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Faculty of Global Business, Osaka International University

Yasuko Hinoki,

Faculty of Economics, Chukyo University

Junya Masuda,

Faculty of Economics, Otemon Gakuin University

Manami Ogura,

Faculty of Economic Sciences, Hiroshima Shudo University

Kazuaki Okamura

Regional Wage Spillover in Japan: A Short-run Analysis[1]

Yasuko Hinoki[*], Junya Masuda[†], Manami Ogura[‡], Kazuaki Okamura[§]

Abstract

We explored the macroeconomic consequences of spatial wage spillover in Japan. We estimated a spatial panel data model with interdependent regional wages. Our findings suggest that spatial wage spillover among regions is heterogeneous and asymmetric. Wage shock in densely populated areas does not spread to other local areas, though wages in the local area spread to other regions. As a result, the effect of region-specific wage shock on aggregate wage level is larger in local areas than in densely populated areas. This result contributes to discussions on how to increase national wage and decrease regional disparity. Local areas, rather than densely populated areas, should be considered as a policy target to achieve short-run national wage increase.

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[*] Faculty of Business Administration and Economics, Osaka International University

[†] Faculty of Economics, Chukyo University

[‡] Faculty of Economics, Otemon Gakuin University

[§] Faculty of Economic Sciences, Hiroshima Shudo University

1. Introduction

The interdependence of the local labor market and its macroeconomic consequence is a key issue for understanding regional economic integration and evaluating the effects of regional economic policies. Paying attention to wage determination in the local labor market includes two perspectives: (1) determination of spatial equilibrium in local wage and (2) adjustment of equilibrium wage through wage spillover in the local labor market. In the determination of “equilibrium” in spatial wage disparities, many studies focus on the “spatial equilibrium model” (Rosen (1979), Roback (1982), Topel (1986) and subsequent studies such as Combes, Duranton, and Gobillon (2008)).[2] The model is useful for analyzing the difference in intra-country local labor market performance. Conversely, interregional wage spillover has been examined as a variation of the traditional Phillips curve (Brechling (1973)), the new economic geography model (Mion (2004)), the wage curve (Longhi, Nijkamp, and Poot (2006)), and the application of recent spatial econometric methods (Huang and Chand (2015)). We focus our interest on Mion’s (2004) work among previous studies. He estimates the structural wage equation incorporating spatial externalities and simulates the effects of wage changes in the central-western region of Italy (Latium provinces) on the wage changes of other provinces. However, he has not measured the overall effects of wage change because he focuses on the mechanism that shapes the spatial distribution of earnings.

On the contrary, we focus on the “aggregate” effects of wage shock in a region through wage spillover effects among other regions. As a background with such interest, recent government policies of Japan promote increasing national wage and decreasing regional disparities. In 2013, the government of Japan enacted the National Strategic Special Zones (NSSZs) that deregulate targeted regions to promote their economic activity. The law aims to decrease the economic differences among urban and rural regions. However, the aggregate effect of wage shock differs depending on the selection of zones. Thus, if we consider the aggregate effect of deregulating certain specific zones, the selection process of the zone subject to deregulation will be an important issue in terms of policy in promoting national wage increase. By considering spatial wage spillover, wage shock in the targeted zones affects the wages in the adjacent area, which further affects another adjacent area. If the wage spillover effects in the adjacent area are heterogeneous and asymmetric among other regions, then the aggregate effects of wage shock are dependent on the degree of wage spillover around the targeted regions. Theoretically, the wage spillover is explained by the turnover model of the efficiency wage hypothesis (Stiglitz (1974). As Drewes (1987) explains in detail, the adjacent regions’ wage increase enables the relevant regions’ employers to increase the wage with the aim of reducing turnover.[3] Based on the turnover model of the ‘efficiency wage hypothesis, the asymmetry of wage spillover is explained by the degree of “permanence” in wage increase. As Topel (1986) writes, “Wages are higher in a particular market the higher is the expected future equilibrium cost of migration.” In other words, if the wage increase in some regions is regarded as “transitory,” then positive wage spillover to other regions is expected to be small. Future equilibrium (opportunity) cost of migration from one region to another is not high, and the other regions’ need for wage increase to attract

[2] On the comprehensive survey of “spatial equilibrium model,” see Moretti (2011).

[3] On the turnover model of the efficiency wage hypothesis and its variants, see Molho (1992).

workers is less. Conversely, if the wage increase in some regions is regarded as "permanent," then positive wage spillover to other regions is expected to be large because the future equilibrium (opportunity) cost of migration from some regions to other regions are high, and the other regions' need for wage increase to attract workers rises.

The purpose of this paper is to estimate the spatial wage spillovers in Japan and compare the aggregate effects of wage shock across the region. We perform the analysis according to following steps: (1) estimating the wage equation by incorporating the spatial wage spillover using the spatial panel data, (2) simulating the effects of wage shock on aggregated wage rise of all regions based on estimated parameters in (1), and (3) comparing the aggregated wage rise for each targeted region and examining which region should be selected as a target policy to boost national wage increase. If we pay attention to the long-term consequences of spatial wage spillover, the model assumes that labor is perfectly mobile and land price is incorporated in the spatial equilibrium model. However, we focus on the short-term effects of regional wage increase policy on aggregate wage increase, not on its *long-term* effects on regional wage gap. Therefore, in our model, labor is only supposed to move across regions for daily commuting, and movements in residential areas are excluded.

In the next section, we describe the spatial econometric model that incorporates the spatial wage spillover and show the data sources and description. In Section 3, we report the estimated results and show the simulation of wage shock in certain regions on overall wage rise. In Section 4, we conclude our discussions regarding policy implications.

2. Estimation Model and Data Description

We assume that wage in each region is determined by the following function:

$$\ln W_{it} = \ln W_{it}{}^{*} + \sum_{j=1}^{N} \delta_{ij}\left(\ln W_{jt}{}^{*} - \ln W_{it}{}^{*}\right) + \theta_t + u_{it}$$

$$\text{for} \quad i = 1, \ldots, N, \;\; t = 1, \ldots T. \qquad (1)$$

where W_{it} is the wage at the region i in period t, W_{it}^{*} is the part of wage determined only by the income of region i in period t, θ_t is the common variations across regions in period t, and u_{it} is the error term.

The wage of the i-th region is determined by three factors. First, wages affect i-th region's local productivity and unemployment. Second, if there is a wage difference in other regions, wages will fluctuate. δ_{ij} represents the magnitude of the influence of wage level from other regions to relevant regions. That is, the larger the δ_{ij}, the stronger is the impact from other regions. If wages in other regions are higher, then it is expected that the wages will also be higher in that region. Third, wages are affected by uniform wage shocks throughout the regions, such as changes in the system (referred to as θ_t).

We assume that $\ln W_{it}{}^{*}$ follows random walk, which is expressed by:

$$\ln W_{it}{}^{*} = \ln W_{it-1} + \epsilon_{it}. \qquad (2)$$

Because $\ln W_{it}^{*}$ and θ_t cannot be observed at first, we substitute Eq. (2) into Eq. (1) to remove $\ln W_{it}^{*}$ from the model.

$$\ln W_{it} = \ln W_{it-1} - N\delta_i \ln W_{it-1} + \sum_{j=1}^{N} \delta_{ij} \ln W_{jt-1} + \theta_t + v_{it}$$

$$\text{where } \delta_i = \textstyle\sum_{j=1}^{N} \delta_{ij} / \mathrm{N}. \qquad (3)$$

Next, we consider removing θ_t from Eq. (3). Taking the average in the cross-section direction, the following equation is obtained:

$$\overline{\ln W_t} = \overline{\ln W_{t-1}} - \sum_{j=1}^{N} \ln W_{jt-1} \delta_i + \sum_{i=1}^{N} \ln W_{it-1} \delta_j' + \theta_t + \overline{v_t}$$

$$\text{where } \delta_j{}' = \textstyle\sum_{i=1}^{N} \delta_{ij} / \mathrm{N}. \qquad (4)$$

When Eq. (4) is subtracted from Eq. (3), the following equation is obtained:

$$\Delta \ln W_{it} - \Delta \overline{\ln W_t} = \textstyle\sum_{j=1}^{N} \delta_{ij} \left(\ln W_{jt-1} - \ln W_{it-1} \right) + \sum_{j=1}^{N} \left(\delta_j - \delta_j{}' \right) \ln W_{jt-1} + v_{it} - \overline{v_t} \qquad (5)$$

By estimating Eq. (5), verifying how wages change is possible when a difference in wages in other regions exists. In Eq. (5), the explanatory variable is the lagged variable, which is not correlated with the error term; thus, it can be estimated by the ordinary least squares (OLS), which has consistency. In this model, if the explanatory variable is a cointegration vector, it becomes a vector error correction model.

Eq. (5) is a spatial model with spatial terms δ_{ij}, however, it can be regarded as one of the VAR models. Then, as a further specification, we specify the spatial terms δ_{ij} including three factors: adjacent effect, reciprocal of distance, and GDP. Although estimating δ_{ij} without restriction is possible, the estimation will not be stable because estimating an enormous number of $N \times N$ parameters is necessary. Therefore, the following restrictions are imposed on δ_{ij} in the estimation:

$$\delta_{ij} = \alpha_1 \frac{1}{m} n_{ij} + \alpha_2 \frac{1}{m} \cdot \frac{1}{d_{ij}} n_{ij} + \alpha_3 \left(\frac{1}{m} \cdot \frac{1}{d_{ij}} \right)^2 n_{ij} + \alpha_4 \frac{Y_j}{Y_i} + \alpha_5 \frac{\frac{Y_j}{Y_i}}{d_{ij}} + \alpha_6 \frac{\frac{Y_j}{Y_i}}{\left(d_{ij} \right)^2}, \qquad (6)$$

where n_{ij} is a dummy variable that takes 1 if $i \neq j$ and i and j are adjacent, m represents the number of adjacent regions to the i-th region, d_{ij} is the distance between i and j regions and takes 0 if $i = j$, and Y_j is the GDP of j regions. The first term of Eq. (6) represents the influence in the case where it is adjacent, and in the case where it is not adjacent, influence does not exist. The second term represents the intersection of the first term and the effect of attenuating according to the distance. The third term is quadratic of the second term. The fourth term represents the gravity term. If the GDP of the adjacent region is relatively larger than the main region, the effect will be greater. The fifth term represents the intersection of the second and fourth terms, and the sixth term is quadratic of the fifth term.

In addition, δ_{ij} is a parameter indicating how the wage will be affected if a wage difference exists from other regions. These terms are determined depending on the number of adjacent regions, the distance between i and j regions, and the economic scale. It usually takes a positive value and never exceeds 1. In addition, in the case of a negative value, if the wage in other regions is high, the wage in that region will fall. We suppose that the influence from other regions is large when it is geographically close and is small when it is far. By identifying δ_{ij} in advance, Eq. (5) can be estimated by the OLS.

The dataset consists of a panel of 47 prefectures from 1980 to 2016. The wage data are sourced from Basic Survey on Wage Structure by the Japanese Ministry of Health, Labour and Welfare. We analyzed separately for men and women, taking into account the differences between them. We use the data of the total industry and the overall size of the enterprise. The distance between the prefectural capitals is used as the inter-regional distance d_{ij}. GDP by prefectures is obtained from the Annual Report on Prefectural Accounts by the Cabinet Office and is fixed by the estimation value in 2010. Japan consists of 47 prefectures, which is divided into nine regions, namely, Hokkaido, Tohoku, Kanto, Chubu, Kinki, Chugoku, Shikoku, Kyushu, and Okinawa. To clarify the argument in this paper, we will often describe results based on the nine regions.

Japan has industrial areas around Tokyo (Kanto region), Aichi (Chukyo region), and Osaka (Kansai region), which have high GDP. Table 1 shows the correspondence of regions and prefectures and GDP, and Figure 1 shows the locations. In high-GDP regions, wages are assumed to be high, and men and women have high actual wage levels (Figures 2 and 3).

Table 1 Regions, prefectures, and GDP

Region	Prefecture	GDP 【million yen】	Population 【person】	GDP per capita 【million yen】
Hokkaido	Hokkaido	18,165,554	5,506,419	3.299
Tohoku	Aomori	4,422,900	1,373,339	3.221
	Iwate	4,053,586	1,330,147	3.047
	Miyagi	7,802,198	2,348,165	3.323
	Akita	3,423,257	1,085,997	3.152
	Yamagata	3,615,019	1,168,924	3.093
	Fukushima	6,936,791	2,029,064	3.419
Kanto	Ibaragi	11,232,676	2,969,770	3.782
	Tochigi	7,938,796	2,007,683	3.954
	Gunma	7,496,838	2,008,068	3.733
	Saitama	20,020,989	7,194,556	2.783
	Chiba	19,377,150	6,216,289	3.117
	Tokyo	91,925,672	13,159,388	6.986
	Kanagawa	30,244,370	9,048,331	3.343

Chubu	Niigata	8,586,257	2,374,450	3.616
	Toyama	4,351,549	1,093,247	3.980
	Ishikawa	4,415,554	1,169,788	3.775
	Fukui	3,340,530	806,314	4.143
	Yamanashi	3,161,463	863,075	3.663
	Nagano	7,640,898	2,152,449	3.550
	Gifu	7,085,149	2,080,773	3.405
	Shizuoka	15,404,225	3,765,007	4.091
	Aichi	32,072,720	7,410,719	4.328
Kinki	Mie	7,388,579	1,854,724	3.984
	Shiga	5,967,608	1,410,777	4.230
	Kyoto	9,728,425	2,636,092	3.690
	Osaka	36,726,803	8,865,245	4.143
	Hyogo	19,335,074	5,588,133	3.460
	Nara	3,554,306	1,400,728	2.537
	Wakayama	3,503,121	1,002,198	3.495
Chugoku	Tottori	1,772,811	588,667	3.012
	Shimane	2,327,375	717,397	3.244
	Okayama	7,103,171	1,945,276	3.651
	Hiroshima	10,518,571	2,860,750	3.677
	Yamaguchi	5,639,727	1,451,338	3.886
Shikoku	Tokushima	2,864,603	785,491	3.647
	Kagawa	3,631,694	995,842	3.647
	Ehime	4,783,322	1,431,493	3.341
	Kochi	2,232,073	764,456	2.920
Kyusyu	Fukuoka	17,694,366	5,071,968	3.489
	Saga	2,775,532	849,788	3.266
	Nagasaki	4,352,069	1,426,779	3.050
	Kumamoto	5,495,725	1,817,426	3.024
	Ooita	4,175,884	1,196,529	3.490
	Miyazaki	3,481,421	1,135,233	3.067
	Kagoshima	5,447,553	1,706,242	3.193
Okinawa	Okinawa	3,703,999	1,392,818	2.659

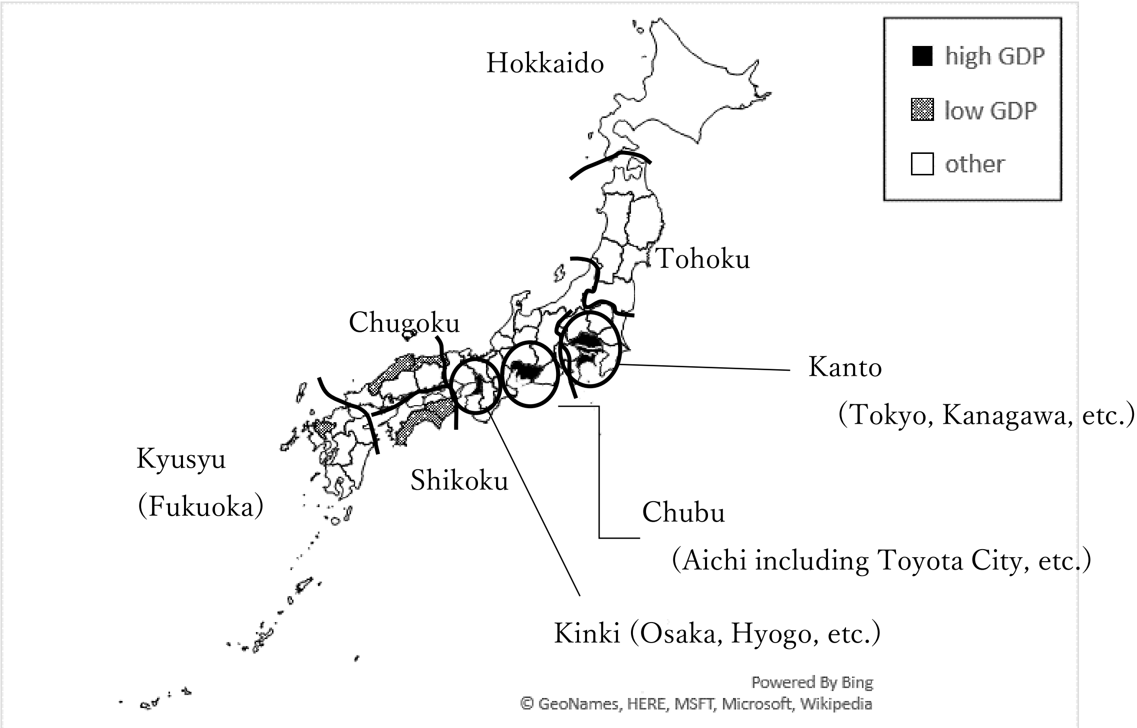

Figure 1 Distribution map of top and bottom five prefectures of GDP

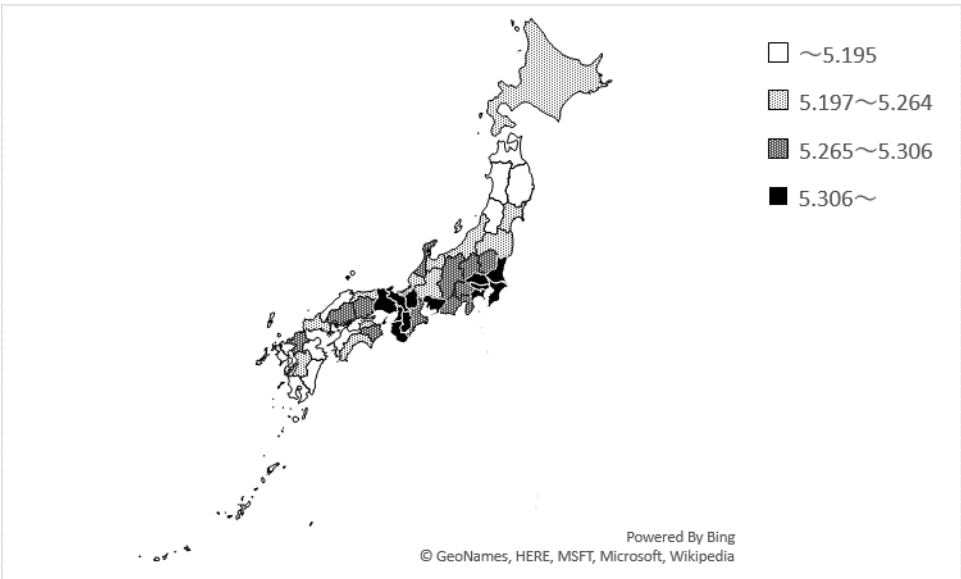

Figure 2 Distribution map of men's average log wages in Japan

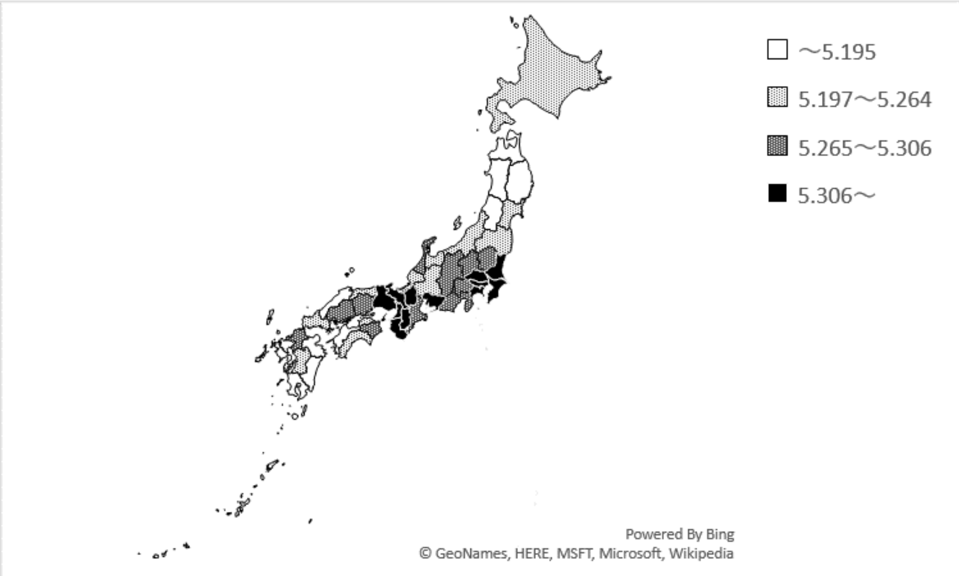

Figure 3 Distribution map of women's average log wages in Japan

3. Empirical Results and Simulations

Table 2 shows the result of panel unit root test (Maddala and Wu (1999), Levin, Lin, and Chu (2002), and Im, Pesaran, and Shin (2003)) for $\ln W_{it}$. We adopt the individual unit root process for 47 cross sections. When the equations in the unit root test include only the individual effects, the null hypothesis of no unit root is will not be rejected at 5% in all test types. Then, we confirm that $\ln W_{it}$ can be a nonstationary variable I(1). Table 3 shows the results of panel cointegration test. This test is executed as the panel unit root test for $\ln W_{it} - \overline{\ln W}$. Wages are generally unsteady and confirmed. In addition, one prefecture data needs to be excluded from the test to impose a constraint that the sum of all prefecture values is 1. Therefore, panel unit root tests were conducted on 46 prefecture data excluding Okinawa. If these cointegration relationships are established, then the linear combinations are stationary. The null hypothesis of no unit root in all test types is not rejected at the 5% level and the construction of cointegration relationships is confirmed. That is, we confirm that the wage difference in other regions has a long-term stable relationship. It was confirmed that wages will converge in the long term between regions. This finding indicates that the labor market is not divided between regions. Furthermore, even if wages change temporarily, they will be the same in the long run. As a result, we can estimate Eq. (6) by OLS. As shown in Table 4, all parameters are significantly positive at the 5% level. Above all, the magnitude of the effect is large for the adjacent effect.

Table 2 Panel unit root tests

Test type	Level		First difference	
Men	Test statistics	p-value	Test statistics	p-value
(a) individual effects, linear trend				
Levin, Lin, and Chu t*	-1.516	0.065	-30.147	0.000
Im, Pesaran, and Shin W-stat	10.107	1.000	-29.995	0.000
ADF-Fisher chi-square	31.023	1.000	979.851	0.000
PP-Fisher chi-square	26.437	1.000	1513.580	0.000
(b) linear trend				
Levin, Lin, and Chu t*	-25.451	0.000	-17.345	0.000
Im, Pesaran, and Shin W-stat	-18.395	0.000	-12.420	0.000
ADF-Fisher chi-square	499.374	0.000	329.428	0.000
PP-Fisher chi-square	518.088	0.000	509.359	0.000
(c) none				
Levin, Lin, and Chu t*	11.571	1.000	-19.999	0.000
ADF - Fisher chi-square	16.025	1.000	642.814	0.000
PP-Fisher chi-square	1.339	1.000	706.714	0.000
Women	level		first difference	
(a) individual effects, linear trend				
Levin, Lin, and Chu t*	0.285	0.612	-31.141	0.000
Im, Pesaran, and Shin W-stat	12.230	1.000	-33.685	0.000
ADF-Fisher chi-square	5.640	1.000	912.431	0.000
PP-Fisher chi-square	5.511	1.000	1429.260	0.000
(b) linear trend				
Levin, Lin, and Chu t*	-25.562	0.000	-15.100	0.000
Im, Pesaran, and Shin W-stat	-16.927	0.000	-14.259	0.000
ADF-Fisher chi-square	453.552	0.000	422.475	0.000
PP-Fisher chi-square	601.553	0.000	629.094	0.000
(c) none				
Levin, Lin, and Chu t*	19.132	1.000	-13.373	0.000
ADF-Fisher chi-square	7.715	1.000	324.240	0.000
PP-Fisher chi-square	0.129	1.000	596.760	0.000

Table 3 Panel cointegration tests

Test type	Men		Women	
(a) individual effects, linear trend				
Levin, Lin, and Chu t*	-26.910	0.000	-19.076	0.000
Im, Pesaran, and Shin W-stat	-21.017	0.000	-19.241	0.000
ADF-Fisher chi-square	708.699	0.000	511.449	0.000
PP-Fisher chi-square	816.276	0.000	855.825	0.000
(b) linear trend				
Levin, Lin, and Chu t*	-23.292	0.000	-16.972	0.000
Im, Pesaran, and Shin W-stat	-18.002	0.000	-17.286	0.000
ADF-Fisher chi-square	419.590	0.000	483.818	0.000
PP-Fisher chi-square	431.545	0.000	528.277	0.000
(c) none				
Levin, Lin, and Chu t*	-2.614	0.005	-2.329	0.010
ADF-Fisher chi-square	192.113	0.000	194.435	0.000
PP-Fisher chi-square	209.485	0.000	256.182	0.000

Table 4 Estimation results

	Men			Women		
	Coefficient	P-value		Coefficient	P-value	
$\alpha 1$	0.127	0.033	***	0.185	0.042	***
$\alpha 2$	0.000	0.000	***	0.000	0.000	***
$\alpha 3$	0.000	0.000	***	0.000	0.000	***
$\alpha 4$	0.005	0.000	***	0.003	0.000	***
$\alpha 5$	0.000	0.000	***	0.000	0.000	***
$\alpha 6$	0.000	0.000	***	0.000	0.000	***
$\overline{R^2}$	0.445			0.251		
H_0: $\alpha 1 = \alpha 2 = \alpha 3 = \alpha 4 = \alpha 5 = \alpha 6 = 0$						
χ^2 stat		1363.802	***		632.3165	***

Interpreting the coefficient estimates in Eq. (6) intuitively is complicated. On the contrary, this model is a spatial model that can be regarded as a VAR model. In Eq. (3), all explanatory variables are lag variables and can be regarded as a VAR model with 47 variables. Therefore, the estimation result can be interpreted based on an impulse response style. We predict the effect of innovation of a wage increase of 1% in a certain region as its application. In addition, when calculating Japan's average wage level, weight is given by GDP without using the average number of workers. Figures 4 and 5 show the impact on Japan's average wage levels when a 1% exogenous shock was given to wage levels in each regional block. If the impulse response converges to more than 1, then it can be interpreted that an increase of 1% in the area leads to a nationwide increase in wages. Based on this result, the regions that exceed 1 for men and women are Shikoku, Tohoku, and Chugoku. In the case of women, in addition to these three regions, Kyushu region is only over 1. The remaining regions were above 1 for relatively small economic areas. The impact of wage shocks in densely populated areas is considered greater than in rural areas. Thus, by assuming that the densely populated areas include Hokkaido, Saitama, Chiba, Tokyo, Kanagawa, Aichi, Osaka, Hyogo, and Fukuoka, we calculate the similar impulse response as shown in Figure 6. However, unlike intuition, it appears that the ability of the effect of wage increase in the concentration area to spread throughout the country is small. Moreover, any convergence speed is fast, which is approximately 10 years at maximum.

Figures 7– 22 show the wage spillover from particular regions to the other regions in the next 10 years. Regions excluding Kanto have a substantial impact on the surrounding area, but not on other areas. On the contrary, Kanto region affects all other regions. No significant difference exists between men and women.

In summary, it is concluded that the wage spillover to other regions and the resulting national wage increase is greater in rural areas than in densely populated areas. This result coincides with the finding of Hinoki et al. (2019), that is, the price spillover to other regions is greater in rural areas than in densely populated areas.

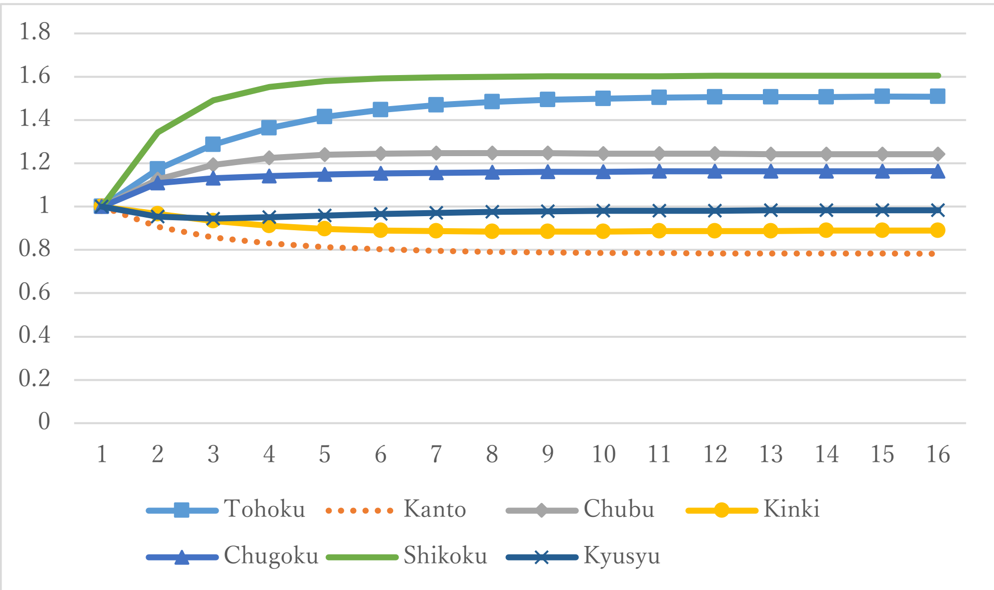

Figure 4 Simulation results of men's national average wage level by region

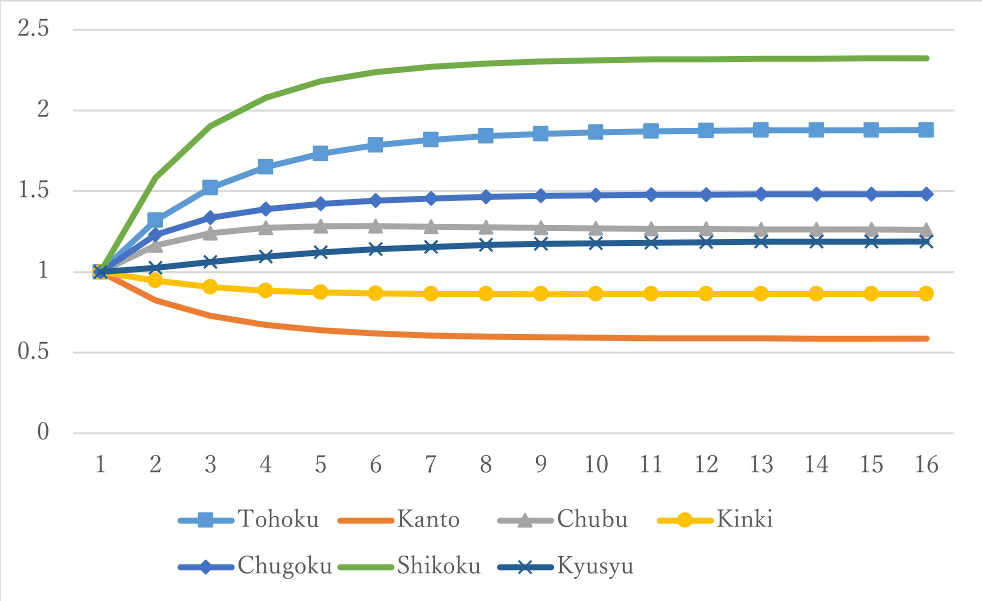

Figure 5 Simulation results of women's national average wage level by region

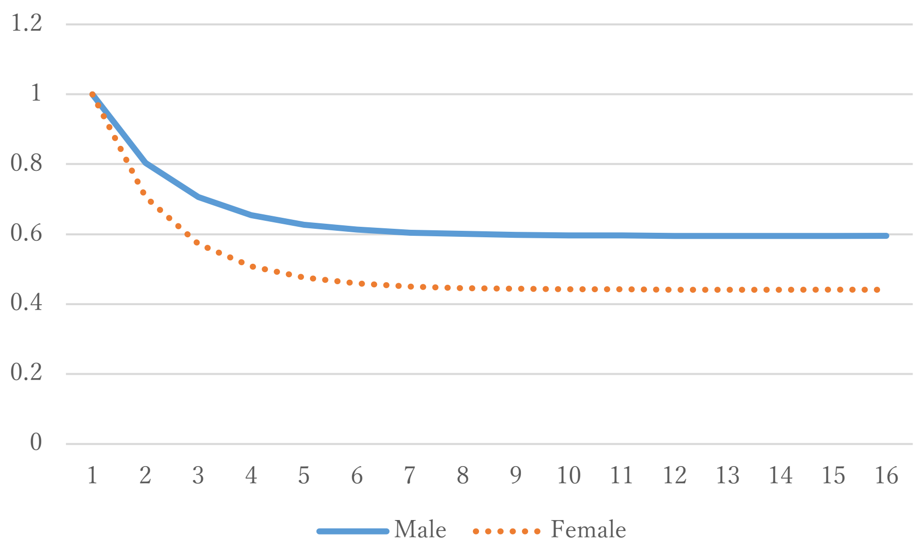

Figure 6 Simulation results of densely populated regions

Figure 7 Men's wage spillover from Tohoku region to other regions in the next 10 years

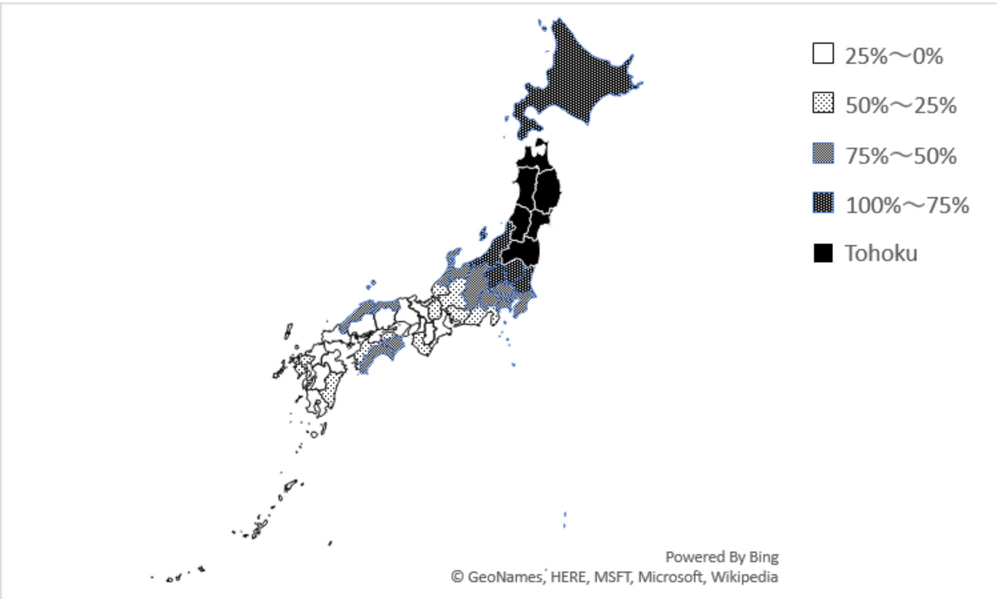

Figure 8 Women's wage spillover from Tohoku region to other regions in the next 10 years

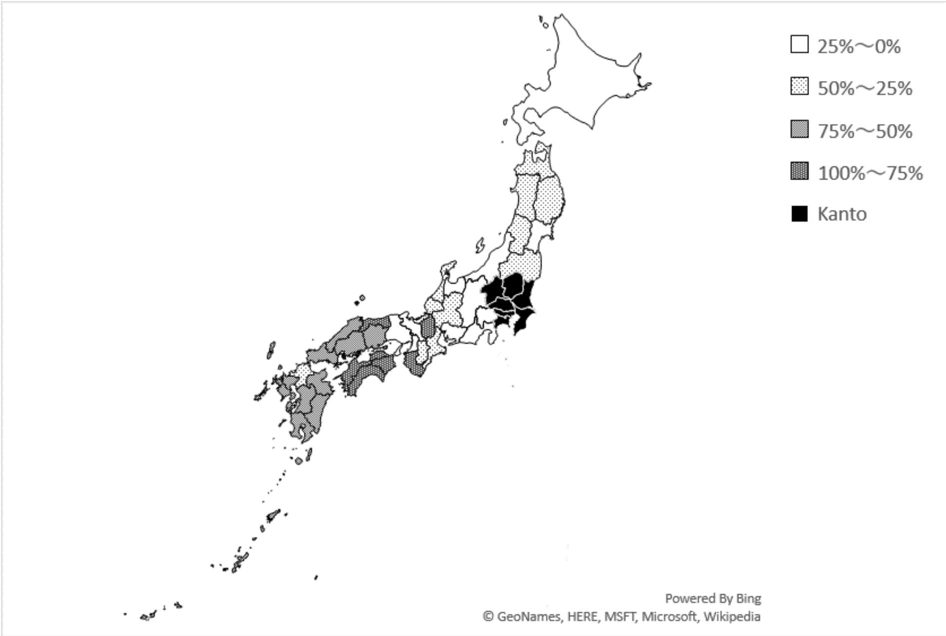

Figure 9 Men's wage spillover from Kanto region to other regions in the next 10 years

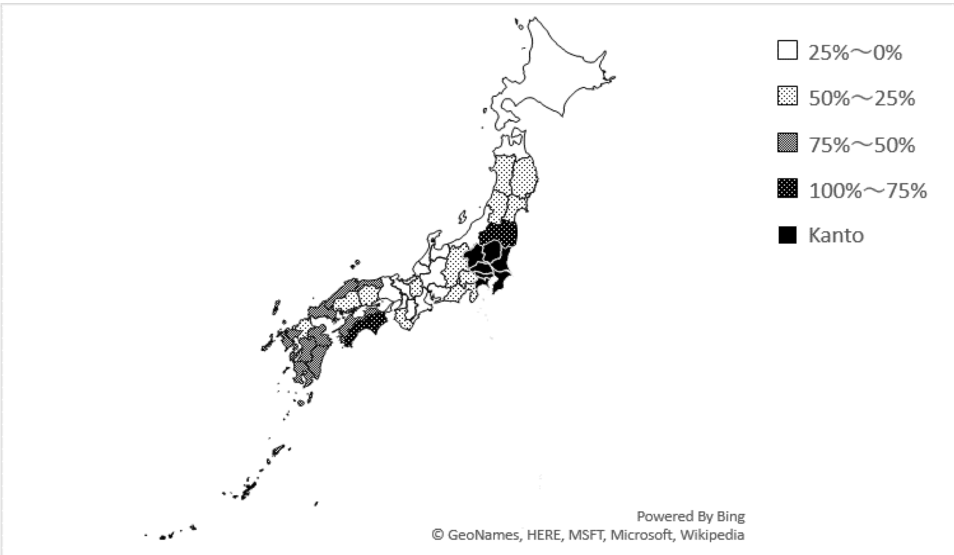

Figure 10 Women's wage spillover from Kanto region to other regions in the next 10 years

Figure 11 Men's wage spillover from Chubu region to other regions in the next 10 years

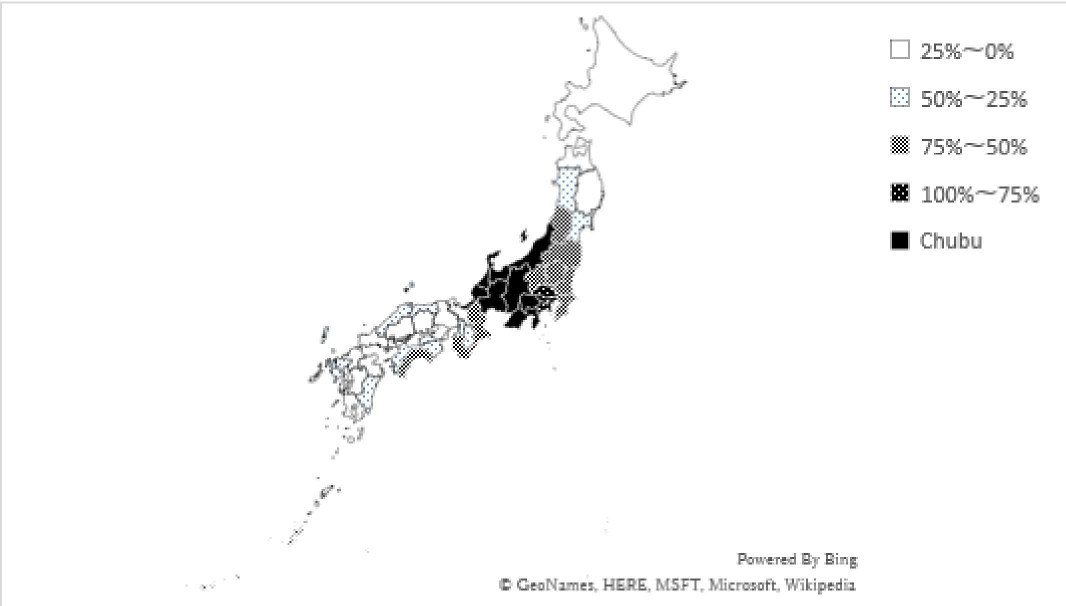

Figure 12 Women's wage spillover from Chubu region to other regions in the next 10 years

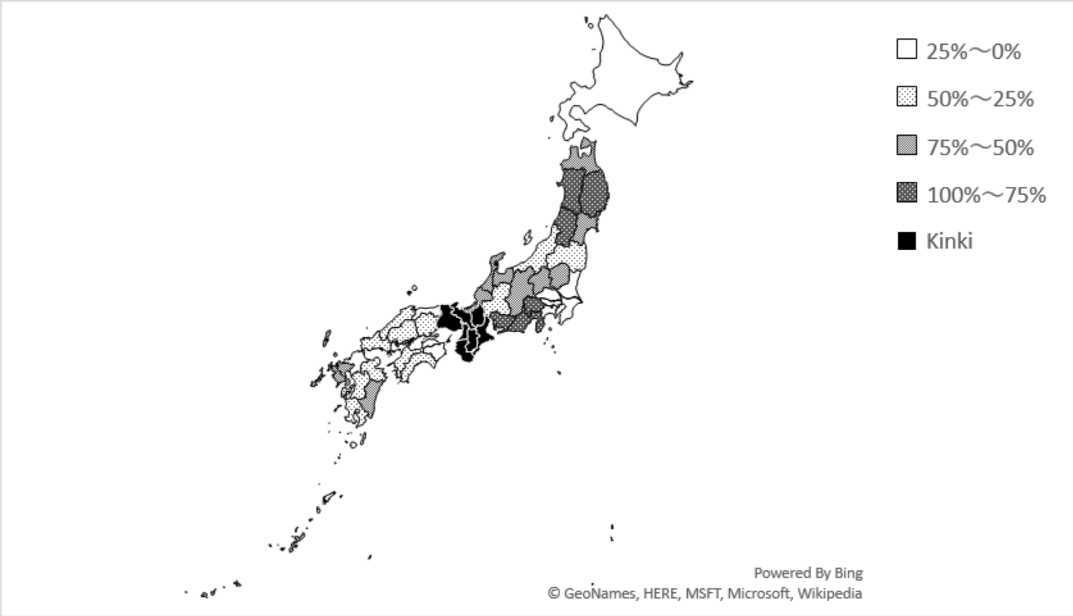

Figure 13 Men’s wage spillover from Kinki region to the other regions in the next 10 years

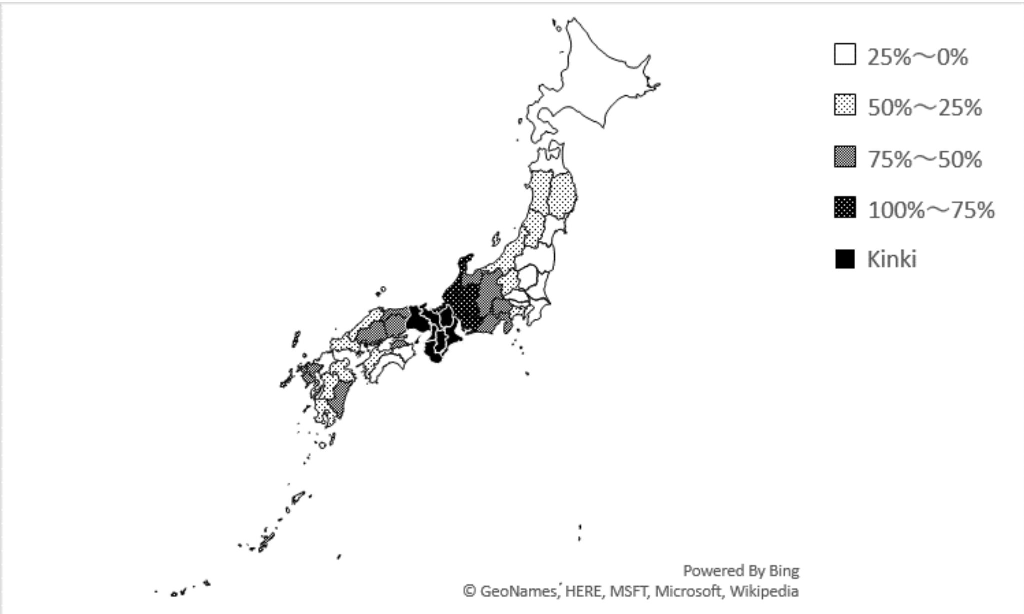

Figure 14 Women’s wage spillover from Kinki region to other regions in the next 10 years

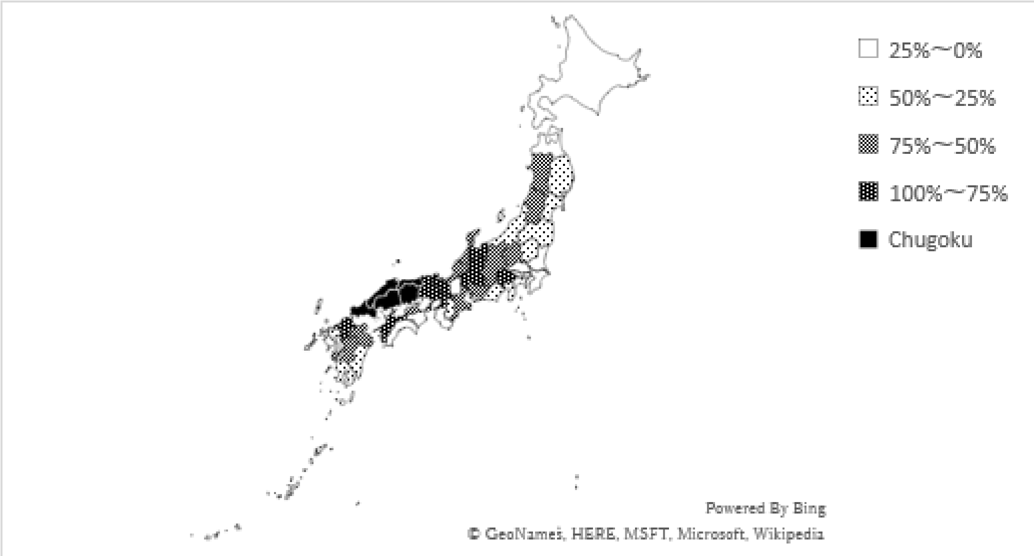

Figure 15 Men’s wage spillover from Chugoku region to other regions in the next 10 years

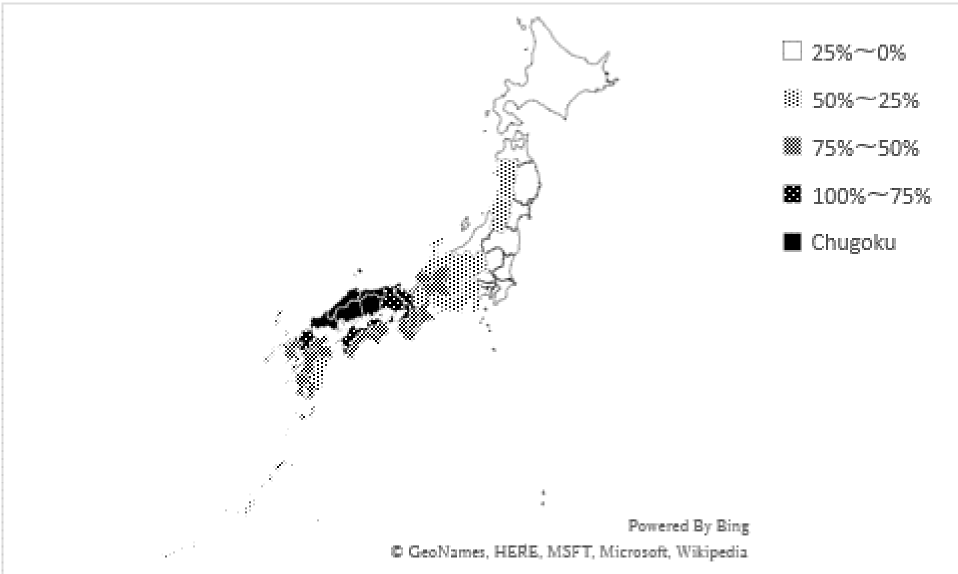

Figure 16 Women’s wage spillover from Chugoku region to other regions in the next 10 years

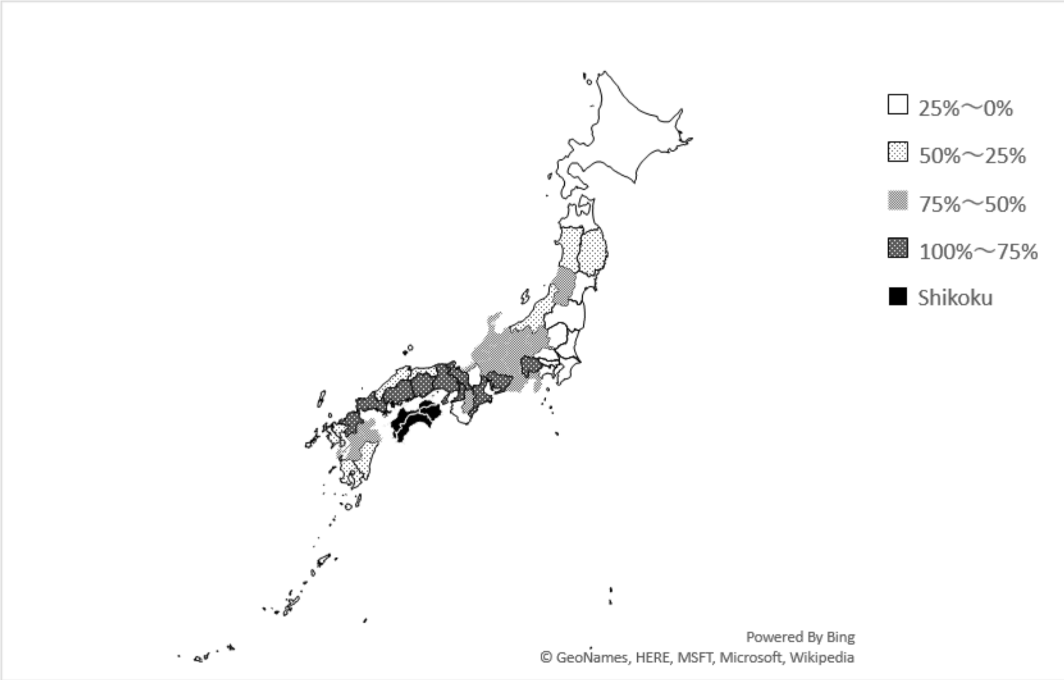

Figure 17 Men's wage spillover from Shikoku region to other regions in the next 10 years

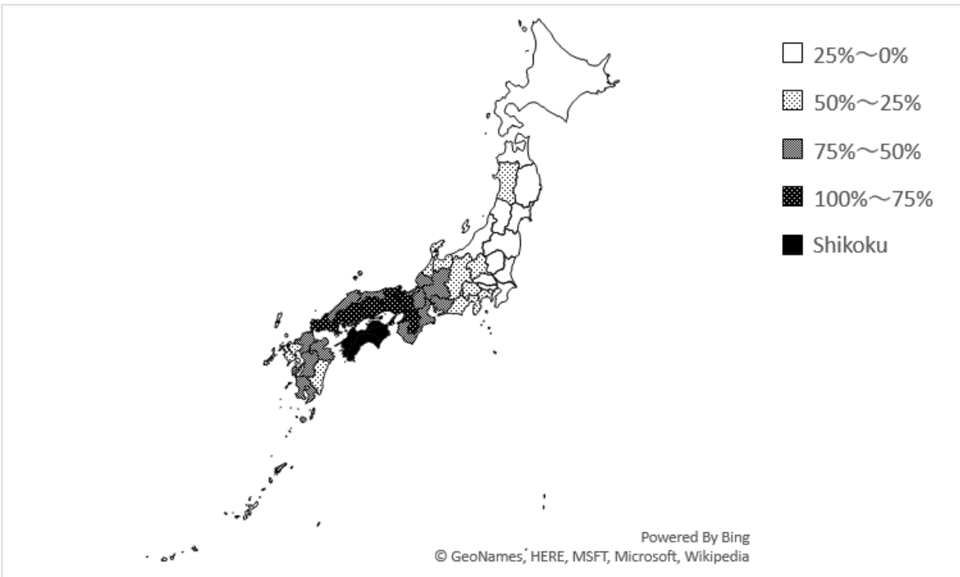

Figure 18 Women's wage spillover from Shikoku region to other regions in the next 10 years

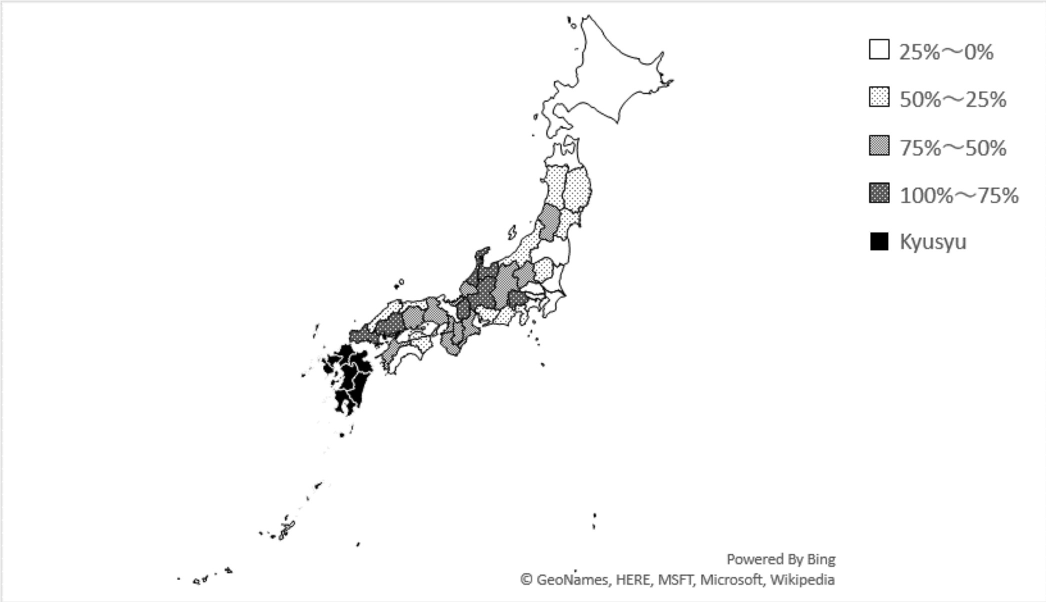

Figure 19 Men's wage spillover from Kyusyu region to other regions in the next 10 years

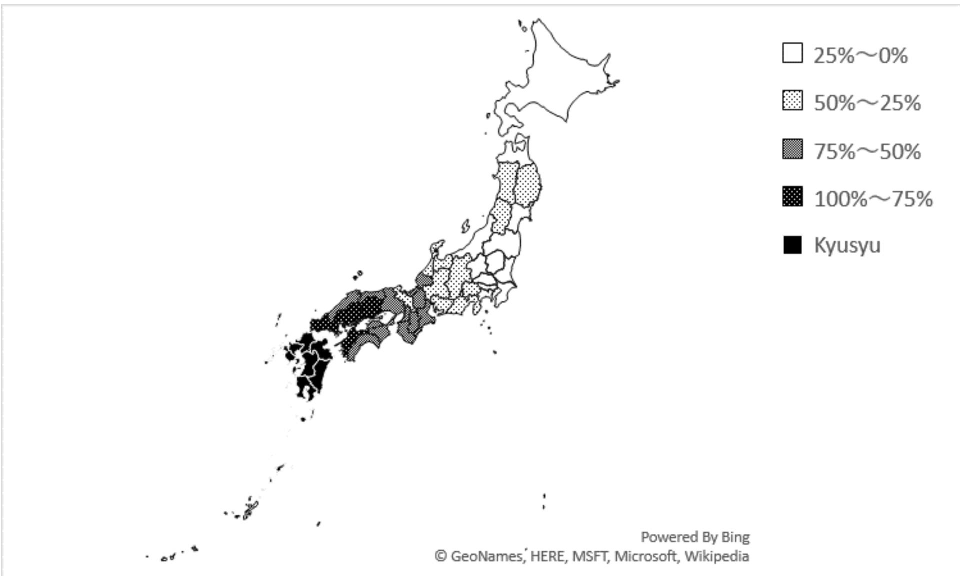

Figure 20 Women's spillover from Kyusyu region to other regions in the next 10 years

Figure 21 Men's wage spillover from Tokyo to other regions in the next 10 years

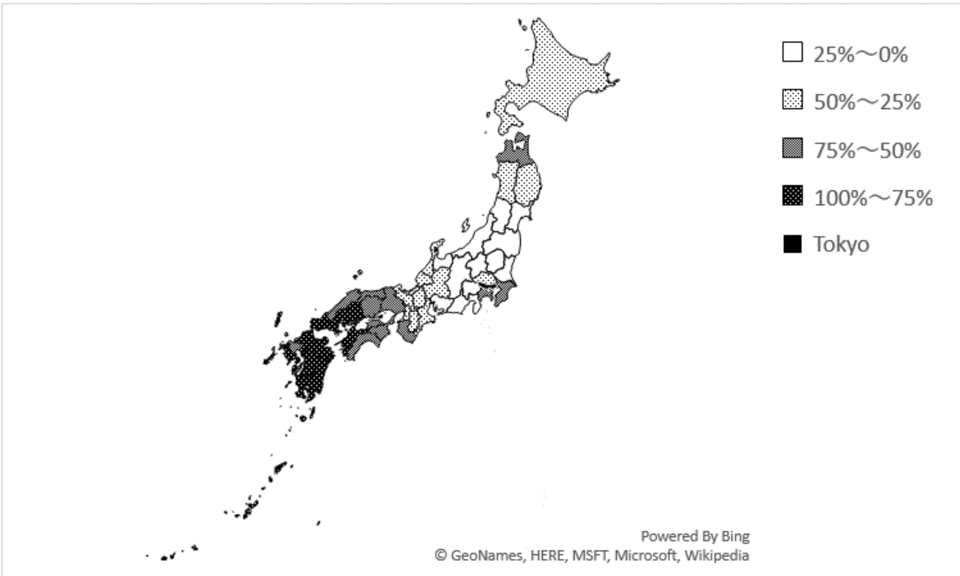

Figure 22 Women's wage spillover from Tokyo to other regions in the next 10 years

4. Conclusion

We explored the macroeconomic consequences of spatial wage spillover in Japan. We estimated spatial panel data model using interdependent regional wages. Our findings suggest that spatial wage spillover among different regions is heterogeneous and asymmetric. Heterogeneity and asymmetry in wage spillover effects among regions imply that the aggregated effects of wage rise differ between targeted regions. To confirm this finding, we simulated the effects of wage shock in certain regions on national wage increase, that is, aggregated wage increase of all regions, and compared the effects of wage shock between densely populated areas and local areas. Simulation results suggest that wage in densely populated areas does not spread to other local areas, though the wage in the local areas spread to others. As a result, the effects of region-specific wage shock on aggregate wage level are larger in local areas than in densely populated areas. Based on the turnover model of the efficiency wage hypothesis, this result can be interpreted in that the wage shock in densely populated areas and local areas is “transitory” and “permanent,” respectively. Generally, wage shock is not considered to be based on fundamental factors because diverse firms are concentrated and job creation and destruction are intense in densely populated areas. By contrast, wage shock in local areas is considered to be based on fundamental factors. Future research is necessary to explain this difference in wage shock. Nevertheless, this result contributes to the discussion on how to make the national wage increase and decreasing regional disparity compatible. To achieve short-run national wage increase, local areas should be considered as a policy target rather than densely populated areas. For example, in the case of the NSSZs described in the Introduction, local areas, rather than densely populated areas, should be targeted as deregulation areas in terms of national wage increase.

Finally, two important points should be considered for future research. First, dataset with more available variables should be used to identify the factors that cause regional wage spillover. Second, our analysis is limited to regular employees due to data limitations. Considering the variation in non-regular worker ratio among different regions, analysis of wage spillover in non-regular employee is indispensable. Because our analysis is based on raw macro data and simple estimation technique, we aim that our tentative results are supported by using microdata and more sophisticated estimation methods.

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