Estimates of the Future Number of Companies by Region*

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Abstract

This paper projects the number of companies that will play a vital role as a source of labor demand and the number of employees for each prefecture in Japan until 2040. The noteworthy point of this paper lies in the fact that it utilizes the population decline and the change in age structure of the population in each region as the driving factors of company openings and closings and then estimates the number of employees using companies' demand for labor.

According to our estimates, the number of companies and employees will fall from 4,025,000 and 58,457,000, respectively, in 2015 to 2,956,000 and 45,981,000 in 2040. The rate of decline is not uniform across the nation; in fact, the concentration of companies and employees in major urban areas will continue to rise. In addition, the rate of decline in companies and employees is greatest until around 2025, when many current company managers will be retiring. As a result, until around 2025, almost all prefectures in Japan will temporarily experience sharper rates of decline in the number of employees than in the working-age population. The excess supply of labor will be particularly noticeable in urban areas. By 2040, the labor market will go back to another period of tightness similar to that experienced in 2015.

Therefore, until around 2025, it will be critical to provide focused support for business succession, so as to prevent business closures caused by managers' retirement. Our simulation suggests that focusing support for businesses on start-ups by women and retired elderly would be effective to increase the number of new company start-ups.

Keywords: business start-ups, business closures, business succession, number of companies, labor supply

JEL Classification: J11, J23, R12

* This paper represents the personal opinions of its authors, not the opinions of their respective organizations.

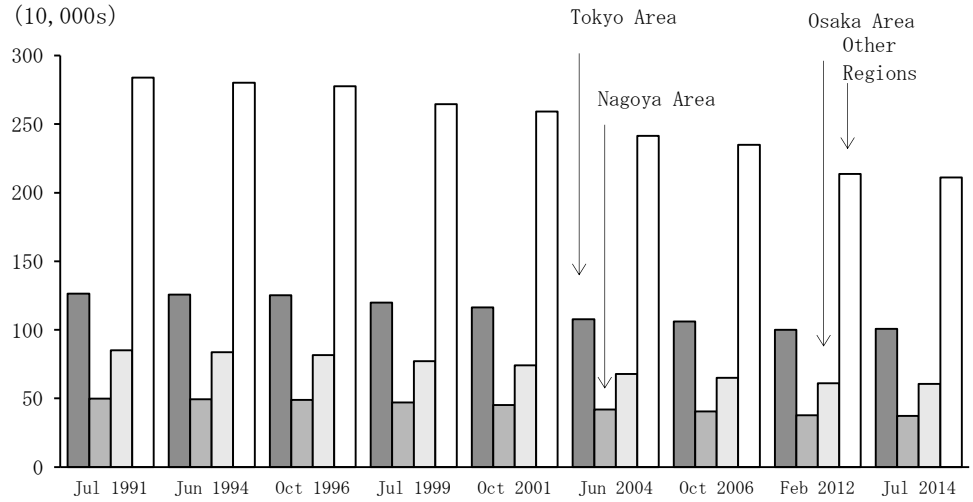
I. What Are the Issues?

Since the 1990s, Japanese business start-ups have stagnated, falling below the business closure rate. This has resulted in a decline in the number of companies, which is especially notable in non-urban areas (Figure 1). In regional economies, companies play a critical role as providers of employment. A decline in the number of companies means a decline in regional economic vitality.

Masuda (2014) warns about the decline in population, and thus in the labor supply. Yet this paper instead focuses on the number of companies—used as a metric for labor demand—and the number of employees and estimate their changes over time as the population declines and its composition changes.

"Estimated Future Workforce Supply and Demand in Japan," issued by the Japan Institute for Labour Policy and Training (JILPT) in December 2015, forecasts the populations of the workforce and those actually working for each prefecture until 2030 while breaking them down by gender and age demographics. However, it does not hypothesize any values for the variables in workforce demand (economic growth rates, productivity by industry, etc.) or supply (the labor force participation rate, etc.) [Ministry of Health, Labour and Welfare (MHLW), 2015]. This paper can be significant in that it goes beyond the MHLW's estimates in the following three ways: (1) In estimating the number of companies (which are the source

Figure 1. Trend in Number of Companies by Area



Notes: 1 Company numbers calculated as the total number of single offices and headquarters, derived from the number of private businesses in all industries (excl. public service).
2 Tokyo Area = Saitama, Chiba, Tokyo, Kanagawa Nagoya Area = Gifu, Aichi, Mie
Osaka Area = Kyoto, Osaka, Hyogo, Nara Other Regions: Those not listed above
Source: Ministry of Internal Affairs and Communications' Establishment and Enterprise Census, Business Register, and Economic Census.

of labor demand), it projects business start-ups and closings given the population decline and changes in the population structure by age; (2) it estimates the number of employees based on labor demand from companies; and (3) it includes considerations on labor market tightness based on the difference between labor demand and supply.

More specifically, this paper answers the following questions: although it is often said that the success or failure of business succession greatly influences company closure rates, to what extent are companies being shut down in the future due to aging of managers? Also, if business start-up rates do not improve, how much will the number of companies decline? And how does the trend vary across regions?

As part of the comprehensive strategy for creating towns/people/work, local governments are analyzing data and drafting what are known as "Prefectural and Municipal Comprehensive Strategies for Creating Towns/People/Work (Regional Comprehensive Strategies)" to deal with the issues in their areas. We believe that this paper will contribute to such regional developments.

This paper is organized as follows. Section II projects the future number of companies and employees for each prefecture. Section III discusses the characteristics of the estimation output. Section IV takes the estimates from Section III as a baseline for simulating how fluctuations in such variables as population influence the number of employees. Section V sets forth the policy implications based on our findings.

II. Estimation Method and Data Used

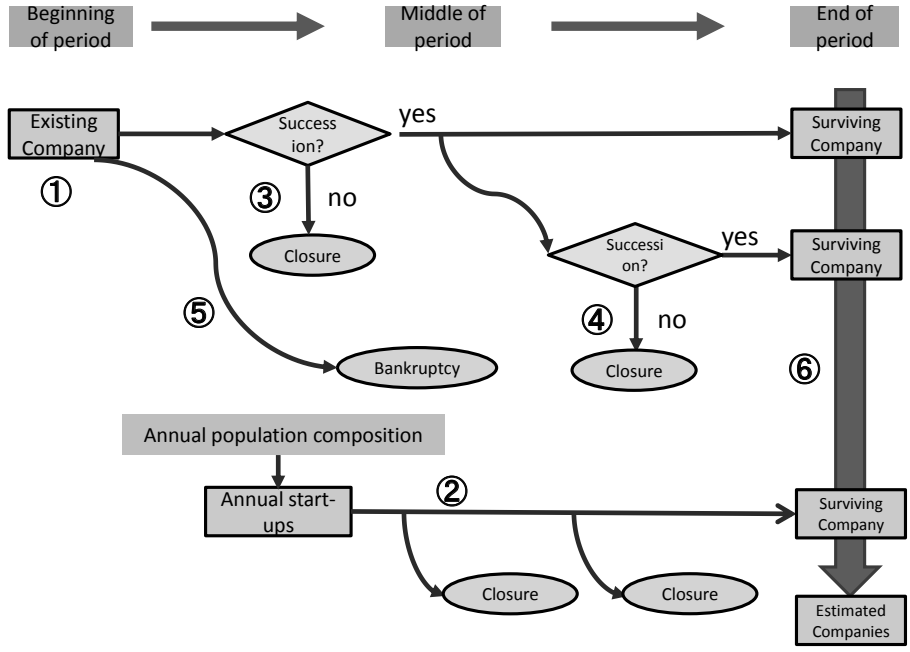
II-1. Overview of estimation method

Movements in the number of companies are caused primarily by companies starting up (start-ups) and companies going out of business (closures). Therefore, to estimate the number of companies in the future, we have projected the number of start-ups and closures during the estimation period by adding to or subtracting from the number of companies in the baseline year of 2015.

Figure 2 gives a flowchart for the estimation process.

First, we estimate the numbers of companies and employees for the baseline year (① in Fig. 2). Next, after calculating the gross number of start-ups based on each year's population and its age composition, we multiply the gross number of start-ups by their survival rate to obtain net start-ups (② in Fig. 2). We then estimate the number of closures due to the lack of business succession as result of the company management's age (③ in Fig. 2, representing closures by current management). We must also consider the possibility that even if the business ownership is transferred, the second succession may be necessary during the estimation period; thus, we also estimate closures related to lack of succession in these cases (④ in Fig. 2, closure by successor). We furthermore estimate the number of companies that go out of business due to bankruptcy separately from those that close due to management's retirement (⑤ in Fig. 2). From the above process, we obtain the number of companies that

Figure 2. Flowchart for Estimation Process



survive to the end of the estimation period (2040) (⑥ in Fig. 2). Finally, we take the number of companies obtained by this estimation method and use it to calculate the number of employees.

The estimation method and the data used in it are explained in the following: estimates of baseline year numbers of companies/employees, business start-ups, business closures, business bankruptcies, and number of employees.

II-2. Estimation of Baseline Numbers of Companies/Employees

We took 2015 as our baseline year for the estimation period to project the number of companies and the number of employees through 2040.

First, we use the Economic Census conducted by the Ministry of Internal Affairs and Communications (as of July 1, 2014) to estimate the number of companies and employees for our baseline year.

Table 1 shows the number of companies for the baseline year. The 2014 Economic Census shows the number of establishments (column *e*) and breaks down changes in surviving offices (column *a*, those in existence at both the beginning and end of the period), new establishments (column *b*, those established during the period), and closed establishments (column *c*, those shut down during the period) during the period. Extrapolating from the opening and closing rates, we calculated the number of sole proprietorships and corporations for each prefecture for the baseline year (December 31, 2015). Similarly, we estimate company numbers for

Table 1. Number of Companies for the Baseline Year (2015)

All Industries	Sole Proprietorships / Corporations	Single Offices + Headquarters (excl. non-corporate organizations)	Existing Businesses		a
			New Businesses		b
			Closed Businesses		c
			Businesses at Beginning of Period	As of 2/1/2012	d=a+c
			Businesses at End of Period	As of 7/1/2014	e=a+b
			Start-up Rate (Annualized)	29 months	f=(b×12/29)÷d
			Closure Rate (Annualized)	29 months	g=(c×12/29)÷d
			Number of Businesses as of 12/31/2015	18 months	h=(f-g)×18/12×e+e

Table 2. Numbers of Companies and Employees over Time
(Private Companies, All Industries Except Public Service, Nationwide Statistics)

	1990/12/31	1995/12/31	2000/12/31	2005/12/31	2010/12/31	2015/12/31
No. of Companies	5,463,407	5,353,212	4,997,128	4,505,260	4,346,723	4,025,398
No. of Employees	55,122,745	56,523,777	54,543,639	53,503,953	57,500,314	58,457,143
Avg. Employees per Company	10.1	10.6	10.9	11.9	13.2	14.5

Notes: 1 Since survey methods used in the Economic Census differ from those in the Establishment and Enterprise Census and the Business Register, the figures up to 2005 are not comparable with those from 2010 on.
2 National estimates are calculated by totaling the estimates for all prefectures (the same applies hereinafter).
Source: Estimated from annual editions of the Ministry of Internal Affairs and Communications' Establishment and Enterprise Census, Business Register, and Economic Census.

year-end 1990, 1995, 2000, 2005, and 2010, using data from the Economic Census, the Establishment and Enterprise Census, and the Business Register. Following the methodology as above, we calculate employee numbers once every five years.

The trend in the total number of companies in Japan shows that the number of companies in existence fell from 5.463 million in 1990 to 4.025 million in 2015 (Table 2).[1] However, we can see that the number of employees is flat to up slightly, with average employees per company rising significantly, from 10.1 in 1990 to 14.5 in 2015. The closures of small companies lead to an increase in the average number of employees per company.

[1] However, because survey methods for the Economic Census differ from those of the Establishment and Enterprise Census and that Business Register, we cannot directly compare the number of companies through 2005 with those from 2010 on.

II-3. Estimation of Number of Business Start-ups

Here, we estimate the number of business start-ups based on changes in the population to which the founders belong, including changes in gender and age composition.

II-3-1. Data Used

Data used for estimations are as follows: ① future estimated population by gender and age, ② the number of business founders by gender and age, and ③ the survival rate of start-ups by years in operation.

(1) Future Estimated Population by Gender and Age

Future estimated population by gender and age is derived from the prefectural data in the National Institute of Population and Social Security Research's Population Projections for Japan by Region (March 2013). According to this report, which projects the population of Japan from 2015 to 2040, the total population will fall from 126.6 million people in 2015 to 107.28 million people in 2040, a decline of 15.3% over 25 years. Similarly, the working-age population (defined as those between 15 and 64 years of age), is projected to fall by 24.7%, from 76.818 million to 57.866 million. All prefectures will see a drop in the total population and the total working-age population.

Since this data only has the population in five-year intervals, we estimate the populations between intervals for linear interpolation for estimating business start-ups.

(2) Number of Business Founders by Gender and Age

For the number of business founders by gender and age, we use the Employment Status Survey conducted by the Ministry of Internal Affairs and Communications (2012). This survey presents the population of employed persons by years of continuous employment, by their rank and type of job, and by whether the employed person is a business founder, as well as by gender and age. We define "founders" as "self-employed business founders"[2] and "employed (including as a company director) business founders" who have a continuous period of service[3] of less than three years.

We calculate the nationwide number of founders from publicly available statistics. However, the published data do not include gender and age breakdowns by prefecture.

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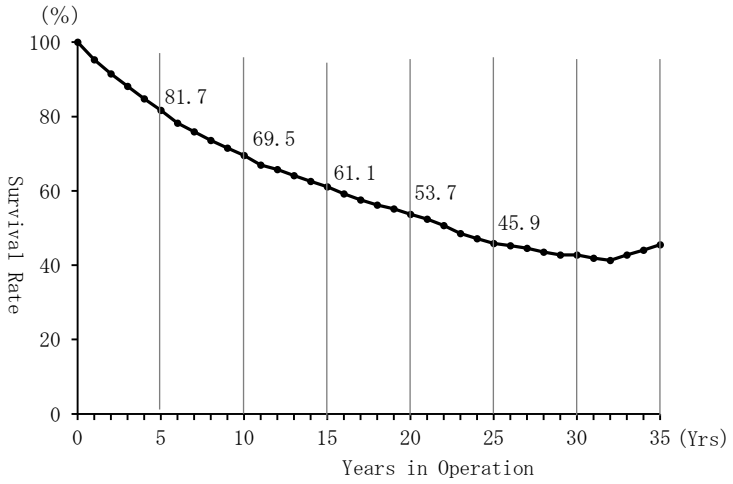
[2] A "business founder" denotes a person who is a company executive or a self-employed person who has started up their own business.

[3] "Continuous period of service" means the number of years since the person started working at their present place of employment. For a business founder, this equates to the number of years since starting their business.

Figure 3. Survival Rate by Years in Operation



Source: Small and Medium Enterprise Agency, 2016 White Paper on Small and Medium Enterprises.

Therefore, we obtained this data by custom-ordering statistics from the National Statistics Center.[4]

(3) Survival Rate for Business Start-ups by Years in Operation

For the survival rate of business start-ups by years in operation, we use data from the Small and Medium Enterprise Agency's 2016 White Paper on Small and Medium Enterprises in Japan (see Figure 3).[5]

II-3-2. Estimation Method

As shown in Figure 4, our estimations consisted of three processes: (1) calculation of the founder ratio, (2) projection of the gross number of start-ups, and (3) projection of the net number of start-ups.

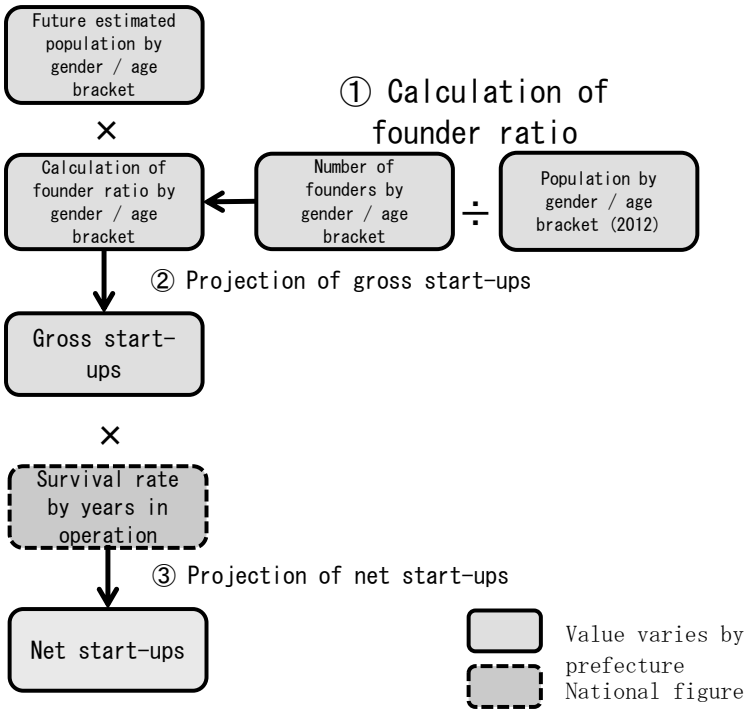
(1) Calculation of the Founder Ratio

The "founder ratio" means the percentage of founders in the population in this paper. We

[4] For the non-public data, we compensated by subtracting the number of males and females from the male–female totals, and by subtracting the figures for the individual prefectures within a regional bloc from the total for those regional blocs. Note that these statistics are calculated based on prefecture of residence. Therefore, a person who lives in Chiba Prefecture but started a business in Tokyo is considered a Chiba-based founder.

[5] Japan Small and Medium Enterprise Agency (2016) p. 418.

Figure 4. Method for Projecting Corporate Start-ups



obtain it by dividing the number of founders per year by age and gender acquire from the Employment Status Survey (2012) by the population of each gender and age group. Note that since there are no data on business founders aged 14 or under, we use the population of those aged 15 and older as the denominator for the founder ratio.

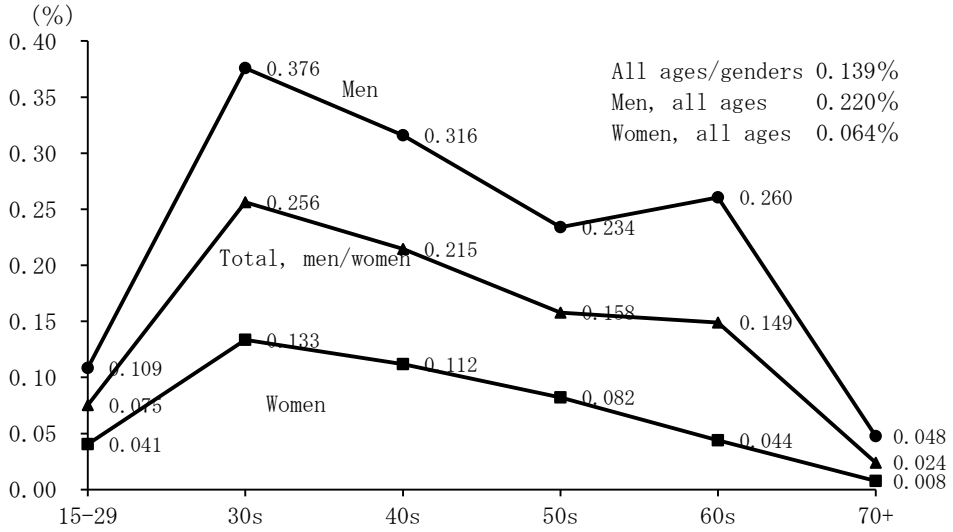
Figure 5 shows the founder ratios by gender and age group nationwide. The founder ratio for both genders and all age groups is 0.139%. The ratio for men across all age groups is 0.220%, while that for women is significantly lower, at 0.064%. By age, the ratio is highest for those in their 30s for both men and women. The ratio declines for women from their 40s on, but for men, the ratio jumps in their 60s. We believe this is because there are a relatively large number of men who start businesses after retirement. The disparity between the founder ratios for each gender is significant regardless of the age group.

Looking at the founder ratios by prefecture (for both genders and all ages), we see the highest is in Okinawa (0.231%), followed by Tokyo (0.191%), Kagoshima (0.183%), and Saitama (0.175%). Toyama has lowest ratio (0.085%), followed by Fukushima (0.087%), Yamagata (0.090%), and Aomori (0.093%).

(2) Estimation of Number of Gross Start-ups

We estimate the number of gross openings by multiplying the founder ratios for each

Figure 5. Company Founders by Age Bracket (Nationwide)



Note: The "founder ratio" is the ratio of entrepreneurs to the total population in each year.
Sources: Employment Status Survey (2012), Ministry of Internal Affairs and Communications, and Population Projections for Japan by Region (March 2013 projections), National Institute of Population and Social Security Research.

gender and age group as calculated in (1) above by the projected future population (2016–2040).

The number of gross start-ups will decrease as the years go by due to population decline and increasingly top-heavy population demographics for the older age brackets, which have lower founder ratios. The total number of gross start-ups nationwide for 2016–2020 is 735,000 (avg. 147,000 per year) but 610,000 for 2036–2040 (122,000 per year, on average).

(3) Estimation of Number of Net Start-ups

It would be unrealistic to assume that all start-ups continue to exist in perpetuity. To correct it, we estimate the number of net start-ups by multiplying the number of gross start-ups by the survival rate for the years in operation. The total number of net start-ups count for 2.266 million companies during the survey period.

II-4. Estimation of Number of Closures

We estimate the timing and frequency of closures of existing businesses (those in existence in the baseline year) due to population factors. In other words, we project the number of businesses that will close because management grew old and failed to hand over the business to a successor.

II-4-1. Data Used

We split three processes in calculating projected business closures: (a) the intention to hand over the business to a successor, (b) the number of companies by organization type and the number of employees in the baseline year (by prefecture), and (c) the age distribution of company management by organization type and the number of employees (by prefecture).

(1) Intentions Regarding Business Succession of Existing Companies

To estimate closings, we need to know how many managers intend to close their businesses when they stop working and when this will occur. We rely on the Japan Finance Corporation Research Institute's Internet Survey on Small and Medium Enterprise Business Succession (2015).[6] We set weights to mimic the actual distribution of companies.[7]

In this survey, we have identified whether they have determined a successor, and if they have not, why not. We categorized firms into "successor determined" (a successor has been decided upon and agreed to take over), "successor not determined" (the incumbent management has the intention to hand over the business, but the successor has not been determined), "planned closure" (the current management intends to close down the business upon retirement), and "deferred" (the current management is young and feel less need to determine a successor at present). Of the companies surveyed, as many as 50% (Table 3, column *a*) were under "planned closure."

The composition of these classifications varies greatly depending on the number of employees and organizational type. Planned closures comprised 53.3% of companies with 1–19 employees, far exceeding the 19.7% figure for companies with 20–299 employees (Table 3, columns *b* and *c*). In terms of organizational type, 66.8% of sole proprietorships fall under planned closure (column *d*). However, corporations are less likely to fall under planned closure, at 32.4%, due to their status as a going concern (column *e*). We then classify these results into (i) sole proprietorships, (ii) corporations (with 1–19 employees), and (iii) corporations (with 20–299 employees), and project the number of closures for each (columns *d*, *f*, and *g*). We have also made the reasonable assumption that corporations of 300 or more employees will not close down due to the aging of their management (that they will definitely plan for business succession).

Business closure estimates also require information about the planned closure period. The aforementioned survey asked companies planning to close, "Until what age do you plan to stay in business?" We have calculated the planned closure period based on the responses to

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[6] For more on the Internet Survey on Small and Medium Enterprise Business Succession, see Murakami (2017).

[7] Weighted values were calculated based on the distribution of companies by manager's age bracket, size of employee base, and organizational type according to the MIC's Basic Economic Census (2014) and Teikoku Databank (more detail later).

Table 3. Classification of Intentions regarding Business Succession

(Units: %)

Classification	Definition (per Survey Response)		Total	By Employment Scale		By Org. Type / Employment Scale				By Relationship Between Founder and Management	
				1-19	20-299	Sole Proprietorships	Corporations			Management is 2nd Generation or Later	Founder is Management
								1-19	20-299		
			(n=4,104) a	(n=3,685) b	(n=419) c	(n=2,141) d	(n=1,963) e	(n=1,595) f	(n=368) g	(n=1,423) h	(n=2,681) i
Successor Determined	Have determined a successor (and successor has consented)		12.4	12.1	14.7	9.3	15.6	15.4	16.2	13.4	11.8
Successor Undetermined [Intent to succeed exists, but no successor determined]	No Successor Determined	Multiple candidates for succession, but not chosen/determined yet	3.5	2.9	8.3	2.3	4.7	4.0	8.2	4.7	2.8
		Have a preferred successor, but person is too young to take over yet	6.0	5.0	15.6	3.2	8.9	7.6	15.8	8.8	4.5
		Currently seeking successor	7.7	7.2	12.1	3.5	12.1	11.9	13.4	10.4	6.3
		Desired successor has not consented	3.4	3.0	6.9	3.0	3.8	3.2	7.0	4.3	3.0
		Other	1.2	1.0	2.4	0.6	1.7	1.5	2.9	2.0	0.8
			21.7	19.2	45.2	12.6	31.3	28.1	47.3	30.1	17.4
Planned Closure		Intend to close business when I retire	50.0	53.3	19.7	66.8	32.4	35.7	15.5	38.2	56.3
Deferred		Still young, so not necessary to determine successor	15.9	15.4	20.4	11.2	20.8	20.7	20.9	18.3	14.6
Total			100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Notes: 1 These are weighted aggregates. However, values for n are original figures.
2 Recompilation from the Japan Finance Corporation Research Institute's Internet Survey on Small and Medium Enterprise Business Succession.

this question (Figure 6). Naturally, the older the management (those in their 60s, 70s, and older), the higher the ratio of those planning to close their businesses "by 2020" is. In contrast, younger managers (those in their 40s or younger) are more likely to close their business "on or after 2041," beyond our estimation period. Among those under 40, however, a markedly high proportion is targeting closure "before 2020." This may be because their businesses are not doing well.

(2) Number of Companies by Organization Type and Firm Size in Base Year (Prefectural Figures)

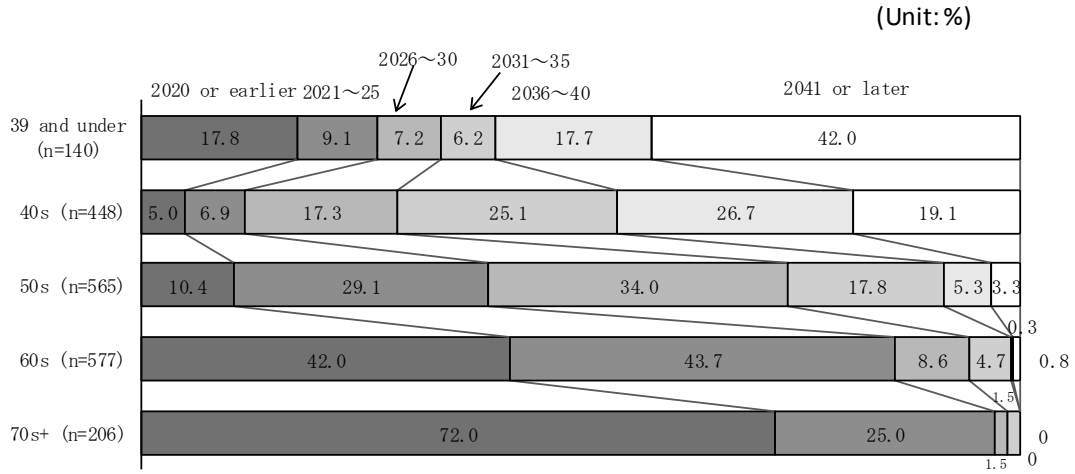
We estimate the number of companies in the baseline year, as in II-2, classifying them into four groups: (i) sole proprietorships, (ii) corporations (with 1–19 employees), (iii) corporations (with 20–299 employees), and (ix) corporations (with 300 or more employees).[8]

(3) Age Distribution of Company Management by Organization Type and Firm Size (Prefectural Figures)

To project the number of companies that will close due to the aging of their management,

[8] Corporations were classified into three categories by size of employment base after estimating the number of companies in the baseline year in terms of sole proprietorships and corporations.

Figure 6. Breakdown of Planned Closure Timing



Note: Same as Table 3.

we need data about the age distribution of managers in existing companies. Since this cannot be obtained from published statistics, we aggregated this information as of 2014 using Teikoku Databank's corporate database.

Figure 7 shows sole proprietorships have a relatively high percentage of managers aged 70 or older compared to corporations. Comparing it with data as of 2004, the average age has increased from 57.97 in 2004 to 59.82 in 2014, jumping by almost two years. Those aged 60 and older climbed to over half the total number of managers, increasing by 10 percentage points from 44.5% in 2004 to 54.9% in 2014.

II-4-2. Method for Projecting Number of Company Closures due to Aging of Current Management

As seen in Figure 8, our projections go through three processes: ① calculation of the number of companies by management's age bracket, ② projection of the number of closures by management age bracket, and ③ projection of closures by year of closure. Note that these processes are conducted separately for the three company categories: ① sole proprietorships, ② corporations (1–19 employees), and ③ corporations (20–299 employees). The next sections explain each of these processes in order.

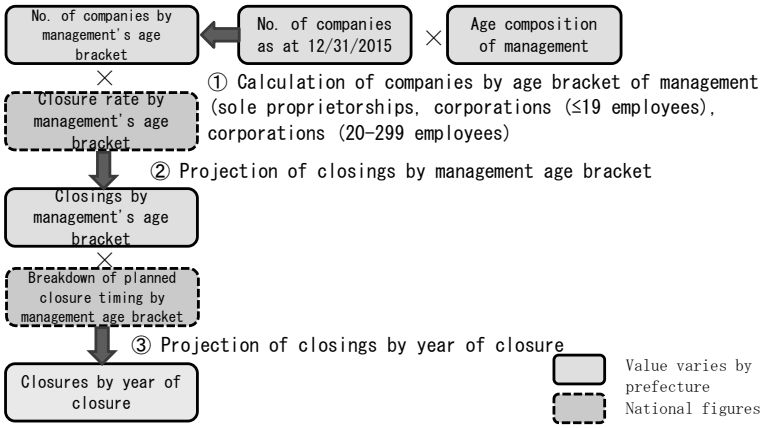
(1) Calculation of Number of Companies by Management's Age Bracket (for sole proprietorships and corporations by employee scale)

To calculate the number of companies by age bracket of management, we multiply the number of companies by organization type and firm size obtained in II-4-1(2) by the age

Figure 7. Age Breakdown of Managers (2014)

Note: Aggregate excludes those whose age is unknown.
Source: Teikoku Databank database (compiled for the Japan Finance Corporation).

Figure 8. Method for Projecting Closures due to Aging of Management



distribution of company managers by organization type and employee scale from (3) in II-4-1.

(2) Projection of Closures of Companies by Management's Age Bracket

To estimate the number of closures of companies by management's age bracket, we multiply the number of companies by management's age bracket in (1) (by organization type and employee scale) by the closure rate by management's age bracket.

Here, the closure rate by management's age bracket is an aggregate by age bracket of

Table 4. Closure Rate (Closure due to Aging of Current Management)

(Units: %)

		Successor Determined	Successor Undetermined					Planned Closure	Deferred	Total	Closure Rate (Base-Case)	Closure Rate (Simulation 6)
			No Successor Determined									
		Have determined a successor (and successor has consented)	Multiple candidates for succession, but have not chosen determined/one yet	Have a preferred successor, but person has not consented yet	Currently seeking successor	Desired successor has not consented	Other	Intend to close business when I retire	Still young, so not necessary to determine successor yet			
		a	b	c	d	e	f	g	h	i	j=(d+e+g)/(i-h)	k=g/(i-h)
Sole Proprietorships	<=39(n=368)	2.5	0.5	2.9	0.2	1.1	0.8	28.7	63.4	100.0	81.9	78.4
	40s(n=519)	2.6	1.7	4.9	2.5	1.4	0.3	52.8	33.8	100.0	85.6	79.8
	50s(n=511)	3.3	1.5	6.2	5.2	2.5	1.0	64.2	16.1	100.0	85.7	76.5
	60s(n=509)	10.2	1.7	2.5	3.3	2.2	0.6	74.8	4.6	100.0	84.2	78.4
	70s+(n=234)	15.6	4.0	1.6	3.3	5.3	0.6	67.5	2.2	100.0	77.8	69.0
	All ages(n=2,141)	9.3	2.3	3.2	3.5	3.0	0.6	66.8	11.2	100.0	82.6	75.2
Corporations (1-19 employees)	<=39(n=110)	1.7	0.5	8.2	7.4	0.0	0.0	11.8	70.3	100.0	64.9	39.8
	40s(n=514)	3.0	2.6	9.2	8.8	1.0	0.5	26.5	48.7	100.0	70.5	51.5
	50s(n=515)	10.3	4.5	10.9	11.9	2.1	0.8	35.2	24.3	100.0	65.0	46.5
	60s(n=379)	22.8	4.0	6.6	13.5	3.8	2.0	41.4	5.9	100.0	62.4	44.0
	70s+(n=77)	23.9	5.6	3.3	13.1	6.2	2.8	40.8	4.4	100.0	62.8	42.7
	All ages(n=1,595)	15.4	4.0	7.6	11.9	3.2	1.5	35.7	20.7	100.0	64.1	45.1
Corporations (20-299 employees)	<=39(n=37)	2.9	2.3	5.3	5.3	2.9	0.0	13.5	67.6	100.0	67.3	41.8
	40s(n=109)	7.3	2.0	14.7	14.7	1.9	0.0	12.6	46.9	100.0	54.9	23.8
	50s(n=152)	13.0	8.7	21.2	14.5	4.3	1.9	15.2	21.4	100.0	43.1	19.3
	60s(n=63)	24.0	15.0	8.0	19.1	7.5	1.3	17.0	8.0	100.0	47.4	18.5
	70s+(n=7)	16.2	0.0	27.9	0.0	16.2	11.7	16.2	11.7	100.0	36.7	18.4
	All ages(n=368)	16.2	8.2	15.8	13.4	7.0	2.9	15.5	20.9	100.0	45.4	19.6

Note: Same as Table 3.

intentions regarding business succession calculated in II-4-1 (1) (see Table 4).[9] We regard a company as closing when the current management retires having intentions regarding succession with the following categories: planned closure (Table 4, column *g*), currently seeking successor (column *d*), and successor not determined (column *e*). Our calculations for the closure rate do not include companies under premature (column *h*) in the denominator.

82.6% for sole proprietorships (all ages) will close their business when they retire. Corporations have a 64.1% closure rate for those with 1–19 employees and a 45.4% closure rate for those with 20–299 employees.

We can estimate the number of closures by multiplying the number of companies by the closure rates in each management age bracket. This results in a forecast that 2.896 million companies out of the 4.025 million companies nationwide in 2015 will close. However, as mentioned previously, this does not mean that all of these companies will definitely close their business during the projection period. Therefore, we must use the following process to estimate closings by year of closure.

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[9] Normally, it would be preferable to use prefectural figures for closure rates. However, because the Internet Survey on Small and Medium Enterprise Business Succession has a limited sample size, classification by prefecture is difficult, so we are using national figures.

Note that although we do not describe this in detail, we use the binary yes/no attribute for closure planning as the explained variable, with management attributes, company attributes, and location as explanatory variables in our analysis of the determining factors in closure planning. We found that although such factors as the age of current management, the relationship between management and the founder, organizational structure, number of employees, financial performance, and presence/absence of borrowings from financial institutions were significant, location was not significant. In short, geographical location does not create significant disparities in closure rates. We, therefore, determined that using national figures would be permissible.

(3) Estimation of Closing of Companies by Year of Closure

We estimate closings of companies by year of closure by multiplying the number of closures by management's age bracket from (2) above by the planned closure timing by management's age bracket (Figure 6). This results in a projected number of nationwide closures during the estimation period of 2.735 million companies.

II-4-3. Method for Estimating Closures due to Aging of Successor Management

We must also consider the possibility that even if business ownership is successfully transferred, the second succession may be necessary during the estimation period. Here, we project the number of companies that close instead of handing over the business a second time. The projection method here is somewhat complicated, but the concept is the same as for the first succession. From the companies in existence as of the baseline year, we estimate the number of closures by calculating the year of succession and the age distribution of the successors for each company to be handed over.[10] Closures are projected in the same manner as with the current management.

Note that the closure rate by management age bracket is based on the figures under current management is 2nd or later generation in Table 3, column *h*. This is because the closure rate is relatively low for those companies that have successfully gone through business succession. As in Table 4, we use the closure rates aggregated by the age bracket. We also use the values in Figure 6 for a breakdown of planned closure timing by management's age bracket. However, for the planned closure timing, we replace "2020 or earlier" with "5 years or sooner," "2021–25" with "6–10 years," and "2026–30" with "11–15 years" and apply the same hereinafter.

Projecting closures by successors in this fashion results in the closure of approximately 380,000 companies nationwide during the projection period. Adding this to the projected closures by current management puts forecast closures at approximately 3.115 million over a period of 25 years.

II-5. Projecting Bankruptcies

Company closures are caused not only by such voluntary factors as the aging of management but also by involuntary factors such as bankruptcy, which reduces the number of companies and employment. Here, we project the number of companies that will close due to bankruptcy.

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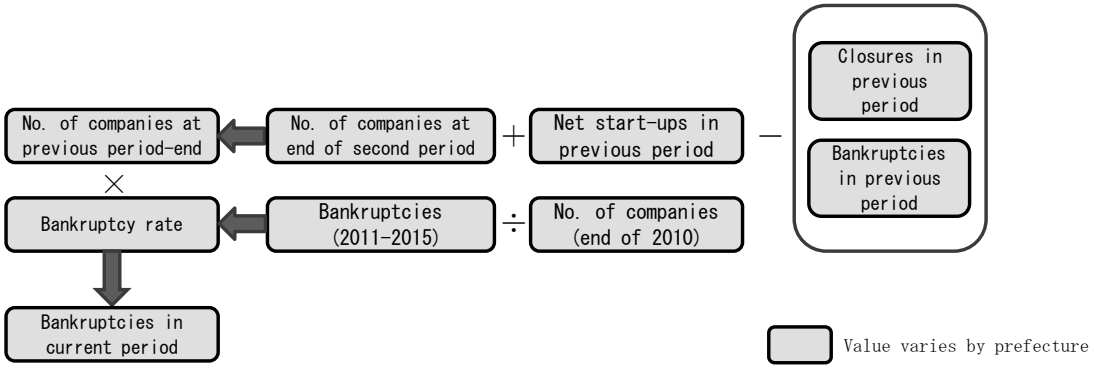
[10] The Internet Survey on Small and Medium Enterprise Business Succession asked those companies classified as "successor determined" the current age of the successor and the successor's age at the time of succession. From this, we were able to obtain the distribution of successor age and succession year.

Figure 9. Method for Projecting Bankruptcies



II-5-1. Data Used

To project bankruptcies, we use the number of bankruptcies by prefecture given in the Business Mutual Aid Association's Corporate Insolvency Survey Report.[11]

II-5-2. Method for Projecting Bankruptcies

The number of companies going bankrupt heavily depends on the state of the economy. However, since forecasting the economic fluctuations until 2040 is impractical, we use a simple method to project bankruptcies (Figure 9).

Here, we assume that a certain percentage of companies in existence at the end of one period will go bankrupt during the following period. More specifically, first, we calculate the rate of bankruptcy obtained from the Corporate Insolvency Survey Report, which is divided by the number of bankruptcies per prefecture (total from FY2011–FY2015) by the number of companies per prefecture as of the end of 2010. We multiply this rate of bankruptcy by the number of companies existing at the end of this five-year period to estimate the number of companies going bankrupt per prefecture in the following five-year period.

Our calculations result in an estimated 220,000 companies going bankrupt over a 25-year span. This is a relatively small number than that of companies closing due to aging management (approximately 3.115 million).

II-6. Projecting Number of Employees

Next, we project the number of employees at the end of the current period by taking the

[11] This annual report defines bankruptcy as a company's effective insolvency due to: ① suspension of bank transactions, ② procedures triggered by the Bankruptcy Act, Civil Rehabilitation Act, or Corporate Reorganization Acts, ③ special liquidation procedures triggered by the Companies Act, or ④ voluntary liquidation or other such procedures not directly pertaining to the preceding items.

previously estimated net start-ups, closures, and bankruptcies, multiplying each by the respective average number of employees, then adjusting the result by the number of employees at the end of the previous period.

We start by taking data on the average number of employees by years in operation to calculate the number of employees at start-ups. However, the Economic Census does not provide the number of employees by years in operation. Therefore, for corporations, we use data from the Basic Survey on Small and Medium Enterprises conducted by the Ministry of Economy, Trade and Industry (2015) to calculate the average employees by years in operation.[12] This data is not provided by prefecture, so we have used national figures. On the other hand, in the case of sole proprietorships, we used the Economic Census Basic Survey (2014) to calculate the average number of employees by year of establishment of single business locations. Because sole proprietorships very rarely have more than one business location, single business locations can be considered as companies. The Economic Census provides the number of sole proprietorships by prefectural figures. A weighted average of the average employees at corporations and sole proprietorships on the basis of a proportion of start-ups,[13] gives us the average number of employees by years in operation (Table 5①).

Then, we calculate the number of employees at closed companies for sole proprietorships and corporations with 1–19 employees and 20–299 employees, using average employees as given in the Economic Census Basic Survey (2014) (Table 5 ②) by prefectures.

In addition, the average number of employees for each prefecture (Table 5 ③) by the Corporate Insolvency Survey Report allows us to calculate the number of bankruptcies by firm size.[14]

III. Characteristics of Projection Results

III-1. Number of Companies

Our projections for the number of companies is given in Table 6. Nationwide, the number of companies is forecast to decline from 4.025 million at year-end 2015 to 2.956 million by year-end 2040. We see a dramatic drop in the number of companies between 2015 and 2025,

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[12] This survey covers small and medium enterprises as defined in the Small and Medium-sized Enterprise Basic Act except for some industries, such as “healthcare & welfare” and “education and learning services”.

[13] This breakdown can be calculated by prefecture from the Employment Status Survey. We consider entrepreneurships that are within the business-owner group and have been in business for less than three consecutive years as sole proprietorships, and entrepreneurships that are similarly within the employee group (incl. directors) as corporations.

[14] Employment scale is divided into six categories: 4 or fewer employees, 5–9 employees, 10–29 employees, 30–99 employees, 100–299 employees, and 300 or more employees. For each category, we calculate the average number of employees (by prefecture) from the Economic Census (2014), weighting the average based on the employee scale of bankrupt companies (FY2011–FY2015), to find the average number of employees at bankrupt companies.

Table 5. Average Number of Employees Used to Project Employee Numbers

(Units: Persons)

① Average # of employees per years	Years in operation	≤4yrs	5-9yrs	10-19yrs	20-29yrs	30+yrs
	Avg. employees	5.00	5.24	4.88	4.59	5.12

② Avg. # of employees by org. type & employment scale	Org. type	Sole Proprietorships	Corporations		
	Employment scale		1-19	20-299	300+
	Avg. employees	2.86	5.73	57.01	1,216.85

③ Avg. number of employees at bankrupt companies	7.17

Notes: 1 All figures shown are national, but calculations of employee numbers by prefecture use average number of employees by prefecture.

2 Calculation of average number of employees by org. type and employment scale includes companies with only temp/dispatched employees. However, corporations with only temp/dispatched employees are included in corporations (1-19 employees).

3 Calculated based on METI's Economic Census Basic Survey (2014) and Basic Survey on Small and Medium Enterprises (2015), MIC's Employment Status Survey (2012), and the Business Mutual Aid Association's Corporate Insolvency Survey Report (multi-year).

Table 6. Results of Company Population Projections (National Total)

(Unit: Companies, 2015 = 100)

National Total	2015/12/31	2020/12/31	2025/12/31	2030/12/31	2035/12/31	2040/12/31
Number of Companies	4,025,398	3,607,478	3,194,723	3,102,620	3,013,555	2,956,245
2015 = 100	100.0	89.6	79.4	77.1	74.9	73.4
Increase in # of Companies	-321,325	-417,920	-412,756	-92,102	-89,065	-57,310
Net Start-ups	-	675,551	526,781	429,812	353,824	279,822
Gross Start-ups	-	735,456	699,147	670,390	642,482	609,753
Post-startup Closures	-	-59,905	-172,366	-240,578	-288,658	-329,931
Closure due to aging of managers	-	-1,042,290	-893,106	-480,178	-402,062	-297,304
Closure by Current Mgt	-	-1,034,052	-845,471	-395,540	-286,851	-173,397
Closure by Successor Mgt	-	-8,237	-47,635	-84,637	-115,212	-123,908
Bankruptcy	-	-51,181	-46,430	-41,737	-40,827	-39,828

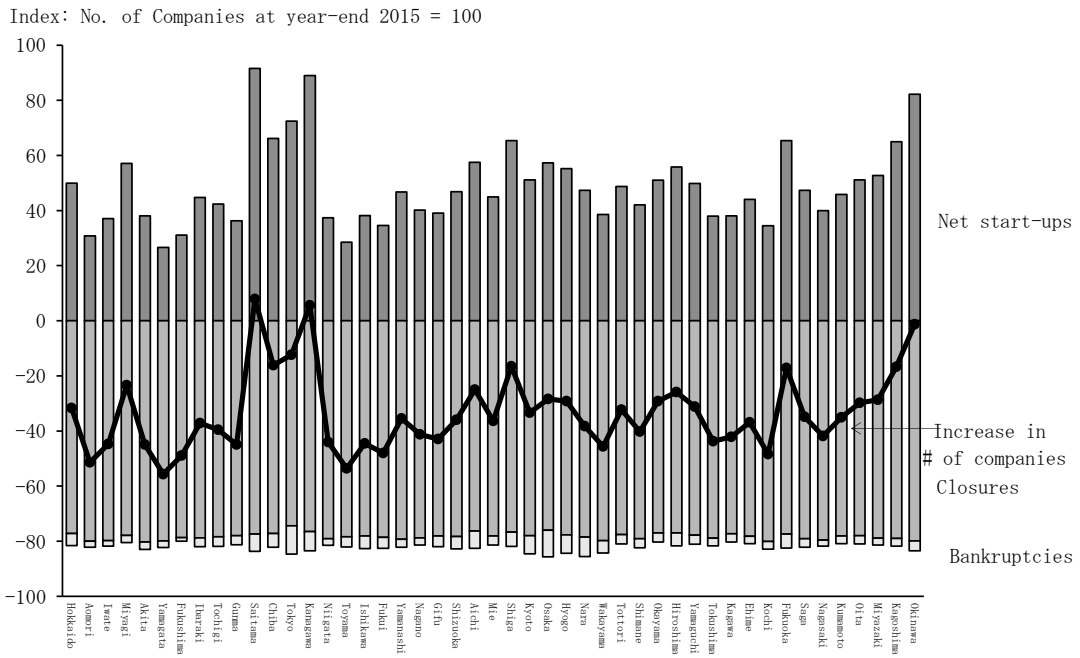
Note: Numbers inside heavy border are projections.

after which the decline is more moderate.

Given the breakdown in the change in the number of companies, we see that although net start-ups are forecast at 676,000 in the period from 2016 to 2020, they fall dramatically to 280,000 by the period from 2036 to 2040. However, company closures by current management are concentrated in the first half of the projection period. The pattern of change whereby the number of companies drops dramatically between 2016 and 2025 and then declines moderately thereafter is primarily due to business closures by current management. However, although company closures by successors become more frequent in the second half of the projection period, the figure is not large in absolute terms. Also, the contribution of bankruptcies is not significant in any period of these projections.

Figure 10 shows the change in the number of companies and the breakdown by prefecture from the end of 2015 to the end of 2040, with 2015 set at 100. The number of companies increases in Saitama (+7.9 pts.) and Kanagawa (+5.6 pts,). The next highest (though negative) figures are for Okinawa (−1.3 pts.), Tokyo (−12.3 pts.), and Chiba (−16.1 pts.). With the exception of Okinawa, the top rankings are in the Tokyo metropolitan area. The

Figure 10. Increases in Number of Companies (year-end 2015 → year-end 2040) and Breakdown (by Prefecture)



Note: Increase in number of companies is an index determined by the difference between the number of companies at year-end 2040 and the number of companies at year-end 2015, with the number of companies at year-end 2015 set at 100.

lowest is Yamagata (－55.6 pts.), where the number of companies drops by more than half over 25 years. Next from the bottom are Toyama (－53.5 pts.), Aomori (－51.4 pts.), Fukushima (－48.9 pts.), and Kochi (－48.4 pts.).

With the breakdown in the change in the number of companies, the differences among regions are mainly caused by differences in net start-ups. Meanwhile, for all prefectures, company closures varied less than net start-ups. Almost all management will certainly stop working at some point during the projection period, since the percentage of these to total company management is very high for all prefectures, at 75%–90%. Similar percentages of older management leads to uniformity in the contribution of business closures in each prefecture.

III-2. Number of Employees

The results of our projections for the number of employees are shown in Table 7. The nationwide number of employees is forecast to decrease from 58.457 million in 2015 to 45.981 million in 2040. Since closures due to the aging of the current management are concentrated to the first half of the projection period, not only does the number of companies decline during that part of the period but the number of employees does as well.

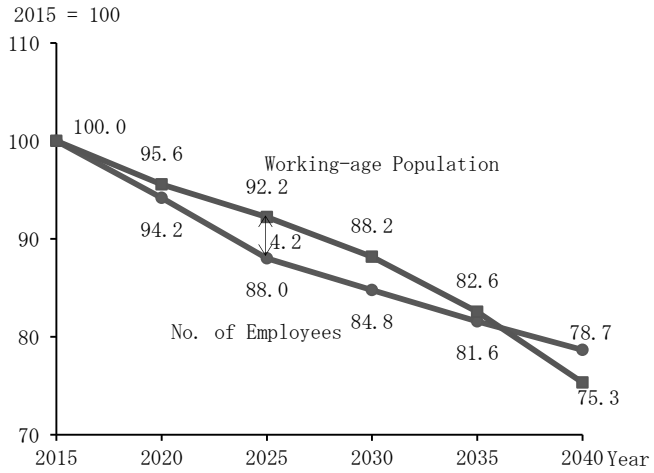
Table 7. Results of Number of Employee Projections (National Total)

(Unit: persons, 2015 = 100)

National Estimates	Yr-end 2015	Yr-end 2020	Yr-end 2025	Yr-end 2030	Yr-end 2035	Yr-end 2040
No. of Employees	58,457,143	55,053,914	51,459,926	49,553,244	47,693,145	45,981,367
(2015 = 100)	100.0	94.2	88.0	84.8	81.6	78.7
Increase in Employees	956,830	-3,403,230	-3,593,988	-1,906,682	-1,860,100	-1,711,778
Net Start-ups	-	3,398,544	2,791,598	2,104,502	1,734,861	1,261,966
Closures due to Manager Aging	-	-6,431,022	-6,049,592	-3,709,369	-3,299,718	-2,685,717
Closures by Current Mgt	-	-6,333,032	-5,584,660	-2,859,324	-2,111,567	-1,348,256
Closures by Successor Mgt	-	-97,990	-464,931	-850,045	-1,188,151	-1,337,461
Bankruptcy	-	-370,752	-335,994	-301,815	-295,243	-288,027
Average Employees per Company	14.5	15.3	16.1	16.0	15.8	15.6

Note: Numbers inside heavy border are projections.

Figure 11. Comparison of Number of Employees and Working-age Population (2015 = 100)



Source: Working-age population data are derived from the National Institute of Population and Social Security Research's Population Projections for Japan by Region (March 2013 projections) (the same applies hereinafter).

If we index the number of employees (labor demand) and the working-age population (labor supply) (with 2015 = 100), we see that in 2040, employees (at 78.7) will exceed the working-age population (at 75.3) (Figure 11). Looking at the prefectural numbers for these two figures in 2040, all prefectures except for Saitama, Kanagawa, and Chiba plot on a 45° line (Figure 12). The relationship between labor demand—shown by the number of employees—and labor supply—shown by the working-age population—remains as tight in 2040 as it is in 2015.

The number of employees decline more rapidly than the working-age population between 2020 and 2035. In other words, in 2025, the gap between these two is significant, at 4.2 points (Figure 11). Compared with 2015, labor demand is lower than labor supply. Figure 13 shows that the number of employees in all prefectures except Saitama and Kanagawa is lower than the total working-age population in 2025. In some prefectures, there is a discrepancy of 9–10 points between them. In these regions, there is a high probability of insufficient

Figure 12. Number of Employees and Working-age Population in 2040 (2015 = 100)

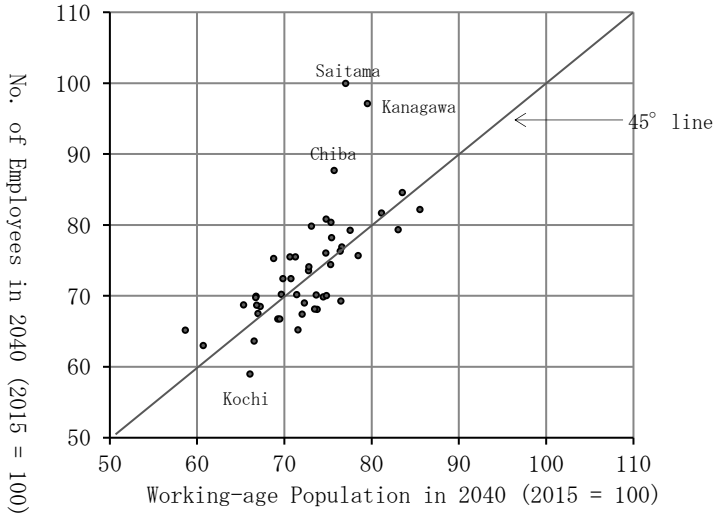
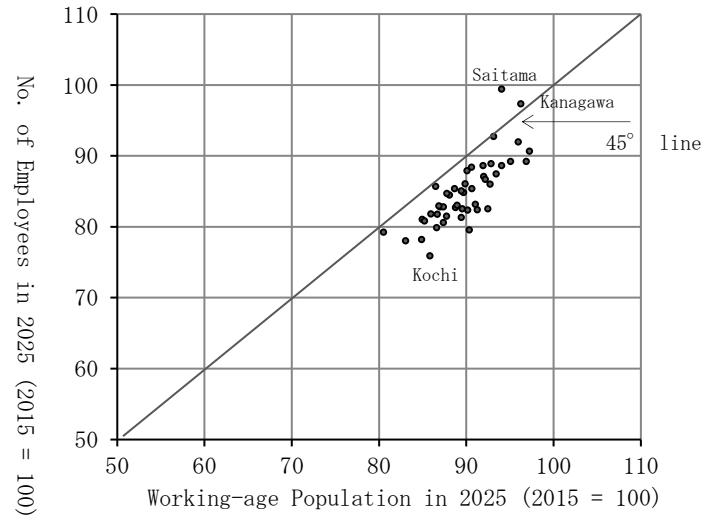


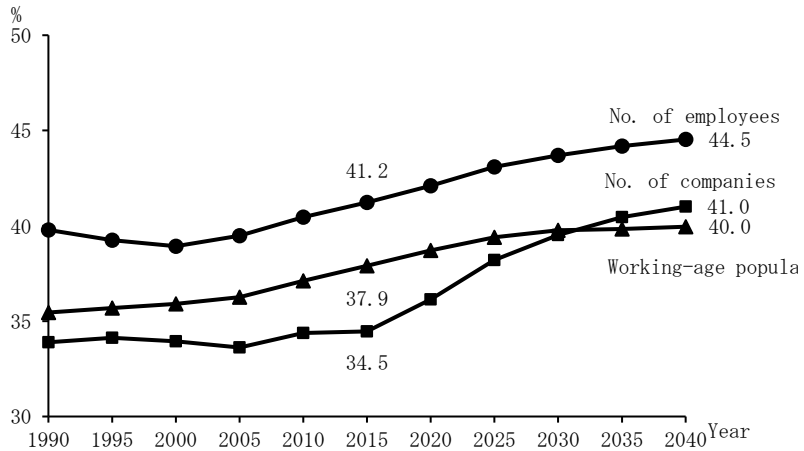
Figure 13. Number of Employees and Working-age Population in 2025 (2015 = 100)



employment opportunities between 2025 and 2030, compared with 2015.

The average number of employees per company increases from 14.5 in 2015 to 16.1 in 2025 (Table 7). This is due to the relatively high closure rate among the small companies (mainly sole proprietorships) due to the aging of management. This average starts to decline modestly after 2025, reaching 15.6 in 2040. Though the average number of employees per company has increased greatly over the past 25 years (1990–2015), from 10.1 to 14.5 (Table 2), the overall rate of increase between 2015 and 2040 will be more moderate. From 2015 to

Figure 14. Composition of Top 5 Prefectures



Note: As of 2015, Saitama, Tokyo, Kanagawa, Aichi, and Osaka are the top five prefectures in terms of number of companies, number of employees, and working-age populations as a percentage of the national total.

2040, in prefectures where the number of companies is decreasing significantly, the growth of the average number of employees per company is higher.

The number of companies and employees, as well as the working-age populations, will be concentrated in urban areas during the projection period. Percentage of the top five prefectures (Saitama, Tokyo, Kanagawa, Aichi, and Osaka) in the number of companies, the number of employees, and the working-age population as a share of the national totals, their working-age population is forecast to increase from 34.5% in 2015 to 41.0% in 2040 (+6.5 pts.), from 41.2% to 44.5% (+3.3 pts.), and from 37.9% in 2015 to 40.0% in 2040 (+2.1 pts.), respectively (Figure 14).

IV. Simulations

In the projections in Section III (hereafter the "base-case scenario"), we assume that the structure of start-ups and closures remain as they are. In other words, the projections assume a case in which there is no change in the future population outlook, the founder ratio, or the closure ratio. Since there is a concern that almost all of Japan's prefectures will face a shortage of employment opportunities in 2025 compared with 2015, it will be necessary for these prefectures to take political action to increase (or limit decreases in) the number of companies and the number of employees. In this section, we, therefore, simulate how changes in these variables could alter the number of employees in 2025.

IV-1. Scenarios

We conduct simulations of a total of six cases changing around the three variables of ① the population and demographics, ② the founder ratio, and ③ the closure ratio.

IV-1-1. Population and Demographics

In the base-case scenario, changes in the population and demographics resulted in a decline in the number of start-ups. In this case, what are the relationships between the population decline and population aging and the number of start-ups, and to what extent? We posit the two following scenarios.

In the first scenario (hereinafter, Simulation 1), we assume that the population does not decline after 2015, and that each prefecture's age and gender demographic ratio vary in accordance with the estimates by the National Institute of Population and Social Security Research. In short, we assume that although the population continues to age, the population remains at its 2015 level.

In the second scenario (Simulation 2), we assume that gender and age demographic ratio do not change after 2015, but that the population declines in line with the estimates by the National Institute of Population and Social Security Research. In short, we assume that the population declines but does not become older.

IV-1-2. Founder Ratio

In Simulations 1 and 2, we vary the population and demographics from which the founders emerge. However, increasing the founder ratio also increases the number of start-ups. We, therefore, posit three scenarios for the founder ratio.

In the first scenario (Simulation 3), we assume that the founder ratios by gender and age bracket for each prefecture increase by 10% over their actual levels. Taking the founder ratio for Tokyo as an example elicits the expected values in Table 8, column *b*. Note that the population and demographic forecasts are the same as in the base-case scenario (the same applies hereinafter).

The founder ratios are lower among females than among males (Figure 5). Therefore, in our second scenario (Simulation 4), we assume that a business climate is created to help women succeed. As a result, the founder ratios for women aged 49 and under rises to the same level as those for men in the same age bracket. However, if the founder ratio for women exceeds that of males, we assume that the ratio for women stays unchanged. For example, the founder ratios for Tokyo would be the expected values given in Table 8, column *b*.

Men tend to start businesses around the time of their mandatory retirement age (Figure 5). Therefore, in our third scenario (Simulation 5), we assume that the founder ratios for men in their 50s and 60s increase by 20% over their actual values. For example, the founder ratios

Table 8. Expected Founder Ratios in Simulations

(Units: %)

13 Tokyo		Actual Value	Expected Value		
			Column a	Column b	Column c
Male	15-29	0.167	0.184	0.167	0.167
	30s	0.471	0.518	0.471	0.471
	40s	0.411	0.453	0.411	0.411
	60s	0.197	0.217	0.197	0.237
	60s	0.289	0.317	0.289	0.346
	70+	0.027	0.029	0.027	0.027
	15 and over	0.272	0.299	0.272	0.286
Female	15-29	0.076	0.083	0.167	0.076
	30s	0.192	0.212	0.471	0.192
	40s	0.223	0.245	0.411	0.223
	60s	0.094	0.104	0.094	0.094
	60s	0.073	0.080	0.073	0.073
	70+	0.018	0.019	0.018	0.018
	15 and over	0.112	0.123	0.210	0.112
Total (15 and over)		0.191	0.210	0.240	0.197

Notes: 1 Shaded areas indicate that the expected values differ from the actual values.
2 Column a represents a 10% increase from actual values.
3 Column b represents an increase in levels for women aged 49 and under to the same levels as those for men.
4 Column c represents a 20% increase in levels for men in their 50s and 60s from the actual values.

for Tokyo would be the expected values given in Table 8, column *c*.

IV-1-3. Closure Ratios

In the base-case scenario, we projected closures due to the aging of management by classifying intentions regarding business succession and determining that closures would be those falling under planned closure, currently seeking a successor, and have a preferred successor but the person has not consented yet. However, the latter two cases represent companies that have the desire to remain in business if they can find a successor. We, therefore, exclude these two cases from closures and assume they will be able to remain in business (Simulation 6). This scenario, therefore, has the greatest effect on holding down closures. Table 4, column *k* gives the expected values for closure rates when the closure is effected by current management. We used the same method to calculate the expected values of closure ratios when the successor closes the business.

IV-2. Results

Figure 15-20 show the increases in employee numbers for 6 simulations as of 2025. Here, we subtract the number of employees in the base-case scenario (2015 = 100) from the number of employees in each simulation (2015 = 100) to get what we call the "boosting effect." In diagramming our results, the boosting effect is shown on the Y-axis, while the X-axis shows the gap between the working-age population in 2025 and the number of employees in 2025 according to the base-case scenario (2015 = 100). In other words, this is the expected severity of job shortages in 2025 compared with the base year of 2015 (nationally, this is 4.2 pts). A boosting effect that can exceed this gap (that is if we can plot it above the 45° line) is a desirable scenario for any prefecture.

IV-2-1. Simulation 1

Simulation 1 assumes that population does not decline after 2015.[15] Although this is an unrealistic assumption, the boosting effect of Simulation 1 is low in general, even in Akita Prefecture, where the boosting effect on the number of employees is greatest, it tops out at a paltry 0.6 percentage points above the base-case scenario (base-case at 79.3 vs. simulation at 79.9)[16] (Figure 15).

IV-2-2. Simulation 2

Simulation 2 posits the unrealistic assumption that population aging does not advance. Boosting effects are low overall, limited to 0.9 percentage points at best (in Chiba, base-case at 92.8 vs. simulation at 93.7) (Figure 16).

IV-2-3. Simulations 3-5

Simulations 3, 4, and 5 change the founder ratio.

Simulation 3 assumes a 10% increase in the founder ratios for each gender and age bracket. Here, the boosting effect on the number of employees is lowest in Aomori at 0.5 percentage points (base-case at 78.1 vs. simulation at 78.6) and highest in Saitama at 2.0 points (99.4→101.5), which shows relatively higher effects than both Simulations 1 and 2

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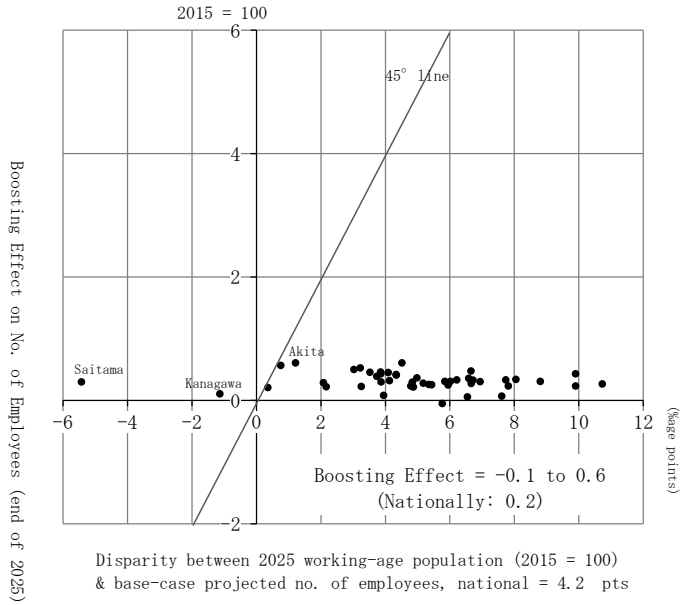
[15] If the population does not decline, the working-age population will exceed the National Institute of Population and Social Security Research estimates. However, we use the Institute's estimates for working-age population as to facilitate comparability with the other simulations. The same applies to Simulation 2.

[16] Since the figures are rounded to the second decimal place, there may be discrepancies between the base-case scenario, simulation, and boosting effect figures (the same applies to the following simulations).

Figure 15. Boosting Effect in Simulation 1



Note: The boosting effect for the number of employees is defined as simulation number of employees (2015 = 100) less the base-case scenario number of employees (2015 = 100) (the same applies hereinafter).

Figure 16. Boosting Effect in Simulation 2

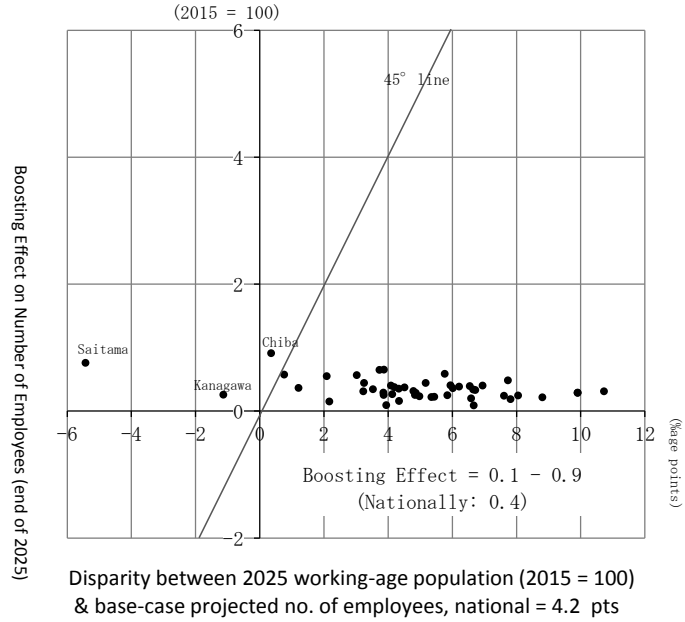
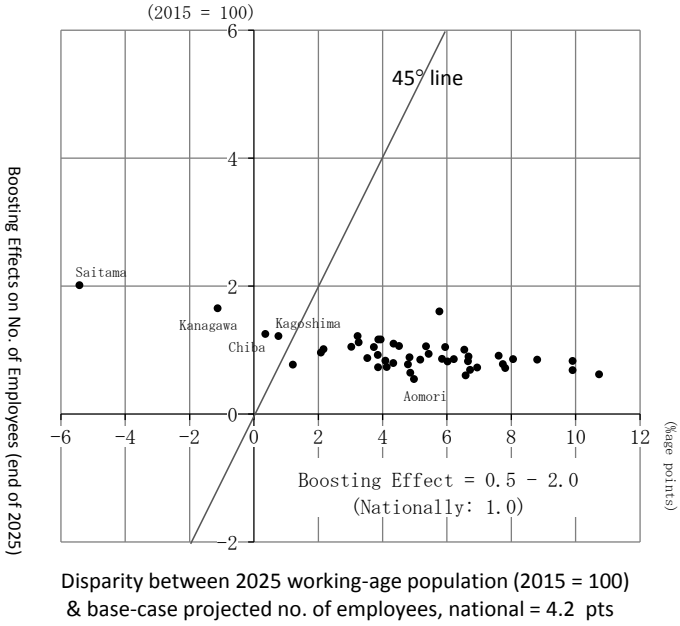


Figure 17. Boosting Effect in Simulation 3



(Figure 17). Even though 43 prefectures still fall below the 45° line, and this simulation is unable to eradicate the gap between the working-age population and the number of employees that will occur in 2025.

In Simulation 4, we assume that the founder ratios for women aged 49 and younger rise to the same level as those for men in the same age brackets. The boosting effects are strong overall, although there are significant differences among prefectures (Figure 18). On one hand, the boosting effect is lowest in Aomori, at 0.1 points (78.1 vs. 78.1), on the other hand, it peaks at 5.7 points in Fukuoka (88.7 vs. 94.4). The nationwide boosting effect is 3.0 points (88.0 vs. 91.0), exceeding that of Simulation 3. 39 prefectures, however, are still unable to eradicate the gap in working-age population and number of employees in 2025.

In Simulation 5, we assume that the founder ratios for men in their 50s and 60s rise by 20% over their actual values. The nationwide boosting effect is fairly limited compared with Simulation 3, at 0.6 points (88.0 vs. 88.6), although it exceeds those of Simulations 1 and 2 (Figure 19).

Figure 18. Boosting Effect in Simulation 4

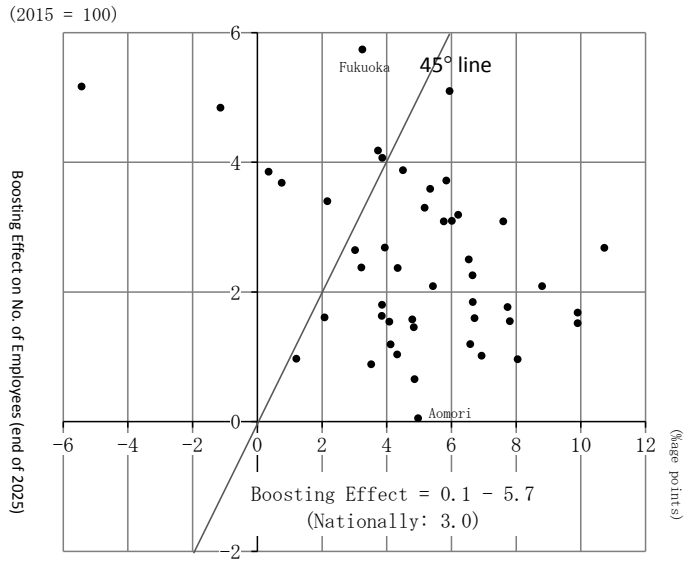


Figure 19. Boosting Effect in Simulation 3-3

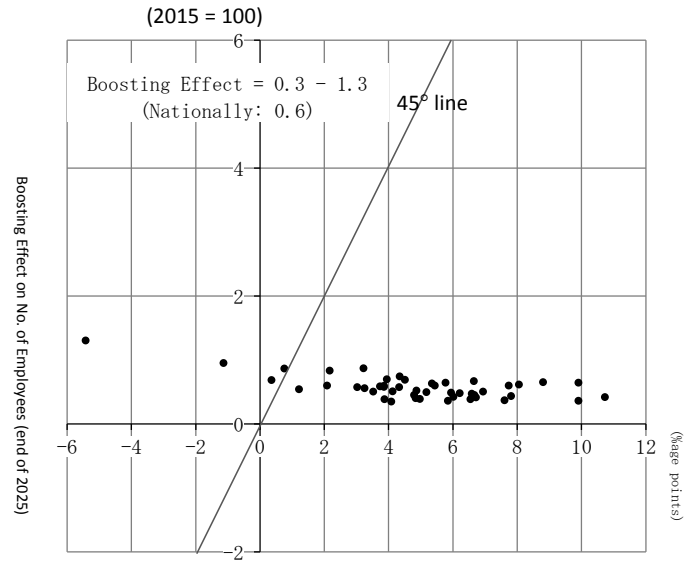
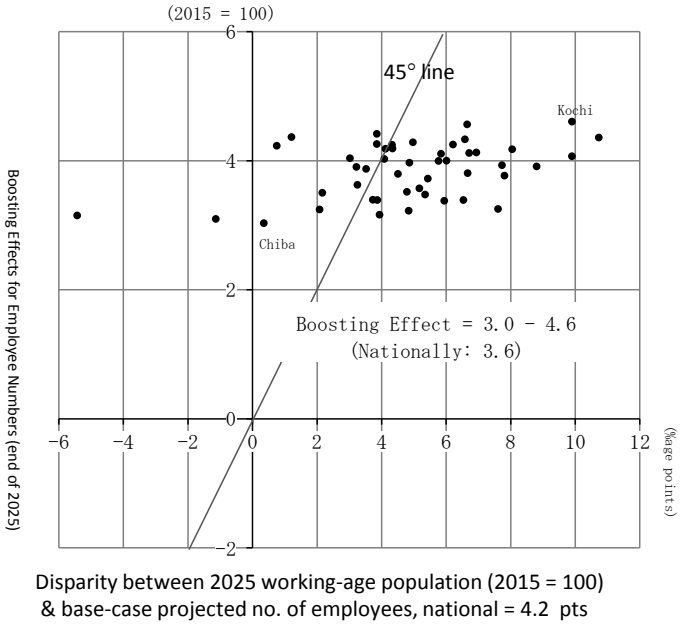


Figure 20. Boosting Effect in Simulation 6



IV-2-4. Simulation 6

Simulation 6 assumes that closures due to the aging of management are minimized. This results in a large boosting effect overall, at 3.6 points nationwide (88.0 vs. 91.6) (Figure 20). Here, there are small differences among prefectures. The largest boosting effect is presented in Kochi, at 4.6 points (75.9 vs. 80.5), but the boosting effect remains significant even at its lowest level, at 3.0 points in Chiba (92.8 vs. 95.8).

V. Conclusion

V-1. Characteristics of the Base-Case Scenario

According to the base-case projections in this paper, the number of companies and the number of employees will fall significantly from 4.025 million and 58.457 million in 2015 to 2.956 million and 45.981 million in 2040, respectively. Four points should be noted with respect to the base-case scenario.

The first is that these declines are not uniform across the nation. Disparities increase among prefectures. While the number of companies declines by as much as 55.6% in Yamagata (from 44,000 to 19,000), Saitama sees a 7.9% increase (from 178,000 to 192,000). Similarly, while the number of employees could drop as much as 41.0% in Kochi (from 287,000 to 169,000), it is flat in Saitama, going from 2.633 million to 2.632 million. As a

result, the concentration of companies and employees in major cities will increase even more.

The second point is that the rates of decline are not uniform within the estimation period. Although the number of companies decreases by 1.069 million over the 25-year estimation period, 830,000 of that occurs in the first ten years. Similarly, among the 12.476 million decrease in the number of employees over the 25-year period, 6.997 million of that occurs in the first ten years. This is because closures due to the retirement of current management are concentrated in the first half of the estimation period. This trend is common to all regions.

The third point is related to the working-age population. Even if the number of employees (i.e., demand for labor) goes down, a simultaneous decline in the working-age population would lead to a tight labor market in almost all prefectures in 2040, the level similar to that in 2015. Because of the declines in employees and the working-age population do not occur simultaneously over time, the rate of decline in the number of employees will temporarily exceed that of the working-age population around 2025. Therefore, it is critical that prefectures consider how to reduce the gap in labor demand and supply that is expected to occur around 2025. Furthermore, since companies, as well as the demand for labor, will further concentrate in major cities, declines in the number of local companies need to be limited in order to maintain the viability of local communities.

The fourth point concerns productivity. In the base-case scenario, the average number of employees per company increases moderately during the estimation period (Table 7). Whether this leads to higher overall economic productivity or not hinges on the relationship between firm size and productivity. If we assume, that the bigger the company, the higher its productivity, then increasing average company scale would increase productivity. However, Kodama (2016) showed that small and medium enterprises do not necessarily have lower total factor productivity (TFP) than large companies. Most existing research indicates that productivity increases come more from within existing companies than from companies coming into or going out of business (Bartelsman and Doms, 2010; Kwon, Kim, and Fukao, 2008; Kwon, Fukao, and Kim, 2007) or that in Japan, the negative effect of exit, that is, average productivity of existing companies is higher than the industry average[17] (Fukao and Kwon, 2011). Therefore, even though the average firm size may increase during the projection period, this does not necessarily mean that productivity is improving.

V-2. Policy Implications from the Base-Case Scenario and Simulation Results

The results of our base-case scenario and simulations yield the following four policy implications.

The first is that support for start-up businesses and business succession are both critical. Only encouraging start-ups or only constraining closures will not yield significant results.

Simulations 3, 4, and 5 all assume a higher founder ratio, but none of these scenarios

[17] However, since we are using METI's Basic Statistical Survey of Japanese Business Structure and Activities, "exit" means that the company is no longer in the survey sample.

succeeded in closing the gap between labor supply and demand that is to occur in most prefectures in 2025. Even in Simulation 6, where closures are reduced to minimal levels, the gap persists in most prefectures. Therefore, it is necessary to support and increase start-ups as well as to reduce closures due to aging management by providing support for business succession. It is important to note that the scope of business succession support would be for companies that have the will and ability to remain in business but would otherwise be forced to close solely because they do not have a successor.[18]

The second point is that increasing the number of start-up companies also requires increasing the founder ratio. If the population decline or the aging of the population structure could be held in check, start-ups would flourish and the number of employees would grow. However, the impact would be relatively limited than when we increase the founder ratio. As observed in Simulation 3, increasing the founder ratio by 10% has a higher expected boosting effect on the number of employees than in both the scenario where the population level is maintained (Simulation 1) and the scenario where we halt the advance of aging (Simulation 2). Moreover, increasing the founder ratio by 10% is more realistic than maintaining the population level or reining in population aging. Prefectures should consider population decline and aging as givens.

According to Okamuro (2014), compared with other countries, Japan has a higher success probability among potential entrepreneur. Half of those wanting to start a business are in the process of doing so, and half of those succeed in starting up a business. Yet, the reason that Japan's start-up ratio is lower than those of the United States or Great Britain is that few people in Japan want to start businesses. It is important not only to assist those in the process of starting a business but also to increase the number of people who want to start a business by providing a hospitable environment for start-ups to flourish.

The third point is to increase the founder ratio. Policy measures targeting a specific segment, for example, female or retired elderly are more effective than those across the board. For example, let us take start-up assistance for women. In Simulation 4, where we increased the founder ratio for women aged 49 or under to the same level as males in the same age bracket, the boosting effect for the number of employees nationally in 2025 was greater than that in Simulation 3, where we raised the founder ratio by 10% across the board. This holds for Simulation 5 as well, where start-up assistance is provided to men in their 50s and 60s. This kind of targeted start-up assistance would probably be highly effective in prefectures where the founder ratio for women is relatively low or where there is room to increase the founder ratio for men in their 50s and 60s.

The Japan Finance Corporation goes beyond offering ordinary funding to founders through programs that provide entrepreneurial funding assistance to women, young

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[18] In Simulation 6, for companies that fall under Currently Seeking Successor and Desired Successor Has Not Consented, we assumed they would go through with business succession and not close. These companies have the desire to remain in business if they can secure a successor. Furthermore, these firms' current financial performance is on a par with those under Successor Determined. Therefore, we can probably say that these companies also have the capability of staying in business.

entrepreneurs (under 30),[19] and senior entrepreneurs (55 and older). These types of preferential policies for entrepreneurs will be critical going forward. For women, in particular, policies that remove obstructions to starting up businesses, such as relatively a low desire to start businesses[20] and insufficient management experience,[21] are desirable.

The fourth point is that business succession support needs to be focused on the early stages of the projection period. The number of companies and employees decline significantly during the first ten years of our projection period. This is because current managers will be reaching retirement age during this decade. Therefore, support for business succession should be focused on the earlier years of our projection period. We did not plot this graphically; doing this for Simulation 6 would result in a significant boosting effect during the first ten years.

As the baby boomers of Japan's post-World War II began reaching the age of 70 in 2017 and thereafter, there is concern about a rapid uptick in business closures. Hence, support measures are being put in place to help business succession proceed smoothly. For example, in October 2016, the Sumida Ward branch of the Tokyo Chamber of Commerce and Industry began a program where it conducts checkups on the health of companies where the presidents are aged 60 and older. In this program, the checkup is meant to encourage early action on succession by managers aged 60 and over by giving them feedback from the checkup, a tailored support plan for succession drafted by an SME consultant, and assistance in succession execution. The expectation is to allow the president to take another clear look at his or her company's strengths, to recommend a family member as a successor, and to promote the transition through MBO, M&A, MBI, and so forth. Business succession networks are being set up on both a prefectural and national level so that checkup systems, like that in Sumida Ward, are getting off the ground in 2017.

As two years have passed in our projection period, the decline in the number of companies is already advancing, leading to calls for more assistance for start-ups and succession support appropriate to each region.

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[19] Eligibility was expanded to those under 35 years of age starting in FY2017.
[20] White Paper on Small and Medium Enterprises (2014).
[21] Kodama and Odaki (2011).

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