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Estimation of the Start-up, Closure and Relocation Rates of Local Units

-A case study for Hachioji city based on the NTT Town Page data-

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Abstract

The Entrepreneurship Indicators Programme (EIP) launched in 2006 as a joint project initiated by Eurostat and OECD, has since been conducting an international macro-based comparison focusing on a business demographic analysis of the start-up and closure rates of enterprises based on the business register, a database that uses enterprises and local units as the major statistical units. The programme has also attracted wider concern among economists as research relevant to the recent academic area of business demography.

As with human demography, the demographic events in businesses include the natural changes of start-ups and closures, as well as relocations within and into or away from the area, which are the so-called social changes of spatial movements (openings and closings accompanying relocations). Unless aspects of changes which fall in the latter category are disregarded, the rates of start-ups or closures would in fact be overestimated due to the number of pseudo start-ups and closures caused by relocations.

In this paper, Hachioji City, a city with a population of 550,000 on the outskirts of Tokyo, is taken as the target area. The rates of start-ups, closures and relocations within or outside the area by local units in the target area are estimated for each of the two years 2011 and 2012 based on a crosscheck of the data in the Town Page telephone number database and on the results of a survey conducted by the authors.

Keywords

business demography, local unit, start-up, closure, relocation, EIP, Town Page

Introduction

Since 2011, the Hosei University Japan Statistics Research Institute (JSRI) has updated the data on local units(1) in the target area, Hachioji City, Tokyo, on the final day of January each year, based on NTT Town Page data. By crosschecking every record for each year, it is possible to obtain information not only on the number of existing local units but also on the changes in such units, such as start-ups and closures.

Using the three datasets from the final day of January 2011, January 2012 and January 2013, this paper analyses the natural and social demographic changes in local units within the area in question for each year.

This research was also inspired by the Entrepreneurship Indicators Programme (EIP)[(2)], an international project on business demography being carried out by the Organization of Economic Cooperation and Development (OECD). In addition, concerning previous estimations and associated issues in studies on the measurement of the start-up and closure rates of firms and local units in Japan, as well as the characteristics of the Town Page database and its relation to the population of local units, and so on, please see our forerunning work (Mori and Sakamoto 2012).

1. Data cleaning

Among the telephone numbers included in the Town Page database there are some that for a variety of reasons are not currently in use or have been temporarily disconnected, as well as those that have been set up to inform callers of the new telephone number of a local unit that has relocated out of the area, and so on. We therefore commissioned the task of cleaning the telephone number data to a special agent.

The data cleaning aided in the discovery of some cases in which a new number was being referred to. In these cases, with respect to local units informing callers of an area code number outside the target area (except for free dial and cell phone numbers) we assumed that the local unit had already relocated away from the target area, and the number was excluded as a target of the data crosschecking that was scheduled at a later step in the study. In the same way, the cases which fall into the categories of suspensions, removals, missing numbers and channel errors were also excluded as targets of the record crosschecking.

As for the notations in this paper we denoted the former by N_orig and the latter by N_clnd in order to distinguish the original pre-cleaning dataset from the cleaned dataset. Further, when it is necessary to stipulate the data reference time point, the last two digits of the year have been indicated in brackets. For example, original data from January 2011 are shown as N_orig(11). Table 1 shows the relation between the list of items obtained as a result of cleaning the telephone numbers, the original data N_orig(*), and the cleaned data N_clnd(*).

Table 1 Statuses of telephone number cleaning and their relations with N_ori and N_clnd(*)

status	explanation			
active	active telephone number		N_clnd(*)	N_ori
number error	automated switchbord detected wrong number of digits			
unidentified	obtained unidentifiable signals			
improper number	number with nonnumerals			
forward with wrong digit number	forwarding the wrong digit telephone number			
relocation	announcing new numbers due to the relocation	within		
		out	M(out)	
suspended	suspended temporary due to arrearage or other reasons		removed from matching	
removed	removed from channel			
missing number	currently unused number			
channel error	unable to obtain signals			

Table 2 shows the number of local units that have out-relocated (M) and cases excluded from the scope of record crosschecking identified as a result of the cleaning carried out on N_orig(11), N_orig(12) and N_orig(13).

Table 2 cases of out-relocation(*) and exempt from crosschecking

datasets	out-relocation	exempt cases
N_orig(11)	25	773
N_orig(12)	20	174
N_orig(13)	14	122

(*)announcing telephone numbers starting other than 042-6

2. Crosschecking of data across two points in time

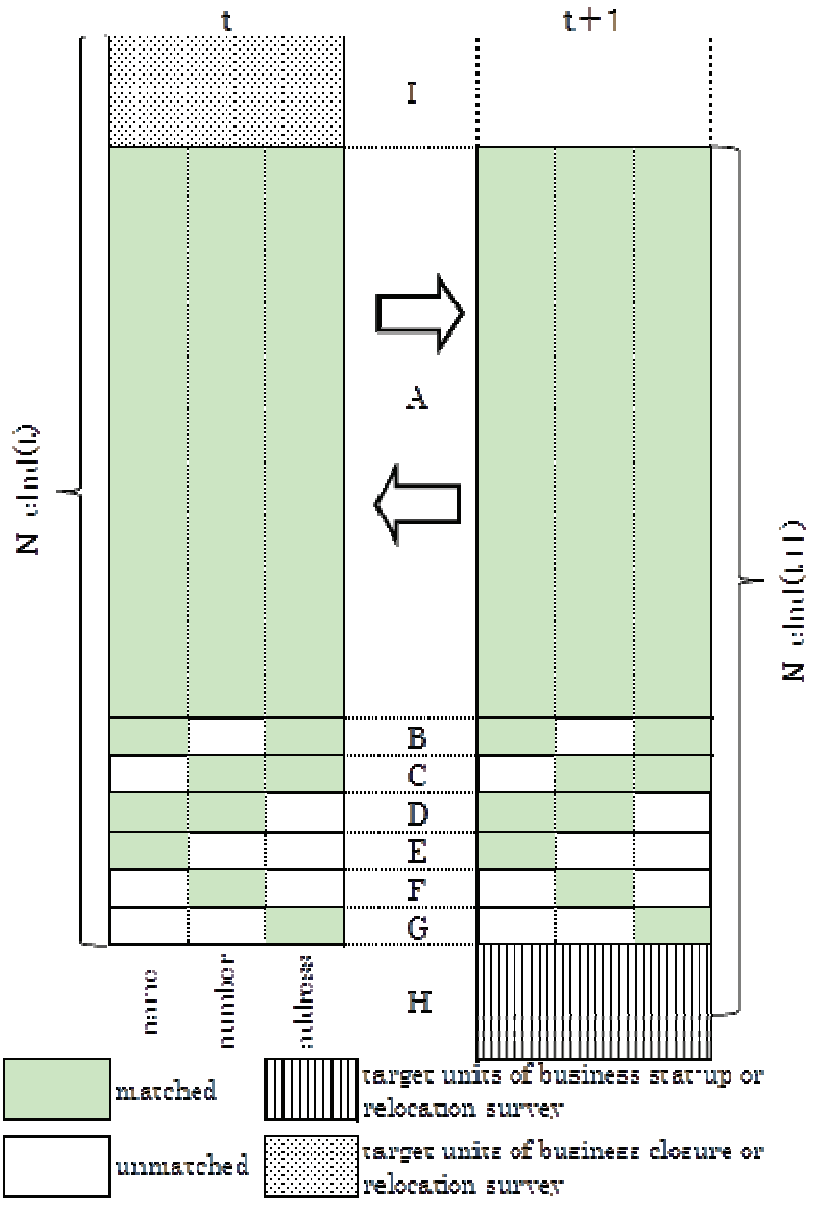
We then obtained the basic data to draw some demographic sketches of local units by using the data for business out-relocation found from the data cleaning and the crosschecked results of the cleaned datasets for two points in time, N_clnd(t) and N_clnd(t+1).

(1) Patterns of crosschecking

As the next step in the data processing, we carried out a crosscheck between two points in time of local units listed in the Town Page using the cleaned datasets N_clnd(t) and N_clnd(t+1), where out-relocation of local units, disconnections and so on that had been revealed by the telephone number cleaning were deleted. For the crosschecking operation we used three variables, i.e. telephone number, name of local unit and street address.

As shown in Figure 1, the results of the crosschecks consist of eight matching patterns: all three variables match, two variables match (three patterns), single variable match (three patterns) and complete disagreement.

Diagram 1 Crosschecking patterns of Town Page data



(i) complete agreement (Category A)

[A] All three variables were matched.

active local unit

(ii) partial agreement – two variables match (Categories B, C and D)

[B] Only the telephone number was changed.

active local unit (Change of telephone from an NTT fixed-line phone to a toll-free one)

[C] Only the name of the local unit was changed.

alteration of the title of the local unit listed in the Town Page

[D] Only the street address was changed.

relocation within the target area not accompanied by a change in telephone number

(iii) partial agreement - one variable match (Category E, F, G)

[E] Only the name of the local unit matched.

relocation within the target area accompanied by a change in telephone number

[F] Only the telephone number was matched.

This category includes local units for which relocation to a relatively nearby location within the target area was not accompanied by a telephone number change, but which took the opportunity of the relocation to alter the local unit name (or the name listed in the Town Page). At the same time, there may exist cases where the same telephone number was used by different local units at the two reference dates. In other words, it is possible that local units which fall into Category F identified in N_clnd(t) were closed units or units that relocated with the accompaniment of a telephone number change, while those identified in N_clnd(t+1) may involve start-ups or relocated local units. Because of this, we treated the former as Category “If,” a quasi-category to the “I” category for the set of completely unmatched cases with the recipient N_clnd(t) as matching record. At the same time, Category F local units included in N_clnd(t+1) were treated in the same manner as “Hf,” a quasi-Category H, complete failure to match, when crosschecked with N_clnd(t) as recipient matching record.

[G] Only the street address was matched.

Of the local unit data belonging to this category, cases of a location of a single local unit and cases of the location of multiple local units that share the same street address among multiple local units give different story. The former indicates the replacement of a local unit by another. In the latter, since one street address is being used for multiple local units, the crosschecking result for Category G indicates not only the replacement of one local unit by another on the same plot of land (tenancy), but a tenancy vacancy due to the withdrawal (business closure or closing due to relocation) or an entry of local units (new start-up or opening accompanying a relocation into the

area from elsewhere) into the unoccupied tenancy. These constitute cases directly related to local unit business demography.

Regarding cases belonging to Category G, the meaning differs depending on which reference time point file the local unit belongs to, either N_clnd(t) or N_clnd(t+1). Local unit data detected as G in N_clnd(t) can be regarded as demographic events (withdrawals), while local units categorized as G in N_clnd(t+1) are those of entries. Because of this, we termed the former "Ig" and the latter "Hg" and decided to include them in the subsequent analyses.

(iv) complete disagreement (Categories H and I)

There also exist completely unmatched records: those which failed to match with N_clnd(t) as the recipient and N_clnd(t+1) as the donor (Category I) and those that failed to match with the recipient and donor in the reverse order (Category H).

(2) Results of crosschecking

The results of the crosschecking using the cleaned data N_clnd(11) with N_clnd(12) and N_clnd(12) with N_clnd(13) are shown in Table 3.

Table 3 Crosschecked cases of cleand datasets

categories	cases	
	2011/2012	2012/2013
A	14,372	13,628
B	72	53
C	210	33
D	144	110
E	39	34
F	10	7
G	0	0
H (inclding Hf、Hg)	545	1,014
I (including If、Ig)	1,150	1,002

The local units belonging to Category I in Table 3 include not only business closures but also out-relocations, relocations within the target area accompanied by a change in local unit name or the title of the published listing, and so on (suspension of listing in the Town Page or change in subscription of the telephone with the telephone company so as not to include the listing of a telephone number in the Town Page that was formerly listed). On the other hand, Category H includes not only start-ups, but also those that have relocated into the target area, those that have relocated within the target area, and so on (a new listing in the Town Page of a telephone number that was already in use or the new listing in the Town Page of a number that is eligible for listing accompanying a change in subscription of the telephone with the telephone company).

Of these cases, the new local unit start-ups and business closures are the *natural*

change of the local units, and the relocations within the target area and relocations into or away from the target area are classified as the *social change*, which together make up the business demography of local units. At the same time, the remainders are simply related to handling within the Town Page, and since there is no change in the existence of the local units between the two points in time, no event occurs for these in relation to demography.

The aim of this paper is to elucidate the scale and level of the natural changes (start-ups, closures) and social changes (relocation) that constitute the different aspects of business demography of local units. Through the crosschecking between the data for two time points, with regard to the relocation aspect within local unit business demography, it was possible for the time being to extract the local unit group that makes up Categories D and E. However, it was not possible to distinguish between natural and social changes by simply using matching procedures.

We therefore attempted to distinguish these two different segments by conducting a survey using a "business start-up or relocation survey form" that targeted each local unit categorized in Category H and the "business closure or relocation survey form" that targeted local units in Category I.

3. Comprehension of the changes through the implementation of a survey

(1) The distribution and collection of the survey forms

Of the local units classified into the different categories by crosschecking between N_clnd(11) and N_clnd(12), a mail survey using the "business start-up or relocation survey form" was conducted with respect to the 545 local units belonging to Category H (including Hf [5] and Hg [155]) in late May 2012. Likewise, a survey using the "business closure or relocation survey form" was conducted with respect to the 1,144 local units belonging to Category I (including If [5] and Ig [218]) in the same period. Of the local units classified into the different categories by crosschecking between N_clnd(12) and N_clnd(13), a survey using the "business start-up or relocation survey form" was conducted with respect to the 1,014 local units belonging to Category H in late May 2013. Likewise, a survey using the "business closure or relocation survey form" was conducted with respect to the 998 local units belonging to Category I in the same period. Table 4-1,4-2 show the years 2012 and 2013 survey results.

Table 4-1 Responses from the 2012, 2013 surveys

＜Business start-up or relocation survey form＞

		year 2012	year 2013
responses	stat-ups	91	152
	relocations into the city	15	37
	relocations within the city	27	50
	new listing	5	10
	change of telephone		
	(subtotal)	138	249
non-responses	undelivered due to the unknown street address	27	23
	nonresponses	380	742
	(subtotal)	407	769
Total		545	1,014

Table 4-2 Responses from the 2012, 2013 surveys

＜Business closure or relocation survey form＞

		year 2012	year 2013
responses	closures	91	66
	relocations outside the city	17	12
	relocations within the city	10(*)	19
	deletion of listing	44	62
	change of telephone	34(*)	24
	suspension of using telephone		2
	(subtotal)	196	185
non-responses	undelivered due to the unknown street address	422	268
	nonresponses	526	545
	(subtotal)	948	813
Total		1,144	998

(*) Three local units which relocated offices within the target area have also changed telephone. We treated them simply as relocation.

(2) Survey response rates

The proportion of the number of responses to the number of survey forms mailed out in each year, after excluding those undelivered due to unknown street address, are as shown in Table 5.

Table 5 Survey response rates by forms

	business start-up or relocation survey form	busine closure or relocation survey form
the 2012 survey	26.6	27.1
the 2013 survey	25.1	25.3

(3) Survey results

(i) “Business start-up or relocation survey form”

From the response results to the “business start-up or relocation survey form,” it is possible to distinguish [1] a new start-up, [2] an opening due to relocation into the target area from outside (relocation inflow), [3] an opening due to relocation within the target area, [4] a new listing due to an application for a listing in the Town Page of an existing local unit, and [5] a new listing due to an application accompanying a change to an eligible telephone number from a telephone number that was not eligible for listing in the Town Page.

Regarding the “business start-up or relocation survey form,” however, 27 forms were undelivered due to an unknown street address in the 2012 survey and 23 in the 2013 survey. It is possible that these “business start-up or relocation survey forms” were undelivered due to an unknown street address cause by a relocation of the local unit (a) during the reference period (February 2011 to January 2012 for the 2012 survey, or February 2012 to January 2013 for the 2013 survey), or (b) during the period between the last day of January 2012 or 2013 and the time when the survey forms were delivered.

As for the former category (a), it is possible that among the local units newly listed in the Town Page due to an application during the two reference periods there were local units that either closed down after that or relocated without applying for forwarding the postal mail. It is inferred that in this case, despite the withdrawal due to closure or relocation, the newly registered listings remained in the Town Page database during the reference period due to lack of notification of the change from the local units in question.

We should understand this kind of local unit relocation from two aspects. The first is that since it is possible that some reason for the local unit to become a survey target for the “business start-up or relocation survey form” occurred at least during the reference period, it is appropriate to treat these cases in the same way as a failure to respond to the survey forms (380 in the 2012 survey and 746 in the 2013 survey). At the same time, these local units also appear as if they should have been targets for the “business closure or relocation survey form.” That is, these local units have also experienced some reasons for relocation in the reference period.

The category (b) would have occurred due to a closure or relocation of the local unit for some reasons during the period after the date when the two sets of Town Page data were crosschecked (January 2012 or January 2013) and when the “business start-up or relocation survey forms” were sent out. We needed approximately four months for the data cleaning operation and the preparation for the survey. This may have been long enough for newly

founded or relocated local units to experience a further change.

It would seem that the occurrence of these demographic events due to the time lag could be prevented by curtailing this time interval. However, there is no way to confirm to which, (a) or (b), these 27 or 23 cases belong. In this paper, therefore, for the sake of convenience, we estimated the number of start-ups, closures and relocations by treating these events as if they had occurred during the reference period.

(ii) "Business closure or relocation survey form"

From the responses to the "business closure or relocation survey forms," it is possible to distinguish [1] a closure, [2] a relocation outside the target area, [3] a relocation within the target area, [4] a deletion of a listing due to an application for suspension of a listing in the Town Page, and [5] deletion of a listing accompanying a change to an ineligible telephone number from a telephone number that was previously eligible for listing in the Town Page.

Non-responses from local units possibly come under the following cases. Firstly, in the case of self-employed local units, owners often carry out their business activities at the spot where they dwell. In these cases, since the street addresses of self-employed local units are also used as postal addresses of their dwellings, even if the business were to close down, mails posted to the local units' addresses would still be delivered to their dwellings. Actually we did receive several notifications of business closure during the reference period from ex-business owners either by return responses or by telephone calls. It is thought that some cases in which such a response was not received are included in the no response group. Also in the case of local units which have applied for mail forwarding service, the "business closure or relocation survey forms" would have been forwarded for up to a year to the new street address of the relocated business. Since this survey is not mandatory and did not bear any direct relation with actual business activities, it would be well supposed that there may be some local units who could be bothered to respond to the survey. Furthermore, it is possible that there was no response to this survey from among the local units whose Town Page listing was deleted due to an application to suspend the Town Page listing, or whose listing was deleted because of the change in the telephone number to an ineligible number from a Town Page listing of an eligible telephone number (fixed telephone or toll-free number). Unfortunately, it is not possible to make clear from the survey the further breakdowns of the above mentioned [1] through [5] with respect to the local units that did not respond to the "business closure or relocation survey form."

It is possible that the "business closure or relocation survey forms" undelivered because of the unknown street address were due to business closures or to local unit relocations where the procedure to forward post mail was not taken. In these cases, in the same way, it is thought that if the local unit is continuing business after the relocation, the business would generally take the procedure to forward post mail. For this reason, we treated these undelivered cases due to unknown street address as business closures.

4. Calculation of the number of local unit start-ups, closures, and relocations

(1) The number of business start-ups and closures

(i) The number of local unit start-ups

From the survey results by the "business start-up or relocation survey form", it is possible to distinguish new business start-ups from the opening of a local unit due to relocation. The former refers to a new business start-up of a local unit as a natural demographic change. Regarding local units targeted by the "business start-up or relocation survey form" not a few forms were undelivered because of the unknown street addresses. As mentioned in the previous section, we regarded in this paper that these undelivered forms suggested the occurrence of events that should be identified by the "business start-up or relocation survey form" during the one-year reference period. As a method of handling these in the calculations, therefore, potential new business start-ups possibly included in no responses and undelivered groups were estimated by multiplying the number of cases in these groups by the ratio of new business start-ups (0.659 in the 2012 survey and 0.633 in the 2013 survey) in the response results.

Table 6 shows the number of new business start-ups estimated from the 2012 and 2013 survey results.

Table 6 Number of start-ups

	reference periods	
	2011.2-12.1	2012.2-13.1
responded start-ups	91	152
estimated from nonresponses or undelivered mails	268	469
Total	359	621

(ii) The number of local unit closures

It is possible that besides the number of business closures obtained from the "business closure or relocation survey form," there were also cases of closure in the no response and undelivered due to unknown address groups. Of these, firstly, the potential number of closures included in the no response group was estimated by multiplying the number of cases in that group by the ratio of business closures (0.464 in the 2012 survey and 0.375 in the 2013 survey) in the response results. On the other hand, those forms undelivered due to unknown address, for the reason mentioned in the previous section, were regarded as closures of local units. Further, the "business start-up or relocation survey forms" undelivered due to unknown address were interpreted as follows. An event that was the target of the "business start-up or relocation survey form" was followed by an event that should have been the target of the "business closure or relocation survey form" which occurred during the same reference period, thereby causing the postal delivery address to be

unknown. Therefore, these cases have all been treated as local unit closures.

Table 7 shows the number of local unit closures estimated from the 2012 and 2012 survey results.

Table 7 Number of closures

	reference periods	
	2011.2-12.1	2012.2-13.1
responded closures	91	66
estimates from nonresponses	440	194
additions from undelivered start-up and closure forms	449	291
Total	980	551

(2) Numbers of relocated local units

In the broad sense of the term, social change includes a shift in business category in terms of industry accompanied by a change or expansion in the business activities of the local unit. Here, however, we take up simply the narrowly-defined social change of the relocation of local units.

Distinguishing social changes from natural change of businesses makes sense. As mentioned above, a local unit might be set up due to the start-up of a new business, or might be due to the relocation of a business. In the same way, the closure of a local unit might be due to the actual closing down of the business, or might be due to relocation elsewhere. Up to now, statistical surveys have been conducted in respective areas which are called survey tracts. In this case, local unit relocation that crosses the boundary of the survey tract has been basically treated as the closures of a local unit in the area from which they relocated, and the start-up of a new local unit in the area to which they relocated. The phenomena of the natural change of the start-up or closure of local units and the social change of relocation, which are completely dissimilar in their socioeconomic nature, have not been distinguished from one another, and used to have been treated as the start-up and closure of local units in the statistics. Such treatment has brought about an overestimation by number of local units opening and closing due to relocation.

In this paper, since the target area has been limited to Hachioji City, we classified three patterns of relocation of local units in terms of the target area boundary according to our survey results: inflows from outside the target area, outflows from the target area, and relocations within the target area.

(i) The opening of local units due to relocation

In the “business start-up or relocation survey form” former postal address of the location was asked for local unit that has changed its location during the reference period

according to the following four choices: [1] a location nearby the present location, [2] another location in the target area, [3] another municipality within the Tokyo Metropolitan District, and [4] a location outside the Tokyo Metropolitan District. Of these, [1] and [2] refer to the setting up of a local unit due to relocation within the target area and [3] and [4] due to relocation from outside the target area.

(a) The setting up of local units due to relocation from outside the target area

Firstly, the number of local units which responded as [3] or [4] in the 2012 and 2013 survey returns were summed together to form the number of local units opened due to relocation from outside the target area (inflow). Further, it is also possible that among the local units that did not respond to the "business start-up or relocation survey form" there were some which had been active outside the target area before relocation. For these, the proportion of local units that relocated from outside the target area in the responses (0.109 in the 2012 survey and 0.154 in the 2013 survey) were multiplied by the number of no responses for the respective years and were estimated as 44 and 114, respectively. These were added to the number of local units that had relocated from outside the target area (see upper part of Table 8).

Table 8 Opening of local units due to relocation

			reference periods	
			2011.2-12.1	2012.2-13.1
relocation into the target area	responded relocations		15	37
	estimates from nonresponses		44	114
	Total		59	151
relocation among the target area	responded relocations		27	50
	estimates from nonresponses		80	154
	relocation by crosschecked data	Category D	144	110
		Category E	39	34
		Category F	10	7
	Total		300	355

(b) The opening of local units due to relocation within the target area

Firstly, the number of local units from which responded as [1] or [2] in the 2012 and 2013 surveys were summed together to form the number of local units opened due to relocation within the target area. Further, it is also possible that among the local units that did not respond to the "business start-up or relocation survey form" there were also some which had been active in the target area before relocation. For these, we multiplied the proportion of local units that relocated within the target area in the responses (0.196 in the 2012 survey and 0.208 in the 2013 survey) with the number of no responses in the respective years to obtain 80 and 154, respectively. These were added to the number of

local units that had relocated within the target area.

In addition to these, we were also able to confirm possible local unit openings due to relocation within the target area from the crosschecking results of the Town Page data. That is, Category D, in which only the street address among the three variables (telephone number, name and street address) failed to match and Category E, in which both telephone number and street address failed to match can be added to the number of local unit set-ups due to relocation that were found from the results of crosschecking between N_clnd(11) and N_clnd(12), and N_clnd(12) and N_clnd(13). Further, Category F, in which except for the telephone number both local unit name and street address failed to match, can also be taken as relocations within the target area in which the relocation of the local unit without changing the telephone number provided an opportunity to change the local unit name. The lower part of Table 8 shows the estimates for the number of openings of local units due to relocation within the target area.

(ii) Local unit closing due to relocation

The "business closure or relocation survey form" requested relocated local units to fill in the name of the prefecture and municipality to which the local unit had relocated. Of the local units that had some reasons to be a target of the "business closures or relocation survey forms," it was possible to distinguish directly between relocations to areas outside the target area and those within the target area according to the responses obtained from the respondent local units.

(a) Local unit closings due to relocation outside the target area

Besides local units that responded on the "business closure or relocation survey form" that they had moved to a location outside Hachioji City, it is possible that there was some out-relocation of local units, for example, that failed to respond to the survey despite receiving the survey forms through the forwarding of post mail. For this reason, we estimated the number of additional local units that had relocated outside the target area by multiplying the no responses to the respective surveys by the ratio of local units that responded that they had relocated outside the target area (0.087 in the 2012 survey and 0.065 in the 2013 survey). Moreover, from the results of the data cleaning on N_orig(12) and N_orig(13), 28 and 14 cases were obtained of local units giving a fixed telephone number containing an area phone code for a municipality other than that for the target area (042-6).

Consequently, the estimated number of local units that relocated outside the target area during the reference periods February 2011 to January 2012 and February 2012 to January 2013 were 127 and 61, respectively (see the upper part of Table 9).

(b) Local unit closings due to relocation within the target area

We can estimate the number of local unit closings due to relocation within the target

area from responses that they had relocated elsewhere within the target area and also from the number of relocations possibly included in the number of local units that failed to respond.

Furthermore, as already mentioned in paragraph 4-(2)-(i)-(b), we can expect that the local units classified into Categories D, E, and F according to the Town Page data crosschecking for each year had had local units within the target area. Thus transferring the numbers of local units in each category from Table 8 to Table 9, these were added to the number of relocations of local units due to relocations elsewhere within the target area.

Table 9 gives estimates of the number of business closings accompanied by relocations of local units both away from and within the target area

Table 9 Closures of local units due to relocation

			reference periods	
			2011.2-12.1	2012.2-13.1
relocation out of the target area	responded relocations		17	12
	estimates from nonresponse		82	35
	relocation from data cleaning		28	14
	Total		127	61
relocation within the target area	responded relocations		10	19
	estimates from nonresponse		48	56
	relocation by croschecked data	Category D	144	110
		Category E	39	34
		Category F	10	7
	Total		251	226

(3) Summary of the results regarding local unit start-up, closure and relocation

Table 10 gives an overall summary of the estimates of local unit start-up, closure and relocation in the target area obtained as the results of the Town Page data cleaning, crosschecking and the surveys.

Table 10 Summary estimates of start-ups, closures and relocations

reference periods	start-ups and closures		relocations			
	start-ups	closures	openings		closures	
			from outside	within	to outside	within
2011.2-12.1	359	980	59	300	127	251
2012.2-13.1	621	551	151	355	61	226

It should be mentioned that the closing of existing local units and the opening of local units in the new location that accompany relocations within the area in many cases correspond on a one-to-one basis. It may support the notion that the numbers of openings and closings of local units should naturally match each other. According to Table 10,

however, in the reference period February 2011 to January 2012, 300 openings are accompanied with 251 closings and the subsequent year period gives the number 355 and 226, respectively.

Three factors seem to account for this discrepancy in the numbers of local unit start-ups and closings. When a local unit expands and diversifies its business by relocating from the former local unit to another within the same area, there may happen the cases where the business activities are carried out anew at multiple local units simultaneously. It is also possible that there are cases in which existing multiple local units are reorganized through merger. But in these cases the units generally tend to be integrated into one of the existing local units. It would seem that the number of local unit start-ups due to reorganization through merger slightly exceeds the number of closings.

The second possible factor is the time lag between the closing of an existing local unit and the subsequent opening of a new one. In the case that either the closing or the start-up alone occurred within the reference period, it would not be possible to confirm from the data the fact that one succeeded the other.

The third factor relates to the circumstances surrounding the responses to the survey. The discrepancy in the closing and start-up numbers in this survey include a factor that arises from the difference in the response rates between the surveys carried out using the "business start-up or relocation survey form" and the "business closure or relocation survey form." It may be probable that among local units, which changed their locations within the target area, there would be some cases to which the data crosschecking gives complete disagreement due to the fact that since, naturally, the street address changed, and along with the relocation of the local unit the telephone number and business name (name listed in the Town Page) may also have changed concurrently, despite the relocation having taken place within the target area.

5. Calculation of the start-up, closure and relocation rates

In this paper, by introducing the concepts regarding the natural as well as social aspects of business demography we estimated the relevant cases as the number of start-ups, closures and relocations in the target area, using Town Page data from the reference periods February 2011 to January 2012 and February 2012 to January 2013, respectively. In this part of the paper we will calculate the start-up, closure and relocation rates.

In calculating these rates, how to define universe population is one of the key issues. As Mori and Sakamoto (2012) have already discussed, the Town Page data tend to underestimate the number of local units when compared either with the actually existing number or the number given by the Economic Census results. Furthermore, the Town Page database itself also partly carries telephone numbers that are no longer in use due to business closure, relocation, and so on.

N_clnd(11) and N_clnd(12) give the number of local units 15,178 and 15,355 as of the last day January, which gives the starting date for each reference period. To these are added the 37 and 30 cases, respectively, offering a new forwarding phone number with the target area code number "042-6." Finally, we achieved to have 15,215 local units for the reference period February 2011 to January 2012, and 15,385 for the period February 2012 to January 2013 employed as the universe in calculating these rates. Table 11 shows the results.

Table 11 Start-up, closure and relocation rates of local units (%)

reference periods	start-up and closure rates		relocation rates			
	start-up	closure	opening rate		closure rate	
			from outside	within	to outside	within
2011.2-12.1	2.4	6.4	0.4	2.0	0.8	1.6
2012.2-13.1	4.0	3.6	1.0	2.3	0.4	1.5

6. Comparison with existing statistics on the start-up and closure rates of local units

The 2011 White Paper on Small and Medium Enterprises in Japan gives 2.6% as the average start-up rate for the period 2006 to 2009 and 6.4% for the average closure rate in the same period (SMEA (2011) p.180, Figure 3-1-2) according to data contained in the Basic Survey of the 2009 Economic Census.

Although the reference periods slightly differ, if we compare these figures with our estimates in Table 11, for the one-year period February 2012 to January 2013 the start-up rate is about 1.5% lower than that given by SMEA, while the closure rate is about 3% higher. For the one-year period February 2011 to January 2012, however, they reveal quite comparable results for both the start-up and closure rates.

The Establishment and Enterprise Statistical Survey which had been conducted as nationwide census shows similar results for closure rate by giving annual averages for the periods 2001 to 2004 and 2004 to 2006 as 6.4% and 6.5%, respectively. These are almost the same level as those given by the Basic Survey of the 2009 Economic Census. On the other hand, the start-up rates were 4.2% and 6.4%, respectively, far exceeding the average annual start-up rate of 2.6% in the period 2006 to 2009 given by the Economic Census.

Although one should avoid generalization about the results because of the difference in reference periods, the differed treatment of start-up of new local units between the Establishment and Enterprise Statistical Survey and the Economic Census seem to account for these discrepancies in closure rates. In the Establishment and Enterprise Statistical Survey field survey staffs have treated the newly found local units in the survey area as new

start-up businesses, whereas the Basic Survey of the Economic Census has amended the methodology to identify new start-ups according to the timing of the start-up of the local unit. In the case of the Basic Survey of the Economic Census, regarding local units opened due to relocation from elsewhere, those that fill in their date of founding on the survey form and not the date of relocation to the current street address are treated not as newly born but as relocation of existing local units. It would be well supposed that the improved treatment in census taking led to lower the level of the start-up rate by that amount. Thus, the new survey method introduced in the the Basic Survey of the 2009 Economic Census has enabled to identify the new business start-ups and business openings due to relocation as the different subcategories that the Establishment and Enterprise Statistical Survey had been unable to distinguish.

Conclusion

We focused on analyzing the demographic events of local units in this paper as a case study by using the NTT Town Page data as of the last day of January in 2011, 2012, and 2013. The originality of this study is to bring under light the social demographic aspect of local units by newly introducing the locational movement indicators regarding the relocation of local units. By doing so, we were able to re-examine traditional discussions on business demography in which only natural aspects of demographic events have been covered as start-ups and closures. We thus attempted here to differentiate the social aspect of demographic events of local units from natural ones by introducing a set of concepts regarding relocation. By properly assessing the intensity of relocation, one can distinguish new local unit start-ups from local unit openings due to relocation, and closures due to the closing down of businesses from the closings of local units caused by relocation.

The undelivered survey forms due to unknown addresses were used as an effective measure to profile the actual status of sampled local units. However, since the achieved survey response rate was not higher than 25 percent, there was little option but to rely quite substantially on proportionate estimations to make up for the non-responses. Despite these limitations in survey response, a set of meaningful findings seem to have been gained. The following are some comments on our achievements.

Firstly, with regard to the natural demographic changes, the obtained results were almost comparable to the figures already given for the nationwide business start-up and the business closure rates given by the Basic Survey of the 2009 Economic Census. Further, by comparing the results obtained in this research for the two reference periods: February 2011 to January 2012 and February 2012 to January 2013, one can recognize a rise in business start-ups and a fall in business closures in the 2012 period when compared to the 2011 period. Following the Great East Japan Earthquake disaster(3) in 2011, company bankruptcies increased nationwide from 11,685 to 12,734 in that year. As the number of

bankruptcies fell to 12,124 in 2013, it can be well assumed that there were more company bankruptcies nationwide in 2011 compared with the preceding and subsequent years. Hachioji city, which we chose as the target area for our case study, experienced a symbolic event of the closure of the largest commercial mall in that area in 2012, followed by reopening in the following year. This microscopic movement seems partly to coincide with the trend of business start-up and closure rates in this target area.

With regard to the social aspect of business demography, the relocation rate for local units relocating within the area, including those relocating within neighborhood areas, was found to be two to three times higher than for those relocating across the target area borders.

Notes

(1) A statistical concept of business establishments is substantially a statistical unit from the standpoint of business activities with regard to industry. Since Japanese concept of business establishments, however, lays much attention on the location where they operate their business activities, we termed them “local units” in this paper.

(2) The EIP of OECD focuses on demographic events not of local units but of enterprises.

(3) Annual bankruptcies related to the 2011 Great East Japan Earthquake disaster are said to have been 543. (See the website of Tokyo Shoko Research, Ltd. http://www.tsr-net.co.jp/news/status/yearly/1215980_1633.html)

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