4. Supply and Demand Developments

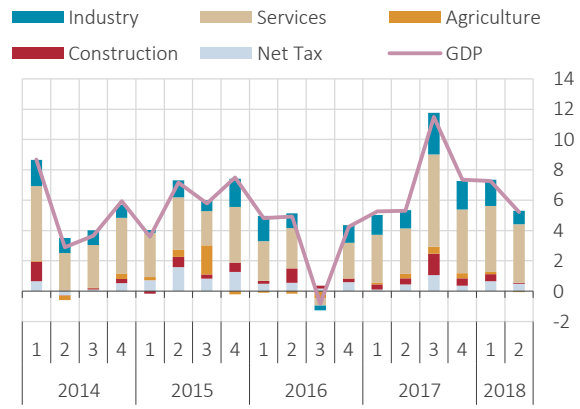
In the second quarter, economic activity was slightly stronger than projected in the July Inflation Report, albeit decelerating. The main driver of quarterly growth was net exports due to decreased imports of goods amid slowing domestic demand and due to a stronger rebound in tourism. Despite direct and indirect support from the public sector, domestic demand was down on a quarterly basis on the back of both consumer and investment spending. Construction investments remained relatively firm, whereas machinery and equipment investments shrunk further. In short, the economy appears to be rebalancing since the second quarter in terms of pace and composition.

Indicators for the third quarter suggest that economic activity continues to slow. In this period, tight financial conditions, high exchange rate volatility and the deepening sentiment of uncertainty weighed greatly on the outlook for domestic demand. On the other hand, the solid growth in exports of goods and services and, in particular, tourism, and the marked drop in import demand helped net exports make an added contribution to growth and thus somewhat curbed the slowdown in economic activity. Indicators for the final quarter of the year signal a deepening slowdown for domestic demand and economic activity. Persistently high levels of financial volatility and perceived uncertainty, rising protectionism in international trade and geopolitical issues keep downside risks alive for the magnitude and duration of the economic slowdown.

4.1 Supply Developments

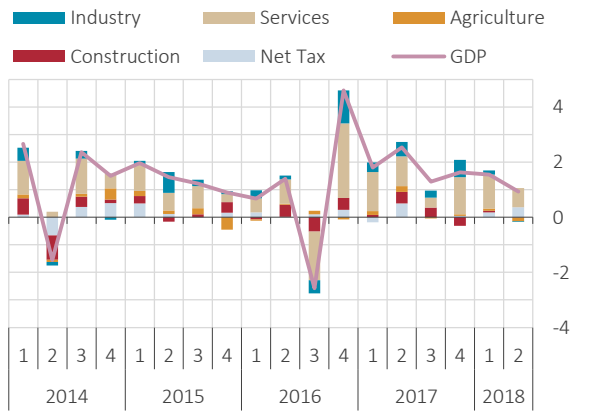
In the second quarter of 2018, gross domestic product (GDP) grew by 5.2 percent year-on-year and, adjusted for seasonal and calendar effects, by 0.9 percent quarter-on-quarter. Increased financial market volatility and the mounting perception of uncertainty led to slower growth. The slowdown spread across the whole economy in the second quarter, with all major industries providing less contribution to growth in both annual and quarterly terms. Services remained the biggest contributor to growth thanks to the booming tourism industry (Charts 4.1.1 and 4.1.2).

Chart 4.1.1: Contributions to Annual GDP Growth from the Production Side (% Point)



Sources: CBRT, TURKSTAT.

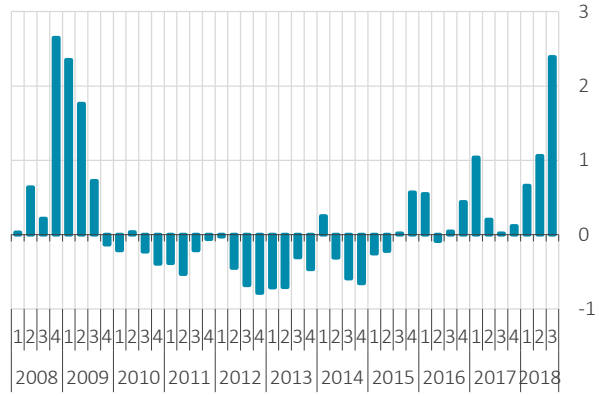
Chart 4.1.2: Contributions to Quarterly GDP Growth from the Production Side (Seasonally Adjusted, % Point)



Sources: CBRT, TURKSTAT.

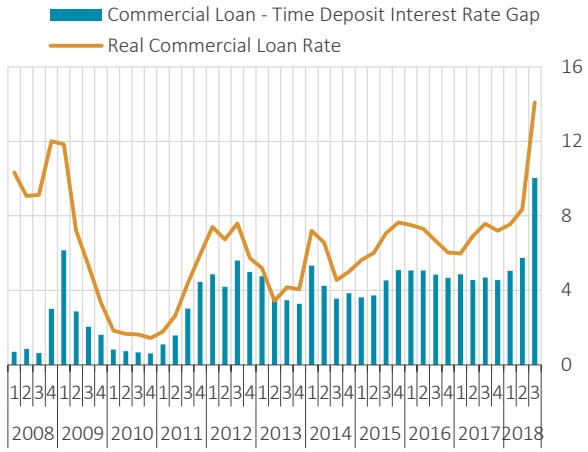
The second quarter's financial turbulence and environment of uncertainty that restrained growth became more pronounced in the third quarter. Due to market volatility, the economic uncertainty index remained on the rise and hit levels last seen during the global financial crisis (Chart 4.1.3). This outlook spilled over into bank loan rates, causing financial conditions to tighten significantly (Chart 4.1.4). As a result, indicators for economic activity were considerably weaker in the third quarter.

Chart 4.1.3: Economic Uncertainty Index (Level)



Source: CBRT.

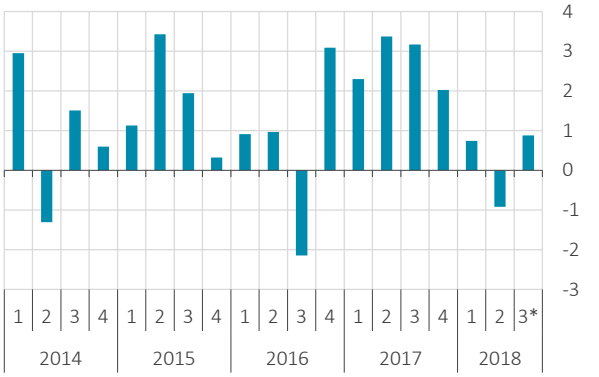
Chart 4.1.4: Commercial Loan-Deposit Rate Spread and Real Commercial Loan Rates* (Annual, Simple, %)



Sources: CBRT, TURKSTAT.
* Deflated by 12-month ahead CPI expectations.

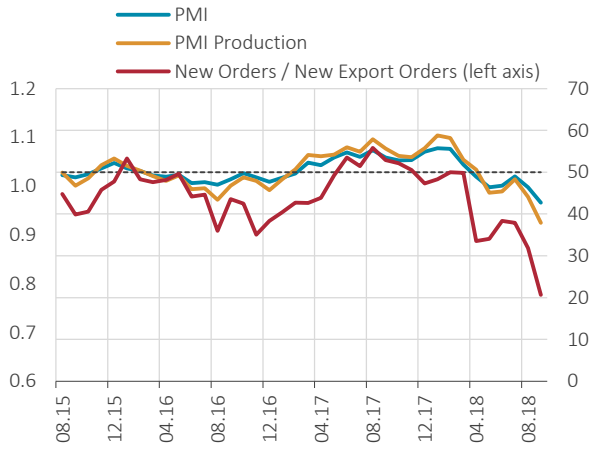
Indicators for the industrial sector suggest that the weaker outlook continued into the third quarter. Although industrial production was higher during July-August than in the previous period, survey indicators for September signal a sharper slowdown of activity following the fall in August and hint at a dim third-quarter outlook (Charts 4.1.5 and 4.1.6). In this period, exporting industries remained relatively buoyant, while industries that cater to the domestic market, particularly those related to construction, weakened. After the slight pickup in July, PMI data saw a significant drop, particularly in September. The gauge, calculated as the ratio of responses to the new orders and new export orders questions in the PMI survey, confirmed that the production drop was driven domestically (Chart 4.1.6).

Chart 4.1.5: Industrial Production Index
(Seasonally Adjusted, Quarterly % Change)



Source: TURKSTAT.
* July-August average.

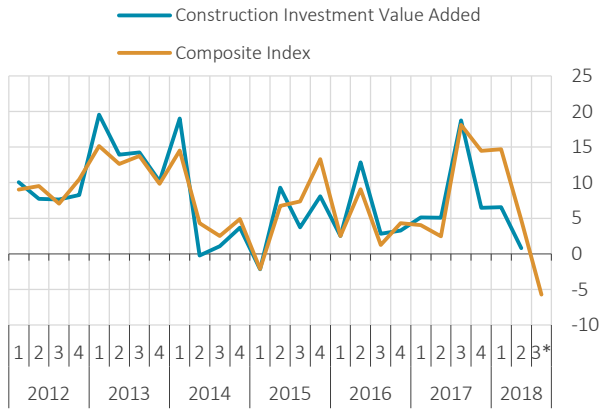
Chart 4.1.6: PMI and PMI Production
(Seasonally Adjusted, Level)



Source: IHS Markit.

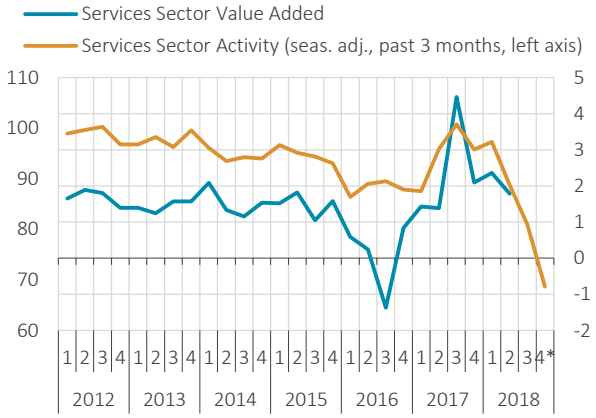
The value added in construction declined in the second quarter, and the sector provided less support to annual growth. Given the third quarter's employment and composite index data, the construction sector remains on the decline (Chart 4.1.7, Chart 4.3.4). The services confidence index shows an increasingly negative pattern for the value added in services in the third quarter (Chart 4.1.8). Activity was weaker across industry and construction-related subcategories of services, but remained healthy across those related to tourism.

Chart 4.1.7: Value Added and Composite Index of Construction (Annual % Change)**



Sources: CBRT, TURKSTAT.
* As of August.
** The composite index of construction is measured by the annual percentage change in domestic real revenues in fabricated metals and mineral products. Weights obtained from linear regression.

Chart 4.1.8: Value Added and Activity in Services ** (Annual % Change)

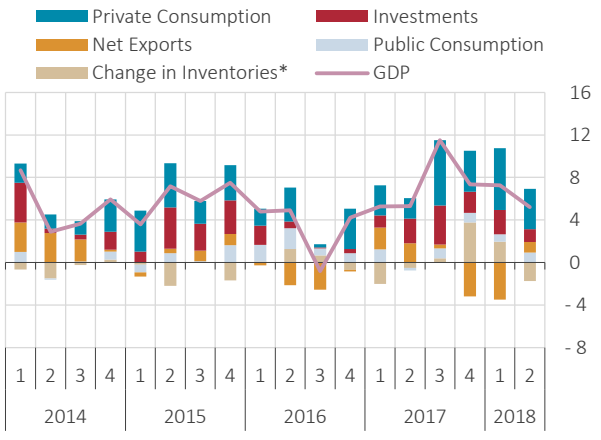


Source: TURKSTAT.
* As of October.
** Services activity question asked in the services confidence index (over the last 3 months) under sectoral confidence indices.

4.2 Demand Developments

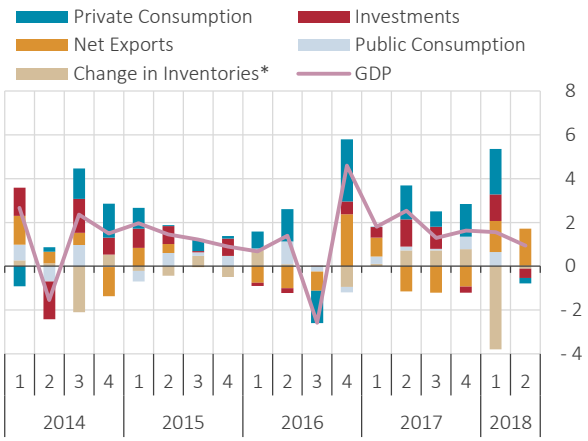
On the expenditures side, the second-quarter data that show signs of an economic slowdown reveal that net exports provided an increased contribution to GDP growth whereas domestic demand's contribution decreased. These developments were in line with earlier predictions that the composition of economic activity would start rebalancing. Exports of goods and services increased in the second quarter while imports declined due to subdued domestic demand and the depreciated real exchange rate, making net exports the main driver of quarterly growth (Box 4.3). Despite both direct and indirect public sector support, private spending contracted marginally on a quarterly basis amid financial turbulence and the weaker labor market, and made a smaller contribution to annual growth. The real exchange rate depreciation, rising costs of financing and the growing perception of uncertainty caused machinery and equipment investments to sink further. Although construction investments recorded a quarterly increase, total investment spending was down quarter-on-quarter. After hovering at high levels in previous periods, public spending was flat in the second quarter and hardly contributed to growth in quarterly terms (Charts 4.2.1 and 4.2.2).

Chart 4.2.1: Contribution to Annual Growth from the Expenditure Side (% Point)



Sources: CBRT, TURKSTAT.
* Includes inventories and statistical discrepancy due to chain linking.

Chart 4.2.2: Contributions to Quarterly GDP Growth from the Expenditure Side (% Point)

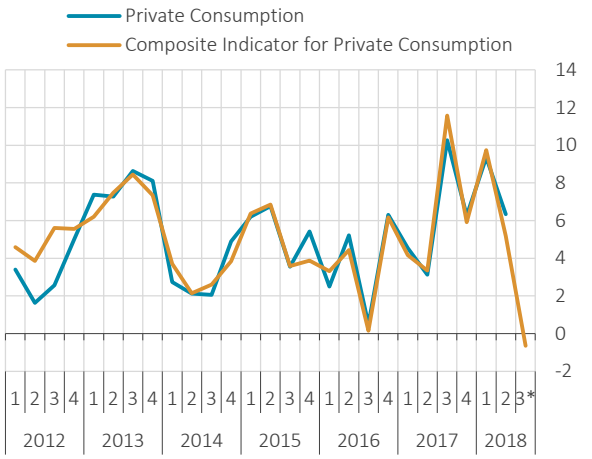


Sources: CBRT, TURKSTAT.
* Includes inventories and statistical discrepancy due to chain linking.

Indicators for the third quarter suggest that the second-quarter slowdown is ongoing and the rebalancing of demand composition is more marked. The quarter-long financial turmoil and higher financing costs heightened the possibility that final domestic demand may weaken further. On the other hand, healthy exports of goods and the strong tourism performance are likely to push up the contribution of net exports. Having fallen due to the likely-to-contract domestic demand, imports may also prop up the increased contribution of net exports.

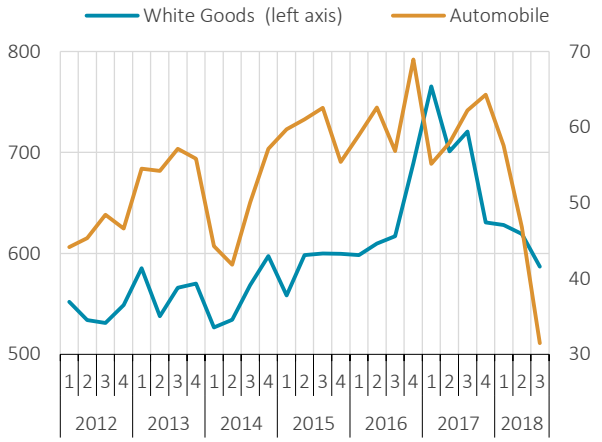
The composite indicator for private consumption hints at a decline in its annual rate of increase for the third quarter, signaling a quarter-on-quarter contraction (Chart 4.2.3). The drop in real disposable income driven by price hikes, weaker employment growth, lower consumer confidence and rising loan rates seems to have put pressure on consumer demand (Chart 4.1.4). The sharp third-quarter fall in sales of durable goods indicates that these factors play a fundamental role (Chart 4.2.4).

Chart 4.2.3: Private Consumption and Composite Indicator for Private Consumption** (Annual % Change)



Sources: ADA, CBRT, TURKSTAT, TURKBESD.
* As of August.
** The composite indicator is the weighted average of the annual percentage changes in the real turnover in non-durable goods, the import quantity index for durable goods, and the volume index for automobile and retail sales. Weights obtained from regression analyses.

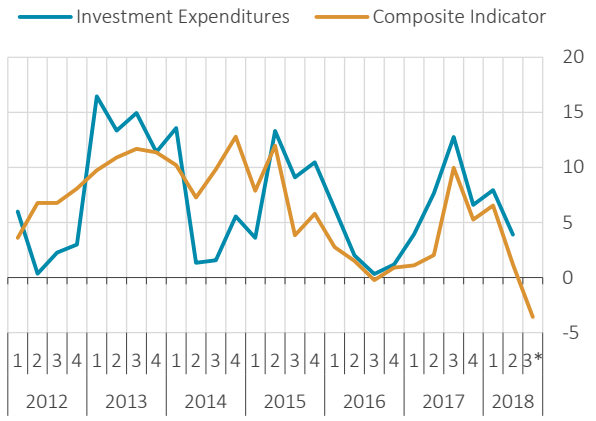
Chart 4.2.4: Sales of Automobiles and White Goods (Seasonally Adjusted, Average, Thousand)



Sources: ADA, CBRT, TURKBESD.

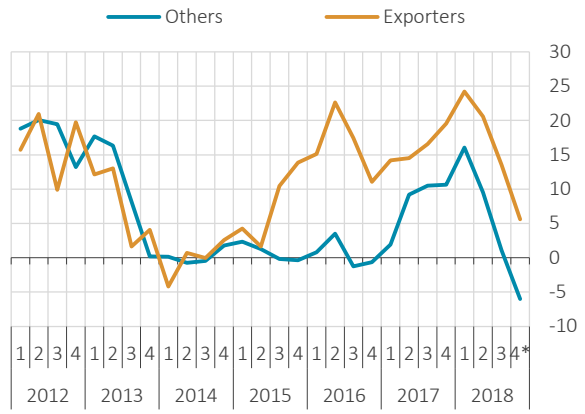
Leading indicators point to a faster decline in investment spending than in consumer spending for the third quarter (Chart 4.2.5). Perceptions of uncertainty due to mounting financial volatility, tighter financial conditions and weaker domestic demand are the main factors curbing investment spending (Charts 4.1.3 and 4.1.4). Spending is expected to be more sluggish for machinery and equipment investments rather than construction investments (Box 4.2). On the other hand, data from the Business Tendency Survey (BTS) show that exporting sectors have a higher tendency to invest than other sectors (Chart 4.2.6).

Chart 4.2.5: Investment Expenditures and Composite Indicator for Investment Expenditures** (Annual % Change)



Sources: CBRT, TURKSTAT.
* As of August.
** The composite indicator for investment expenditures is the average of the annual percentage changes in the production of capital goods, the production and imports of non-metallic minerals, home sales, construction orders, commercial loan rates and FX-denominated commercial loans, and capacity utilization series (manufacturing, services, trade, construction).

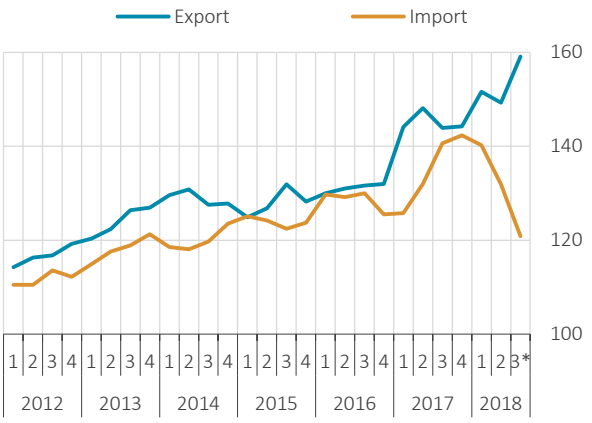
Chart 4.2.6: Fixed Capital Investment Tendency by Sectors based on BTS (Seasonally Adjusted, Up – Down, %)



Source: CBRT.
* As of October.

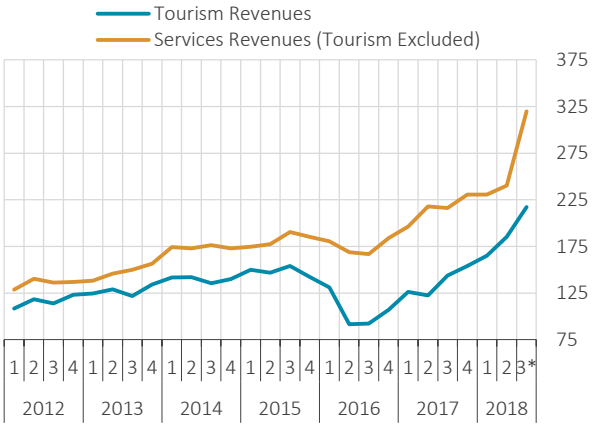
Net exports is expected to provide a significant boost to quarterly growth in the third quarter. The strong external demand, particularly from the EU, and the depreciated real exchange rate continue to support the exports of goods. On the other hand, the depreciation of the Turkish lira and the shrinking domestic demand put downward pressure on import demand (Chart 4.2.7). The acceleration in tourism and related services activities (transport) helped net exports provide an increased contribution to growth and limited the negative impact of weak domestic demand to some extent (Chart 4.2.8).

Chart 4.2.7: Quantity Indices for Imports and Exports (Excl. Gold, Seasonally Adjusted, 2010=100)



Sources: CBRT, TURKSTAT.
* Actual figure of July-August, forecast for September.

Chart 4.2.8: Tourism and Services Revenues (Real, Seasonally Adjusted, 2010=100)

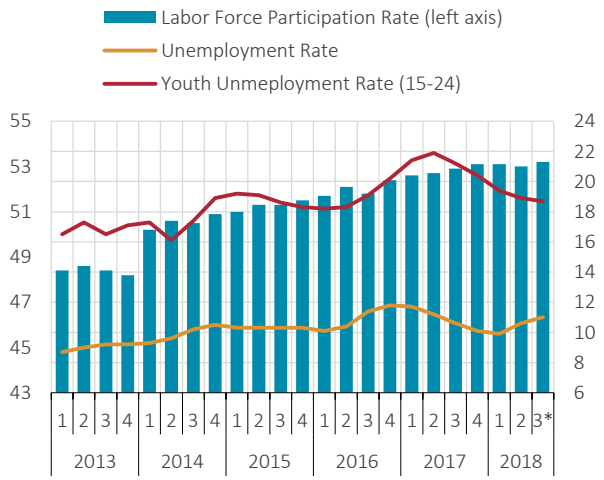


Sources: CBRT, TURKSTAT.
* Actual figure of July-August, forecast for September.

4.3 Labor Market

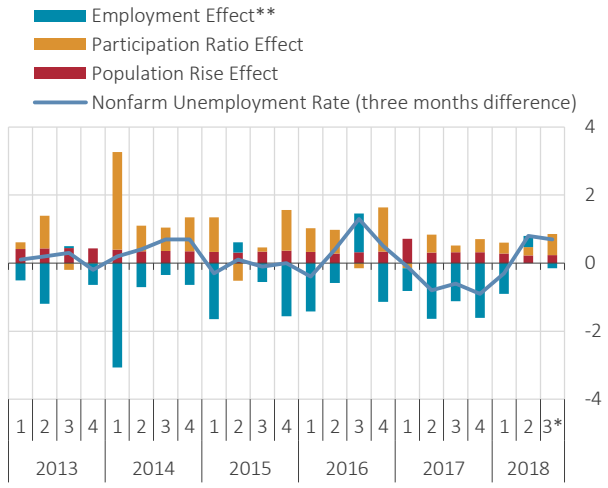
After falling through 2017, unemployment rates have been back on an uptrend since the second quarter of 2018. In the second quarter, seasonally adjusted total and nonfarm unemployment rates were up 0.7 and 0.8 points quarter-on-quarter to 10.6 and 12.6 percent, respectively (Chart 4.3.1). This was due to the drop in employment from the previous period (Chart 4.3.2). In the July period covering June, July and August, seasonally adjusted total and nonfarm unemployment rates were up 0.4 points from the second quarter to 11.0 and 13.0 percent, respectively.

Chart 4.3.1: Unemployment and Labor Force Participation Rates (Seasonally Adjusted, %)



Source: TURKSTAT.
* As of the July period.

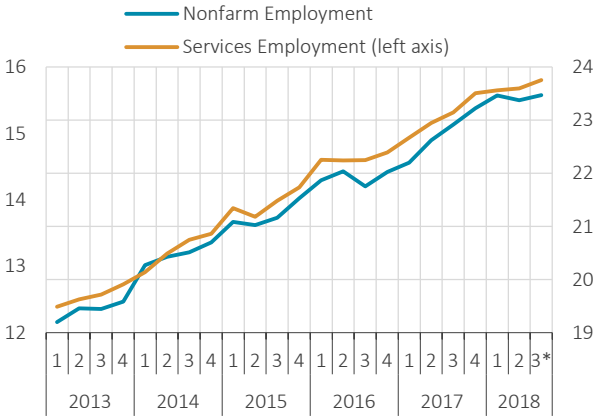
Chart 4.3.2: Contributions to Quarterly Changes in Nonfarm Unemployment (Seasonally Adjusted, % Point)



Source: TURKSTAT.
* As of the July period.
** Employment growth pulls nonfarm unemployment down.

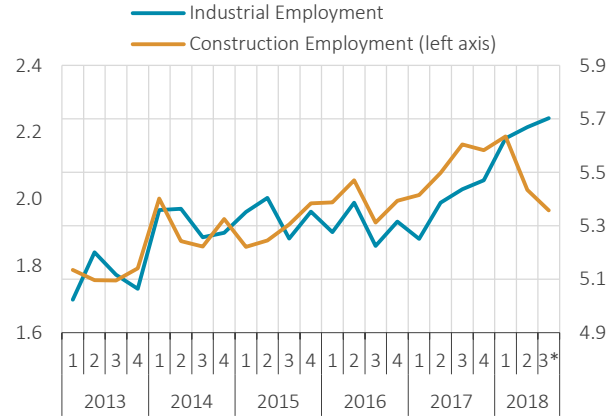
In the second quarter of 2018, nonfarm employment increased by about 750,000 year-on-year. The largest contributors to nonfarm employment growth were services followed by industrial sectors (Charts 4.3.3 and 4.3.4). The first-half gains in industrial employment are in line with the strong industrial output. Meanwhile, construction employment recorded a dramatic fall in the second quarter (Chart 4.3.4). In the July period, services employment increased by 0.5 percent from the June period whereas industrial and construction employment went down.

Chart 4.3.3: Nonfarm and Services Employment (Seasonally Adjusted, Million People)



Source: TURKSTAT.
* As of the July period.

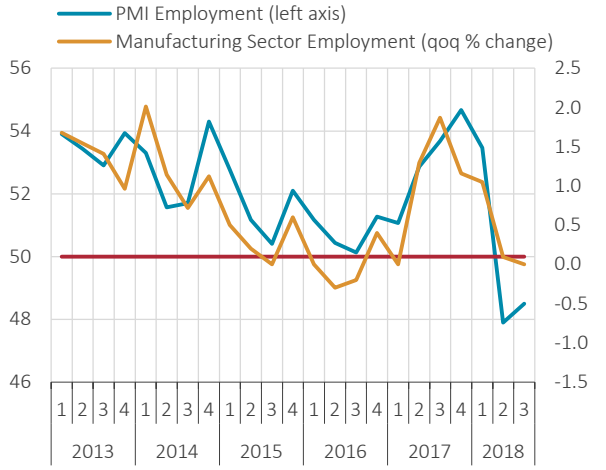
Chart 4.3.4: Industrial and Construction Employment (Seasonally Adjusted, Million People)



Source: TURKSTAT.
* As of the July period.

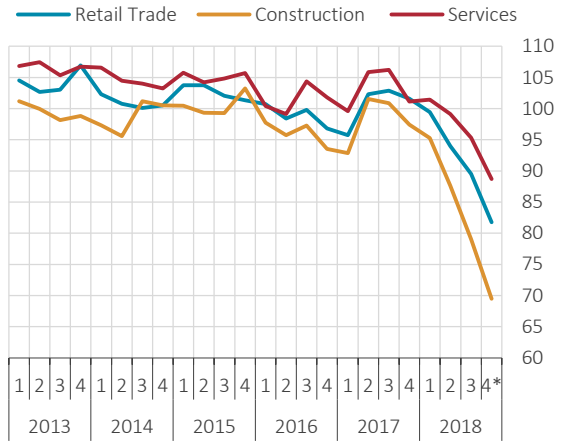
According to employment expectations across industries, there is an economy-wide expectation that employment will slow. The PMI employment index reveals a quarter-on-quarter increase in expected employment for the third quarter, but remains below the 50-point threshold. This suggests that July's narrowing industrial employment might continue into the upcoming period (Chart 4.3.5). Among all industries, retail trade, construction and services expect employment to shrink further over the next three months (Chart 4.3.6).

Chart 4.3.5: PMI and Manufacturing Industry Employment (Seasonally Adjusted)



Sources: CBRT, TURKSTAT.

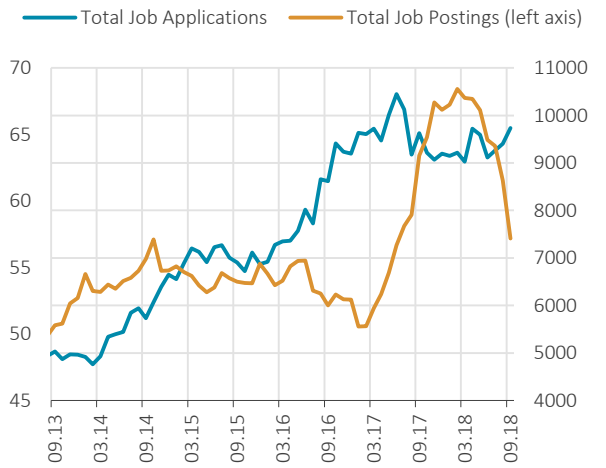
Chart 4.3.6: Three-Month Ahead Employment Expectation by Sectors (Seasonally Adjusted, Up-Down)



Sources: CBRT, TURKSTAT.
* As of October.

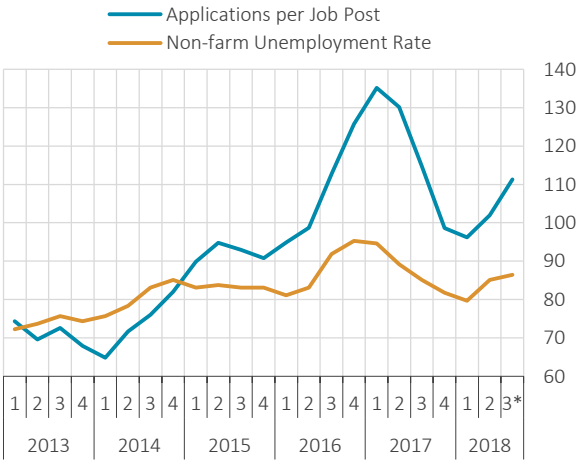
Data from Kariyer.net indicate that the total number of job postings decreased considerably while applications per job vacancy increased (Chart 4.3.7). The waning labor demand combined with increasing labor supply hints at rising unemployment. Applications per job posting, which are highly correlated with the nonfarm unemployment rate, recorded a dramatic quarter-on-quarter rise in the third quarter (Chart 4.3.8). Leading indicators suggest that the weak course of employment will spread across all industries in the upcoming period and unemployment rates will remain on the rise.

Chart 4.3.7: Total Job Postings and Applications on Kariyer.Net (Seasonally Adjusted, Thousand)



Sources: Kariyer.net, CBRT.

Chart 4.3.8: Applications per Posting on Kariyer.net and Nonfarm Unemployment (Seasonally Adjusted, 2010=100)

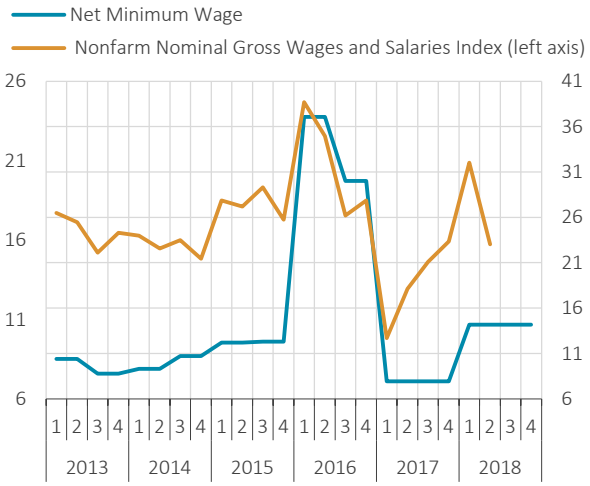


Sources: Kariyer.net, CBRT.
* As of the July period.

4.4 Wages and Productivity

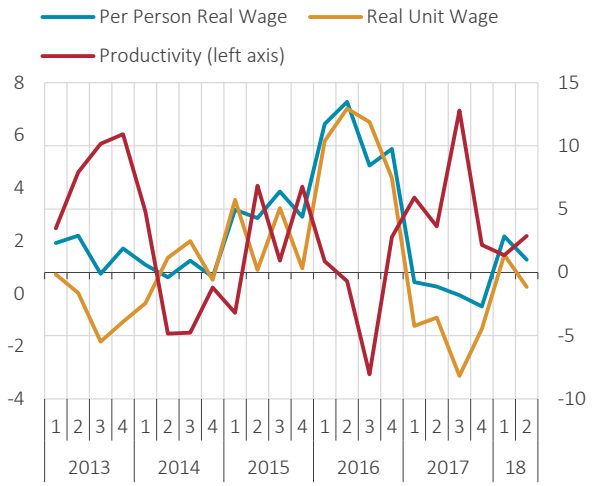
Raised by 14.2 percent in 2018, the minimum wage has put upward pressure on other wages. With the first quarter's adjustments, wages rose sharply by 20.9 percent in that period but saw a slowing rate of increase in the second quarter (Chart 4.4.1). The year-on-year increase in nonfarm nominal gross wages and earnings slowed from the first quarter to 15.7 percent, while consumer inflation accelerated by 12.8 percent year-on-year. Thus, real wages recorded a slower rate of increase in the second quarter. In this period, nonfarm partial labor productivity (value added/employment) grew by 2.2 percent whereas per capita real wages rose only by 1.0 percent. As a result, real unit wages (per capita real wage/productivity) dropped (Chart 4.4.2).

Chart 4.4.1: Nonfarm Wages and Net Minimum Wages (Nominal, 2015=100, Annual % Change)



Sources: MLSS, CBRT,TURKSTAT.

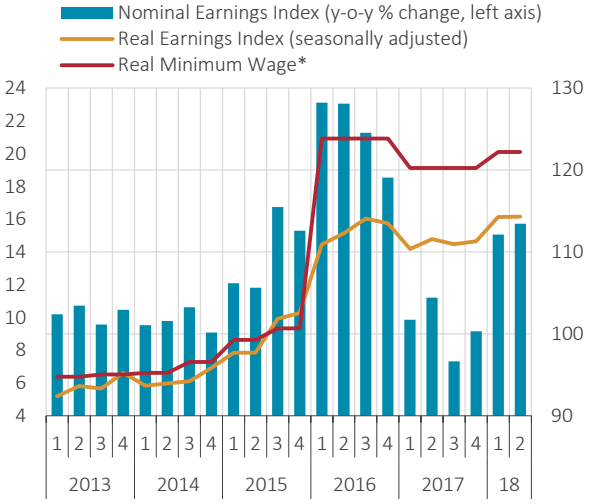
Chart 4.4.2: Partial Labor Productivity*, Per Capita Real Wages and Real Unit Wages** (Nonfarm, 2015=100, Annual % Change)



Sources: CBRT, TURKSTAT.
* Nonfarm value added/nonfarm employment (HLFS).
** Per capita real wage x employment/value added.

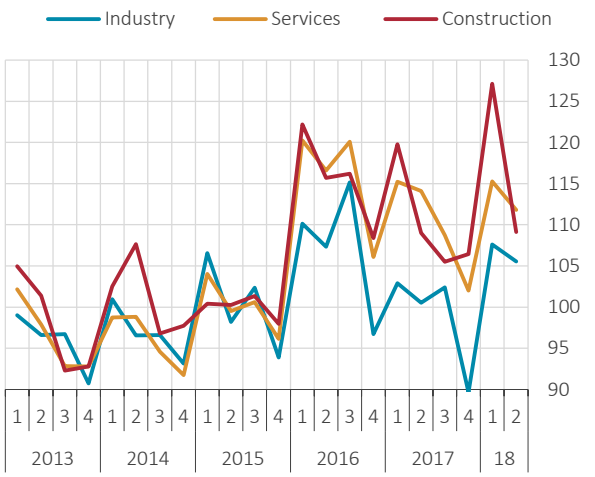
After a quarterly rise in the first quarter, the real earnings index remained virtually unchanged in the second quarter (Chart 4.4.3). Real earnings posted a slight quarter-on-quarter drop across industrial and construction sectors in the second quarter but edged up in services. Similarly, the real minimum wage was flat in the same period. In the second quarter, the real labor cost per hour index registered a small quarter-on-quarter decrease in seasonally adjusted terms. As labor costs were on the decline in real terms, the gains in partial labor productivity put significant downward pressure on real unit labor costs, particularly in construction (Chart 4.4.4).

Chart 4.4.3: Nonfarm Hourly Earnings Index (Seasonally Adjusted, 2015=100)



Sources: CBRT, TURKSTAT.
* Deflated by the CPI.

Chart 4.4.4: Real* Unit Labor Costs by Sectors** (Seasonally Adjusted, 2015=100)



Sources: CBRT, TURKSTAT.
* Deflated by the CPI.

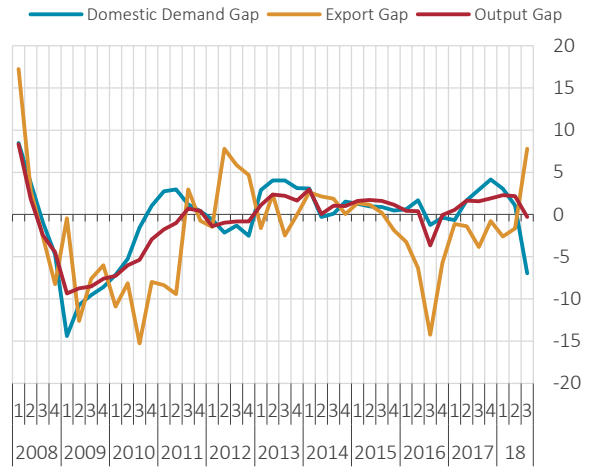
Aside from minimum wage changes, other key factors affecting wages include the course of the economy, the unemployment rate and inflation developments. Given the weakening aggregate demand outlook, high inflation will continue to affect wages through indexation although by the third quarter economic activity and unemployment will provide less upward support to wage inflation (Box 4.1). Against this backdrop, nominal wages are expected to see larger increases in 2018 compared to historical averages. Therefore, restraining unit labor cost pressures in the period ahead will require continued productivity gains.

4.5 Output Gap

To assess the cyclicality of the economy and the demand-driven pressures on inflation, the CBRT monitors output gap indicators estimated by several methods.[1] Indicators for economic activity suggest that the second quarter's economic slowdown became more pronounced in the third quarter. The weakening Turkish lira, heightened financial market volatility, rising loan rates and the strengthening perception of uncertainty were among the key factors curbing domestic demand in this period. On the other hand, having remained solid amid the buoyant services exports from tourism and transport industries and developments in external demand and real exchange rates, exports of goods helped limit the economic slowdown to some degree. A breakdown of the output gap by its components suggests that exports were well above their long-term trend in the third quarter, largely owing to accelerating services exports (Chart 4.5.1). However, the inflationary contribution of aggregate demand conditions has been largely neutralized by the weakening domestic demand. In fact, although alternative indicators for the output gap give out different signals in the neighborhood of zero, there is widespread agreement that they are, on average, close to the economic potential level for the third quarter (Chart 4.5.2). Exports are expected to remain above trend in the final quarter, while domestic demand will shrink further, causing aggregate demand to provide an increased disinflationary contribution.

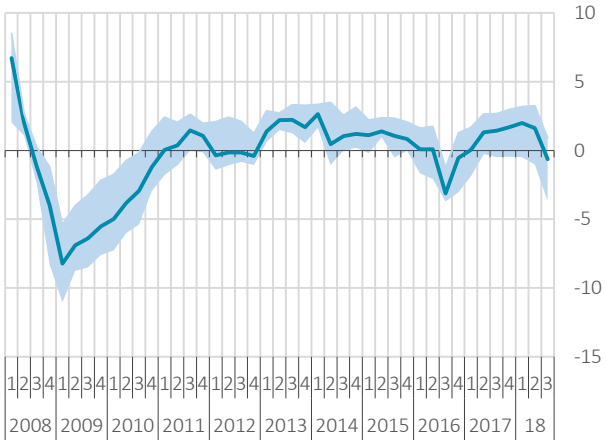
[1] See Inflation Report 2017-1, Box 4.2, “Alternative Indicators for Output Gap”, pp. 55-59.

Chart 4.5.1: Output Gap and Demand Components*



Source: CBRT calculations.
* Output gap series constructed from demand components (*See* Inflation Report 2018-III Box 4.1).

Chart 4.5.2: Output Gap Indicators (Average and Min/Max Band)



Source: CBRT calculations.

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.

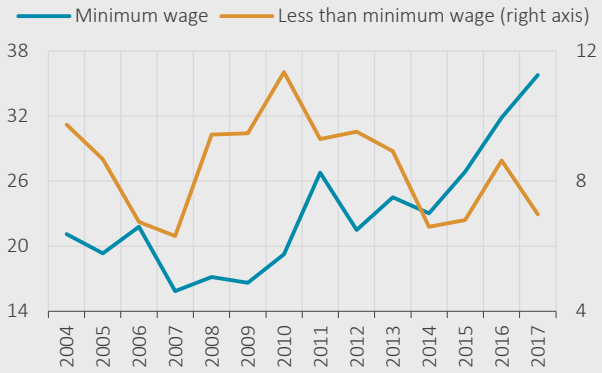
Wage Distribution in Turkey

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).

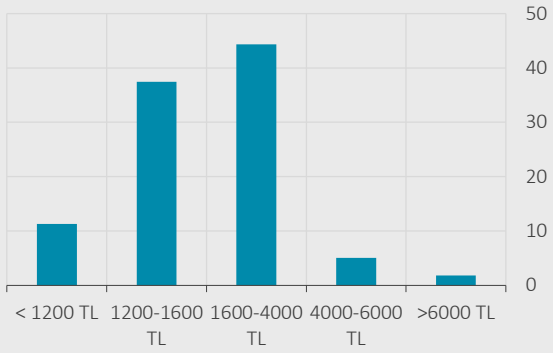
Chart 2 shows that 11.3% of wage and salary workers received an income less than 1,200 TL, while 37.5% earned in the neighborhood of the minimum wage (1,200-1,600 TL) and 44.3% declared an income between 1,600 and 4,000 TL.

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 (Gürcihan-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
$constant$	-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 auto regressive 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).

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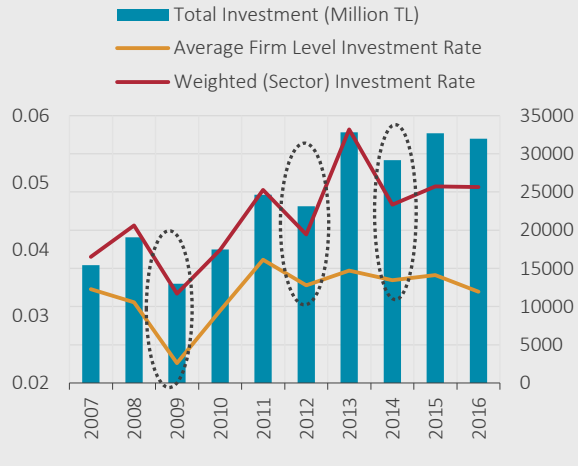
Box 4.2

Firm Investment Dynamics in the Manufacturing Sector

One of the most important determinants of sustainable economic growth is investment. Considering the fact that investment is mostly carried out by the private sector, analyzing the investment behavior of firms will help to understand the basic dynamics of economic growth and help to design the relevant policies more effectively. This study examines the investment dynamics of firms in the manufacturing industry.[1] The data used in the analysis covers about 325 thousand manufacturing industry firms registered in the Ministry of Science, Industry and Technology Enterprise Information System (EIS) including 1.6 million balance sheet and income statement information for the period of 2006-2016.

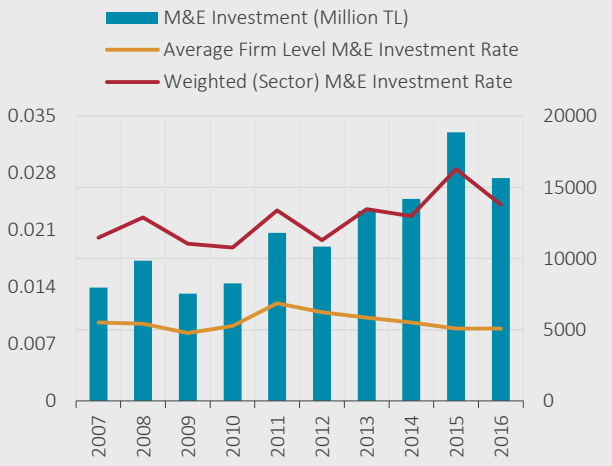
Chart 1: Total Investment (Million TL, Ratio)



Source: EIS and Authors' Own Calculations Last Observation: 2016

Footnote: Weights are based on net sales.

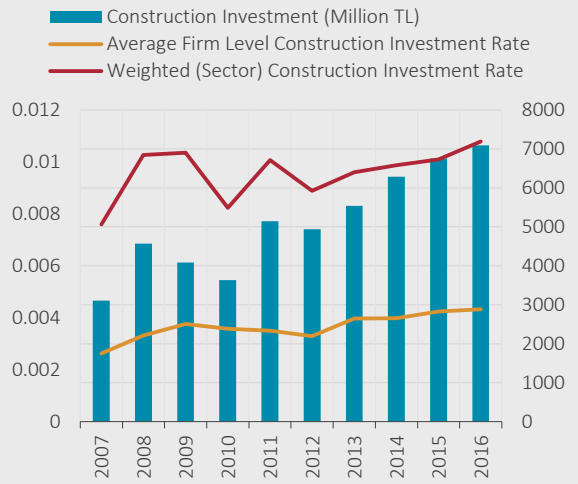
Chart 2: Machinery and Equipment (M&E) Investment (Million TL, Ratio)



Source: EIS and Authors' Own Calculations Last Observation: 2016

Footnote: Weights are based on net sales.

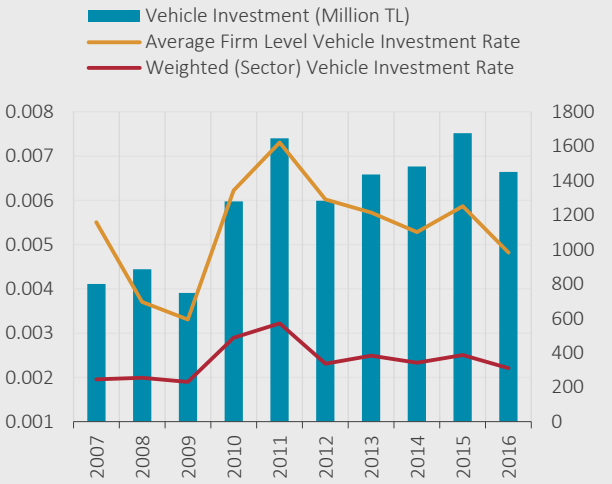
Chart 3: Construction Investment (Million TL, Ratio)



Source: EIS and Authors' Own Calculations Last Observation: 2016

Footnote: Weights are based on net sales.

Chart 4: Vehicle Investment (Million TL, Ratio)



Source: EIS and Authors' Own Calculations Last Observation: 2016

Footnote: Weights are based on net sales.

Although the investment trend generally followed an upward long-run trend between 2006 and 2016, short-term declines were recorded in some years (Chart 1). These short-term declines happened (1) in 2009 when the global financial crisis took a toll, (2) in 2012 when the European sovereign debt crisis was felt most heavily, and (3) in 2014 when balance sheets saw lagged effects of the FED's tapering along with the geopolitical developments in Turkey. The orange line in each chart shows the average firm investment rate, while the red line depicts the weighted (sector) investment rate by net sales. Due to the abundance of small firms in the manufacturing industry, the average firm investment rate is affected by the tendencies of small firms, and similarly, the sector investment rate rather reflects the trend of relatively larger firms. Accordingly, the data shows that, generally after 2011, investment rates for large firms increased while those for small firms gradually decreased (Chart 1).

A breakdown of investment by capital types appears to vary significantly across firm types. For instance, the weighted (sector) machinery-equipment investment rate follows a similar trend to total investment (Chart 2), however the decline of average investment rates in machinery-equipment is more pronounced compared to total investment. Based on this finding, the decrease in total investment of small firms can be actually attributed to the decline in machinery and equipment investments.

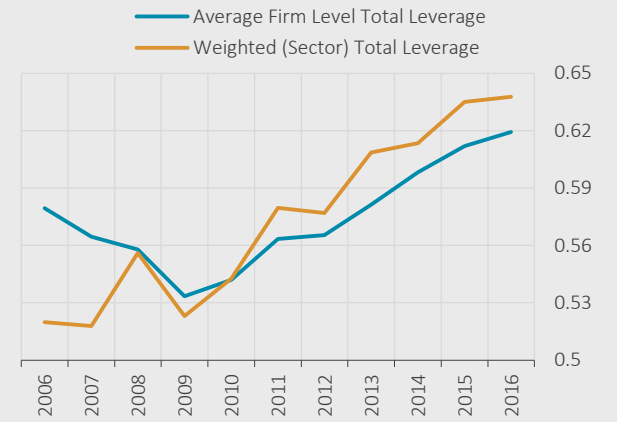
In contrast to the investment outlook in other items, investment rates for non-residential construction have increased since 2011 both on sector and average bases (Chart 3). This situation, which is actually in line with the macroeconomic data, can be interpreted as an indication of the desire of the firms to benefit from the increase in real estate asset prices. Lastly, the vehicle investment rate in the manufacturing industry suggests that the average investment rate is well above the sector's average (Chart 4). This is to say that small firms have a significant share of capital expenditures made on vehicles among all investment items. In the post-2011 period, while investment rates within this sector remained relatively stable, the average vehicle investment rates declined. This means that while vehicle investment of small firms decreased as a share, no significant change was observed in large firms, which can possibly be attributed to the hike in the special consumption tax on vehicle purchases in 2011.

Another highlight from the above charts is that capital investment by relatively smaller firms, except non-residential construction investments, have declined sharply since 2011. In order to outline potential explanations for this decline, it would be appropriate to examine the progress of internal and external financing resources used in investments during this period. To this end, firm profitability (interest and pre-tax profit (EBITDA) / net sales) and leverage ratios (total liabilities / total assets) are presented in Charts 5, 6 and 7. Chart 5 shows that leverage has steadily increased for both small and large firms (average and sector) since 2009. However, bank leverage ratios, defined as the ratio of firms' bank debts to total assets, exhibited significant differences with respect to the size of firms, especially after 2011. The upward movement in the sector's bank leverage indicates that the use of bank loans among large firms increased during this period, while the downward movement in the average bank leverage (mainly for relatively smaller firms) shows that small firms might have experienced difficulty in access to loans (Chart 6). A joint analysis of total and bank leverage ratios indicates a decrease in bank debts and an increase in non-bank debts (e.g., trade credits, receivables from shareholders etc.) of small firms after 2011. Nevertheless, the decline in investment during the mentioned period suggests that small firms did not use financing channels other than bank loans for their investment.

Similarly, profitability of large and small firms presented a significant divergence after 2011 (Chart 7). While the profitability of small firms declined, that of large firms posted a significant increase. This implies a tightening in the conditions for internal financing for small firms.

Moreover, it should be noted that the decline in firm' investment during 2009 did not last long due to abundant capital flows towards emerging markets in the aftermath of the crisis. The recent depreciation of the TL is considered to jeopardize the investment of large firms in addition to that of small firms. As opposed to the post-2009 episode, investment recovery may take longer this time, as a credit glut in global markets seems unlikely in the upcoming years. In this regard, it would be appropriate to implement well-designed growth-enhancing policies, particularly those that can directly target supporting machinery-equipment investments.

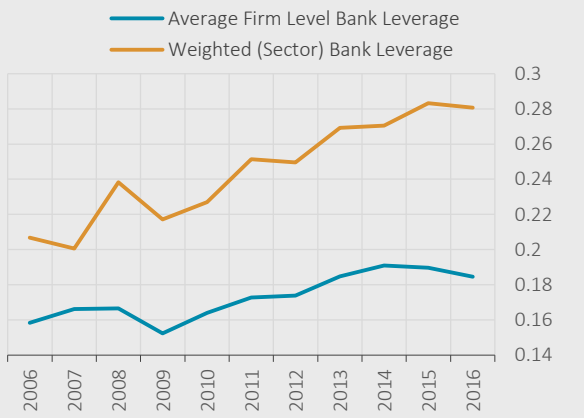
Chart 5: Total Leverage (Ratio)



Source: EIS and Authors' Own Calculations Last Observation: 2016

Footnote: Weights are based on net sales.

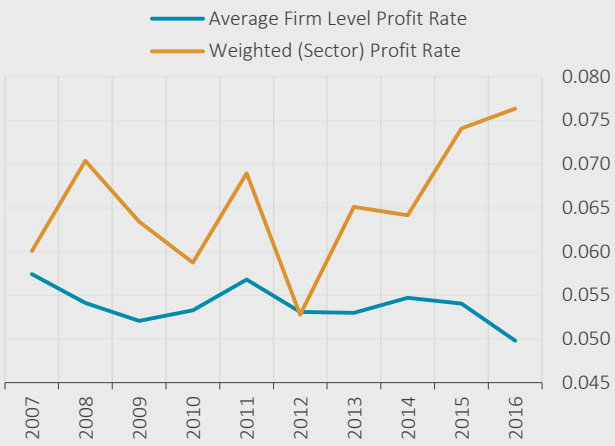
Chart 6: Bank Leverage (Ratio)



Source: EIS and Authors' Own Calculations Last Observation: 2016

Footnote: Weights are based on net sales.

Chart 7. Profitability (Ratio)



Source: EIS and Authors' Own Calculations Last Observation: 2016

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[1] For a further discussion on determinants of firm level investment in Turkey, see OECD Turkey Report (2018), thematic chapter on firm level investment.

Box 4.3

Manufacturing Industry Firms' Elasticity to Shift into External Markets[1]

Manufacturing industry firms that sell goods in both domestic and international markets are subject to not only domestic but also external demand shocks. Against these shocks, the degree of flexibility to switch between domestic and foreign markets is important to continue operations and to minimize the effects of shocks. For instance, in response to a negative domestic demand shock, a firm will be able to reduce its losses to the extent that it can shift its sales to external markets, and in some cases it can achieve more sales. A similar shift can be observed in response to a negative external demand shock as well. These shocks affect the firm's sales at the micro level and economic activity at the macro level. The size of these effects depends on the relationship between the domestic sales and exports of firms.

In economic literature, there are three main approaches to explain the relationship between domestic sales and exports at the firm level. First is the capacity constraints approach suggesting that an increase in domestic demand reduces exports in the short-term due to existence of production constraints (Belke et al., 2015). On the other hand, a decline in domestic demand facilitates allocation of more resources to production of export-oriented goods by releasing some production capacity reserved for domestic goods. If a firm does not have capacity constraints, it can adjust its sales in domestic and foreign markets independently from each other. The second main approach takes into account domestically-operating multinational companies and foreign direct investment (Wang et al., 2014). According to this approach, multinational firms or foreign direct investment inflows increase the efficiency of local firms, thereby create a positive effect on sales (*Direct Impact*). However, increased competition in the domestic market stemming from the entry of multinational companies has a negative impact on the sales of local firms (*Indirect Impact*). The third main approach focuses on the existence of differentiated exporters in international markets (McQuoid and Rubini, 2014). The term "differentiated" refers to whether a firm is a permanent exporter or a firm that can only be called a temporary exporter that shifts to external markets only in certain periods. The group under which a firm is classified depends on the relationship between firm size and marginal costs. Being a permanent or temporary exporter affects the relationship between domestic sales and exports. In addition to those approaches, factors such as the effectiveness of global value chains, the type and quality of goods sold in domestic and foreign markets, the relative profitability of selling goods in both markets, and the loyalty relationship between the seller and the buyer also play a role in determining the relationship between domestic sales and exports.

The relationship between domestic sales and exports of Turkish manufacturing firms that sell their goods in both domestic and external markets is examined in this box. The aim of the study is to question whether firms can substitute exports for their domestic sales (or have the flexibility of shifting from domestic sales to exports) in periods of weak domestic demand. We follow the methodology in Salomon and Shaver (2005) but we model exports by a single equation. Below are the main dynamic estimation models:

[1] This box involves the initial findings of the study by Gül (2018) in progress.

$$ex_{it} = \alpha_0 + \sum_{k=1}^{\rho} \beta_k (ex_{it-k}) + \alpha_1 ds_{it} + \alpha_2 \boldsymbol{X}_{it} + \mu_i + \varphi_t + \vartheta_{it} \quad (1)$$

$$ex_{it} = \alpha_0 + \sum_{k=1}^{\rho} \beta_k (ex_{it-k}) + \alpha_1 ds_{it} + \gamma (DD_{t-1}) ds_{it} + \alpha_2 \boldsymbol{X}_{it} + \mu_i + \varphi_t + \vartheta_{it} \quad (2)$$

In the model (1), *ex* and *ds* represent the real exports and real domestic sales in Turkish liras for the firm *i* in year *t*, respectively. $\boldsymbol{X}$ is the matrix of control variables that includes firm characteristics such as age, size, leverage ratio, profitability ratio and cash ratio. Export and domestic sales are defined as logarithmic. The coefficient estimate of the α_1 parameter indicates the percentage change in exports caused by a 1 percent change in domestic sales, holding all the other conditions constant. Model (2) differs from the former by including the interaction term that is defined as the product of domestic sales and the domestic demand indicator (DD). The coefficient estimate of the interaction term shows the additional effect of a change in domestic sales on exports, when domestic demand is weaker than average. The domestic demand indicator is a dummy variable that takes the value 1 if the domestic demand is below the average of the period or the long-term trend and 0 otherwise. To construct this indicator, both the domestic demand forecasts published by the OECD and total and household final consumption statistics published by TurkStat are used. The main reason for considering the previous year's demand conditions in the estimation model is that it takes time for firms to adjust their sales between domestic and foreign markets. Since our data set is annualized, it is assumed that the adjustment will be completed within one year. In the study, which is based on the CBRT's Company Accounts Statistics for the 2004-2014 period, models were estimated by the system-GMM method considering the possible endogeneity problem. Taking the common domestic and external shocks and firm heterogeneity into account, we control for the time and firm fixed effects.

Table 1: Summary of Findings

	Model I	Model II	Model III	Model IV
$Exports_{it-1}$	0.395*** *(0.046)*	0.409*** *(0.050)*	0.398*** *(0.049)*	0.452*** *(0.040)*
$Domestic\ Sales_{it}$	-0.262*** *(0.068)*	-0.220*** *(0.071)*	-0.210*** *(0.071)*	-0.081* *(0.048)*
$Domestic\ Sales_{it} * (DD_{t-1})$		-0.070** *(0.035)*	-0.119*** *(0.042)*	-0.076* *(0.041)*
$Leverage\ Ratio_{it}$	-0.007* *(0.004)*	-0.007* *(0.004)*	-0.007* *(0.004)*	-0.011** *(0.005)*
$Profitability\ Ratio_{it}$	0.012*** *(0.004)*	0.011*** *(0.004)*	0.011*** *(0.004)*	0.006 *(0.005)*
$Cash\ Ratio_{it}$	0.008*** *(0.002)*	0.008*** *(0.002)*	0.008*** *(0.002)*	0.009*** *(0.002)*
$Firm's\ Age_{it}$	0.016* *(0.009)*	0.014 *(0.010)*	0.014 *(0.010)*	0.004 *(0.010)*
$Firm's\ Size_{it}$	0.817*** *(0.088)*	0.780*** *(0.095)*	0.795*** *(0.094)*	0.619*** *(0.057)*
$Number\ of\ Firms$	5947	5947	5947	5947
$Number\ of\ Observations$	24167	24167	24167	24167

Note: Leverage ratio is the ratio of short and long-term liabilities to total liabilities. Profitability ratio is defined as the ratio of net profits to total assets. Cash ratio refers to the ratio of cash and cash equivalents to short-term liabilities. Age is a categorical variable spanning 5-year periods between 0-50 years. Firm size is the logarithm of the number of employees. Models pass the tests for both autocorrelation and over identifying restrictions for instruments. Figures in parentheses are heteroscedasticity-robust standard errors. Significance levels are given as * p <0.10, ** p <0.05, *** p <0.01.

Table 1 presents the summary of findings. Estimates of equation (1) are provided in the first column. To show the robustness of the results, the remaining columns summarize the estimates of equation (2) in which three different domestic demand indicators are used. Findings can be listed under three main statements. The first finding indicates that there is a

substitution relationship between domestic and foreign sales of firms. In other words, while firms increase their exports as a response to the decline in their domestic sales, they decrease their exports when their domestic sales increase. In terms of magnitude, a 10-percent decline in domestic sales of a firm increases its exports by 2.6 percent on average, when holding other conditions constant. Demonstrating the substitution relationship between domestic and external markets, this finding is compatible with the findings of studies conducted for European countries and can be explained by the capacity constraints approach.

The second main finding is that the substitution relationship between domestic sales and exports differs among subsectors and according to firm characteristics. The elasticity of substitution is estimated to be higher for export-oriented, low-indebted and younger firms compared to domestic market-oriented, high-indebted and older firms. Several reasons underlying the heterogeneity at firm level can be listed as the firms' production technologies (labor or capital- intensive), the countries to which their exports are mostly destined, the degree of competition for the goods they sell in foreign markets, the imported input dependency of their goods and the price developments in foreign markets.

The third main finding is that the relationship between the domestic sales and exports is stronger in times following the periods of below average domestic demand. This result indicates that Turkish manufacturing industry firms operating in both domestic and foreign markets have the elasticity to shift from domestic market to external market (or to adjust their sales among both markets) in response to weak domestic demand. Since this mechanism is countercyclical, it supports economic activity through exports in times of weak domestic economic activity due to demand conditions. On the other hand, this finding can be interpreted as that manufacturing industry firms will shift to domestic market when domestic demand proves stronger than average. In this context, favorable performance in economic activity will worsen the foreign trade balance both by stimulating imports and by firms' favoring of domestic markets rather than export markets. Considering that exporters are the leading firms in manufacturing industry in terms of productivity (Demirhan, 2018), this tendency to abandon exports in periods of high growth can be expected to have a negative impact on long-term investment and the level of potential growth.

As a result, a substitution relationship exists between the domestic sales of the manufacturing industry firms and their exports. In other words, firms have the elasticity to shift to external markets when their domestic sales decline. This elasticity is stronger in years ensuing those with weak domestic demand. Due to its countercyclical nature, it supports the economy against weakening in domestic demand through the external demand channel. In this context, the slowdown in economic activity in the second half of the year is expected to accelerate the firms' tendency towards exporting in the coming period by the specified channel. Considering the favorable outlook for foreign demand conditions, it is predicted that net exports may continue to contribute to growth in 2019.

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