65 and more show especially high values and mean that those retired often visit art museums, theaters and halls.

Coefficient for age under 14 of concert hall visit and classical music appreciation shows positive high value and this seems to reflect some students at junior high school go to concert hall and appreciate classical music as a part of school activities.

In addition to age, period and cohort effect, income effect, sexual effect, educational background effect and city size effect are observed. Less male participate in arts and culture related activities in comparison with female. As people get richer, their tendency to participate in arts and culture related activities increase. As people get higher education, their tendency to visit art museums, theaters and halls also increase. For people living in larger cities, the possibility to appreciate arts, drama and dance, classical music and popular music is higher. Supply side problem of limited opportunities to present drama, dance and concert in local small town seems to lead this result.

Table 2 shows that there do exist regional effect, but our hypothesis that coefficients of museum and theater going for densely populated regions such as Kanto2 and Kinki2 will show positive sign was not verified. Further analysis would be required on this point.

Table 1 List of variables and results of logistic regression using data from 1986 to 2006

		Art museum visit and art appreciation		Theater or music hall visit and drama and dance appreciation		Consert hall visit and Classical music appreciation		Hall visit and popular music appreciation	
Sample size		1,071,775		1,071,775		1,071,775		1,071,775	
-2×Log likelihood		1037870.1		864116.63		575804.07		772194.74	
McFadden's quasi-R²		0.088		0.054		0.055		0.046	
		Estimated coefficient	Standard error	Estimated coefficient	Standard error	Estimated coefficient	Standard error	Estimated coefficient	Standard error
Constant		9.340	0.841 ***	13.909	0.882 ***	6.767	1.291 ***	5.354	1.078 ***
Age	Under 14	-0.534	0.055 ***	-1.070	0.057 ***	0.015	0.084	-0.280	0.069 ***
	15-19	-0.741	0.047 ***	-0.995	0.049 ***	-0.269	0.074 ***	-0.083	0.060
	20-24	-0.744	0.049 ***	-1.026	0.051 ***	-0.203	0.076 ***	-0.196	0.062 ***
	25-29	-0.694	0.038 ***	-0.963	0.040 ***	-0.626	0.061 ***	-0.287	0.050 ***
	30-34	-0.651	0.041 ***	-1.012	0.043 ***	-0.494	0.066 ***	-0.132	0.054 **
	35-39	-0.560	0.031 ***	-0.735	0.032 ***	-0.414	0.049 ***	-0.400	0.040 ***
	40-44	-0.659	0.034 ***	-0.829	0.035 ***	-0.598	0.054 ***	-0.425	0.044 ***
	45-49	-0.341	0.023 ***	-0.483	0.024 ***	-0.259	0.037 ***	-0.223	0.031 ***
	50-54	-0.438	0.026 ***	-0.627	0.027 ***	-0.293	0.042 ***	-0.302	0.034 ***
	55-59	-0.121	0.016 ***	-0.197	0.017 ***	-0.126	0.026 ***	-0.084	0.021 ***
	60-64	-0.208	0.019 ***	-0.328	0.019 ***	-0.209	0.030 ***	-0.142	0.025 ***
	65-69	0.039	0.011 ***	-0.004	0.011	0.032	0.017 *	0.061	0.015 ***
	70-74	0.009	0.012	-0.051	0.012 ***	0.001	0.019	0.029	0.016 *
	75-79	-0.023	0.012 *	0.008	0.011	-0.020	0.021	0.016	0.018
	Over 80								
Period	1986	0.126	0.016 ***	0.080	0.017 ***	-0.212	0.026 ***	0.142	0.021 ***
	1991	0.145	0.013 ***	0.252	0.013 ***	-0.142	0.020 ***	0.062	0.016 ***
	1996	0.015	0.009	0.098	0.010 ***	-0.238	0.014 ***	-0.036	0.012 ***
	2001	-0.070	0.006 ***	0.051	0.007 ***	-0.175	0.009 ***	0.041	0.008 ***
	2006								
Sex	Male	-0.262	0.003 ***	-0.506	0.003 ***	-0.461	0.004 ***	-0.366	0.003 ***
	Female								
Household income	Less than 1 million yen	-0.451	0.010 ***	-0.527	0.011 ***	-0.422	0.015 ***	-0.309	0.012 ***
	100-199 million	-0.503	0.009 ***	-0.488	0.009 ***	-0.478	0.013 ***	-0.311	0.011 ***
	200-299 million	-0.435	0.008 ***	-0.420	0.008 ***	-0.426	0.011 ***	-0.262	0.009 ***
	300-399 million	-0.360	0.007 ***	-0.358	0.008 ***	-0.375	0.010 ***	-0.234	0.009 ***
	400-499 million	-0.318	0.007 ***	-0.318	0.008 ***	-0.323	0.010 ***	-0.206	0.009 ***
	500-599 million	-0.288	0.007 ***	-0.282	0.008 ***	-0.286	0.010 ***	-0.178	0.009 ***
	600-699 million	-0.234	0.008 ***	-0.244	0.008 ***	-0.246	0.010 ***	-0.133	0.009 ***
	700-799 million	-0.186	0.008 ***	-0.198	0.008 ***	-0.191	0.010 ***	-0.116	0.009 ***
	800-899 million	-0.159	0.008 ***	-0.163	0.009 ***	-0.174	0.011 ***	-0.089	0.010 ***
	900-999 million	-0.117	0.008 ***	-0.142	0.009 ***	-0.139	0.011 ***	-0.073	0.010 ***
	1,000-1,499 million	-0.042	0.007 ***	-0.065	0.008 ***	-0.066	0.009 ***	-0.032	0.009 ***
	More than 1,500 million								
Educational background	Go to elementary school	-0.053	0.031 *	0.320	0.034 ***	0.047	0.040	-0.206	0.036 ***
	Go to junior high school	0.019	0.029	0.275	0.032 ***	0.142	0.038 ***	-0.002	0.033
	Go to senior high school	0.054	0.025 **	0.429	0.029 ***	0.156	0.035 ***	0.117	0.028 ***
	Go to junior college	0.162	0.025 ***	0.225	0.029 ***	0.021	0.035	0.090	0.028 ***
	Go to university or graduate school	-0.168	0.023 ***	-0.047	0.027 *	-0.286	0.033 ***	-0.075	0.027 ***
	Graduate from elementari or junior high school	-0.367	0.023 ***	-0.078	0.026 ***	-0.484	0.033 ***	-0.171	0.026 ***
	Graduate from elementari or junior high school	0.088	0.023 ***	0.114	0.026 ***	-0.022	0.032	-0.024	0.026
	Graduate from elementari or junior high school	0.410	0.023 ***	0.326	0.026 ***	0.327	0.032 ***	0.101	0.027 ***
	Graduate from elementari or junior high school	0.591	0.023 ***	0.445	0.027 ***	0.605	0.033 ***	0.126	0.027 ***
	Never go to school								
Work	At work	-0.065	0.003 ***	0.022	0.004 ***	-0.069	0.005 ***	0.083	0.004 ***
	Not at work								
Birth cohort	Before 1916	-0.957	0.067 ***	-1.026	0.069 ***	-0.838	0.104 ***	-0.921	0.086 ***
	1917-1921	-0.631	0.063 ***	-0.785	0.066 ***	-0.547	0.098 ***	-0.567	0.081 ***
	1922-1926	-0.497	0.060 ***	-0.683	0.062 ***	-0.309	0.092 ***	-0.467	0.077 ***
	1927-1931	-0.344	0.056 ***	-0.576	0.059 ***	-0.087	0.087	-0.260	0.072 ***
	1932-1936	-0.221	0.053 ***	-0.474	0.056 ***	0.091	0.081	-0.077	0.068
	1937-1941	-0.097	0.049 **	-0.380	0.052 ***	0.196	0.074 ***	0.037	0.063
	1942-1946	-0.003	0.046	-0.317	0.049 ***	0.244	0.069 ***	0.120	0.058 **
	1947-1951	0.006	0.043	-0.304	0.045 ***	0.264	0.063 ***	0.167	0.054 ***
	1952-1956	0.006	0.040	-0.274	0.042 ***	0.263	0.058 ***	0.193	0.049 ***
	1957-1961	0.064	0.036 *	-0.191	0.039 ***	0.301	0.052 ***	0.265	0.045 ***
	1962-1966	0.149	0.034 ***	-0.096	0.036 ***	0.357	0.047 ***	0.412	0.041 ***
	1967-1971	0.187	0.031 ***	-0.019	0.033	0.356	0.041 ***	0.433	0.037 ***
	1972-1976	0.212	0.028 ***	-0.019	0.030	0.315	0.036 ***	0.335	0.034 ***
	1977-1981	0.227	0.027 ***	0.023	0.029	0.320	0.033 ***	0.305	0.031 ***
	1982-1986	0.226	0.022 ***	0.125	0.024 ***	0.281	0.026 ***	0.219	0.027 ***
	1987-1991	0.158	0.022 ***	0.195	0.024 ***	0.247	0.023 ***	0.184	0.026 ***
	After 1992								
City size	Big city designated by ordinace (except Shizuoka)	0.234	0.004 ***	0.179	0.005 ***	0.193	0.007 ***	0.142	0.005 ***
	Middle city with population between 0.15 and 1 million	0.214	0.004 ***	0.074	0.004 ***	0.166	0.006 ***	0.124	0.005 ***
	Small city with population between 50 and 150 thousand	0.138	0.004 ***	0.064	0.005 ***	0.102	0.006 ***	0.075	0.005 ***
	Small city with population less than 50 thousand	0.023	0.006 ***	-0.001	0.006	0.030	0.009 ***	0.022	0.007 ***
	Town and village								

Table 2 List of variables and results of logistic regression using 2006 micro data

		Art museum visit	Theater or music hall visit	Hall visit (clasical music)	Hall visit (popular music)	Music appreciation by media	Movie theater visit
	Log likelihood	−70043.4	−61503.8	−44800.3	−56530.9	−93042.6	−92636.6
	McFadden's quasi-R^2	0.204	0.145	0.207	0.119	0.447	0.313
	R^2(U)	0.102	0.073	0.104	0.060	0.224	0.157
	Sample size	173,335	173,335	173,335	173,335	173,335	173,335
		Estimation	Estimation	Estimation	Estimation	Estimation	Estimation
	Consatant	2.862 ***	2.773 ***	3.468 ***	3.358 ***	2.531 ***	3.198 ***
Sex	Male	0.651 ***	1.035 ***	1.020 ***	0.881 ***	0.351 ***	0.517 ***
	Female						
Age	Under 14	0.324 *	0.831 ***	0.246	−0.047	−3.207 ***	−2.313 ***
	15〜19	0.563 ***	0.727 ***	0.506 ***	−0.614 ***	−3.359 ***	−2.463 ***
	20〜24	0.615 ***	0.750 ***	0.532 ***	−0.468 ***	−3.460 ***	−2.529 ***
	25〜29	0.396 ***	0.673 ***	0.722 ***	−0.629 ***	−2.725 ***	−1.882 ***
	30〜34	0.461 ***	0.784 ***	0.666 ***	−0.627 ***	−2.959 ***	−2.201 ***
	35〜39	0.345 ***	0.418 ***	0.253 ***	−0.422 ***	−2.410 ***	−1.608 ***
	40〜44	0.451 ***	0.530 ***	0.611 ***	−0.472 ***	−2.486 ***	−1.610 ***
	45〜49	0.072 *	0.315 ***	0.031	−0.429 ***	−1.904 ***	−1.506 ***
	50〜54	0.170 ***	0.390 ***	0.019	−0.478 ***	−2.230 ***	−1.607 ***
	55〜59	−0.306 ***	−0.130 ***	−0.175 ***	−0.530 ***	−1.049 ***	−0.998 ***
	60〜64	−0.143 ***	0.142 ***	0.010	−0.473 ***	−1.394 ***	−1.249 ***
	65〜69	−0.632 ***	−0.480 ***	−0.551 ***	−0.730 ***	−0.629 ***	−0.754 ***
	70〜74	−0.636 ***	−0.463 ***	−0.533 ***	−0.699 ***	−0.839 ***	−0.975 ***
	75〜79	0.089 *	−0.006	0.057	0.178 ***	0.070	0.171 ***
	Over 80						
Work	At work	0.167 ***	−0.044 **	0.090 ***	−0.125 ***	0.123 ***	−0.144 ***
	Not at work						
Household income	Under 1million yen						
	1.00〜1.99million yen	−0.143 ***	−0.178 ***	−0.186 ***	−0.116 **	−0.035	−0.090 **
	2.00〜2.99million yen	−0.333 ***	−0.362 ***	−0.385 ***	−0.352 ***	−0.190 ***	−0.197 ***
	3.00〜3.99million yen	−0.529 ***	−0.456 ***	−0.514 ***	−0.388 ***	−0.305 ***	−0.376 ***
	4.00〜4.99million yen	−0.597 ***	−0.578 ***	−0.672 ***	−0.513 ***	−0.391 ***	−0.404 ***
	5.00〜5.99million yen	−0.596 ***	−0.598 ***	−0.722 ***	−0.488 ***	−0.420 ***	−0.478 ***
	6.00〜6.99million yen	−0.638 ***	−0.654 ***	−0.687 ***	−0.591 ***	−0.487 ***	−0.602 ***
	7.00〜7.99million yen	−0.735 ***	−0.754 ***	−0.777 ***	−0.632 ***	−0.527 ***	−0.653 ***
	8.00〜8.99million yen	−0.784 ***	−0.742 ***	−0.847 ***	−0.638 ***	−0.549 ***	−0.759 ***
	9.00〜9.99million yen	−0.838 ***	−0.844 ***	−0.843 ***	−0.706 ***	−0.668 ***	−0.805 ***
	10.00〜14.99million yen	−0.965 ***	−1.020 ***	−0.990 ***	−0.752 ***	−0.685 ***	−0.903 ***
	Over 15.00million yen	−1.066 ***	−1.197 ***	−1.070 ***	−0.780 ***	−0.681 ***	−0.822 ***
Education	Go to elementary school	−0.832 ***	−1.267 ***	−1.460 ***	−0.380 *	0.715 ***	−0.537 ***
	Go to junior high school	−0.881 ***	−1.004 ***	−1.576 ***	−0.713 ***	0.015	−0.427 ***
	Go to senior high school	−0.853 ***	−1.293 ***	−1.426 ***	−0.564 ***	−0.184 **	−0.371 ***
	Go to junior college						
	Go to university	−1.744 ***	−1.398 ***	−1.669 ***	−0.880 ***	−1.158 ***	−1.021 ***
	Grad from primary education	0.534 ***	−0.044	0.864 ***	0.168	0.088	0.192 **
	Grad from secondary educat	−0.633 ***	−0.575 ***	−0.443 ***	−0.410 ***	−0.540 ***	−0.484 ***
	Graduate from junior college	−1.225 ***	−1.018 ***	−1.139 ***	−0.710 ***	−0.967 ***	−0.850 ***
	Graduate from university	−1.743 ***	−1.274 ***	−1.643 ***	−0.872 ***	−1.296 ***	−1.055 ***
Region	Hokkaido	0.154 ***	0.209 ***	−0.248 ***	−0.141 **	−0.116 ***	−0.044
	Tohoku	0.060	0.038	−0.058	0.071 *	0.100 ***	0.030
	Kanto1(inland)	−0.016	−0.180 ***	−0.086 *	−0.054	−0.097 ***	−0.287 ***
	Kanto2(coastal)	−0.016	−0.043	−0.168 ***	−0.065	0.003	−0.029
	Hokuriku	−0.244 ***	0.023	−0.083	−0.025	0.168 ***	−0.230 ***
	Tokai	0.012	−0.163 ***	0.073	−0.118 ***	0.014	−0.233 ***
	Kinki1(inland)	−0.013	−0.203 ***	−0.014	−0.025	0.018	−0.208 ***
	Kinki2(coastal)	−0.015	−0.024	−0.059	−0.097 **	−0.083 **	−0.336 ***
	Sanin	−0.416 ***	0.068	−0.005	0.010	0.158 ***	0.278 ***
	Sanyo	−0.087 **	0.158 ***	0.111 *	0.049	0.131 ***	−0.129 ***
	Shikoku	−0.030	0.173 ***	0.057	0.123 **	0.103 ***	−0.162 ***
	Northern Kyushu	0.038	0.009	0.063	−0.035	0.162 ***	−0.091 ***
	Southern Kyushu						
	Okinawa	0.512 ***	−0.229 ***	0.073	0.156 **	0.147 ***	−0.283 ***
City size	Big city	−0.578 ***	−0.276 ***	−0.394 ***	−0.310 ***	−0.317 ***	−0.411 ***
	Middle city	−0.388 ***	−0.081 ***	−0.277 ***	−0.185 ***	−0.220 ***	−0.227 ***
	Small city 1	−0.181 ***	−0.047 *	−0.112 ***	−0.096 ***	−0.098 ***	−0.045 **
	Small city 2	0.045	0.008	0.031	0.017	0.003	0.094 ***
	Town and village						

5. Concluding Remarks

In this paper, we tried to evaluate the effect of public spending to arts and culture related field by applying logistic regression analysis based on the framework of APC analysis. When applying APC analysis, we have to consider identification problem and our study too is not free from that problem. Furthermore, appropriateness of definition of variable is under question. We should consider combining the age class of 70-74, 75-79 and 80 or more into one class and change the reference class. Our study is tentative and further efforts will be required in the future.

Acknowledgement

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