4. Supply and Demand Developments

In the last quarter, economic activity remained strong in line with the projections in the January Inflation Report. The main drivers of quarterly growth were private and public consumption, while investments pulled quarterly growth down. Notwithstanding the high level of exports, the strengthening domestic demand and the historically high imports of gold pushed imports considerably upwards, which caused the contribution of net exports to quarterly growth to lose pace. Nevertheless, net exports contributed positively to growth across 2017. Excluding gold, net exports provided a large contribution to annual growth in 2017.

Leading indicators suggest that economic activity remained strong, albeit some deceleration in the first quarter of 2018. Industrial production data and the first-quarter survey indicators show that the industrial sector continued to grow, despite a quarter-on-quarter slowdown. Capacity utilization rate in exporting sectors of the manufacturing industry posts high figures. Meanwhile, sectors providing input to the construction sector as well as textiles and clothing, which are also related to tourism, experience a robust level of production. Survey indicators for services and trade hint at a more moderate course.

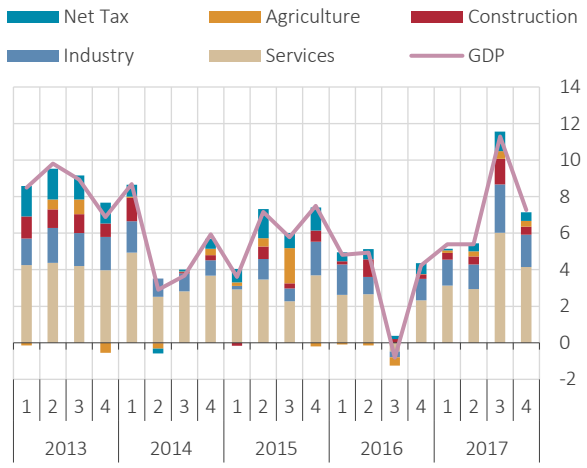
On the expenditures side, first-quarter indicators suggest a sustained support from private consumption to growth amid the ongoing recovery in the labor market and a remarkable quarter-on-quarter growth in machinery and equipment investments. Exports remained strong, while imports decelerated slightly due to exchange rate developments in this period. Against this background, net exports are expected to provide higher contribution to quarterly growth in the first quarter. Domestic demand is expected to remain as the key driver of annual growth.

4.1 Supply Developments

In the last quarter of 2017, GDP grew by 7.3 percent year-on-year and by 1.8 percent quarter-on-quarter in seasonal and calendar-adjusted terms. On the production side, annual growth was spurred by all major sectors in the last quarter (Chart 4.1.1). Quarterly growth, on the other hand, was driven by services and industry but restricted by construction (Chart 4.1.2).

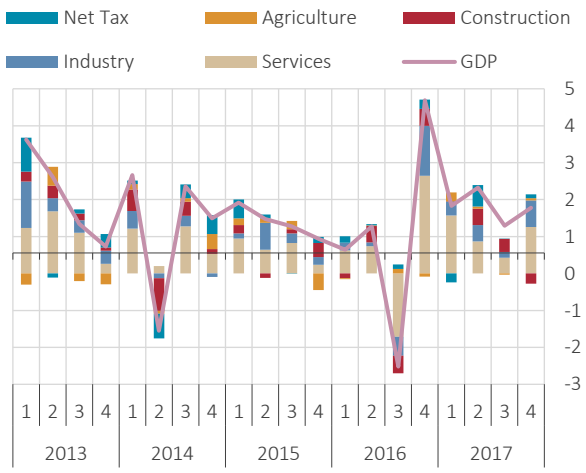
In 2017, growth posted a significant year-on-year acceleration and reached 7.4 percent. This high-rated increase was induced by measures and incentives to boost domestic demand, robust exports of goods spurred by global growth and the real exchange rate, tourism revenues recovering on the back of waning geopolitical risks and the base effect from the third quarter of the year. With the rebound in economic activity and its sectoral spillovers, recovery in the labor market also grew more apparent.

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



Source: CBRT, TURKSTAT.

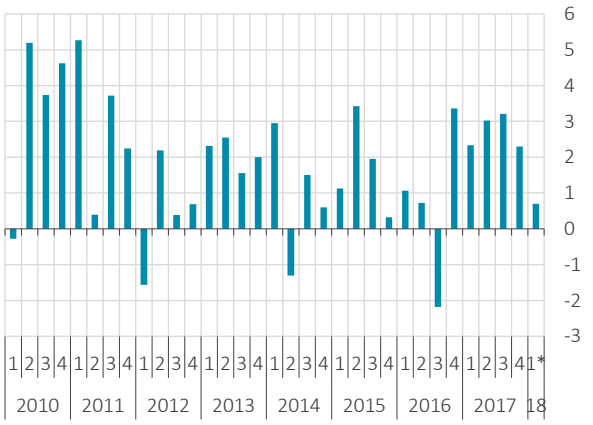
Chart 4.1.2: Contributions to Quarterly GDP Growth from the Production Side (Seasonally Adjusted, % Point)



Source: CBRT, TURKSTAT.

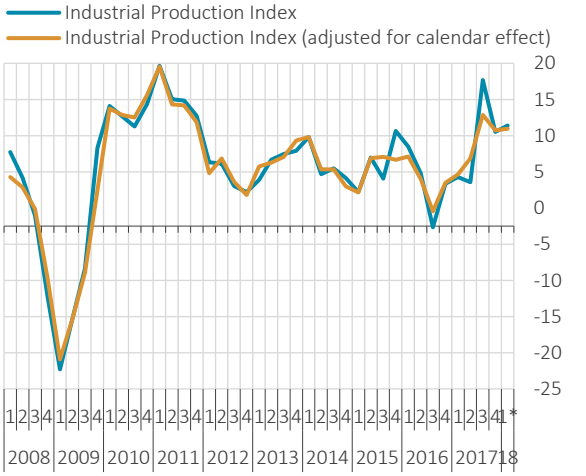
March revision by the TURKSTAT indicates that industrial production realizations in the January-February 2018 signal some deceleration in economic activity in the first quarter (Chart 4.1.3).[1] Across subcategories of industrial production, capital goods registered a decline in contrast to an increase in intermediate goods and non-durable consumption goods compared to the last quarter of 2017, while durable goods remained somewhat weak following the tax incentives. The steady increase in non-durable consumption goods is consistent with the recovering prospects for labor market and tourism. On the other hand, industrial production posted a year-on-year surge of 11.4 percent in the same period (Chart 4.1.4).

Chart 4.1.3: Industrial Production Index (Seasonally Adjusted, Q-o-Q % Change)



Source: TURKSTAT.
* As of February.

Chart 4.1.4: Industrial Production Index (Y-o-Y % Change)

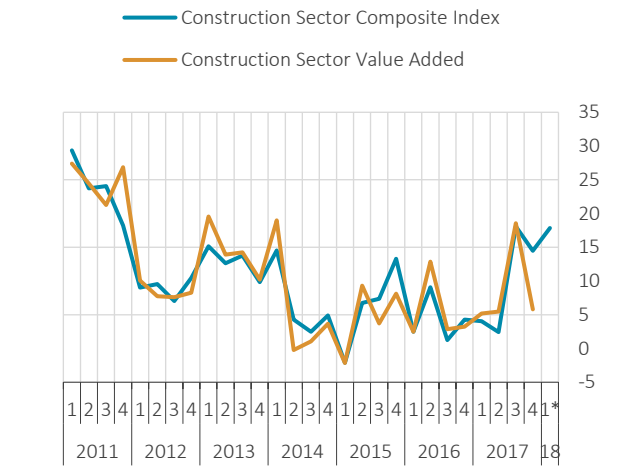


Source: TURKSTAT.
* As of February.

The value added from the construction sector is expected to support growth further in the first quarter of 2018 (Chart 4.1.5). Non-building construction activity particularly including infrastructure investments proved strong in this period. This is confirmed by the outlook in sectors supplying construction inputs, particularly the production of non-metallic minerals as well as fabricated metals in addition to the course of employment in the construction sector.

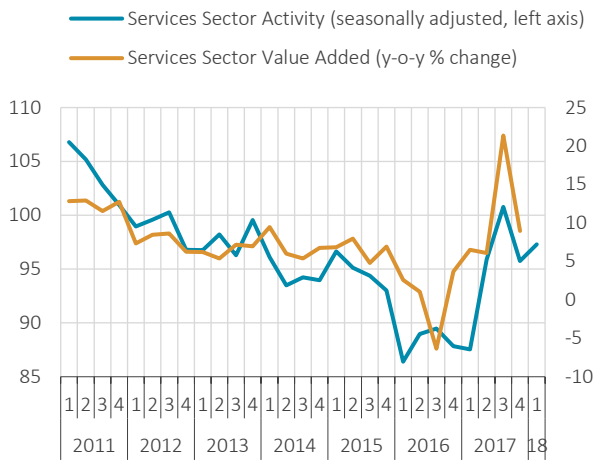
[1] For more information on the revision in the industrial production index and the correlation between the new series with national accounts, see Box 4.1.

Chart 4.1.5: Construction Sector Value Added and Composite Index* (Y-o-Y % Change)



Source: TURKSTAT.
* Construction sector composite index is measured by the annual percentage change in domestic real revenues in fabricated metals and mineral products. Weights are obtained from regression. As of February.

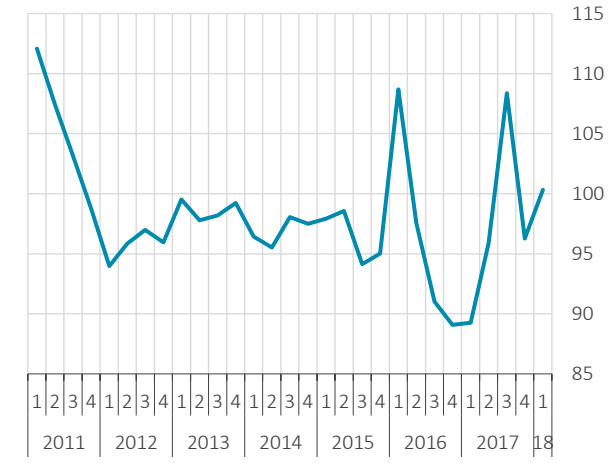
Chart 4.1.6: Services Sector Activity and Value Added*



Source: TURKSTAT.
* Services sector activity is measured by the question on services sector activity in the last 3 months under sectoral confidence indices.

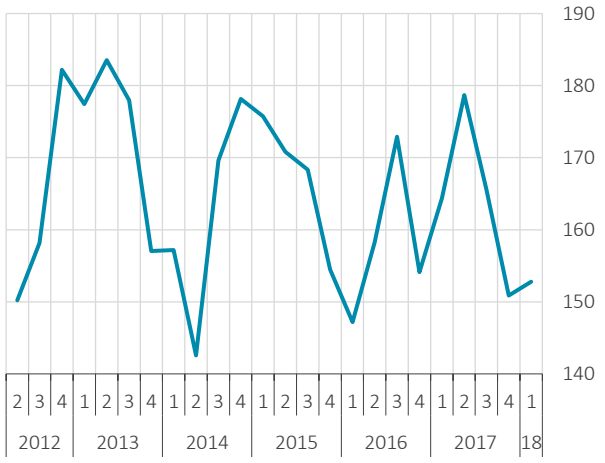
Indicators for services display an ongoing rise in the value added in the first quarter (Chart 4.1.6). Activity in retail trade, a major component of services that is closely associated with consumption demand, confirms this signal (Chart 4.1.7). Value added from the financial sector is likely to post a relatively moderate rise owing to the normalized credit use (Chart 4.1.8).

Chart 4.1.7: Retail Trade Activity*
(Seasonally Adjusted)



Source: TURKSTAT.
* Retail trade activity is measured by the question on volume of sales in retail trade in the last 3 months under sectoral confidence indices.

Chart 4.1.8: Financial Sector Activity*
(Seasonally Adjusted)



Source: CBRT, TURKSTAT.
* Financial sector activity is measured by the question on financial sector activity in the last 3 months under sectoral confidence indices.

Overall, current indicators hint at sustained strength in economic activity, albeit a slight deceleration in the first quarter of 2018. These developments are consistent with expectations that economic activity would gradually revert to its underlying trajectory amid the waning support from factors specific to 2017, and the pace of growth would normalize in 2018.

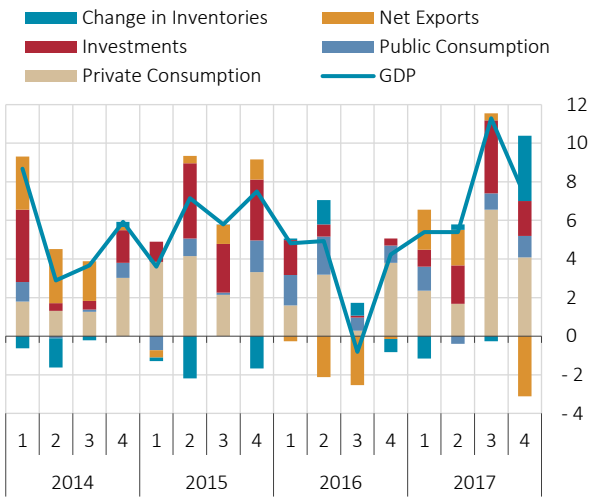
4.2 Demand Developments

On the expenditures side, the fourth-quarter data on GDP indicate that annual growth was fueled by domestic demand, but drawn down by net exports (Chart 4.2.1). Contribution of domestic demand was mainly driven by private consumption, while investments and public consumption also added to annual growth. In the last quarter, exports provided a lower contribution to annual growth than the first three quarters, and net exports curbed growth due to accelerated imports driven by recovering domestic demand.

In 2017, economic activity gained momentum compared to 2016 due to measures and incentives put into effect in the last quarter of 2016, which bolstered domestic demand through a variety of channels. Commercial loans extended through the CGF, macroprudential support offered to consumer loans, the VAT support for the housing sector and tax reductions in white goods and furniture contributed to a wide-ranging growth. Investments posted a year-on-year uptick particularly due to the construction sector. Despite the rebound in the second half, machinery and equipment investments provided a limited contribution to growth throughout 2017. The rebound in tourism and the favorable course of foreign demand underpinned growth through the exports channel. As for net exports, the contribution to growth remained limited at 0.1 points due to the strong performance of gold imports. In national income accounting, net gold imports are balanced by change in inventories. Therefore, excluding the gold trade will produce more accurate results in estimating the contribution of net exports to growth. Accordingly, when gold is excluded, net exports are projected to add around 1.3 points to growth in 2017.

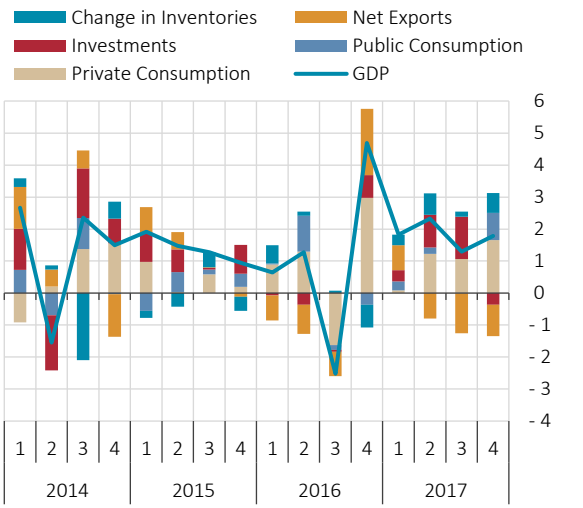
Seasonally adjusted data point at domestic demand as the main driver of quarterly growth in the last quarter as in the second and third quarters (Chart 4.2.2). Private consumption increased despite the restrictive effect of public consumption and tax reductions, while construction and machinery-equipment investments declined (Charts 4.2.3 and 4.2.4). In the last quarter, imports outgrew exports, so net exports had a dampening effect on quarterly growth.

Chart 4.2.1: Contributions to Annual GDP Growth from the Expenditures Side* (% Point)



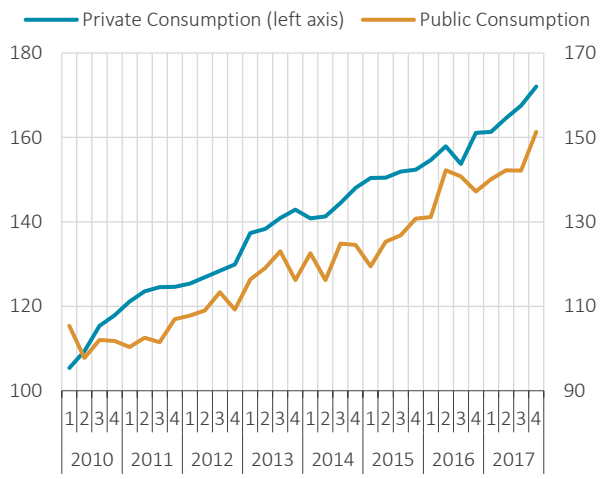
Source: CBRT, TURKSTAT.
* Change in inventories denote inventories and statistical discrepancy due to the use of chain-linked index.

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



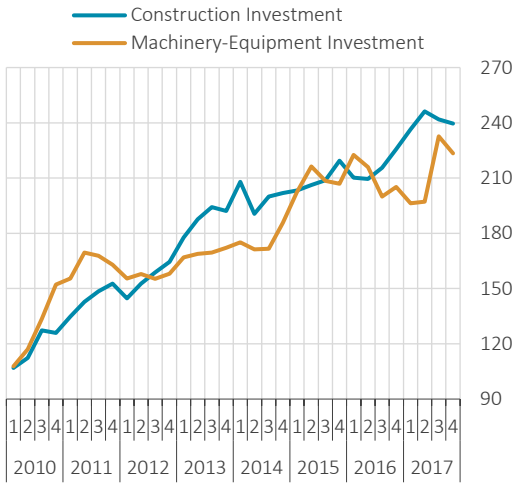
Source: CBRT, TURKSTAT.
* Change in inventories denote inventories and statistical discrepancy due to the use of chain-linked index.

Chart 4.2.3: Private and Public Consumption (Seasonally Adjusted, 2009=100)



Source: TURKSTAT.

Chart 4.2.4: Construction and Machinery-Equipment Investment (Seasonally Adjusted, 2009=100)

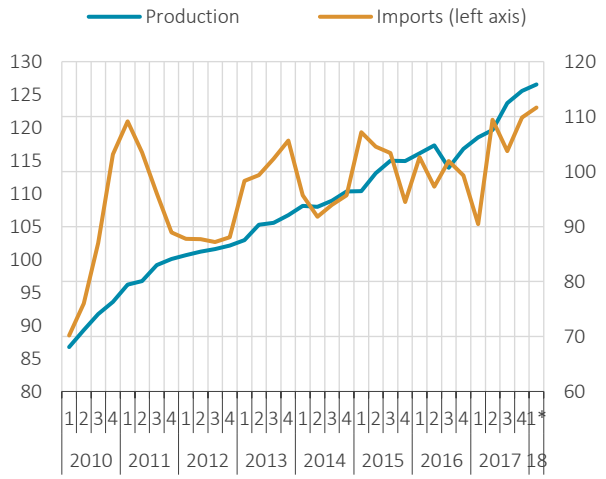


Source: TURKSTAT.

Indicators suggest that private consumption demand remained strong in the first quarter. In the January-February period, both production and imports of consumption goods have posted an increase since the last quarter of 2017 (Chart 4.2.5). This was led by the steady increase in demand for non-durable consumption goods on the back the rebound in tourism and the improved labor market conditions. On the other hand, automobile sales recorded a slowdown in the first quarter, while domestic sales of white goods, which plummeted upon the expiration of tax incentives in the last quarter of 2017, rose slightly in the January-February period (Chart 4.2.6).

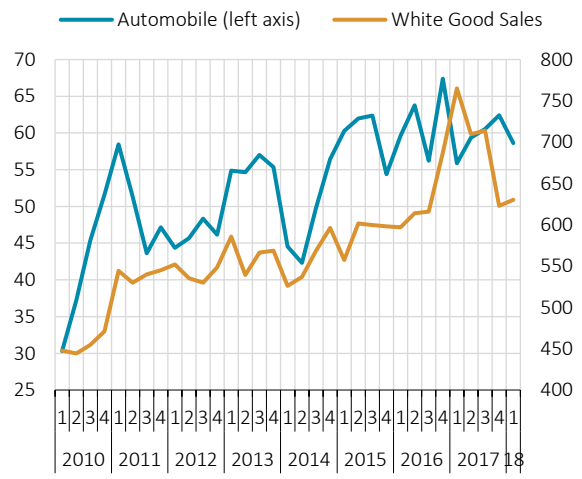
A joint analysis of production and sales data for the first quarter shows an ongoing support from private consumption to growth (Chart 4.2.7). Improved consumer confidence indices in this period also confirms this outlook (Chart 4.2.8). The expectation for an annual upsurge notwithstanding, the analysis in quarterly terms suggests that the first-quarter pickup in private consumption expenditures reveals some slowdown compared to the last quarter of 2017.

Chart 4.2.5: Production and Imports of Consumption Goods (Seasonally Adjusted, 2010=100)



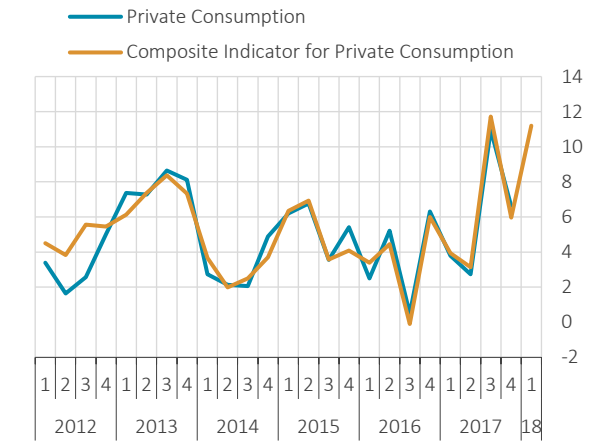
Source: CBRT, TURKSTAT.
* As of February.

Chart 4.2.6: Automobile and White Good Sales (Seasonally Adjusted, Average, Thousand)



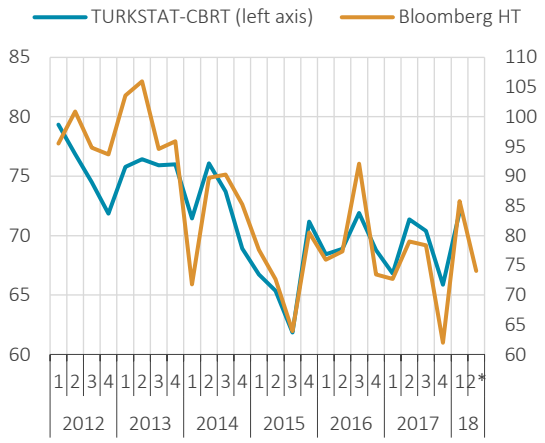
Source: AMA, WGMA, CBRT.

Chart 4.2.7: Private Consumption and Composite Indicator for Private Consumption* (Y-o-Y % Change)



Source: AMA, WGMA, CBRT, TURKSTAT.
* The Composite indicator is the weighted average of the annual percentage changes of real turnover in non-durable goods, durable goods import quantity index, passenger car sales and retail sales volume index. Weights are obtained from regression.

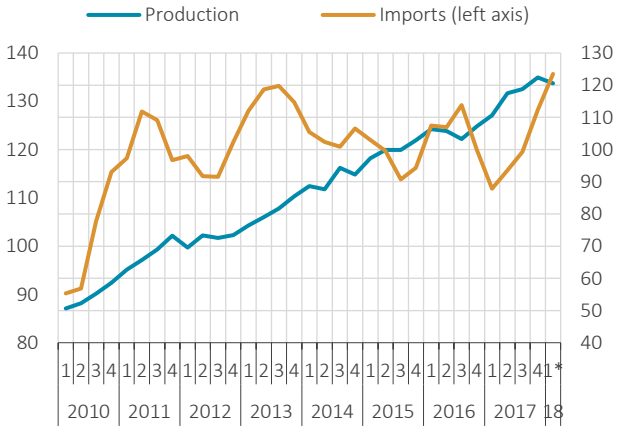
Chart 4.2.8: Consumer Confidence



Source: Bloomberg HT, TURKSTAT.
* As of April.

Leading indicators on investment expenditures exhibit an increase in the first quarter. In the January-February period, production of capital goods excluding vehicles recorded a limited quarter-on-quarter decline, whereas the upsurge in imports thereof continued (Chart 4.2.9). The composite indicator for investment expenditures suggests that investments have recovered further in the first quarter of 2018 (Chart 4.2.10). The rebound in investments is expected to be boosted both by construction and machinery-equipment investments. In fact, in the January-February period, machinery-equipment production and imports registered a year-on-year upsurge by 17.6 and 15.6 percent, respectively. The high course of capacity utilization rate in the manufacturing industry creates the need for new investments. Accordingly, 12-month-ahead fixed investment tendency gained strength in the first quarter (Chart 4.2.11). First-quarter indicators also signal for an ongoing steady course in construction investments (Chart 4.2.12).

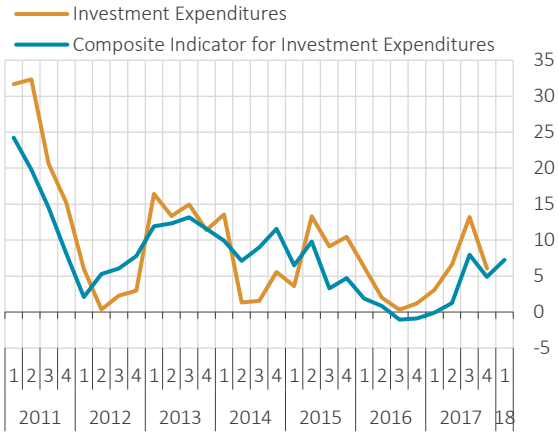
Chart 4.2.9: Production and Imports of Capital Goods Excluding Vehicles (Seasonally Adjusted, 2010=100)



Source: CBRT, TURKSTAT.

* As of February.

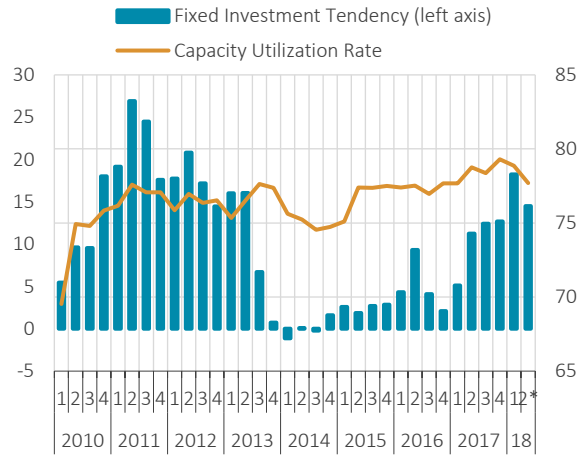
Chart 4.2.10: Investment Expenditures and Composite Indicator for Investment Expenditures* (Y-o-Y % Change)



Source: CBRT, TURKSTAT.

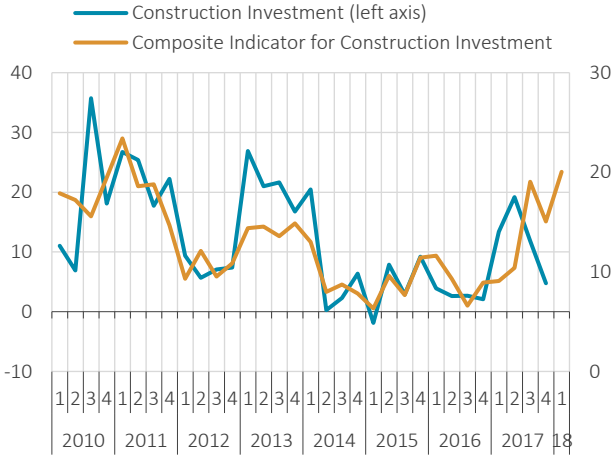
* The composite indicator for investment expenditures is the average of the annual percentage changes in production and imports of capital goods and mineral products as well as commercial vehicle sales, housing sales and FX-denominated loans, construction sector orders, commercial loan rate and capacity utilization rate (manufacturing, services, trade, construction).

Chart 4.2.11: Fixed Investment Tendency and Capacity Utilization Rate (Seasonally Adjusted, Up-Down, 12-Month-Ahead)



Source: CBRT.
* As of April.

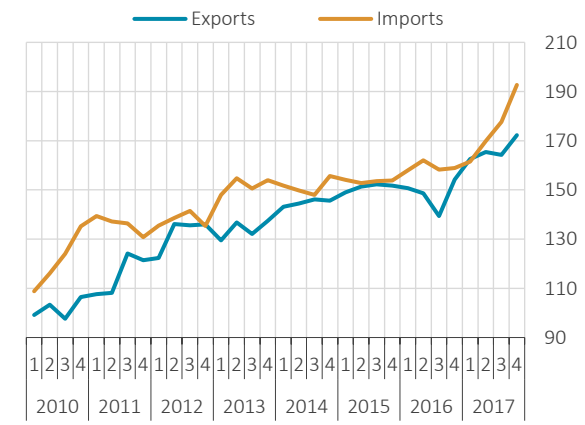
Chart 4.2.12: Construction Investment and Composite Indicator for Construction Investment* (Y-o-Y % Change)



Source: CBRT, TURKSTAT.
* The indicator for construction investment is the weighted average of production of base metal products, fabricated metal, mineral goods, plastic-rubber and the imports of base metal and plastic-rubber, where weights are obtained from a linear regression.

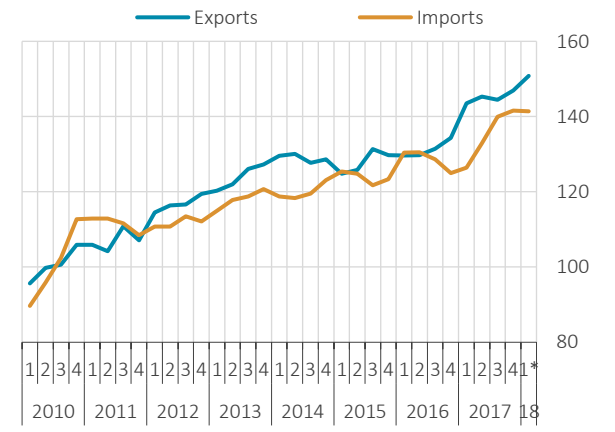
In the last quarter of 2017, exports of goods and services recorded a quarterly pickup, while imports gained momentum due to the upbeat course of domestic demand accompanied by the developments in gold trade (Chart 4.2.13). Thus, net exports pulled quarterly growth down in the last quarter. Meanwhile, quantity indices excluding gold point to a flat course in imports of goods and an increase in exports of goods in the first quarter (Chart 4.2.14). The upswing in the global economy, the course of the real exchange rate and the flexibility in market diversification all stimulate exports of goods further (Box 4.2). On the other hand, the recently debated protectionist policies in foreign trade may spill over a wider range at a global scale and weaken the global trade volume, thereby posing a downward risk to Turkey's total exports. The rebound in tourism stimulated also by the recent increases in number of European visitors boosts the rise in exports of services (Charts 4.2.15 and 4.2.16). All in all, due to the deceleration in imports coupled with the rise in exports in the first quarter, net exports are envisaged to give an impetus to quarterly growth.

Chart 4.2.13: Exports and Imports of Goods and Services (Seasonally Adjusted, 2009=100)



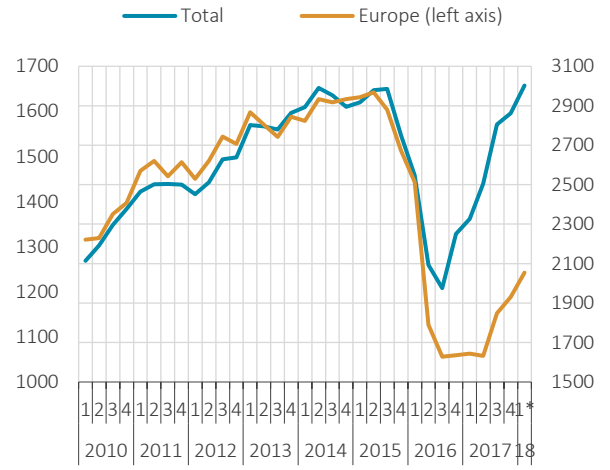
Source: TURKSTAT.

Chart 4.2.14: Quantity Indices for Exports, Imports and Exports of Services (Seasonally Adjusted, 2010=100)



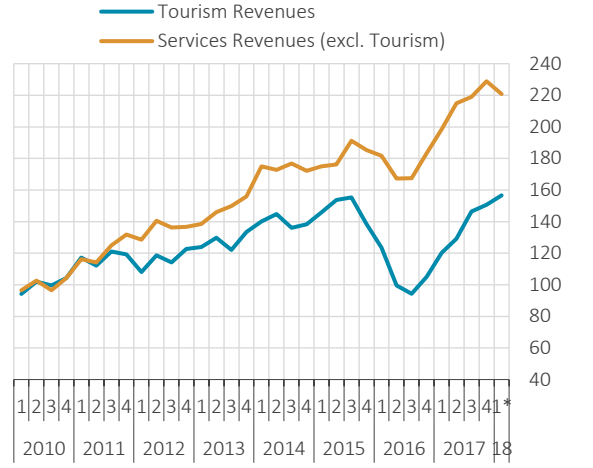
Source: CBRT, TURKSTAT.
* Forecast for March.

Chart 4.2.15: Number of Visitors (Seasonally Adjusted, Thousand People)



Source: TURKSTAT.
* As of February.

Chart 4.2.16: Tourism and Services Revenues (Real, Seasonally Adjusted, 2010=100)



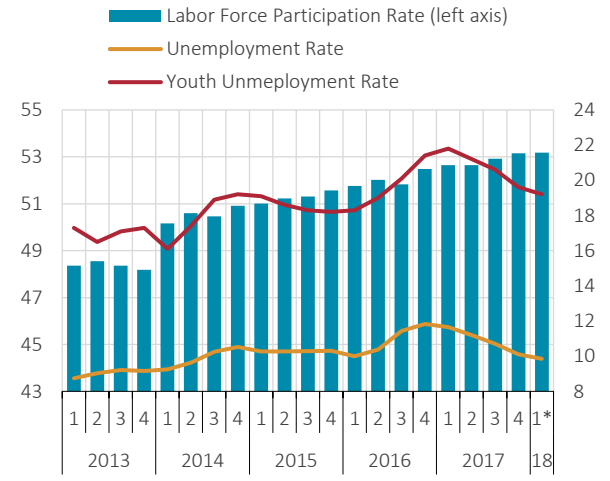
Source: CBRT.
* Forecast for March.

In sum, indicators for the first quarter signal a sustained strength in economic activity, albeit a slight slowdown. In this period, quarterly growth is projected to be fueled both by domestic demand and net exports.

4.3 Labor Market

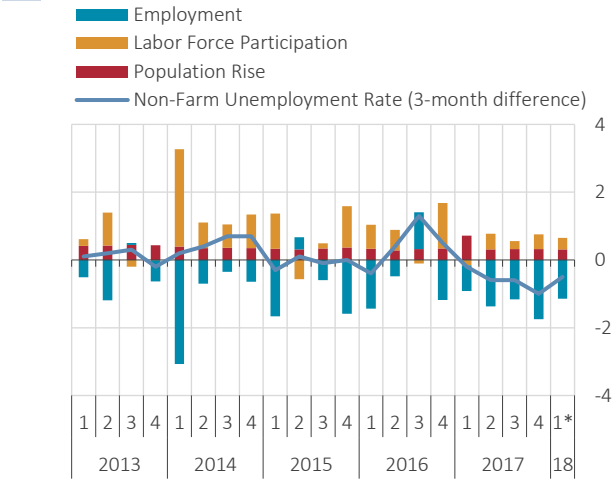
In 2017, the pickup in employment opportunities spurred by the firm economic activity and the widening range of growth across sectors enabled a steady fall in unemployment rates (Chart 4.3.1). On a seasonally adjusted basis, total and non-farm unemployment rates in the January period receded to 9.9 and 11.7 percent, respectively. Thus, on the back of the employment of 1.4 million new people during the last year, total and non-farm unemployment rates fell by 2.2 and 2.5 points, respectively. On the other hand, the fall in unemployment remained restricted due to the rising labor force participation rate, which is a natural outcome of the economic transformation especially the integration of female population in the working life (Chart 4.3.2).

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



Source: TURKSTAT.
* As of January period.

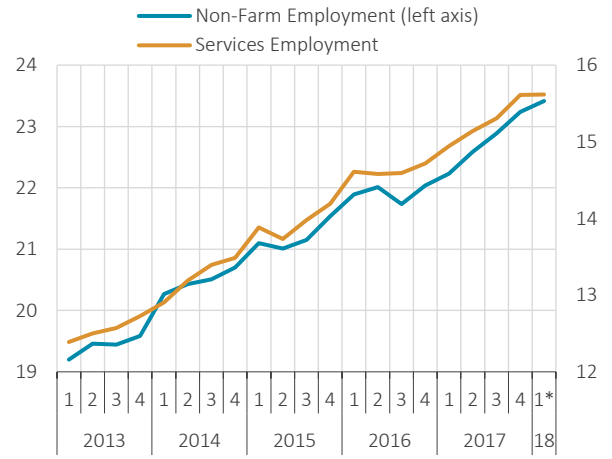
Chart 4.3.2: Contributions to Quarterly Changes in Non-Farm Unemployment (Seasonally Adjusted, % Point)



Source: TURKSTAT.
* As of January period.

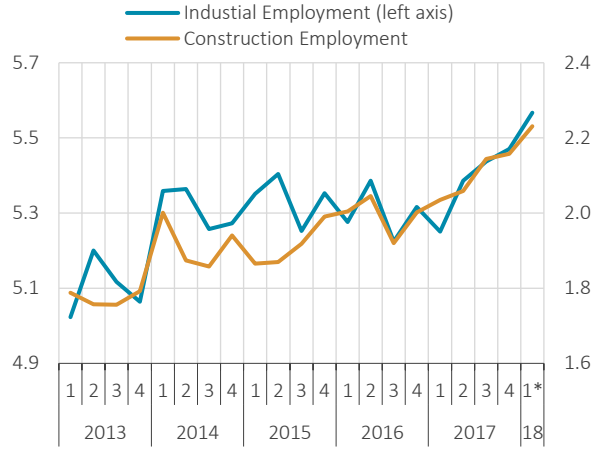
The robust course of economic activity supports labor market. Non-farm employment in the January period rose in the construction and industrial sectors, and services employment recorded a slight uptick (Charts 4.3.3 and 4.3.4). Sectoral employment developments are consistent with the growth performance of the sectors providing input for construction and the strong course of the manufacturing industry. Across subcategories, a weak course of employment is noted in trade, transport-storage, information-communication, real estate activities and public administration sectors.

Chart 4.3.3: Non-Farm and Services Employment (Seasonally Adjusted, Million People)



Source: TURKSTAT.
* As of January period.

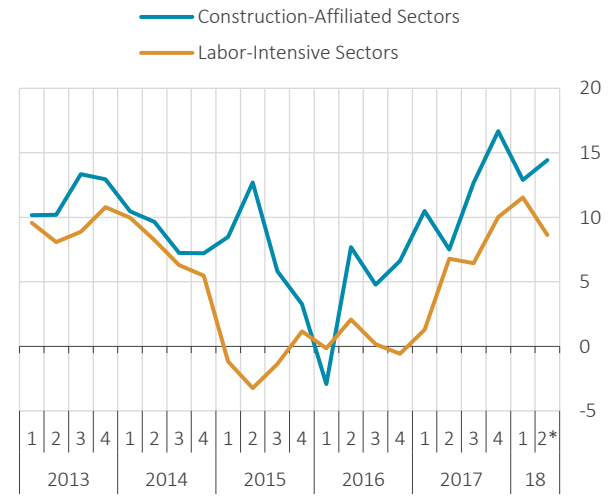
Chart 4.3.4: Industrial and Construction Employment (Seasonally Adjusted, Million People)



Source: TURKSTAT.
* As of January period.

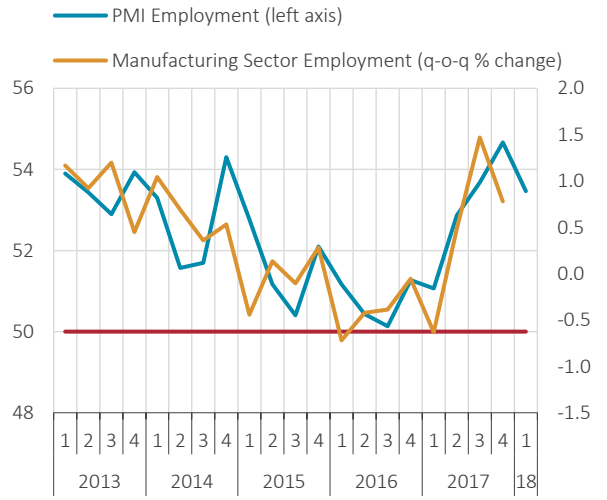
Despite the buoyant industrial production throughout 2017, increases in industrial employment proved limited, especially in the first half of the year. In the second half of 2017, sectoral spillovers of the manufacturing industry growth accompanied by the pick-up in relatively more labor-intensive sectors reflect more markedly on industrial employment (Chart 4.3.5).

Chart 4.3.5: Employment Expectation by Sectors for the Next 3 Months* (Up-Down, Seasonally Adjusted)



Source: CBRT.
* Construction-affiliated sectors include rubber and plastics, minerals, basic metal and fabricated metal. Labor-intensive sectors include textile, clothing, leather and furniture. As of April.

Chart 4.3.6: PMI and Manufacturing Employment (Seasonally Adjusted)

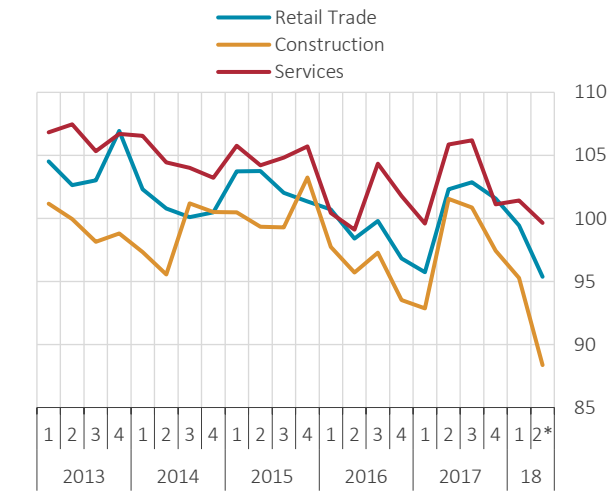


Source: IHS Markit, TURKSTAT.

Leading indicators suggest that employment growth will continue in the first quarter of 2018, and unemployment rates will remain on a downward track. The PMI employment index hints at continued

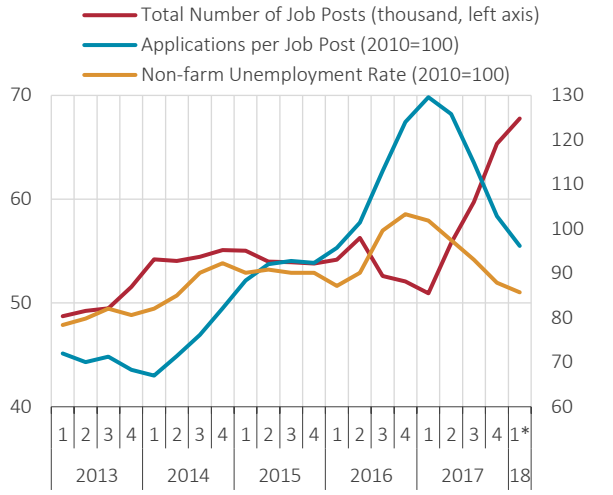
growth for industrial employment (Chart 4.3.6). The slowdown in expected number of employees for the next 3 months in retail trade, construction and services sectors signal a slowing pace of employment growth (Chart 4.3.7). Moreover, data from Kariyer.net indicate that the total number of job posts signifying new job opportunities remained strong in the first quarter of 2018, while the number of applications per job posts that moves close to the unemployment rate dropped further (Chart 4.3.8). Thus, leading indicators and the current employment trend provide a supportive outlook for private consumption demand and economic activity.

Chart 4.3.7: Expected Number of Employees by Sectors for the Next 3 Months (Seasonally Adjusted)



Source: CBRT, TURKSTAT
* As of April.

Chart 4.3.8: Applications per Job Post, Non-Farm Unemployment Rate and Total Number of Job Posts* (Seasonally Adjusted)



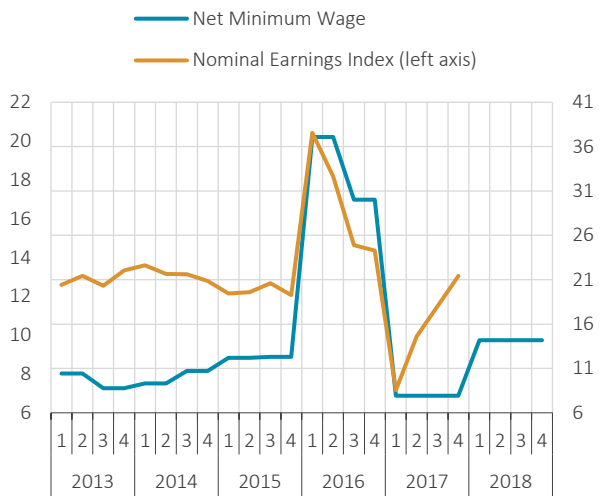
Source: Kariyer.net, CBRT.
* As of January period for non-farm unemployment rate.

4.4 Wages and Productivity

The growth rate of non-farm nominal wages lost pace in 2017 due to the strong base effects from the previous year and stood at 10.5 percent (Chart 4.4.1). Thus, the average wage increase went above past averages with 13.6 percent in the 2016-2017 period. In 2017, consumer inflation rose by 11.1 percent on average, causing real wages to decline.

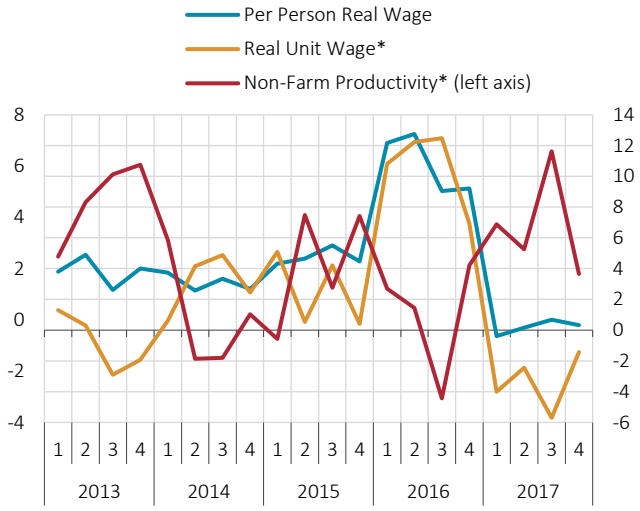
In the same period, changes in partial labor productivity contributed greatly to the fall in real unit labor costs in non-farm sectors. Partial non-farm labor productivity, which is value added as a ratio of employment, picked up by 3.6 percent year-on-year in 2017 (Chart 4.4.2). Moreover, per person real wages has levelled off since the previous year. As a result, real unit wages declined compared to previous year (Charts 4.4.2 and 4.4.3). During 2016 and 2017, real unit wages rose by 3.6 percent on average and stood above past years' averages, causing labor cost pressures to reside on inflation.

Chart 4.4.1: Non-Farm Nominal Earnings Index and Net Minimum Wage (2010=100, Y-o-Y % Change)



Source: CBRT, TURKSTAT.

Chart 4.4.2: Non-Farm Productivity, Per Person Real Wage and Real Unit Wage (2010=100, Y-o-Y % Change)

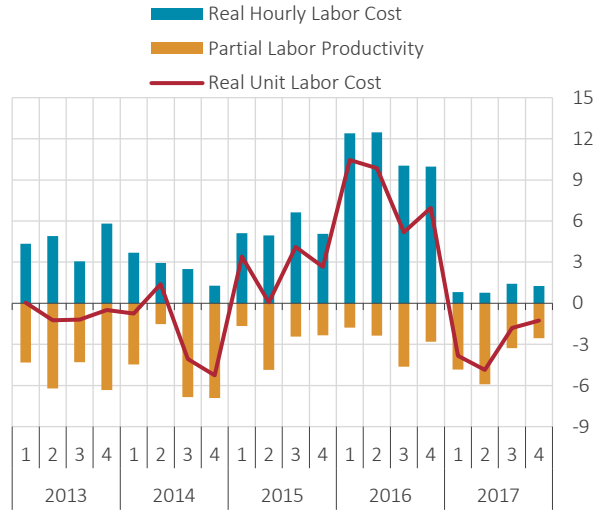


Source: CBRT, TURKSTAT.

* Real unit wage is real wages per person*employment/value added and non-farm productivity is non-farm value added as a ratio of employment.

Real minimum wage and real earnings indices that diverged following the minimum wage hike in the first quarter of 2016 converged again in 2017 (Chart 4.4.4).[2] The acceleration in real earnings in this period is attributable to the robust course of economic activity (particularly in high-wage groups with high sensitivity to business cycles). In 2017, real minimum wages posted a year-on-year fall, while the real earnings index rose by 1.0 percent. Across sectors, real earnings grew at a more limited rate in the services sector than industrial and construction sectors in 2017.

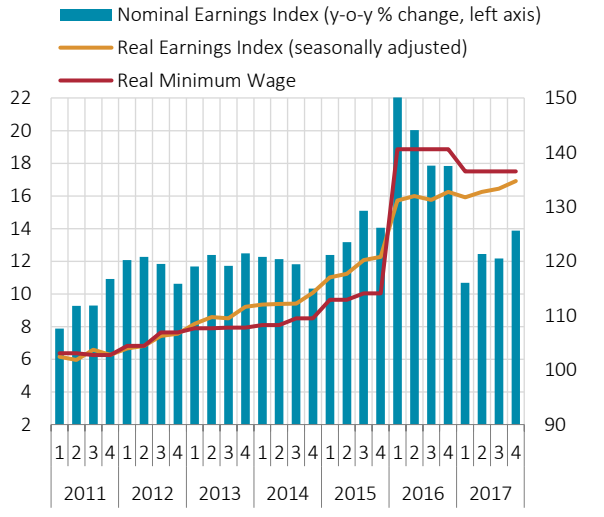
Chart 4.4.3: Contributions to Annual Changes in Non-Farm Real Unit Labor Cost* (% Point)



Source: CBRT, TURKSTAT.

* Real minimum wage is deflated by CPI. Partial labor productivity is non-farm value added as a ratio of hours worked.

Chart 4.4.4: Non-Farm Hourly Earnings Indices and Real Minimum Wage*



Source: CBRT, TURKSTAT.

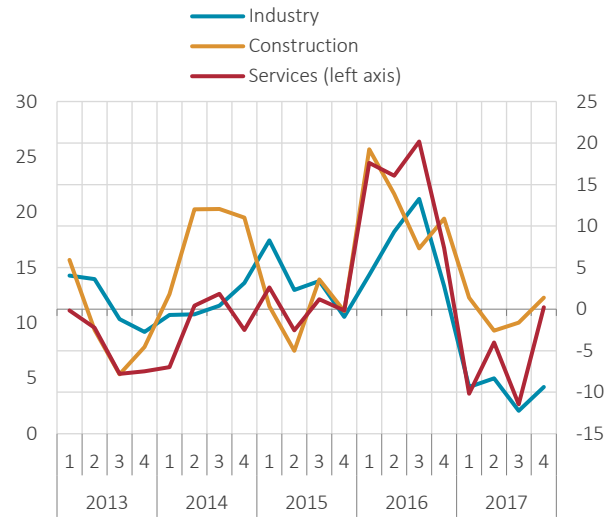
* Real minimum wage is deflated by CPI.

[2] In 2016, real minimum wage increased by 22.5 percent while headline CPI inflation was 8.5 percent. SSI total real wage data pointed to an increase of 23.5 percent. Annual increases in real earnings and minimum wage, which posted similar growth rates in the past, saw a considerable divergence in 2016 and the rise in average earnings lagged well behind that in the minimum wage.

Hourly labor cost increased by 12 percent in 2017. The index surged by 4.0 percent in the last quarter in seasonally adjusted terms. On the other hand, improvements in partial labor productivity amid the fast economic recovery across the year limited real unit wage increases in all sectors (Chart 4.4.5). However, as mentioned above, given the cumulative increases in the last two years, real unit labor costs are believed to push inflation upwards.

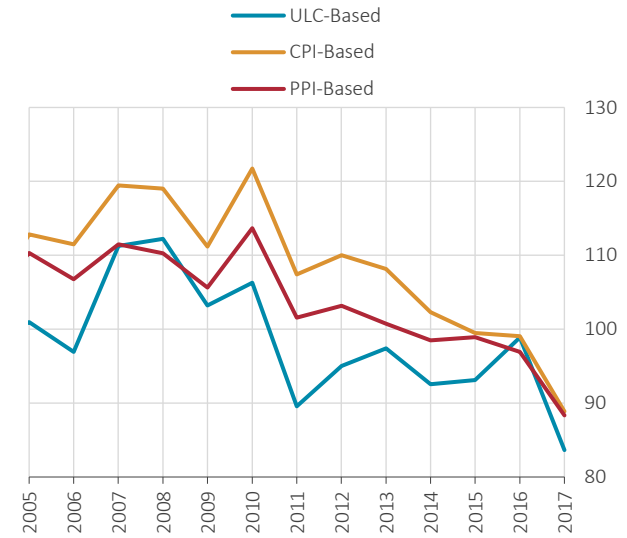
With regard to international competitiveness, unit labor costs recorded a year-on-year improvement in 2017.[3] The minimum wage hike in 2016 accompanied by a slightly elevated productivity triggered an increase in the unit labor cost. Moreover, it pushed the relative price of domestic goods up, and also led to an upside divergence of the ULC-based real effective exchange rate index from the CPI and PPI-based indices (Chart 4.4.6). Meanwhile, the fall in unit labor costs in 2017 underpinned the competitiveness and gave a push to the upbeat performance of exports.

Chart 4.4.5: Real Unit Labor Cost by Sectors* (Y-o-Y % Change)



Source: CBRT, TURKSTAT.
* Measured by sectoral value added and deflated by CPI.

Chart 4.4.6: Real Effective Exchange Rate Indices



Source: CBRT.
* Provisional data for 2017.

In 2018, the 14.2-percent raise in the minimum wage may trigger a similar increase in other wages close to the minimum wage throughout the year. Given the fact that the relationship between the business cycle and wages gets stronger as wages increase, the cycle led by a strong course of economic activity supports overall wage increases. Taking into account the current increase in the minimum wage, the cyclicality of the economic activity and the elevation in inflation, the nominal wage increases are projected to hover above past averages in the overall economy throughout 2018. Thus, sustaining productivity gains is crucial to curb unit labor cost pressures.

[3] See CBT Research Notes in Economics No. 12/17.

Box 4.1

Updated Short-Term Business Statistics: Harmony with National Accounts

As the GDP data are announced with a lag, this creates the need for a more timely data to interpret the recent course of economic activity. Accordingly, coincident indicators such as industrial production, sectoral turnover indices, retail sales volume, etc. covered by Short-Term Business Statistics (STBS) of TURKSTAT play a crucial role.

After the TURKSTAT'S methodological change in national accounts, GDP was revised significantly, which implied that the Turkish economy experienced a much stronger growth performance in the 2009-2016 period. Moreover, after this revision, 2010-based STBS could no longer be used as an indicator for GDP. TURKSTAT made methodological revisions to STBS in March 2018 and started to publish new series taking 2015 as the reference year. This box analyzes the correlation between the revised STBS and the current GDP series. Results indicate an improved link between STBS and GDP. This indicates that errors in GDP forecasts by using STBS have declined considerably.

Scope of the Revision

In addition to the planned base year changes for years ending with 0 and 5, the most important feature of revision in STBS is the use of administrative records instead of survey data in deriving the statistics. A similar revision was applied to national income accounts in 2016. The coverage of all firms instead of a sample provided a timely tracking of economic activity across the whole country.[1] Moreover, the use of administrative records facilitated access to monthly data (turnover, production) in sectors such as construction, services and trade, which were normally published quarterly. This enables the tracking of a more timely dataset on economic activity with an expanded sectoral range.

After this revision, all sectoral TURKSTAT statistics on economic activity were based on the same administrative record database. This is expected to restore the link between the GDP and STBS, which was detached after the GDP revision in 2016.

STBS-GDP Correlation

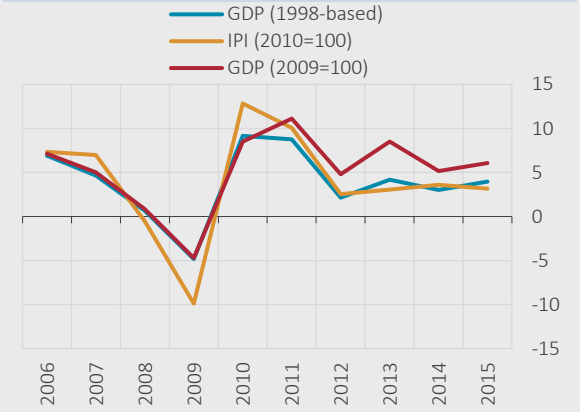
Industrial Production Index (IPI) is the primary series monitored closely among STBS as an indicator for the national income. In fact, historical evidence shows that the annual GDP growth is mostly correlated with the annual IPI growth. This relationship was clearly manifested between the 1998-based GDP series and 2010-based IPI series (Chart 1). However, following the release of 2009-based GDP series, this link weakened remarkably, which challenged the forecast of the current GDP series.[2]

[1] The representation power of the sample used in the measurement of 2010-based turnover index declined over years due to new entry and exits. In 2017, the representation ratio was around 55, 14, 48 and 60 percent for manufacturing, construction, wholesale-retail trade and transport-storage services, respectively (TURKSTAT, 2018).

[2] For a detailed analysis on the precision of 2010-based IPI in forecasting the 2009-based GDP, see CBRT (2017).

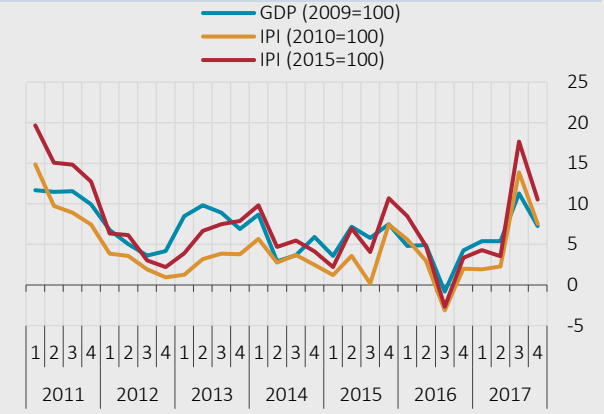
The analysis of the new 2015-based IPI and 2009-based GDP shows that the detached link between these two series has been restored to a great extent (Chart 2). This proves that the main reason for the disconnection during the initial stages of the data revision is the use of different databases in deriving the series.

Chart 1: GDP and IPI (Y-o-Y % Change)



Source: TURKSTAT.

Chart 2: GDP and IPI (Y-o-Y % Change)

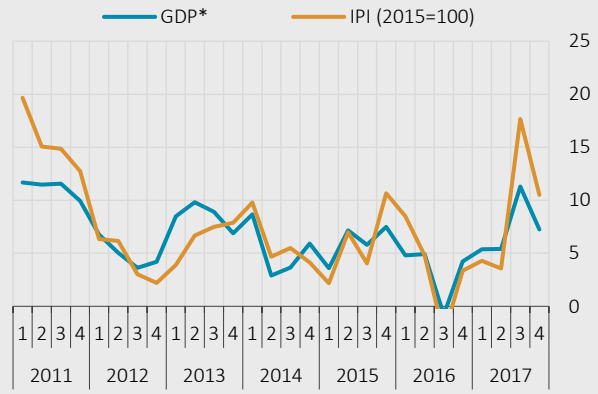


Source: TURKSTAT.

Among STBS, IPI is not the only indicator, which had an improved compliance with the current GDP data. With the use of administrative records, turnover data for construction, services and trade were also started to be published monthly in addition to already available monthly IPI data. Chart 3-6 show that sectoral turnover indices are also closely associated with value added of the respective sectors in current prices. One crucial point here is that the turnover data is not in real but in nominal terms. Therefore, among other STBS indicators, IPI continues to be the series that has the highest informative value for real GDP growth.

In sum, the use of administrative records, on which the national income accounts were also based, in STBS indicators such as industrial production and turnover indices improved the predictive power of these statistics in monitoring economic activity. Accordingly, the capacity to produce coincident indicators for GDP as well as its subcomponents from both production and expenditure sides has improved remarkably.

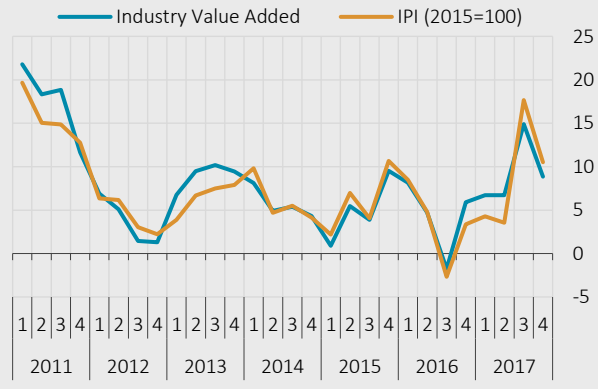
Chart 3: GDP and IPI in Current Prices (Y-o-Y % Change)



Source: TURKSTAT.

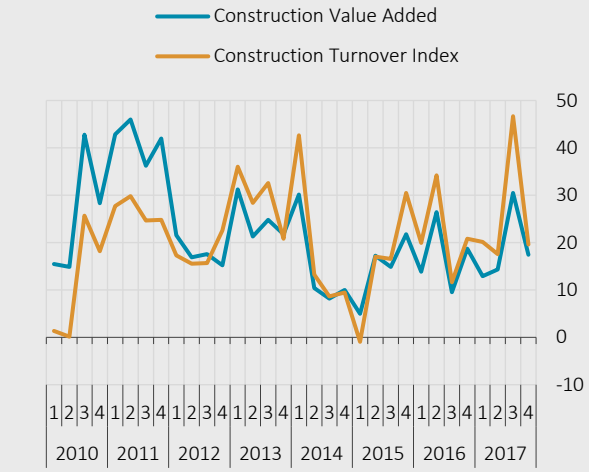
* Excludes agriculture, financial and insurance activities, public administration, education, human health and social services activities, other services activities and net tax as these items are not included in turnover indices.

Chart 4: Industry Value Added and IPI in Current Prices (Y-o-Y % Change)



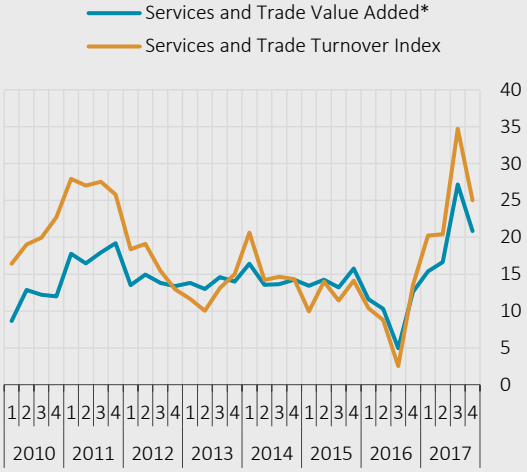
Source: TURKSTAT.

Chart 5: Construction Value Added and Turnover Index in Current Prices (Y-o-Y % Change)



Source: TURKSTAT.

Chart 6: Services and Trade Value Added Value and Turnover Index in Current Prices (Y-o-Y % Change)



Source: TURKSTAT.

* Sum of items excluding financial and insurance activities, public administration, education, human health and social services activities, other services activities that are not included in turnover indices.

References

CBRT, 2017, GDP Forecasts with New National Income Series, Box 4.1 in Inflation Report 2017-III.

TURKSTAT, 2018, Extending the Use of Administrative Data in the Production of Business Statistics, TURKSTAT Irregular Report dated 9 March 2018, available at https://biruni.tuik.gov.tr/yayin/views/visitorPages/english/publicationView.zul?yayin_no=423.

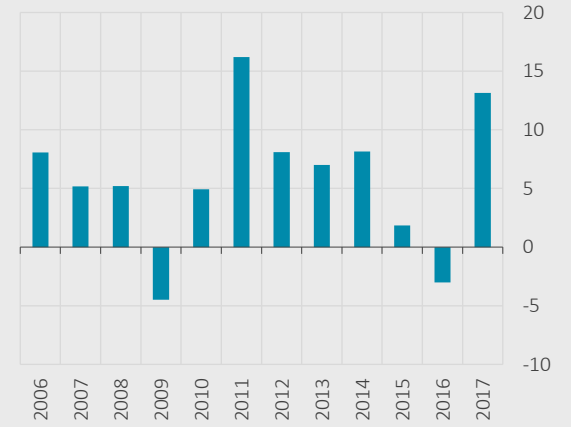
Box 4.2

Decomposition of Demand and Relative Price Effects in Exports: A Historical Account

Turkey maintained an outstanding exports performance in recent years and continued to increase its share within the global exports volume. Even though the EU remained as the main export market, market diversity of exports increased (products were largely destined to the Middle East and North Africa region) and the product range improved as well (Charts 1 and 2).

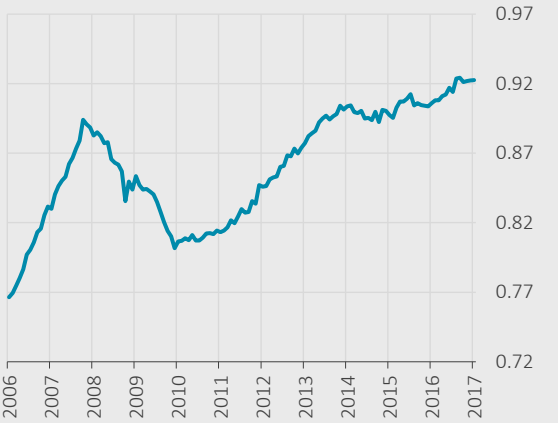
This box discusses the recent exports performance and presents a numerical account of the impact of external demand and real exchange rate movements on exports of goods and services excluding gold, and then the importance of regional differences is mentioned. Empirical findings indicate that real exchange rate movements are partially important in boosting exports performance, but demand developments remain as the main determinant. On the other hand, studies show that effects of foreign demand and relative prices may vary to a large extent among export markets.

Chart 1: Exports of Goods and Services Excluding Gold (Annual % Change)



Source: CBRT, TURKSTAT.

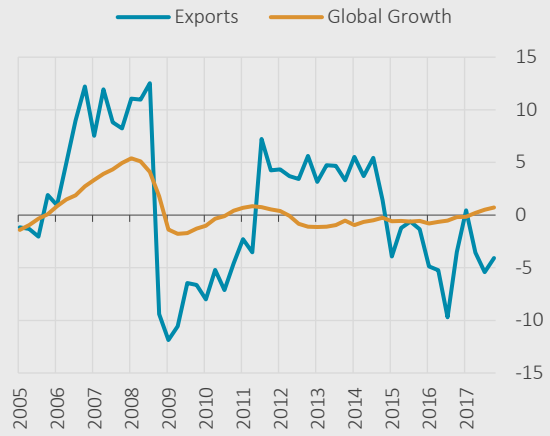
Chart 2: Share of Turkey's Exports of Goods in Global Exports Volume (%, Excluding Gold)



Source: CBRT, World Trade Organization.

Exports developments from a historical perspective reveal that two sub-periods stand out in which exports of goods excluding gold followed a rather strong course compared to the long-term trend. The first sub-period is the one before the 2008 crisis, which is marked by an upsurge in global economic activity. In this period, Turkey's exports of goods surged as well and exceeded its trend by around 10 percent in 2007-2008. In addition, real exchange rate developments did not provide a significant support, except in 2006 during the depreciation period. The second sub-period is from 2011 to 2014. Despite the aggravated problems in the Euro area, Turkey's leading exports market, exports grew at a higher rate than implied by its long-term trend in this period. This performance is attributed to rising demand from the Middle East and North Africa due to soaring oil prices and regional political developments coupled with the depreciation of the real exchange rate (Charts 3 and 4). Meanwhile, owing to the feeble course in the Euro area, the deviation of exports from its long-term tendency remained more limited compared to the first period with 5 percent.

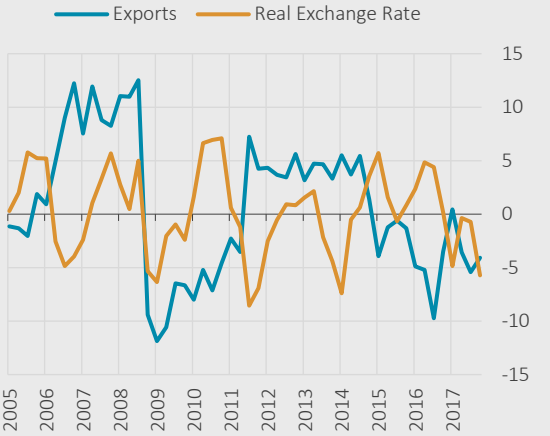
Chart 3: Exports of Goods Excluding Gold and Global Growth* (% Deviation from Tendency)



Source: CBRT, TURKSTAT.

* Export-weighted global production index.

Chart 4: Exports of Goods Excluding Gold and Real Exchange Rate* (% Deviation from Tendency)



Source: CBRT, TURKSTAT.

* PPI-based real exchange rate.

In order to quantify the effects of foreign demand and relative price (real exchange rate) on the export performance, an error correction model is adopted for exports of goods and services excluding gold (EXP), utilizing quarterly data covering the 2003-2017 period. The explanatory variables are export-weighted global production index ($EWGPI$), CPI-based real effective exchange rate ($REER$) and oil prices (OIL). Given the rising significance of the Middle East and African countries, the issue of underrepresentation of these countries in the export-weighted global production index was tried to be solved by including oil prices into the estimation. The model was estimated using seasonally adjusted data where $\ln$ shows the natural logarithm and d stands for the difference operator. Moreover, in the short-term equation, dummy variables were included for the global financial crisis in 2008 ($d08$) and aggravated geopolitical turmoil in 2016 ($d16$).

Table 1: Exports Equation*

Long-Term

$$\ln(EXP)_t = -4{,}4 + 2{,}67 * \ln(EWGPI)_t - 0{,}59 * \ln(REER)_t + 0{,}08 * \ln(OIL)_t + u_t$$

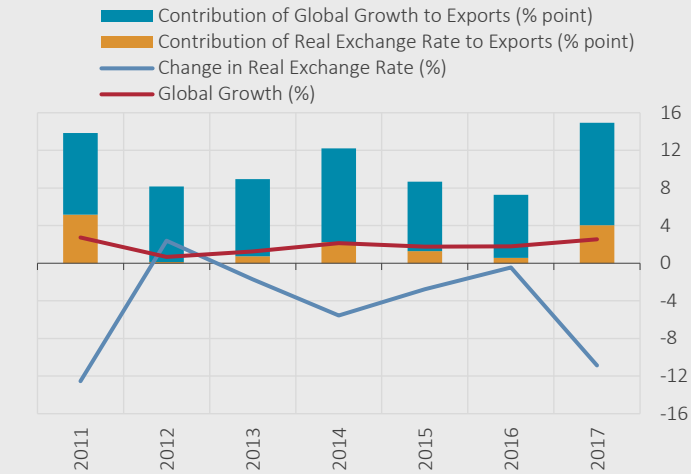
Short-Term

$$d\big(ln(EXP)\big)_t = 0{,}01 - 0{,}22 * u_{t-1} + 1{,}90 * d\big(ln(EWGPI)\big)_t - 0{,}39 * d\big(ln(REER)\big)_t - 0{,}25 * d\big(ln(EXP)\big)_{t-1} - 0{,}15 * d08 - 0{,}05 * d16 + \varepsilon_t$$

* In the long term equation, all variables are significant at 0.1 percent, whereas in the short term equation, the variables are significant at 1 percent. Adjusted R^2 value of the long term equation is 96 percent, while it is 60 percent in the short term equation. u_t and ε_t show the error terms in the long and short term equations, respectively.

Coefficients obtained from model estimations are shown in Table 1, and the contributions to exports are depicted in Chart 3. In calculating the contributions, changes at any point are assumed to be affecting the dependent variable until the end of the period given the dynamic nature of the model. The analysis indicates that the significant depreciation of the real exchange rate in the recent years had only a limited effect on exports compared to global growth. Relative prices had the most pronounced effect on exports during 2011 and 2017, which is marked by high-rate depreciation of the real exchange rate. On the other hand, increasing global demand is the main determinant of exports.

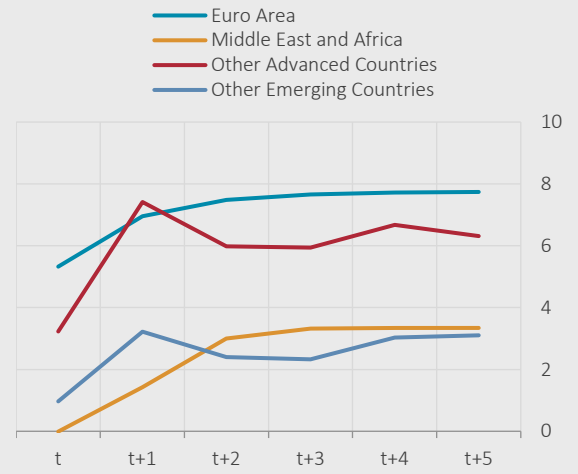
Chart 5: Accounting of Exports



Source: CBRT.

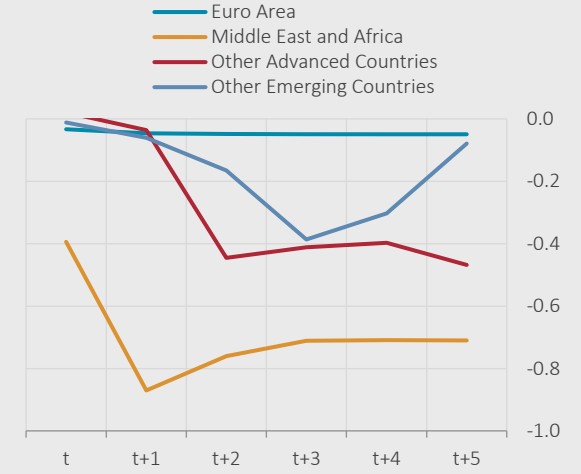
This analysis based on macro data may fail to capture the varying tendency and sensitivity of sub-components of exports, and thus may be subject to aggregation bias. In fact, in a study by Çulha and Kalafatcılar (2014) that analyzes regional differences in exports, it is concluded that income elasticity of exports to advanced economies is substantial, whereas the effect of real exchange rate on exports is not statistically significant. In particular, the contemporaneous income elasticity of exports to the Euro area countries is estimated to be 5.3 percent, which implies that exports to these countries would increase considerably in times of high economic growth. On the other hand, it is also found out that the coefficient of real exchange rate is high and statistically significant for exports to Middle East and African countries (Charts 6 and 7).

Chart 6: Foreign Demand Elasticity of Exports by Region



Source: Çulha and Kalafatcılar (2014).

Chart 7: Real Exchange Elasticity of Exports by Region



Source: Çulha and Kalafatcılar (2014).

In a study by Gül (2018) that analyzes exports on a country basis, it is reported that demand and relative price elasticities of export are heterogeneous across countries. In particular, Gül (2008) constructs singular-country models for 48 countries, which have major shares in exports, and finds a significant long-term relationship between exports and the real exchange rate in these countries, which account for almost half of Turkey's exports. As for income elasticities, their absolute values are found to be higher than real exchange rate elasticities in line with the estimations presented in Table 1.

In sum, the analysis of exports in this box indicates that despite the contribution of real exchange rate to exports in recent years, exports continue to be mainly determined by demand developments. In fact, owing to strengthening global demand especially stemming from the EU, exports gained considerable momentum and offered a high contribution by 2.6 percent to annual growth of 7.4 percent in 2017.

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Çulha, O., Kalafatcılar, M.K., 2014, Türkiye'de İhracatın Gelir ve Fiyat Esnekliklerine Bir Bakış: Bölgesel Farklılıkların Önemi (in Turkish), CBT Research Notes in Economics No. 05/14.

Gül, S., 2018, Reel Kur Hareketlerinin İhracat Üzerine Etkileri: Türkiye için Asimetrik Bir Bakış (in Turkish), Work in progress.