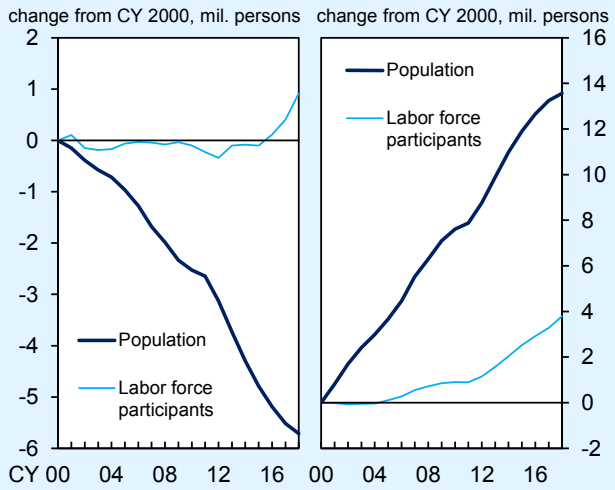
(Box 1) The Recent Increase in Labor Supply and Wage Developments

Relative to the heightening degree of serious labor shortage, nominal wages have been sluggish. Basically, the reason for this is that, under Japan's labor market structure, which is characterized by different wage-setting mechanisms for regular and non-regular employees, the increase in wages of regular employees has been remarkably sluggish.[40] Regular employees tend to place priority on the long-term stability of employment over wage increases, while firms are maintaining their cautious wage-setting stance in reflection of an insufficient rise in medium- to long-term growth expectations. As an additional factor, this box examines the effects of the labor supply of women and seniors.

With labor shortage intensifying recently, the pace of increase in the labor force participation rate, especially among women and seniors, is accelerating. A closer look shows that, even though the population of women (aged 15-64) is decreasing, the number of those in the labor force is increasing, partly due to government initiatives to improve the work environment for women (Chart B1-1[a]).[41] In addition, while the number of

Chart B1-1: Labor Force Participants



Source: Ministry of Internal Affairs and Communications.
Note: Figures for 2018 are January-May averages on a seasonally adjusted basis.

Chart B1-2: Wage Elasticity of Labor Supply (Part-Time Employees)

Estimation Results

	Women aged 15-64	Men aged 15-64	Seniors aged 65 and over
Wage	0.40 *** <0.11>	0.27 *** <0.07>	0.56 *** <0.12>
Adj.R^2	0.96	0.94	0.97
Number of observations	6,580	6,580	1,316

Estimation period: CY 2004-2017.
The estimation is based on the prefecture-level panel data. The figures in brackets in the table are standard errors.
*** denotes statistical significance at the 1% level.

Sources: Ministry of Health, Labour and Welfare; Ministry of Internal Affairs and Communications.
Notes: 1. The dependent variable is the log of the number of part-time employees.
2. "Wage" is the log of the hourly wage of part-time employees.
3. In the estimation, the CPI (all items less fresh food), the unemployment rate, the ratio of the population aged 65 and over (only the estimation for "Seniors"), and dummy variables (for the prefecture, the year, and, in the estimations for "Men" and "Women," individuals' age) are included as control variables.

[40] For features of Japan's labor market and the sluggishness in wages of regular employees due to those features, see Box 2 in the July 2017 Outlook Report.

[41] For firms' efforts to promote the empowerment of women and seniors, see the annex paper to the *Regional Economic Report*, "Kaku chiiki ni okeru jyosei no katsuyaku suishin ni muketa kigyō tō no torikumi" [Firms' initiatives toward promoting women's empowerment in each region] released in June 2017 (available only in Japanese). Meanwhile, for an analysis of the reasons, including government initiatives, for the increase in women in employment, especially since 2012, see "The Recent Increase in Dual-Income Households and Its Impact on Consumption Expenditure," Bank of Japan Review Series (2017-E-7).

seniors (aged 65 and over) has increased with the aging of the population, the number of those in the labor force has increased at a faster pace recently (Chart B1-1[b]).

Examining the wage elasticity of the labor supply of female and senior part-time workers (i.e., the rate of increase in labor supply when wages increase by 1 percent) shows that the wage elasticity of women (aged 15-64) and seniors (aged 65 and over), among whom labor force participation is substantial in recent years, is higher than that of men (aged 15-64) (Chart B1-2).[42] In other words, among these groups, there will be greater labor supply for the same rate of increase in wages (Chart B1-3). As a result, as labor demand increases (represented by a shift of the labor demand curve to the right in the chart), women and seniors will supply more labor, which in turn suppresses wage increases. If the labor supply of women and seniors were not elastic, wage increases likely would have been larger.

In fact, in the prefecture-level data, there is a clear negative relationship between the proportion of female and senior workers in the population and total cash earnings (Charts B1-4 and B1-5). In order to quantitatively examine this relationship, the change in total cash earnings was regressed on changes such as in the ratio of employed

[42] Causality between wages and labor force participation runs in both directions. On the one hand, labor supply increases in response to a rise in wages; on the other hand, an increase in labor supply lowers wages by relieving the shortage of labor. While the regression analysis in this box attempts to control for such reverse causality by adding various variables, generally speaking, it is not easy to control for such reverse causality completely. For this reason, the estimation results should be interpreted with some latitude.

Chart B1-3: Wage Elasticity of Labor Supply

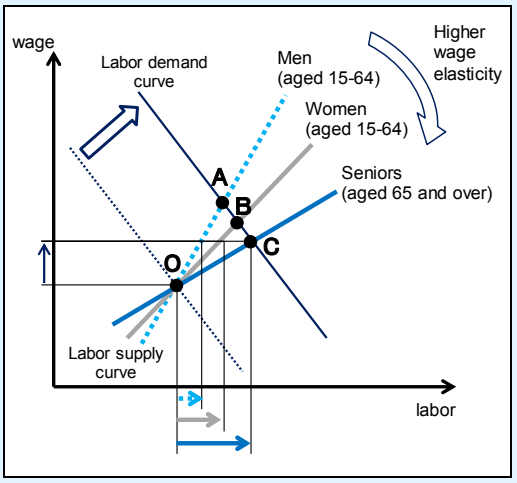
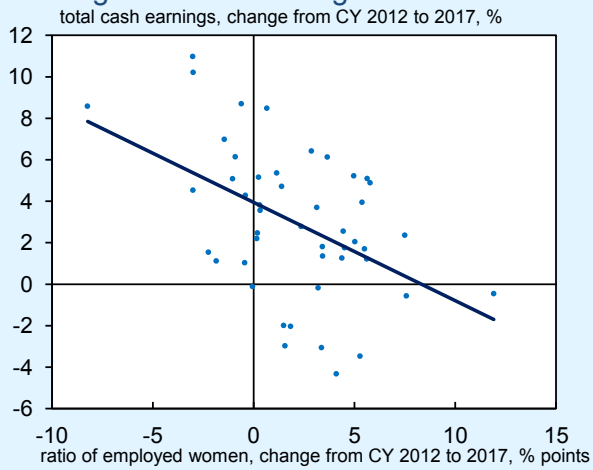
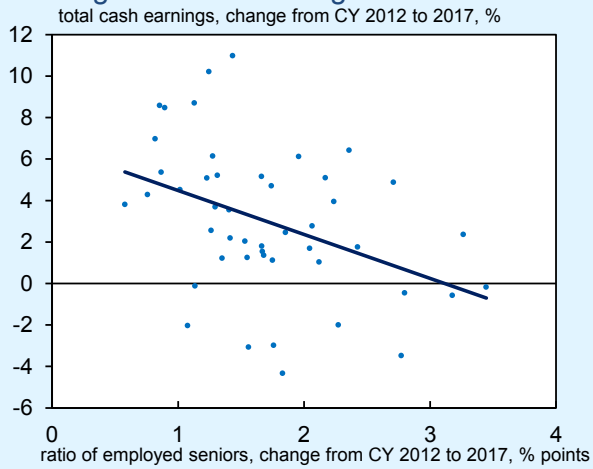


Chart B1-4: Labor Force Participation among Women and Wages



Sources: Ministry of Health, Labour and Welfare; Ministry of Internal Affairs and Communications.
Notes: 1. Based on staff calculations for each prefecture.
2. The "ratio of employed women" is the share of employed persons among women aged 15-64.

Chart B1-5: Labor Force Participation among Seniors and Wages



Sources: Ministry of Health, Labour and Welfare; Ministry of Internal Affairs and Communications.
Notes: 1. Based on staff calculations for each prefecture.
2. The "ratio of employed seniors" is the share of employed persons among seniors aged 65 and over.

women and the ratio of employed seniors (Chart B1-6). The estimation results indicate that the increase in the ratio of employed women and of employed seniors pushes down the growth rate of total cash earnings in a statistically significant manner. The likely reason, as we have indicated, is the high wage elasticity of the labor supply of women and seniors.[43]

Chart B1-6: Impact of Labor Force Participation on Wages

Estimation Results

	Total cash earnings, y/y % chg.		
Unemployment rate, %	-0.76 *** <0.14>	-1.01 *** <0.14>	-0.79 *** <0.14>
CPI (less fresh food) y/y % chg.	0.49 *** <0.16>	0.60 *** <0.17>	0.49 *** <0.16>
Ratio of employed women y/y % points	-0.17 *** <0.06>		
Ratio of employed seniors y/y % points		-2.61 *** <0.39>	
Ratio of employed women and seniors y/y % points			-0.36 *** <0.11>
Adj. R^2	0.11	0.22	0.13
Number of observations	423	423	423

Estimation period: CY 2009-2017. Estimation method: Fixed effect model using the prefecture-level panel data. The figures in brackets in the table are standard errors.
*** denotes statistical significance at the 1% level.

Sources: Ministry of Health, Labour and Welfare; Ministry of Internal Affairs and Communications.

Note: The ratios of employed persons are the share of employed persons in the corresponding population.

[43] An additional reason is likely to be the composition effect: since the wage level of these groups is lower than that of men, an increase in the share of women and seniors in the labor force overall will push down the average wage.