

**(Box 2) Features of Japan's Labor Market and Macro-Level Wages**

Box 1 has shown that, although the labor market has been as tight as during the bubble period, wages have been increasing at a slower pace than during that period. Box 2 examines the relationship between labor market conditions and wages separately for regular (full-time) and non-regular (part-time) employees, taking into account that the wage-setting mechanism for regular and non-regular employees differs in Japan's labor market.

Wages of part-time employees already have risen considerably in response to the tightening of labor market conditions. Estimating wage functions using hourly wages of part-time employees (hourly scheduled cash earnings) as the dependent variable and the various measures of labor slack shown in Chart B1-1 as explanatory variables, the results show that all measures of labor slack are statistically significant, indicating that part-time hourly wages are sensitive to labor slack (Chart B2-1 [a]). In addition, recent increases in wages of part-time employees are within the bands predicted by the estimated wage functions (Chart B2-1 [b]). These observations indicate that wages of part-time employees are rising in response to the tightening of labor market conditions and, moreover, that the pace of increase is in line with the relationship between wages of part-time employees and labor market conditions observed in the past.

Meanwhile, wages of full-time employees are not sensitive to fluctuations in labor market conditions.

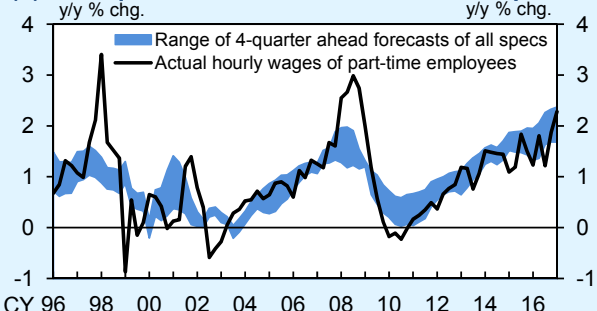
**Chart B2-1: Wage Function for Part-Time Employees' Hourly Wages**

**(a) Estimation Model and Results**

	Active job openings-to-applicants ratio	Employment rate gap	Labor input gap	Employment conditions DI	Unemployment rate	Short-term unemployment rate
Constant	0.64***	0.65***	0.53***	0.88***	1.03***	0.72***
$\rho$	0.68***	0.67***	0.72***	0.70***	0.70***	0.71***
$\beta$	0.21***	0.23***	0.21***	0.26***	0.30***	0.22***
<s.e.>	<0.07>	<0.05>	<0.05>	<0.08>	<0.10>	<0.07>
$\gamma$	0.08	0.06	0.04	0.06	-0.07	-0.03
S.E. of regression	0.47	0.46	0.47	0.47	0.47	0.47

Hourly scheduled cash earnings of part-time employees (y/y % chg.) = Constant +  $\rho$  × Lagged dependent variable +  $\beta$  × Labor slack measure (%) +  $\gamma$  × Minimum wage increase (%)  
 Estimation period: 1995/Q1-2016/Q4.  
 \*\*\*, \*\*, \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**(b) Four-quarter Ahead Forecasts of Each Spec**



Sources: Ministry of Health, Labour and Welfare; Bank of Japan; Ministry of Internal Affairs and Communications, etc.  
 Notes: 1. The 4-quarter ahead forecasts are calculated based on 4-quarter lags of actual wages assuming perfect foresight with regard to labor slack measures and minimum wages.  
 2. Figures for the labor slack measures are normalized.

This is likely due to the fact that labor unions, which are composed of full-time employees, tend to prioritize stable long-term employment and, as a result, do not demand high wage increases even if the labor market tightens. Meanwhile, firms implicitly promise employees wage increases with seniority: relative to their labor productivity, wages paid to employees are low when they are young but then rise above what their labor productivity would warrant as they get older. As a result, employees have little incentive to change jobs when the labor market tightens temporarily.

However, wages of full-time employees tend to respond to changes in inflation expectations through labor-management wage negotiations. The reason for this is that if inflation expectations rise, households will seek wage increases (base pay increases) to the extent necessary to maintain real purchasing power, and firms are likely to respond to such demands if they expect to be able to pass on nominal wage increases to sales prices.

This point can be confirmed by estimating wage functions using the scheduled cash earnings of full-time employees as the dependent variable and the various labor slack measures as well as base pay increases as explanatory variables. The results indicate that most of the labor slack measures are insignificant, while base pay increases are significant (Chart B2-2). Furthermore, estimating a base pay function using base pay increases as the dependent variable and inflation expectations and the year-on-year rate of change in labor productivity as explanatory variables shows the following: (1) recent

**Chart B2-2: Wage Function for Full-Time Employees' Monthly Wages**

**(a) Estimation Model and Results**

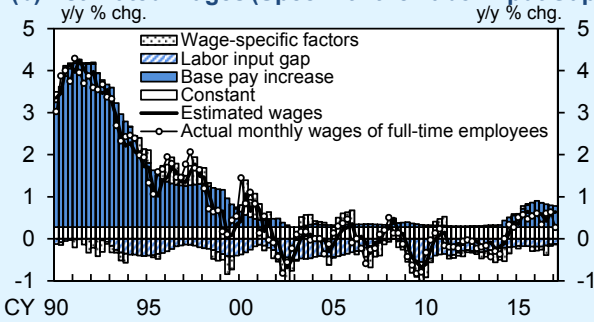
$$\text{Monthly scheduled cash earnings of full-time employees (y/y \% \text{ chg.})} = \text{Constant} + \rho \times \text{Lagged dependent variable} + \beta \times \text{Labor slack measure (\%)} + \gamma \times \text{Base pay increase (\%)}$$

	Active job openings-to-applicants ratio	Employment rate gap	Labor input gap	Employment conditions DI	Unemployment rate	Short-term unemployment rate
Constant	-0.01	0.05	0.08*	0.02	0.16**	0.01
$\rho$	0.71***	0.70***	0.70***	0.71***	0.68***	0.71***
$\beta$	0.00	0.03	0.06	0.01	0.07	0.01
<s.e.>	<0.03>	<0.04>	<0.03>	<0.04>	<0.05>	<0.04>
$\gamma$	0.32***	0.31***	0.32***	0.31***	0.30***	0.32***
S.E. of regression	0.27	0.27	0.26	0.27	0.27	0.27

Estimation period: 1988/Q1-2016/Q4

\*\*\*, \*\*, \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**(b) Estimated Wages (Spec with the Labor Input Gap)**



Sources: Ministry of Health, Labour and Welfare; Bank of Japan; Ministry of Internal Affairs and Communications; Central Labour Relations Commission; Japanese Trade Union Confederation (*Rengo*), etc.

- Notes: 1. Chart (b) shows a historical decomposition of actual wages, where the contribution of each factor is recursively calculated as the cumulative effects from the past.
- 2. Figures for the labor slack measures are normalized. Figures for scheduled cash earnings up through 1993 are for establishments with 30 or more employees.

developments in base pay can mostly be explained by developments in inflation expectations and labor productivity, and (2) the high increases in base pay observed during the bubble period were due to high inflation expectations and high labor productivity growth at the time (Chart B2-3).<sup>33</sup>

These results indicate that, although (1) wages of part-time employees are clearly rising, reflecting the tightening of labor market conditions, (2) increases in scheduled cash earnings of full-time employees, which are not sensitive to labor slack, continue to be sluggish, reflecting low inflation expectations and productivity growth. Given that scheduled cash earnings of full-time employees make up almost 70 percent of total employee income overall, the sluggishness in such earnings explains why hourly wages at the macro-level have been increasing at a slower pace compared to the bubble period (Chart B2-4).

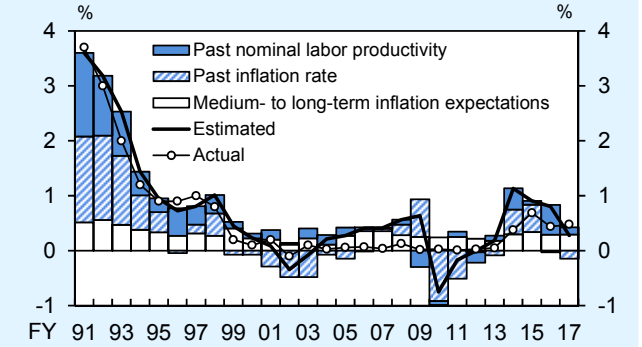
**Chart B2-3: Base Pay Function**

**(a) Estimation Model and Results**

$$\begin{aligned} \text{Base pay increase (\%)} &= (1-0.58-0.19)^{***} \times \text{Medium- to long-term inflation expectations (\%)} \\ &+ 0.58^{***} \times \text{Past inflation rate (4-quarter average, \%)} \\ &+ 0.19^{***} \times \text{Past nominal labor productivity} \\ &\quad \text{(4-quarter average of y/y \% chg.)} \end{aligned}$$

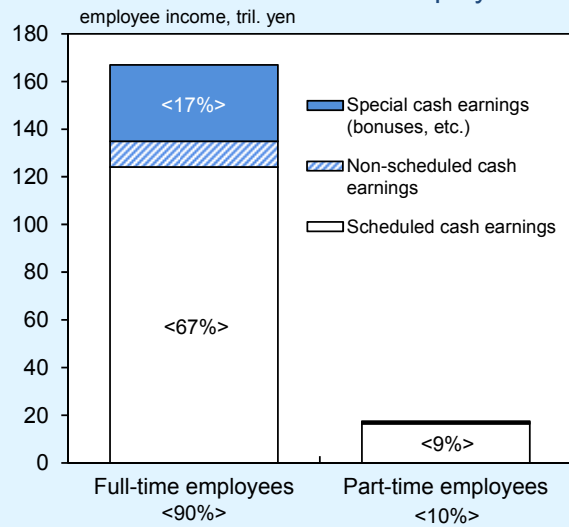
Estimation period: FY 1991-2017.  
 \*\*\* denotes statistical significance at the 1% level.

**(b) Estimated Base Pay Increases**



Sources: Central Labour Relations Commission; Japanese Trade Union Confederation (Rengo); Consensus Economics Inc., "Consensus Forecasts;" Ministry of Internal Affairs and Communications; Cabinet Office, etc.  
 Notes: 1. Figures for medium- to long-term inflation expectations are the expectations for the CPI 6 to 10 years ahead and are based on the "Consensus Forecasts."  
 2. Nominal labor productivity = nominal GDP / (number of employees × hours worked)

**Chart B2-4: Breakdown of Employee Income**



Source: Ministry of Health, Labour and Welfare.  
 Notes: 1. Figures are those for 2016 and are calculated by multiplying total cash earnings by the number of regular employees based on the "Monthly Labour Survey."  
 2. Figures in angular brackets show the shares in total employee income.

<sup>33</sup> Here, inflation expectations indicate both medium- to long-term inflation expectations (i.e., forward-looking inflation expectations) and the past inflation rate (i.e., adaptive inflation expectations) in the estimation model.