

# Investigation of Changes in Library Usage after the Introduction of Outsourcing in Japan

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**Abstract:** In Japan, local governments have long managed public libraries; however, in 2003, organizations including private enterprises took over their management with the introduction of an outsourcing system, namely the “designated administrator system.” Now, whether local governments should apply this system to public libraries is under discussion, and many argue that it is inappropriate for public libraries. To provide basic data for such discussions, we investigated changes in library usage after the introduction of outsourcing. Specifically, we obtained statistics on library usage such as the gate count, number of loans, and number of reference transactions, and measured changes in these statistics before and after the introduction of outsourcing. The results show that the statistics tended to increase after the introduction of outsourcing. This may suggest that the introduction of outsourcing promotes users’ library usage.

**Keywords:** Outsourcing; Library Management; Japanese Libraries; Public Libraries; Library Usage

## 1. Introduction

In Japan, local governments have long managed public libraries; however, in 2003, organizations including private enterprises took over their management with the introduction of an outsourcing system, namely the “designated administrator system.” Although the number of public libraries managed under this outsourcing system (henceforth, “outsourcing libraries”) is increasing, whether local governments should apply this system to public libraries is under discussion. Many argue that it is inappropriate for public libraries. Nevertheless, few studies have examined the performance of outsourcing libraries.

To provide basic data for such discussions, we investigated changes in library usage after the introduction of outsourcing. Specifically, we obtained statistics on library usage and measured changes before and after the introduction of outsourcing. For library usage, we used seven types of statistics: (1) the gate count, (2) number of loans, (3) number of reservations/requests, (4) number of ILL-borrowings, (5) number of ILL-lendings, (6) number of reference transactions, and (7) number of document copies. These statistics were obtained from the “*Statistics on Libraries in Japan (2005–2015)*,” which is published annually by the Japan Library Association. We used the “*Report on Public Libraries Managed by the Designated Administrator System (2016)*” to know which library introduced outsourcing and when. In addition, to clarify that changes are specific to outsourcing libraries, we also investigated changes in the same period in library usage at “traditional” libraries, which are managed directly by local governments (henceforth, “direct management libraries”).

Moreover, we classified libraries according to types such as being (a) a main library or annex and (b) according to the type of municipality served. We also classified outsourcing libraries (c) according to the form of administrators

such as private enterprises or NPOs and (d) according to administrators such as *T company* and *H foundation*. For each category, we examined the changes in library usage.

Our research questions were as follows: (1) How did library usage change after the introduction of outsourcing? (2) Do the tendencies of outsourcing libraries differ from those of direct management libraries? (3) Do these tendencies vary depending on the type of library?

## 2. Related Studies

Few studies have examined the performance of outsourcing libraries. In 2007, Koyama and Nagata (2007) conducted a questionnaire survey to investigate the merits of outsourcing libraries, asking the staff of 82 public libraries that had introduced or planned to introduce the new system to describe the impact on costs and services. Maeda (2007) conducted a survey to determine which services improved under outsourcing, finding that 14 libraries introduced new services and 19 improved existing services such as reference services. The Japan Library Association (2007) also surveyed 51 libraries that introduced outsourcing, ascertaining that 17 libraries changed their operating hours and 10 changed their schedule of days open. Mizunuma and Tsuji (2016) and Mizunuma (2016) investigated reference services in outsourcing libraries. They compared the content of reference services and the number of reference transactions of outsourcing libraries to those of direct management libraries. The results showed that the services provided by these two types of libraries tended to differ, and the number of reference transactions tended to increase after the introduction of outsourcing.

## 3. Method

We selected the following seven statistics as indicative of library usage: (1) the gate count, (2) number of loans, (3) number of reservations/requests, (4) number of ILL-borrowings, (5) number of ILL-lendings, (6) number of reference transactions, and (7) number of document copies. To investigate changes in library usage after the introduction of outsourcing, we calculated the increase rate (IR) for each usage. The IR is defined as follows:

$$IR = \frac{A_2 - B_2}{B_2} \times 100 (\%)$$

where  $B_2$  is the average of the usage statistics during the two years before the introduction of outsourcing and  $A_2$  is the average for the two years after its introduction. These data were obtained from the annual “*Statistics on Libraries in Japan (2005–2015)*.” For example, Chiyoda Library introduced outsourcing in 2007; therefore, we calculated the average of the previously mentioned library usage in 2005 and 2006. There were 280,216 and 259,788 gate counts in 2005 and 2006 respectively. Therefore, the average number of gate counts in these two years was  $(280,216 + 259,788)/2 = 270,002$ . Similarly, the average number of gate counts after the introduction of outsourcing was 921,464 (for years 2008 and 2009). Therefore, the IR of gate counts for Chiyoda Library is  $(921,464 - 270,002)/270,002 = 2.413$ . We assume that if the IR is greater than zero, then library usage increased after the introduction of outsourcing.

We calculated the IRs (of the previously mentioned seven library usages) for each outsourcing library, and calculated the mean (average), median, maximum, minimum, and standard deviation of each. Note that we excluded

libraries from our sample if certain statistics were not listed in the “*Statistics on Libraries in Japan (2005–2015)*.” For example, if the number of loans of one library was missing, that library was excluded from the sample used to calculate the IR of the number of loans.

In addition, to clarify that changes are specific to outsourcing libraries, we also calculated the averages of the IRs for direct management libraries and compared them to those for outsourcing libraries. Since there was no comparable point in time when direct management libraries underwent a change in the system, we calculated the IR for every year from 2004 (the year of the first outsourcing library) to 2014 (the most recent year available), and adopted the average of these numbers for comparison to the IR of outsourcing libraries.

We used 3,811 public libraries listed in the annual “*Statistics on Libraries in Japan (2005–2015)*” as our sample. We classified the libraries as either outsourcing or direct management libraries based on “*the Report on Public Libraries Managed by the Designated Administrator System (2016)*.” This source includes a list of outsourcing libraries. Thus, we identified libraries listed in the report as outsourcing libraries and all others as direct management libraries. This report also indicated when each library introduced outsourcing.

Furthermore, we classified the libraries as either main libraries or annexes, and according to the type of municipality served: (1) prefectures, (2) ordinance-designated cities, (3) Tokyo special wards, (4) cities other than ordinance-designated ones, and (5) towns or villages<sup>1</sup> based on the “*Statistics on Libraries in Japan (2005–2015)*.” In addition, we classified outsourcing libraries according to the corporate forms of administrators: (a) private enterprises, (b) NPOs, (c) public corporations, and (d) other organizations, using “*the Report on Public Libraries Managed by the Designated Administrator System (2016)*.” Next, we clarified the first three predominant administrators (i.e., those managing libraries most) using the “*Survey on the Introduction of the Designated Administrator System (2012)*” conducted by the Ministry of Internal Affairs and Communications, and calculated the IR of each administrator. Table 1 shows the total number of libraries in each category of our sample used to calculate the IR. The predominant administrators are also shown in Table 1.

Table 1. Number of sample libraries

|                                 |                             | Outsourcing libraries | Direct management libraries |
|---------------------------------|-----------------------------|-----------------------|-----------------------------|
| (All libraries)                 |                             | 489                   | 3,322                       |
| Main vs. Annex                  | Main libraries              | 172                   | 1,579                       |
|                                 | Annexes                     | 317                   | 1,743                       |
| Types of municipality           | Prefectural library         | 5                     | 60                          |
|                                 | Ordinance-designated cities | 56                    | 232                         |
|                                 | Tokyo special wards         | 107                   | 124                         |
|                                 | Other cities                | 261                   | 2,004                       |
|                                 | Towns and villages          | 60                    | 902                         |
| Corporate form of administrator | Private enterprise          | 381                   | /                           |
|                                 | NPO                         | 41                    |                             |
|                                 | Public corporation          | 53                    |                             |
|                                 | Other organization          | 14                    |                             |
| Predominant administrators      | T Company                   | 105                   | /                           |
|                                 | V Company                   | 17                    |                             |
|                                 | H Foundation                | 11                    |                             |

<sup>1</sup> In Japan, a “city” is defined as a municipality with a population of more than 50,000 people, and an “ordinance-designated city” is defined as a city with a population greater than 500,000 people. “Tokyo special wards” are 23 municipalities with the highest population densities in Japan. Towns and villages are other municipalities, which are smaller than those already mentioned.

#### 4. Results

The IRs of (1) the gate count, (2) number of loans, (3) number of reservations/requests, (4) number of ILL-borrowings, (5) number of ILL-lendings, (6) number of reference transactions, and (7) number of document copies of outsourcing libraries are provided in Tables 2, 4, 6, 8, 10, 12, and 14 respectively. The results of each library usage of direct management libraries are provided in Tables 3, 5, 7, 9, 11, 13, and 15 respectively. These tables show the mean, median, maximum, minimum, and standard deviation (SD) of IRs (by percentage). For outsourcing libraries, “n” represents the number of libraries and for direct management libraries, “n (total)” represents the total number of samples for each year. “(All libraries)” represents the results of all sample libraries. The results of each type of library (as mentioned in the Introduction) are shown below “(All libraries).”

We first explain the results for all libraries. The means and medians of the IRs of all usages for outsourcing libraries were more than zero, whereas some medians of the IRs for direct management libraries were less than zero, such as for the gate count (-2.6%) and number of document copies (-13.4%). The means of the IRs of five usages for outsourcing libraries were higher than the IRs of direct management libraries. For example, the mean of the IR of the gate count for outsourcing libraries was 30.7%, while that for direct management libraries was 6.6%. In addition, concerning all usages, the medians of the IRs for outsourcing libraries were higher than for direct management libraries. For example, the median of the IR for the gate count for outsourcing libraries was 9.7%, while that for direct management libraries was -2.6%. Furthermore, the median of the IR of the number of loans was 11.1% for outsourcing libraries, while that for direct management libraries was 0.6%. These results suggest that the usages tended to increase after the introduction of outsourcing.

Next, we explain the results of each type of library. The mean and medians of IRs concerning both main and annex outsourcing libraries were more than zero, except for document copies. The medians of the IRs for outsourcing libraries were higher than for direct management libraries for all usages. These results suggest that the usages tended to increase after the introduction of outsourcing in both main and annex libraries. Similar tendencies were observed for the other types such as type of municipality served and type of administrator. Thus, the tendencies for all libraries previously mentioned hold for most types of libraries (i.e., without depending on library type).

Table 2. IRs of gate count for outsourcing libraries

|                             | n   | Mean   | Median | Maximum | Minimum | SD     |
|-----------------------------|-----|--------|--------|---------|---------|--------|
| (All libraries)             | 236 | 30.7%  | 9.7%   | 1207.7% | -45.1%  | 101.8% |
| Main libraries              | 92  | 38.8%  | 4.0%   | 1207.7% | -24.3%  | 144.1% |
| Annexes                     | 144 | 25.5%  | 13.4%  | 645.3%  | -45.1%  | 60.5%  |
| Prefectures                 | 3   | 211.6% | 137.6% | 493.7%  | 3.6%    | 206.8% |
| Ordinance-designated cities | 25  | 14.4%  | 14.8%  | 53.5%   | -18.3%  | 14.3%  |
| Tokyo special wards         | 63  | 28.6%  | 18.4%  | 241.3%  | -18.8%  | 36.6%  |
| Other cities                | 114 | 36.6%  | 6.9%   | 1207.7% | -45.1%  | 135.2% |
| Towns and villages          | 31  | 8.6%   | 1.9%   | 71.1%   | -24.3%  | 26.7%  |
| Private enterprises         | 168 | 39.4%  | 12.4%  | 1207.7% | -24.7%  | 118.7% |
| NPOs                        | 25  | 8.3%   | -0.2%  | 55.2%   | -23.1%  | 20.4%  |
| Public corporations         | 36  | 11.1%  | 5.6%   | 66.6%   | -45.1%  | 25.1%  |
| Other organizations         | 7   | 1.2%   | -1.6%  | 31.5%   | -24.3%  | 15.3%  |
| T Company                   | 68  | 33.7%  | 9.6%   | 645.3%  | -17.3%  | 93.4%  |
| V Company                   | 11  | 14.4%  | 7.4%   | 92.9%   | -24.7%  | 28.3%  |
| H Foundation                | 11  | 18.8%  | 15.2%  | 53.5%   | 0.0%    | 16.3%  |

Table 3. IRs of gate count for direct management libraries

|                             | n (total) | Mean  | Median | Maximum | Minimum | SD    |
|-----------------------------|-----------|-------|--------|---------|---------|-------|
| (All libraries)             | 12,609    | 6.6%  | -2.6%  | 1519.1% | -97.1%  | 60.8% |
| Main libraries              | 6,806     | 5.2%  | -3.6%  | 1088.8% | -90.3%  | 59.2% |
| Annexes                     | 5,803     | 8.2%  | -1.2%  | 1519.1% | -97.1%  | 62.5% |
| Prefectures                 | 482       | 2.6%  | -3.6%  | 669.5%  | -53.9%  | 41.8% |
| Ordinance-designated cities | 1,007     | -0.3% | -2.7%  | 199.2%  | -67.0%  | 19.9% |
| Tokyo special wards         | 496       | 5.9%  | 0.2%   | 213.5%  | -74.7%  | 28.8% |
| Other cities                | 7,616     | 9.6%  | -1.5%  | 1519.1% | -97.1%  | 67.5% |
| Towns and villages          | 3,008     | 2.1%  | -5.7%  | 1088.8% | -89.4%  | 57.6% |

Table 4. IRs of the number of loans for outsourcing libraries

|                             | n   | Mean   | Median | Maximum | Minimum | SD     |
|-----------------------------|-----|--------|--------|---------|---------|--------|
| (All libraries)             | 256 | 20.6%  | 11.1%  | 608.1%  | -38.2%  | 59.0%  |
| Main libraries              | 111 | 21.6%  | 6.8%   | 608.1%  | -38.2%  | 74.7%  |
| Annexes                     | 145 | 19.9%  | 13.2%  | 401.4%  | -35.0%  | 43.4%  |
| Prefectures                 | 3   | 217.0% | 217.3% | 411.6%  | 22.0%   | 159.0% |
| Ordinance-designated cities | 23  | 13.2%  | 13.4%  | 32.2%   | -6.9%   | 9.3%   |
| Tokyo special wards         | 69  | 17.1%  | 14.6%  | 109.5%  | -28.6%  | 20.0%  |
| Other cities                | 125 | 24.3%  | 9.0%   | 608.1%  | -35.0%  | 71.8%  |
| Towns and villages          | 36  | 3.4%   | 1.4%   | 55.4%   | -38.2%  | 18.2%  |
| Private enterprises         | 182 | 25.0%  | 12.2%  | 608.1%  | -38.2%  | 68.7%  |
| NPOs                        | 28  | 9.8%   | 11.0%  | 53.4%   | -21.1%  | 16.9%  |
| Public corporations         | 39  | 10.6%  | 8.4%   | 78.8%   | -15.0%  | 17.9%  |
| Other organizations         | 7   | 7.1%   | 6.1%   | 31.2%   | -13.4%  | 14.4%  |
| T Company                   | 82  | 23.0%  | 12.4%  | 401.4%  | -22.8%  | 55.9%  |
| V Company                   | 13  | 9.1%   | 1.9%   | 109.5%  | -35.0%  | 33.9%  |
| H Foundation                | 11  | 16.3%  | 14.4%  | 32.2%   | 1.7%    | 9.3%   |

Table 5. IRs of the number of loans for direct management libraries

|                             | n (total) | Mean  | Median | Maximum   | Minimum | SD      |
|-----------------------------|-----------|-------|--------|-----------|---------|---------|
| (All libraries)             | 17,853    | 51.6% | 0.6%   | 524845.0% | -99.8%  | 4477.2% |
| Main libraries              | 8,921     | 63.6% | 0.2%   | 524845.0% | -99.8%  | 5556.6% |
| Annexes                     | 8,932     | 39.7% | 1.2%   | 287100.0% | -98.8%  | 3037.8% |
| Prefectures                 | 468       | 6.0%  | 0.6%   | 289.1%    | -50.2%  | 30.9%   |
| Ordinance-designated cities | 1,371     | 0.9%  | -1.2%  | 259.4%    | -45.6%  | 17.5%   |
| Tokyo special wards         | 881       | 8.5%  | 3.7%   | 312.8%    | -83.4%  | 31.7%   |
| Other cities                | 11,152    | 80.3% | 1.6%   | 524845.0% | -98.8%  | 5664.5% |
| Towns and villages          | 3,981     | 3.7%  | -2.3%  | 1033.3%   | -99.8%  | 45.8%   |

Table 6. IRs of the number of reservations/requests for outsourcing libraries

|                             | n   | Mean   | Median | Maximum | Minimum | SD     |
|-----------------------------|-----|--------|--------|---------|---------|--------|
| (All libraries)             | 281 | 64.0%  | 37.8%  | 1818.5% | -84.8%  | 146.5% |
| Main libraries              | 112 | 69.4%  | 39.0%  | 976.0%  | -84.8%  | 136.0% |
| Annexes                     | 169 | 60.5%  | 36.3%  | 1818.5% | -72.3%  | 152.9% |
| Prefectures                 | 3   | 208.4% | 161.7% | 367.2%  | 96.1%   | 115.5% |
| Ordinance-designated cities | 36  | 76.8%  | 69.0%  | 257.5%  | -12.2%  | 52.7%  |
| Tokyo special wards         | 60  | 44.4%  | 26.0%  | 490.6%  | -72.3%  | 76.1%  |
| Other cities                | 146 | 73.6%  | 40.2%  | 1818.5% | -84.8%  | 189.5% |
| Towns and villages          | 36  | 32.9%  | 18.7%  | 286.2%  | -65.4%  | 66.7%  |
| Private enterprises         | 205 | 60.0%  | 39.7%  | 976.0%  | -72.3%  | 101.7% |
| NPOs                        | 27  | 135.5% | 47.7%  | 1818.5% | -84.8%  | 360.6% |
| Public corporations         | 41  | 45.2%  | 31.7%  | 410.6%  | -37.1%  | 71.3%  |
| Other organizations         | 8   | 21.4%  | 13.5%  | 141.0%  | -48.4%  | 50.4%  |
| T Company                   | 96  | 57.2%  | 40.0%  | 292.4%  | -50.8%  | 68.9%  |
| V Company                   | 13  | 20.6%  | 6.8%   | 122.7%  | -13.6%  | 39.8%  |
| H Foundation                | 11  | 89.7%  | 97.1%  | 107.9%  | 55.6%   | 18.7%  |

Table 7. IRs of the number of reservations/requests for direct management libraries

|                             | n (total) | Mean  | Median | Maximum  | Minimum | SD     |
|-----------------------------|-----------|-------|--------|----------|---------|--------|
| (All libraries)             | 19,300    | 54.1% | 21.5%  | 18100.0% | -96.9%  | 216.1% |
| Main libraries              | 9,280     | 48.5% | 21.2%  | 7435.7%  | -96.9%  | 173.3% |
| Annexes                     | 10,020    | 59.2% | 21.8%  | 18100.0% | -96.1%  | 249.2% |
| Prefectures                 | 426       | 66.4% | 22.4%  | 3677.5%  | -69.9%  | 252.3% |
| Ordinance-designated cities | 1,649     | 43.7% | 16.5%  | 1555.2%  | -92.8%  | 109.6% |
| Tokyo special wards         | 975       | 46.9% | 22.7%  | 3137.6%  | -89.1%  | 176.2% |
| Other cities                | 12,458    | 60.4% | 24.9%  | 18100.0% | -96.9%  | 238.3% |
| Towns and villages          | 3,792     | 38.1% | 12.1%  | 5591.4%  | -96.0%  | 174.0% |

Table 8. IRs of the number of ILL-borrowings for outsourcing libraries

|                             | n   | Mean   | Median | Maximum | Minimum | SD     |
|-----------------------------|-----|--------|--------|---------|---------|--------|
| (All libraries)             | 251 | 65.2%  | 16.7%  | 1484.7% | -80.0%  | 188.0% |
| Main libraries              | 111 | 66.2%  | 24.3%  | 1228.6% | -80.0%  | 172.3% |
| Annexes                     | 140 | 64.4%  | 12.0%  | 1484.7% | -77.3%  | 199.5% |
| Prefectures                 | 3   | 31.9%  | 5.6%   | 88.9%   | 1.4%    | 40.3%  |
| Ordinance-designated cities | 26  | 101.3% | 23.0%  | 700.0%  | -54.8%  | 200.2% |
| Tokyo special wards         | 64  | 14.0%  | 1.3%   | 570.3%  | -77.3%  | 85.1%  |
| Other cities                | 124 | 81.2%  | 32.0%  | 1484.7% | -71.1%  | 219.9% |
| Towns and villages          | 34  | 78.4%  | 23.4%  | 841.4%  | -80.0%  | 181.4% |
| Private enterprises         | 179 | 48.0%  | 14.7%  | 1228.6% | -77.3%  | 138.1% |
| NPOs                        | 27  | 184.9% | 45.8%  | 1484.7% | -71.1%  | 382.6% |
| Public corporations         | 37  | 75.1%  | 20.5%  | 700.0%  | -45.9%  | 165.1% |
| Other organizations         | 8   | 0.4%   | 5.9%   | 69.4%   | -80.0%  | 45.2%  |
| T Company                   | 75  | 42.3%  | 32.1%  | 352.1%  | -64.1%  | 70.8%  |
| V Company                   | 15  | -2.9%  | 0.9%   | 42.2%   | -37.0%  | 23.6%  |
| H Foundation                | 9   | 184.3% | 60.2%  | 700.0%  | -38.0%  | 270.2% |

Table 9. IRs of the number of ILL-borrowings for direct management libraries

|                             | n (total) | Mean  | Median | Maximum  | Minimum | SD     |
|-----------------------------|-----------|-------|--------|----------|---------|--------|
| (All libraries)             | 15,460    | 60.6% | 11.6%  | 50350.0% | -99.6%  | 658.9% |
| Main libraries              | 9,177     | 71.4% | 14.6%  | 50350.0% | -99.4%  | 822.0% |
| Annexes                     | 6,283     | 44.8% | 6.9%   | 14400.0% | -99.6%  | 284.2% |
| Prefectures                 | 475       | 49.6% | 27.2%  | 1097.5%  | -99.0%  | 103.6% |
| Ordinance-designated cities | 1,235     | 36.9% | 12.2%  | 1433.3%  | -93.1%  | 110.6% |
| Tokyo special wards         | 944       | 8.8%  | 3.5%   | 354.8%   | -98.7%  | 47.2%  |
| Other cities                | 9,176     | 57.6% | 10.7%  | 50350.0% | -99.6%  | 711.3% |
| Towns and villages          | 3,630     | 91.2% | 15.1%  | 31100.0% | -99.4%  | 749.7% |

Table 10. IRs of the number of ILL-lendings for outsourcing libraries

|                             | n   | Mean    | Median | Maximum   | Minimum | SD       |
|-----------------------------|-----|---------|--------|-----------|---------|----------|
| (All libraries)             | 198 | 782.2%  | 43.1%  | 128220.0% | -99.9%  | 9089.0%  |
| Main libraries              | 98  | 177.0%  | 39.9%  | 4740.0%   | -99.9%  | 569.3%   |
| Annexes                     | 100 | 1375.3% | 60.0%  | 128220.0% | -85.7%  | 12749.2% |
| Prefectures                 | 3   | 157.9%  | 71.0%  | 343.4%    | 59.2%   | 131.3%   |
| Ordinance-designated cities | 25  | 82.4%   | 73.3%  | 270.0%    | -85.7%  | 81.1%    |
| Tokyo special wards         | 56  | 105.2%  | 62.0%  | 686.0%    | -53.6%  | 163.7%   |
| Other cities                | 86  | 1673.4% | 39.5%  | 128220.0% | -99.9%  | 13738.8% |
| Towns and villages          | 28  | 90.7%   | 19.8%  | 1004.1%   | -86.6%  | 242.6%   |
| Private enterprises         | 139 | 1043.2% | 57.4%  | 128220.0% | -99.9%  | 10829.6% |
| NPOs                        | 22  | 295.3%  | 12.6%  | 4740.0%   | -62.1%  | 983.1%   |
| Public corporations         | 31  | 107.5%  | 40.0%  | 829.2%    | -64.2%  | 201.7%   |
| Other organizations         | 6   | 7.0%    | 21.3%  | 65.9%     | -86.6%  | 50.8%    |
| T Company                   | 55  | 162.8%  | 39.0%  | 2344.2%   | -75.5%  | 384.8%   |
| V Company                   | 9   | 73.1%   | -6.3%  | 473.0%    | -53.6%  | 155.2%   |
| H Foundation                | 9   | 117.8%  | 120.9% | 270.0%    | -10.3%  | 82.2%    |

Table 11. IRs of the number of ILL-lendings for direct management libraries

|                             | n (total) | Mean   | Median | Maximum  | Minimum | SD      |
|-----------------------------|-----------|--------|--------|----------|---------|---------|
| (All libraries)             | 12,278    | 152.0% | 14.2%  | 54550.0% | -99.6%  | 1272.9% |
| Main libraries              | 7,886     | 169.1% | 17.4%  | 50900.0% | -99.6%  | 1190.5% |
| Annexes                     | 4,392     | 121.3% | 7.6%   | 54550.0% | -99.6%  | 1408.2% |
| Prefectures                 | 483       | 27.7%  | 8.8%   | 1652.1%  | -92.2%  | 125.3%  |
| Ordinance-designated cities | 850       | 62.8%  | 7.5%   | 6788.6%  | -98.1%  | 354.3%  |
| Tokyo special wards         | 904       | 33.8%  | -1.3%  | 2850.0%  | -98.6%  | 161.6%  |
| Other cities                | 7,397     | 173.9% | 17.3%  | 54550.0% | -99.6%  | 1525.2% |
| Towns and villages          | 2,644     | 182.6% | 17.5%  | 20100.0% | -99.3%  | 975.2%  |

Table 12. IRs of the number of reference transactions for outsourcing libraries

|                             | n   | Mean    | Median  | Maximum  | Minimum | SD      |
|-----------------------------|-----|---------|---------|----------|---------|---------|
| (All libraries)             | 178 | 665.7%  | 24.1%   | 45205.3% | -89.7%  | 4594.6% |
| Main libraries              | 62  | 1635.0% | 50.0%   | 45205.3% | -89.7%  | 7614.5% |
| Annexes                     | 116 | 147.6%  | 21.4%   | 8377.3%  | -84.4%  | 795.9%  |
| Prefectures                 | 3   | 186.2%  | 87.0%   | 409.6%   | 62.1%   | 158.3%  |
| Ordinance-designated cities | 27  | 45.7%   | 16.6%   | 714.7%   | -73.0%  | 147.1%  |
| Tokyo special wards         | 42  | 122.0%  | 10.9%   | 2080.8%  | -80.7%  | 423.3%  |
| Other cities                | 91  | 1216.5% | 36.0%   | 45205.3% | -89.7%  | 6370.2% |
| Towns and villages          | 15  | 58.3%   | 60.0%   | 231.0%   | -80.1%  | 96.0%   |
| Private enterprises         | 140 | 784.2%  | 26.9%   | 45205.3% | -84.4%  | 5164.5% |
| NPOs                        | 12  | 285.4%  | 21.3%   | 2601.8%  | -89.7%  | 713.2%  |
| Public corporations         | 22  | 27.5%   | 16.9%   | 269.8%   | -51.8%  | 65.2%   |
| Other organizations         | 4   | 1168.2% | 1048.7% | 2407.5%  | 168.0%  | 964.5%  |
| T Company                   | 60  | 970.9%  | 35.3%   | 45205.3% | -80.1%  | 5857.8% |
| V Company                   | 14  | 38.7%   | 9.4%    | 356.2%   | -84.4%  | 107.8%  |
| H Foundation                | 11  | 12.3%   | 16.6%   | 48.7%    | -39.9%  | 19.9%   |

Table 13. IRs of the number of reference transactions for direct management libraries

|                             | n (total) | Mean   | Median | Maximum   | Minimum | SD      |
|-----------------------------|-----------|--------|--------|-----------|---------|---------|
| (All libraries)             | 12,262    | 170.5% | 1.7%   | 330280.0% | -99.9%  | 3223.2% |
| Main libraries              | 6,058     | 152.5% | 0.2%   | 67816.7%  | -99.2%  | 1429.8% |
| Annexes                     | 6,204     | 188.1% | 3.5%   | 330280.0% | -99.9%  | 4305.4% |
| Prefectures                 | 497       | 13.4%  | 1.7%   | 667.5%    | -78.9%  | 62.0%   |
| Ordinance-designated cities | 1,541     | 56.3%  | 8.4%   | 7131.4%   | -95.7%  | 298.3%  |
| Tokyo special wards         | 698       | 54.5%  | -1.4%  | 5540.0%   | -96.1%  | 335.9%  |
| Other cities                | 7,491     | 221.0% | 2.0%   | 330280.0% | -99.9%  | 3998.0% |
| Towns and villages          | 2,035     | 149.2% | -3.4%  | 67816.7%  | -99.8%  | 1903.3% |

Table 14. IRs of the number of document copies for outsourcing libraries

|                             | n   | Mean  | Median | Maximum | Minimum | SD     |
|-----------------------------|-----|-------|--------|---------|---------|--------|
| (All libraries)             | 223 | 31.9% | 2.1%   | 3828.9% | -81.2%  | 272.3% |
| Main libraries              | 89  | 60.8% | 5.8%   | 3828.9% | -71.1%  | 406.4% |
| Annexes                     | 134 | 12.7% | -2.1%  | 1218.7% | -81.2%  | 112.9% |
| Prefectures                 | 3   | 10.9% | 6.5%   | 24.5%   | 1.6%    | 9.9%   |
| Ordinance-designated cities | 34  | 7.9%  | 7.6%   | 70.4%   | -49.6%  | 32.7%  |
| Tokyo special wards         | 49  | -0.5% | -4.3%  | 126.2%  | -63.6%  | 29.1%  |
| Other cities                | 110 | 57.9% | 2.1%   | 3828.9% | -81.2%  | 383.5% |
| Towns and villages          | 27  | 17.7% | 12.8%  | 303.2%  | -45.4%  | 66.7%  |
| Private enterprises         | 169 | 36.7% | -0.2%  | 3828.9% | -81.2%  | 310.5% |
| NPOs                        | 19  | 37.6% | 5.7%   | 303.2%  | -71.1%  | 94.1%  |
| Public corporations         | 31  | 4.4%  | 8.3%   | 103.4%  | -62.2%  | 35.8%  |
| Other organizations         | 4   | 17.8% | 27.3%  | 53.2%   | -36.4%  | 33.6%  |
| T Company                   | 73  | 23.1% | -0.8%  | 1218.7% | -75.5%  | 149.5% |
| V Company                   | 14  | -4.9% | -8.0%  | 33.5%   | -42.9%  | 17.0%  |
| H Foundation                | 10  | 19.9% | 15.1%  | 70.4%   | -11.6%  | 26.8%  |

Table 15. IRs of the number of document copies for direct management libraries

|                             | n (total) | Mean   | Median | Maximum   | Minimum | SD       |
|-----------------------------|-----------|--------|--------|-----------|---------|----------|
| (All libraries)             | 14,659    | 61.7%  | -13.4% | 348086.6% | -99.9%  | 3678.6%  |
| Main libraries              | 7,620     | 107.4% | -12.5% | 348086.6% | -99.9%  | 5080.4%  |
| Annexes                     | 7,039     | 12.2%  | -14.5% | 29688.7%  | -99.5%  | 484.8%   |
| Prefectures                 | 461       | -5.7%  | -10.7% | 363.4%    | -88.1%  | 35.4%    |
| Ordinance-designated cities | 1,370     | 435.9% | -16.8% | 348086.6% | -94.4%  | 11715.5% |
| Tokyo special wards         | 780       | -10.6% | -15.9% | 365.2%    | -96.7%  | 35.8%    |
| Other cities                | 9,314     | 29.9%  | -13.2% | 58652.1%  | -99.9%  | 1039.7%  |
| Towns and villages          | 2,734     | 14.6%  | -10.1% | 3360.0%   | -93.7%  | 126.5%   |

## 5. Conclusions

In this study, we calculated the IRs for seven library usages to investigate changes in library usage after the introduction of outsourcing. The results of our investigation suggest that the IRs tended to increase after the introduction of outsourcing, and the rate of the increase for outsourcing libraries was higher than that for direct management libraries during the same period. In addition, similar tendencies were shown for each type of library such as main, annex, type of municipality, and type of administrator. Based on this, we suggest that the introduction of outsourcing promotes library usage.

In the future, we aim to examine the cause of the increase of IRs for outsourcing libraries. Furthermore, we hope to focus not only on library usage, but also on other library services such as reference services, book selection, and loan services to users to clarify the impact of switching to outsourcing by Japanese libraries.

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