

Box 4.1

Understanding Turkey's Wage Dynamics

Wages play a major role in inflation through cost-push and demand-pull factors, and therefore understanding the wage determination process at the macroeconomic level is crucial. To achieve this goal, first, the data sources for wages are introduced. Then, an outline of the distribution of wages in Turkey is presented, followed by the determinants of wage dynamics.

Wage Indicators

"The minimum wage" is one of the main data sources on wages, announced yearly by the Minimum Wage Determination Commission under the Ministry of Family, Labor and Social Services, and serves as an anchor for overall wages (Table 1).

Table 1: Wage Indicators (Y-o-Y % Change)

	2016		2017		2018	
	Nominal	Real ⁽³⁾	Nominal	Real	Nominal	Real
Gross Minimum Wage	33.1	23.5	7.9	-2.9	14.2	1.7
LII Non-farm Hourly Labor Cost Index	22.0	13.2	9.0	-1.9	15.3*	3.4*
LII Non-farm Hourly Earnings Index	21.5	12.7	9.3	-1.6	15.3*	3.4*
LII Non-farm Hourly Labor Cost exc. Earnings Index	24.6	15.7	7.6	-3.1	15.1*	3.2*
LII Gross Wages-Salaries Index	20.7	12.0	13.4	2.0	18.2*	6.0*
SSI Average Daily Earnings ⁽¹⁾	22.0	13.2	10.7	-0.4	15.7**	3.1**
Unit Wage Index ⁽²⁾	21.3	10.7	5.4	-5.2	11.5*	0.4*

Sources: SSI, CBRT, TURKSTAT.

* As of the first six months, **compared to July of the previous year.

(1) Weighted by private employment, aggregated for each sub-category (private wage * private employment), and divided into total private employment.

(2) LII Non-farm Per Person Earnings * HLF Non-farm Employment / Non-farm Real Value Added Index.

(3) Deflated by the CPI.

A key statistic for wage costs is the *"hourly labor cost index"* under the labor input indices (LII) announced quarterly by the Turkish Statistical Institute (TURKSTAT). The labor cost index consists of costs for earnings plus non-wage costs for wage and salary workers registered in the social security system. The hourly earnings index encompasses employee compensation, including regular gross wages, salaries in cash and in kind, overtime payments and irregular bonuses. The labor cost index excluding hourly earnings covers employers' social security contributions and other social security payments such as severance and notice payments.

The *"real unit labor cost"*, which plays a key role in inflation dynamics, is also monitored. This indicator is calculated as the real hourly labor cost index divided by partial productivity (value added / employment) (Table 1). Covering registered employment data, the Social Security Institution's (SSI) statistics also include monthly gross wage figures. The premium-based *"average daily earnings"* for employees under Article 4/a are broken down by activity groups (NACE Rev.2), gender, province, region, private/public sector and permanent/temporary employment. Lastly, the *"gross wages and salaries index"* is another notable wage indicator to follow under the TURKSTAT's LLI.

Wage Distribution in Turkey

This section presents the distribution of wage and salary employees using micro data from the Labor Force Survey (LFS) of 2017. The LFS is a household survey that provides information on total net cash income (in addition to earnings paid to employees, benefits in cash and in kind, bonuses and premiums, etc.) received in the previous month. Accordingly, as of 2017, wage and salary workers account for 67.3% (18.9 million persons) of total employment.

The total number of people whose net income is around the net monthly minimum wage (1,404 TL for those aged 16 and above) was approximately 6.7 million in 2017. Additionally, 1.8 million people declare that their income is below the net monthly minimum wage. Therefore, as of 2017, 8.5 million people who earn around and under the minimum wage account for 42.8% of wage and salary workers (Chart 1).

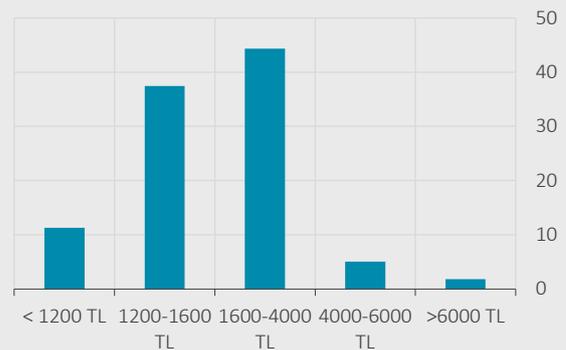
Chart 2 shows that 11.3% of wage and salary workers received an income less than 1,200 TL, while 37.5% earned in the neighborhood of the minimum wage (1,200-1,600 TL) and 44.3% declared an income between 1,600 and 4,000 TL.

Chart 1: Percentage Distribution of Employees Earning Minimum Wage and Under Within Wage and Salary Workers (For 2004-2017, %)



Sources: CBRT, TURKSTAT HLF Microdata through the years 2004 and 2017.

Chart 2: Percentage Distribution of Employees Across Wage Brackets Within Wage and Salary Workers (For 2017, %)



Sources: CBRT, TURKSTAT HLF Microdata for 2017.

In sum, about two-thirds of total employment is composed of wage and salary earners, while half of them earn around and under the minimum wage. Therefore, the share of employees who receive an income around or less than the minimum wage is about one-third of total employment. Thus, the minimum wage rate is an imperative factor for both economy-wide wage increase rates and wage distribution (Gürçihan-Yüncüler and Yüncüler, 2016).

Factors Influencing the Determination of Wage Rates

The main drivers of nominal wage rates are inflation (past and expected) and the output gap. The collective labor agreements (CLA) applicable in various sectors point to a high degree of backward indexation in wage increases. Excluding the abnormal yearly minimum wage changes of the 2016-2017 period, the increase was about 3.0 percentage points above the expected inflation.

Similarly, looking at the CLA and the labor agreements announced on the Public Disclosure Platform (PDP), one can see that wages increased at a faster pace than the expected inflation rate in the first year of the CLA and the rate of increase in the following periods was as much as the actual inflation rate of the previous year (or the previous six months) (Table 2). Wages can

vary according to business cycle (output gap) phases as well as inflation, which is an important determinant of purchasing power. With decreased unemployment during boom periods, wages may increase. Aldan and Gürcihan-Yüncüler (2016) shows that wages around and under the minimum wage are not affected by business cycles, while wages above the minimum wage are more sensitive to business cycles.

Table 2: Collective Labor Agreements in Selected Sectors

Sector	Period Covered	First Six Months Hike Rate	For Other Six-Month Periods Hike Rate
Major Appliances, Iron and Steel, Automotive and Subcontracting Industries	09.01.2017-08.31.2019	26 %	CPI
Tire Industry	01.01.2017-12.31.2019	Support services: 14 %, other workers: CPI	CPI
Cement Sector	01.01.2018-12.31.2019	13.8 %, (CPI + 4 points)	CPI
Textile Sector	04.01.2016–03.31.2019	For 2016: 5 %	4 % + CPI compensation
Furniture Industry	01.01.2018–12.31.2019	For 2018: 16 %	For 2019: (CPI + min. wage)/2
Petroleum Products Sector	01.01.2017-12.31.2018	9.0 %	respectively CPI, CPI and CPI+0.5
Transportation Sector	01.01.2016-12.31.2018	7.0 %	respectively 6 %, 4 %, 4 %, 4 %, 4 %
Glass Industry	01.01.2017-12.31.2018	16.3 %	

Source: Figures are from CLAs published on the PDP.

In order to examine the dynamics of wage rates in the non-agricultural economy, the following model is estimated by using quarterly data for the 2009-2018 period:

$$\Delta wage_t = \alpha_0 + \alpha_1 * \Delta wage_{t-1} + \alpha_2 * \Delta min. wage_t + \alpha_3 * outputgap_{t-1} + \alpha_4 * \Delta CPI_{t-3} + \varepsilon_t.$$

The y-o-y percentage change of the nominal hourly labor cost index, which is shown as $wage_t$, is estimated by changes in the minimum wage, output gap and consumer price index (CPI). In the above model, $min. wage_t$ is the y-o-y percentage change of the minimum wage; $outputgap_{t-1}$ denotes the first lag of the output gap; CPI_{t-3} refers to the third lag y-o-y percentage change of the CPI, and ε_t shows the residuals. The parameters are estimated by the instrumental variable method using the two-stage least squares estimator.

Table 3: Wage Equation Estimation Results ¹

	Coefficients	Standardized Coefficients
<i>constant</i>	-0.38	-
$\Delta wage_{t-1}$	0.20 *	0.20
$\Delta min. wage_t$	0.44 ***	0.69
$outputgap_{t-1}$	0.47 *	0.27
ΔCPI_{t-3}	0.49 *	0.35
Adjusted R ²	0.89	

The (***) and (*) signs indicate that the parameter estimates are statistically significant at 1 percent and 10 percent significance levels, respectively.

- 1) The minimum wage and lagged values of the CPI were used as instrumental variables. According to the Eichenbaum, Hansen and Singleton instrumental orthogonality test, the instruments used in the model estimation are orthogonal and valid according to the Cragg-Donald statistic. According to the Breusch-Godfrey test, there is no serial correlation in the model's error terms. The ARCH-LM test shows that there is no autoregressive conditional heteroscedasticity in the model's error term. The White test shows that there is no heteroscedasticity in error terms. Also, according to the Jarque-Bera test, error terms are normally distributed.

As summarized above, the estimation results confirm that past inflation and the minimum wage increase have a significant impact on non-agricultural wage rates (Table 3). The coefficient of the minimum wage is compatible with the share of the employees who earn wages at the minimum wage and below. It also shows that minimum wage is an important anchor for economy-wide wage increases. According to the standardized coefficients, the most important factors determining non-agricultural wage rates are the minimum wage increase, as claimed by Gürcihan-Yüncüler and Yüncüler (2016), followed by past inflation. Considering the fact that past inflation levels are factored into minimum wage increases, the comparison of the relative size of the coefficients over a reduced form equation may underestimate the real effect of inflation. Nevertheless, the significance of past inflation in the wage equation indicates the importance of backward indexation in determining wage increases, as seen in the CLA.

As proposed by Aldan and Gürcihan-Yüncüler (2016), the fact that the output gap coefficient is positive and statistically significant indicates that wages are pro-cyclical with business cycles, and, hence, the rate of wage increases can be differentiated in the expansion and contraction periods of economic activity.

To sum up, a considerable proportion of wage and salary employees earn wages at and around the minimum wage, and minimum wage rates and the CPI become anchors for wage increases in the private sector. This mechanism limits the sensitivity of wages to business cycles across the economy, leading to a significant rigidity in wage inflation. Undoubtedly, this situation feeds inflation rigidity in the context of the wage-inflation interaction (bidirectional relationship).

References

Aldan, A. and Gürcihan Yüncüler, H. B. (2016), Real Wages and the Business Cycle in Turkey, CBRT Working Papers, Number 16/25.

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