Quantitative analysis of rent arrears in private rental housing in Japan

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Abstract—**This study is the first large-scale quantitative analysis of private rental housing rent arrears in Japan. The study data are from the Leasing Information Communication Center (LICC), which operates a private rental housing rent arrears information database. There are 728 759 data items used in this study, which is the largest scale with the smallest bias. This study aims to provide analysis results required for the discussion of a housing safety net and social loss due to rent arrears. We define new indicators of rent arrears and analyze them. The main findings are as follows. First, the rent arrears rate is about 3%, and in particular, long-term rent arrears are a serious issue for lessors. Second, 0.73% of contracts for long-term rent arrears account for 67% of the total loss. Small lessors cannot always accept loss of long-term rent arrears. Third, social loss due to rent arrears is estimated to be about 68.3 billion yen in Japan. Serious rent arrears do not occur very infrequently, but bring great loss to lessors once they arise. Small-scale lessors are affected more by rent arrears than others. Rent arrears are a social problem that must be solved in Japan.**

Keywords-private rental housing; rent arrears; housing safety net; credit information

I. INTRODUCTION

A. Research background and previous research

After the Lehman Brothers Shock of 2008, a large number of *haken-giri* (layoffs of temporary employees dispatched to companies by staffing agencies) were carried out and a *Kosetsu Hakenmura* (Public Village for Temporary Workers) was opened in Hibiya Park, rent arrears in private rental housing were recognized clearly as a social problem in Japan. Subsequently, newspapers frequently reported cases of people who lost their homes through illegal evictions. In response, in February 2009, the Ministry of Land, Infrastructure, Transport and Tourism prepared documents from Tokyo for industry groups requesting business optimization and in March 2010, this request was submitted to the Diet under the Residence Stabilization Act.

In this field, the only research into the actual conditions of rent arrears is essentially Hirayama [1], which focuses on rent arrears in public housing. In terms of surveys by industry groups, the Japan Property Management Association Research Institute [2] conducted a survey on the rent arrears rate, but it did not include a specific monetary scale or the results of detailed quantitative analysis. Thus, there is no previous research using large-scale quantitative analysis on private rental housing rent arrears.

Among the reasons why there is no previous research is the fact that a large volume of data on rent payments that includes sufficient information on the attributes of people entering into rental contracts (hereafter, “renters”) based on unified criteria has not been accumulated. Even though housing construction-related companies possess hundreds of thousands of rental contracts, rent settings and renter attributes are assumed to be within a predetermined range as the designs of buildings are comparatively homogeneous.

B. Discussion on rent arrears

Within this context, various policy debates on rent arrears have taken place without any sort of quantitative evaluation.

With regard to private rental housing rent arrears, Nakano [3] noted that, “Since the unrecovered rent rate is only about 0.01% of the total, the amount of unrecovered money that is passed on to renters is insignificant.” On the other hand, the Council for Social Infrastructure [4] stated, “The increase in arrears costs from one group of people who are repeatedly and continuously in arrears that is borne by the many other renters in the form of higher rent and guarantee fees has become a problem from the perspective of fairness, and it is important to take a viewpoint for the benefit of renters as a whole.”

Moreover, Kikuchi [5] pointed out that, “It is possible to consider public funding and the financing system for guarantees for rent arrears among elderly and disabled households to be a part of social security benefits.”

C. Research objective

If the actual situation of private rental housing rent arrears could be clarified quantitatively, it would be possible to progress the various abovementioned discussions. Therefore, the objective of this research is to clarify quantitatively such variables as the rate of occurrence of rent arrears, the ratio of long-term rent arrears to total rent arrears, and differences in arrears rates according to rent band, gender, age, and other factors.

It is considered that Japan is approaching a phase in which it will have to reconstruct its safety net owing to the future aging of the population and widening of the income gap. In this context, it is considered that the results of a quantitative analysis of private rental housing rent arrears would contribute significantly to policy creation by providing the basic facts that it requires.

II. FRAMEWORK FOR EMPIRICAL ANALYSIS OF RENT ARREARS

A. Data

This research uses data registered in the private rental housing rent arrears information database provided by the Leasing Information Communication Center (LICC)[6].

In addition to the number of data items on public housing, Urban Renaissance Agency (UR) public corporation housing, and provided by the LICC for the top 10 ranked private rental housing management companies, Table I shows the number of managed properties by 13 management agencies, and the ratios of rented properties and privately rented properties as percentages of the total.

There is clear bias in the attributes of the renters of public housing and UR Public Corporation housing, while among private companies, there are many housing construction-related companies and, as a result, bias is due to their building specifications and construction areas.

Conversely, the data registered by the LICC is from 13 guarantee companies, including several leading industry companies, and there are tens of thousands of data items on real estate companies and landlords, which are the LICC's business partners. Thus, the LICC database has more data items than even the top ranking company in the private sector, and therefore, there is comparatively little bias in the database, which can be considered a representative database that has been unified to a standard able to withstand quantitative evaluation.

Prior to the analysis, data cleansing was carried out, including to remove items with addresses that could not be processed normally. As a result, the numbers of targeted data items were as follows: 728 759 rental contracts, and 11 .4 million subrogation payment data (in principle, monthly rental contracts), giving an average of 15.6 items per rental contract. Public housing was not included in this data.

There are around 13.36 million private rental properties with residents in total nationwide, according to the Statistics Bureau of the Ministry of Internal Affairs and Communications [7], which is 5.5% of the number of targeted data items.

The first month of tenancy for the target data (the first month of the guarantee contract) was set as March 2010, and the last subrogation payment information registration month as December 2012, meaning there were at most 34 months from the start of tenancy.

The regional distribution includes data on all 47 prefectures, while the number of targeted rental contracts was less than 100

TABLE I . NUMBER OF MANAGED RENTAL PROPERTIES BY MANAGEMENT AGNCY

Rank	Management agency (company	No. of managed properties	Ratio of total rental properties	Ratio of private rental properties
1	Public Housing	2,089,000	11.8%	-
2	UR Public Corporation	918,000	5.2%	-
3	**LICC**	**730,206**	**4.1%**	**5.5%**
4	Daito Trust Construction	694,205	3.9%	5.2%
5	Leopalace 21	556,207	3.1%	4.2%
6	Sekisui House Group	489,967	2.8%	3.7%
7	Starts Group	319,767	1.8%	2.4%
8	Daiwa Living	297,948	1.7%	2.2%
9	Able	192,309	1.1%	1.4%
10	Housemate Group	170,657	1.0%	1.3%
11	Minitech (MiniMini)	166,260	0.9%	1.2%
12	Token Corporation	153,936	0.9%	1.2%
13	Taisei Housy Group	80,058	0.5%	0.6%

Total number of rental properties	17,700,000
Total number of private rental pro	13,366,000
Ratio of private rental properties	75.5%

only for Shimane Prefecture and less than 1 000 only for Fukui Prefecture and Yamanashi Prefecture.

A condition of becoming a member of the LICC is membership of the Rent Guarantee Operators Council (hereafter, "the Council") of the Japan Property Management Association (JPMA).

Members of the Council are obliged to comply with voluntary rules for business optimization that the Council has established, and therefore, it is considered that this data is not affected by a shortening of the arrears period by illegal evictions or other such factors.

B. Definitions of indicators

In many cases, the payment deadline for monthly rent is the 25th of each month. Therefore, even supposing that a person is in arrears, in many cases, the arrears are eliminated quickly. A characteristic of arrears is that even if there is a large amount of arrears at the start of the month, by the end of the month, this has been paid, and thus, both the arrears rate and monetary arrears amount fluctuate greatly within the period of a month.

In addition, a feature of rent arrears as a monetary debt is that unlike housing loans and cash loans, in which the total amount of debt is fixed at the time of borrowing, if arrears continue, then the total debt increases without limit until the debt is cleared.

As there are no accepted definitions for the indicators of rent arrears, upon considering the above characteristics, we newly defined the indicators as follows:

Number of elapsed months ＝ number of months of tenancy, with the month the tenancy began as zero.

The reason why the month the tenancy began is set as zero is that generally, the rent for the first month is paid in advance at the time of entering into the rental contract, and so, it is considered that rent arrears practically never occur for this month. The arrears rate is defined as follows:

Arrears rate ＝ number of cases of arrears / number of rental contracts.

Generally, the number of rental contracts with the arrears rate as the denominator is in many cases calculated only from contracts during the tenancy period. However, this research includes not only contracts still in the tenancy period, but also contracts that have been completed already. Next, the arrears loss rate is defined as follows:

Arrears loss rate ＝ cumulative arrears amount / cumulative rent amount.

The arrears loss rate expresses the ratio of the cumulative arrears amount relative to the cumulative rent amount, and the monthly cumulative rent amount is the original rental contract amount, including common area expenses, multiplied by the number of elapsed months. Next, the number of arrears months is defined as follows.

Number of arrears months ＝ cumulative arrears amount / initially contracted monthly rent.

The number of arrears months generally is considered to express the arrears period, but it is not necessarily the case that arrears are always continuous. Therefore, the cumulative arrears amount expresses the amount corresponding to the total amount for the number of arrears months from the initially contracted monthly rent amount, including common area expenses. The number of arrears months is rounded down when the period is more than 1 month and rounded up when it is less than 1 month. However, an arrears monetary amount of less than 10 000 yen is considered to correspond to zero arrears months.

It is important to have a record date, as the numerical values for the arrears rate, arrears loss rate, and number of arrears months differ greatly between the beginning and the end of the month. In this research, the record date is set as the 20th of each month from the LICC's data registration regulations.

III. EMPRICAL ANALYSIS

A. Number of data items by prefecture and basic rent statistics

Table II shows the number of targeted data items by prefecture and basic statistics related to rent. The number of data items excluded by the data cleansing was an extremely small number, or 1.41% of the total.

TABLE Ⅱ. NUMBER OF DATA ITEMS ACCORDING TO PREFECTURE AND RENT BASIC STATISTICS

Prefecture	Data No. of items	Rent Ave	SD	Min	Max	Data No. excluded	Exclusion rate
Hokkaido	14,800	48,682	17,960	10,000	119,750	224	1.49%
Aomori Prefecture	3,236	44,853	12,642	15,000	88,000	37	1.13%
Iwate Prefecture	7,073	43,517	12,493	13,000	89,500	71	0.99%
Miyagi Prefecture	18,170	48,581	16,062	10,000	108,400	237	1.29%
Akita Prefecture	4,379	43,963	11,431	10,000	79,000	71	1.60%
Yamagata Prefecture	2,707	47,021	13,685	12,000	89,000	15	0.55%
Fukushima Prefecture	4,959	44,029	12,213	10,000	89,000	80	1.59%
Ibaraki Prefecture	7,087	50,123	15,084	13,000	99,000	74	1.03%
Tochigi Prefecture	3,951	48,555	14,564	15,000	99,525	48	1.20%
Gunma Prefecture	5,712	46,580	12,873	10,000	89,000	38	0.66%
Saitama Prefecture	28,343	61,949	19,493	14,780	129,500	340	1.19%
Chiba Prefecture	43,206	60,200	20,401	11,000	129,800	525	1.20%
Tokyo	101,691	90,449	37,331	10,000	239,600	1,777	1.72%
Kanagawa Prefecture	36,729	72,805	26,879	10,000	169,700	525	1.41%
Niigata Prefecture	1,668	48,271	14,621	12,000	95,000	9	0.54%
Toyama Prefecture	1,961	48,518	12,236	17,200	88,000	15	0.76%
Ishikawa Prefecture	4,037	49,052	14,308	10,400	99,000	30	0.74%
Fukui Prefecture	554	50,428	14,017	10,000	99,050	3	0.54%
Yamanashi Prefecture	717	49,369	13,531	19,000	88,150	11	1.51%
Nagano Prefecture	1,029	50,038	13,787	15,000	98,000	14	1.34%
Gifu Prefecture	2,049	53,932	12,956	15,000	99,630	24	1.16%
Shizuoka Prefecture	4,108	58,234	14,862	18,400	109,000	41	0.99%
Aichi Prefecture	27,240	61,806	17,475	14,000	129,900	451	1.63%
Mie Prefecture	2,867	52,971	14,187	19,000	97,950	12	0.42%
Shiga Prefecture	4,567	52,413	13,924	14,050	98,000	75	1.62%
Kyoto	20,152	60,610	19,292	10,000	129,970	339	1.65%
Osaka prefecture	77,981	62,809	22,060	10,000	149,800	1,388	1.75%
Hyogo Prefecture	29,120	61,067	20,152	10,000	139,900	583	1.96%
Nara Prefecture	2,905	51,904	18,559	10,000	119,000	43	1.46%
Wakayama Prefecture	1,576	50,654	12,642	16,500	89,000	13	0.82%
Tottori Prefecture	1,390	47,335	12,240	20,000	88,000	7	0.50%
Shimane Prefecture	82	55,232	6,155	45,000	69,500	0	0.00%
Okayama Prefecture	12,103	48,384	14,282	10,000	99,000	125	1.02%
Hiroshima Prefecture	17,000	48,965	15,604	11,000	99,000	253	1.47%
Yamaguchi Prefecture	1,461	51,278	14,112	15,000	92,575	8	0.54%
Tokushima Prefecture	3,484	46,053	13,197	11,500	88,000	26	0.74%
Kagawa Prefecture	4,660	45,484	13,739	14,000	88,000	33	0.70%
Ehime Prefecture	6,855	47,319	12,913	10,250	89,800	41	0.59%
Kochi Prefecture	1,606	44,899	12,580	14,000	89,000	10	0.62%
Fukuoka Prefecture	110,563	49,878	16,354	10,000	109,950	1,627	1.45%
Saga Prefecture	5,019	49,063	12,474	15,000	88,800	53	1.04%
Nagasaki Prefecture	10,700	48,185	13,894	14,000	89,150	114	1.05%
Kumamoto Prefecture	20,467	47,247	13,697	12,000	89,500	257	1.24%
Oita Prefecture	18,688	47,057	13,727	10,000	89,900	230	1.22%
Miyazaki Prefecture	14,247	43,323	12,441	10,000	89,000	115	0.80%
Kagoshima Prefecture	6,383	46,148	13,101	10,000	88,000	71	1.10%
Okinawa Prefecture	29,477	49,839	13,472	10,000	99,800	349	1.17%
All	728,759	59,709	26,025	10,000	239,600	10,432	1.41%

SD indicates the standard deviation

The maximum rent value is generally around 100 000 yen outside of the three major metropolitan areas, and the maximum value in Tokyo is 239 600 yen, which is within the general rent band.

B. Arrears rate and arrears loss rate

Fig. 1 shows the trends in the arrears rate and arrears loss rate for each of the elapsed months.

The arrears rate becomes stable after reaching around 3.5% after 12 months. Immediately after the start of tenancy, the arrears loss rate rises to 1.7%, but over the passage of some months, it converges at about 0.6%. The fact that the arrears loss rate does not decline even as the number of months elapsed increases indicates that the arrears amount is increasing. In other words,

this shows that some people in arrears who continue to reside on the properties remain in arrears, or that some do not repay their arrears even after leaving the properties.

An arrears loss rate of around 0.6% does not include personnel costs for issuing reminders and other costs, and so, the actual cost incurred by the landlord may be several times this amount.

In addition, while it is not shown in Fig. 1, the arrears rate of renters during their tenancy period peaks approaching the 12-month point at around 2.7%.

This is lower than the 3.3% from the arrears amount rate at the end of 1 month in the JPMA survey for the first half of 2012 (as it is 1 month's arrears, it can be considered to be essentially the same as the arrears rate. Thus, the arrears rate obtained from the data used in this study may be lower than the arrears rate for the market as a whole.

C. Arrears rate for long-term arrears

Fig. 2 shows the trends for each elapsed month in the total arrears rate and the rates for arrears of 4 months or more and 7 months

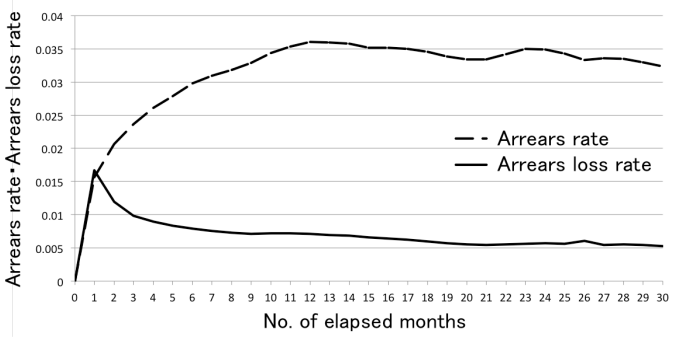

Figure 1. Trends in the arrears rate and arrears loss rate.

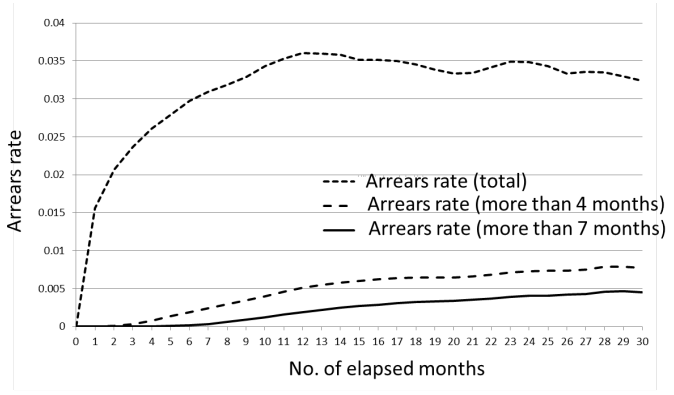

Figure 2. Trends in the total arrears rate and the rates for arrears of 4 months or more and 7 months or more.

or more.

Arrears of 4 months or more involve a state of repeated and continual arrears and also a state in which it is very highly likely that the principle of the breakdown of trust, which is the condition for the contract to be cancelled, will be applied to the rental contract. Seven months of arrears is the shortest possible time for the completion of forced payment following legal proceedings and a legal ruling in the event that the rental contract was cancelled after 3 arrears months and the landlord immediately initiated legal proceedings.

After reaching 3.5% after 12 months, the total arrears rate essentially stays as this level, and the rates of arrears of 4 months or more and of 7 months or more rises alongside the increase in the number of elapsed months. After 24 months, the rate of arrears of 4 months or more is 0.73% and of 7 months or more is 0.4%.

This indicates that while the total arrears rate does not change significantly, the content of the arrears has deteriorated. In other words, while the number of people in arrears has not increased, among those in arrears, there is an increasing rate of those in arrears for a large number of months.

D. Ratio of long-term arrears to total arrears

Fig. 3 shows the trends in the ratio of the arrears amounts of 4 months or more and 7 months or more relative to the total arrears amount for each of the elapsed months.

After 24 months, the arrears amount of 4 months or more constitutes 60.8% of the total arrears amount, and after 30 months, it reaches 67.3%. Similarly, after 24 months, the arrears amount of 7 months or more constitutes 43.3% of the total

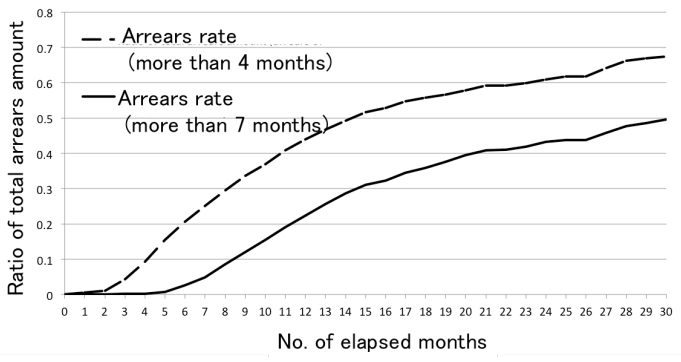

Figure 3. Trends in the arrears amount rate and ratio of arrears of 4 months or more and 7 months or more relative to the total arrears amount.

arrears amount, and after 30 months, has reached 49.5%.

This constitutes the majority of the arrears amount from those people who are repeatedly and continually in arrears, which in

Fig. 2 was a negligible amount of less than 1% of the total.

As described in Subsection III.B, if seen from the average, there is a loss of about 0.6% for lessors, but it is not the case that all lessors incur a loss of around 0.6%.

In private rental housing, privately owned properties constitute approximately 85% of the total, 60.4% of the private landlords are aged 60 years and older, while 28.3% of landlords own 10 properties or less and 55.1% 20 properties or less, meaning there are many elderly micro-manager landlords.

In the case of investment corporations and related organizations that own several hundred rental properties, a loss due to rent arrears can be leveled out completely. However, in the case of small-scale managers, such as individual landlords owning eight properties, even though the group of people who are repeatedly and continually in arrears constitute less than 1%, once a person becomes repeatedly and continually in arrears, the arrears amount after 12 months is equivalent to 1 year's worth of arrears, which is 12.5%, of the total rent. This cannot be described as a small amount, both in terms of economic and psychological impact on landlords.

E. Results of logistic regression on occurrence of rent arrears

Various reasons can be considered for why rent arrears occur, but the research has been insufficient. The data used in this research do not include information on renters' attributes, such as their family situations, annual income, and occupations, and consequently, a full analysis was not possible. However, an analysis was carried out using rent, region, age, and gender, which were included in the data.

A binomial logistic regression analysis was carried out with the objective variable being whether 3 months of arrears had been reached, as this is the time generally considered for relations of trust between the renter and landlord to have been broken. This means the condition for the cancellation of the contract has been met, with the rent band, gender, and age group as the explanatory variables and prefecture of residence as the dummy variables.

In addition, as the difference in rent between regions is large, the regions of analysis were set as Saitama Prefecture, Chiba Prefecture, Tokyo, and Kanagawa Prefecture. Furthermore, as the arrears rate changes according to the number of months elapsed from the start of tenancy, the period of analysis was set as more than 24 elapsed months.

Table III shows the rent- and age-related descriptive statistics. As Tokyo's average rent is high and the standard deviation is also large, the maximum rent is also high, at slightly less than 240 000 yen.

Table IV shows the results of the binomial logistic regression analysis.

With regard to age, the baseline was 40–44 years, which includes the average age; with regard to rent, the baseline was the 70 000 yen range, which includes the average rent; with regard to gender, the baseline was females; and with regard to prefectures, the baseline was Tokyo. The coefficients of determination adjusted for the degree of freedom were 0.016 in Tokyo and the three prefectures, 0.018 in Tokyo, 0.020 in Kanagawa Prefecture, 0.037 in Saitama Prefecture, and 0.019 in Chiba Prefecture. All these values are extremely low and the explanatory variables used in this research have very low explanatory power for whether there were arrears of 3 months.

TABLE III. RENT AND AGE DESCRIPTIVE STATISTICS

Rent	Ave	SD	Min	Max	No. of items
Tokyo and 3 prefectures	78,741	33,881	10,000	239,600	61,681
Tokyo	91,908	37,708	10,000	239,600	30,612
Kanagawa Prefecture	73,445	26,470	13,000	169,000	11,117
Saitama Prefecture	62,611	19,341	14,780	129,000	7,433
Chiba Prefecture	60,824	20,258	14,000	129,700	12,519

Age	Ave	SD	Min	Max	No. of items
Tokyo and 3 prefectures	40.2	12.8	20	93	61,681
Tokyo	39.7	12.5	20	93	30,612
Kanagawa Prefecture	41.2	13.1	20	90	11,117
Saitama Prefecture	40.6	13.2	20	91	7,433
Chiba Prefecture	40.4	12.9	20	93	12,519

SD indicates the standard deviation.

TABLE IV. RESULTS OF BINOMIAL LOGISTIC REGRESSION ANALYSIS

■Binomial logistic regression of arrears of one of Tokyo's three prefectures

Objective variable: whether or not rent arrears has reached 3 months. If yes, = 1

Explanatory variable	Tokyo and 3 prefectures									
			Tokyo		Kanagawa Pref.		Saitama Pref.		Chiba Pref.	
	odds ratio	SE	odds ratio	SE	odds ratio	SE	odds rtio	SE	odds ratio	SE
Rent 2 million level dummy	2.31 ***	0.54	2.23 *	1.06	2.58 *	1.28	3.75 ***	1.57	1.02	0.63
Rent 3 million level dummy	1.87 ***	0.24	1.23	0.35	2.13 ***	0.55	1.95 **	0.62	2.15 ***	0.57
Rent 4 million level dummy	1.67 ***	0.19	1.50 **	0.30	1.25	0.32	1.86 **	0.51	2.08 ***	0.52
Rent 5 million level dummy	1.47 ***	0.15	1.28	0.21	1.21	0.28	1.60 *	0.44	2.01 ***	0.50
Rent 6 million level dummy	1.23 **	0.13	1.09	0.17	1.11	0.26	1.15	0.33	1.82 **	0.46
Rent 7 million level dummy	baseline		baseline		baseline		baseline		baseline	
Rent 8 million level dummy	1.21 *	0.14	1.32 *	0.20	1.34	0.32	0.61	0.26	0.95	0.33
Rent 9 million level dummy	1.44 ***	0.17	1.78 ***	0.27	1.03	0.31	0.48	0.26	1.08	0.43
Rent 10 million level dummy	1.81 ***	0.23	2.13 ***	0.34	1.29	0.40	1.50	0.71	1.18	0.55
Rent 11 million level dummy	0.95	0.17	1.23	0.25	0.63	0.30	(omitted)		(omitted)	
Rent 12 million level dummy	1.31	0.22	1.65 *	0.32	0.54	0.33	0.84	0.87	(omitted)	
Rent 13 million level dummy	1.63 ***	0.30	1.75 ***	0.37	1.30	0.63	(omitted)		(omitted)	
Rent 14 million level dummy	1.05	0.25	1.13	0.31	0.88	0.54	(omitted)		(omitted)	
Rent 15 million level dummy	1.40	0.31	1.53 *	0.38	0.94	0.70	(omitted)		(omitted)	
Rent 16 million level dummy	2.57 ***	0.52	2.97 ***	0.66	0.71	0.73	(omitted)		(omitted)	
Rent 17 million level dummy	1.66 *	0.47	1.80 **	0.53	(omitted)		(omitted)		(omitted)	
Rent 18 million level dummy	1.50	0.50	1.61	0.55	(omitted)		(omitted)		(omitted)	
Rent 19 million level dummy	3.07 ***	0.92	3.27 ***	1.01	(omitted)		(omitted)		(omitted)	
Rent 20 million level dummy	2.22 **	0.75	2.40 **	0.83	(omitted)		(omitted)		(omitted)	
Rent 21 million level dummy	1.59	0.74	1.73	0.81	(omitted)		(omitted)		(omitted)	
Rent 22 million level dummy	1.71	0.88	1.84	0.96	(omitted)		(omitted)		(omitted)	
Rent 23 million level dummy	1.26	0.75	1.36	0.81	(omitted)		(omitted)		(omitted)	
Gender _ male dummy	1.80 ***	0.11	1.82 ***	0.16	1.69 ***	0.26	2.32 ***	0.47	1.79 ***	0.27
Gender _ female dummy	baseline		baseline		baseline		baseline		baseline	
Age 20–24-year-old dummy	1.27 *	0.16	1.65 ***	0.30	1.23	0.38	1.06	0.37	0.83	0.24
Age 25–29-year-old dummy	0.88	0.08	1.08	0.14	0.74	0.17	0.80	0.21	0.61 **	0.13
Age 30–34-year-old dummy	0.72 ***	0.07	0.88	0.11	0.48 ***	0.12	0.53 **	0.15	0.64 **	0.13
Age 35–39-year-old dummy	0.78 **	0.08	0.78 *	0.11	0.88	0.20	0.75	0.21	0.71	0.15
Age 40–44-year-old dummy	baseline		baseline		baseline		baseline		baseline	
Age 45–49-year-old dummy	0.98	0.10	1.12	0.17	0.95	0.23	0.95	0.28	0.75	0.19
Age 50–54-year-old dummy	1.01	0.11	1.10	0.18	0.93	0.25	1.02	0.31	0.87	0.21
Age 55–59-year-old dummy	0.75 **	0.10	0.89	0.16	0.89	0.25	0.54	0.21	0.47 **	0.15
Age 60–64-year-old dummy	0.67 ***	0.10	0.79	0.16	0.68	0.22	0.60	0.24	0.48 **	0.16
Age 65–69-year-old dummy	0.81	0.13	0.90	0.22	1.14	0.37	0.35 *	0.21	0.64	0.24
Age 70–99-year-old dummy	0.41 ***	0.10	0.61	0.20	0.45 *	0.22	0.20 **	0.15	0.23 **	0.14
Residence _Saitama Pref. dummy	0.89	0.08								
Residence _Chiba Pref. dummy	0.78 ***	0.06								
Residence _Kanagawa Pref. dummy	0.87 *	0.06								
Residence _ Tokyo dummy	baseline									
Constant term	0.02 ***	0.00	-4.34 ***	0.16	-4.04 ***	0.26	-4.30 ***	0.33	-4.31 ***	0.28
likelihood	-7246		-3756		-1245		-853		-1344	
Number of samples	61,681		30,612		11,117		7,343		12,192	

***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively

SE represents the standard error

Looking at the effects according to rent band, in Tokyo and the three prefectures, significantly positive effects were observed in the baseline of total rent of less than 70 000 yen. In the rent bands above the baseline, there were also significantly positive effects at the 80 000, 90 000, 100 000, 130 000, 160 000, 170 000, 190 000, and 200 000 yen levels.

However, Tokyo and the three prefectures showed different trends when viewed according to prefecture, and positive effects

above the baseline rent band were seen only for Tokyo, while Kanagawa Prefecture, Saitama Prefecture, and Chiba Prefecture were not classified as having positive effects in the rent bands above the baseline. The results according to gender show it is highly likely that overall, there are more men than women in arrears of 3 months or more.

For the results according to age, in Kanagawa Prefecture, Saitama Prefecture, and Chiba Prefecture, negative effects were observed in the 30–34 year group and the 70–79 year group.

In addition, there were clear differences according to place of residence; compared to the baseline of Tokyo, negative effects were observed in Chiba Prefecture and Kanagawa Prefecture, suggesting the arrears rate in Tokyo is high.

IV. CONCLUSION

The total rent arrears rate starts to increase immediately after the start of the rental contract, then, after 12 months, reaches 3.6%, and subsequently, stays around this level. Arrears of 4 months or more constitute 60.8% of the total after 24 months, and by 30 months, have reached 67.3%, when the arrears rate is 0.77%. After 24 months, arrears of 7 months or more constitute 43.3% of the total arrears amount, reaching 49.5% after 30 months, when the arrears rate is 0.45%.

Thus, we understand that the arrears amount of those people who are repeatedly and continually in arrears increases over time.

From the results of the binomial logistic regression analysis, positive effects were observed in Kanagawa Prefecture, Saitama Prefecture, and Chiba Prefecture in the rent band below the baseline, strongly suggesting the possibility that a large amount of rent arrears occurs in the low rent bands. However, the explanatory power of this variable was weak and the relationship with income was not clear, and thus, it is considered highly possible that there are factors behind rent arrears other than income.

The private rental housing rent arrears amount does not converge over the passage of time and instead increases, and if looking from the average, it is around 0.6% of the rent each month.

When roughly calculated from a total of 17.7 million properties and an average rent of 53 594 yen, the total annual arrears amount for the whole of Japan is approximately 68.3 billion yen. This does not include the costs to eliminate the arrears, personnel costs, and other costs, such as for legal processing.

The total arrears are not what are incurred on an average basis, but what are incurred from some people repeatedly and continually being in arrears. It is highly likely that the management of small-scale landlords is affected greatly by people who are repeatedly and continually in arrears, who they occasionally encounter.

In addition, the total arrears rate is around 3.5% and rent arrears are by no means rare. Moreover, there have been instances of murders due to rent arrears and the psychological burden that rent arrears places on landlords is considerable.

Individual landlords are able to avoid risk, including this psychological burden, by using rent guarantee companies, and this usage is increasing. As of 2010, their use rate was around 27% and annual sales for the industry as a whole had reached 50 billion yen.

As in most cases tenants have to pay the fees of the rent guarantee company, it can be said that the cost of rent arrears due to some persons repeatedly and continually being in arrears is imposed on the majority of tenants, who themselves do not fall into arrears.

In this research, it was not possible to carry out a full analysis of differences in rent arrears according to regions or the attributes of renters. Neither was it possible to analyze fully why people fall into arrears. Thus, these are considered topics for future research.

In addition, there is considered a need for research on methodologies about whether it is possible in some way to suppress rent arrears, as well as research findings for policy issues, such as ways of constructing a housing safety net for people who may need secure housing when moving into low-rent properties, and ways of eliminating the so-called information asymmetry problem.

ACKNOWLEDGMENT

We wish to express our appreciation to the LICC, which provided valuable data for this research. Even as its members compete in the market, the LICC aims to develop its industry and contribute to society through shared operations of managing a rent subrogation payment information database. In addition, we wish to thank the LICC for its cooperation in this research.

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