

4. Supply and Demand Developments

GDP data for the first quarter of 2015 show that economic activity was stronger than anticipated in the April Inflation Report and that national income posted a quarterly and yearly growth of 1.3 and 2.3 percent, respectively. The quarterly GDP growth was mostly driven by agriculture and net taxes, while industrial, construction and services sectors continued to expand modestly. On the expenditures side, in the first quarter, final domestic demand increased on the back of consumer spending in seasonally adjusted terms. Meanwhile, investment spending narrowed quarter-on-quarter across both public and private sectors. Exports of goods and services were up quarterly while imports were down, thus helping net exports to make a positive contribution to quarterly growth.

Data released for the second quarter of 2015 point to a continued modest uptrend in economic activity. During April-May, industrial production grew by 1.0 percent from the first quarter. Indicators of sales, production and imports regarding domestic demand suggest that final domestic demand continues to grow quarterly. After the sharp first-quarter plunge, the export quantity index excluding gold posted only a slight quarter-on-quarter increase during April-May, indicating that external demand might make a small contribution to growth in the second quarter.

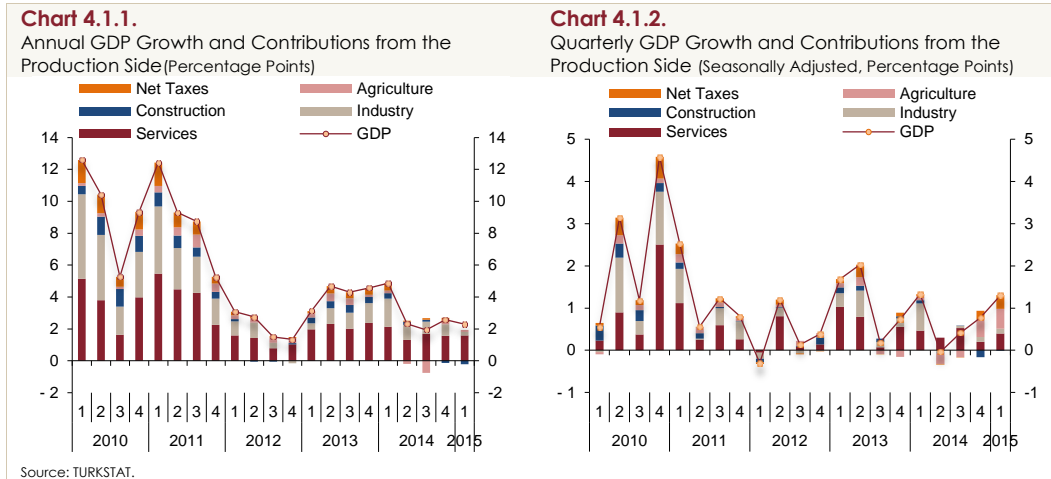
In the upcoming period, economic activity is expected to recover further but downside risks remain for the pace of growth. Due to the weak course of the confidence indices, the support from the confidence channel may remain weak for some time amid uncertainties over the second quarter. Financial conditions have also tightened to some degree lately. Both geopolitical tensions and uncertainties regarding global monetary policies as well as problems in Europe add to the downside risks for external demand. Despite these factors that feed into downside risks, the strong post-crisis employment performance and the expected fall in the current account deficit and inflation are likely to provide some extra room for economic policies, while the anticipated correction in the agricultural value added might support growth.

Output gap indicators show that demand conditions continued to be accommodative of disinflation in the second quarter of 2015. Although the capacity utilization rate in the manufacturing industry recovered slightly in the second quarter, it still hovers at low levels. Despite having come down recently, unemployment remains quite higher than the previous year's readings. Thus, aggregate demand conditions are expected to give further support to disinflation in 2015. It is also expected that the improvement in terms of trade coupled with the current macroprudential framework will underpin the recovery in the current account balance.

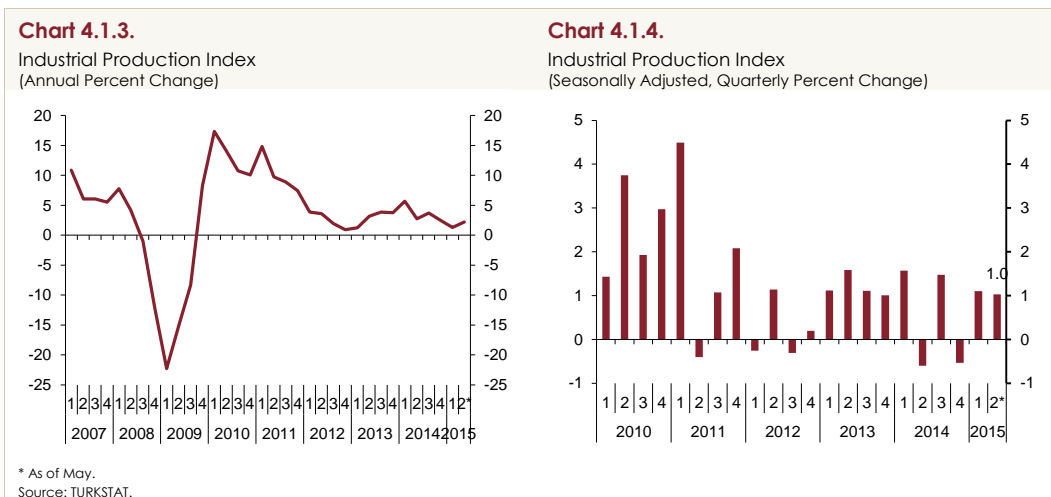
4.1. Supply Developments

According to the TURKSTAT's data, the GDP posted a year-on-year increase of 2.3 percent in the first quarter of 2015 (Chart 4.1.1). On the production side, the value added in non-construction sectors increased on an annual basis, while that of construction contracted by 3.5 percent. Adjusted for seasonal and calendar effects, the GDP grew by 1.3 percent quarter-on-quarter. In this period, the agricultural value added proved the largest contributor to quarterly growth with an increase of 5.3 percent from the fourth quarter of 2014 (Chart 4.1.2). The second biggest growth driver after agriculture

was net taxes, posting a quarterly increase of 3.9 percent. Meanwhile, the value added of industrial and services sectors were up by 0.4 and 0.8 percent quarter-on-quarter, respectively. The value added of construction, on the other hand, fell by 0.2 percent.

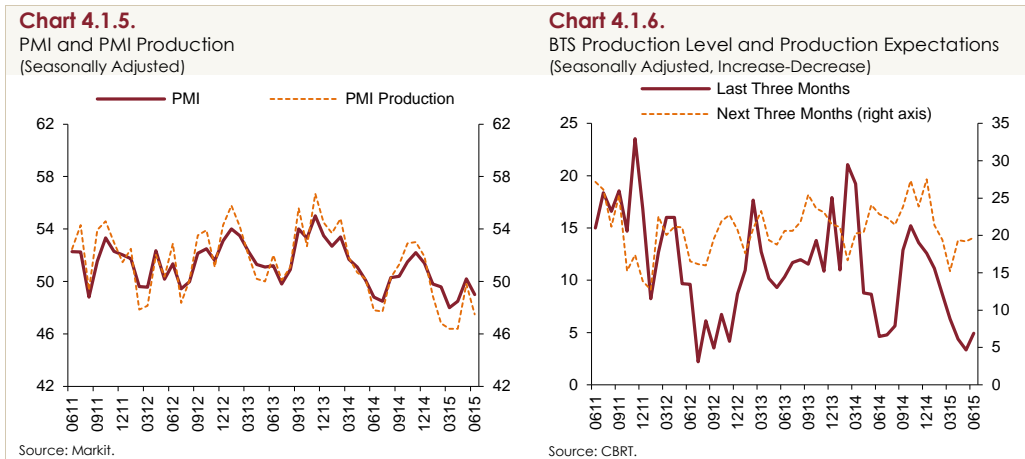


The slowdown in the annual growth rate of industrial production in the last quarter of 2014 continued in the first quarter of 2015. The average of the April-May data was up by 2.2 percent year-on-year; accordingly, the slowdown in the annual growth rate of industrial production for two consecutive quarters was replaced by an increase in this period (Chart 4.1.3). Despite strikes in the automobile industry during May, data adjusted for seasonal and calendar effects suggest a quarter-on-quarter growth in industrial production in the April-May period (Chart 4.1.4). The May strikes are projected to have caused a contraction by 1.7 and 1.0 points in the annual and monthly growth rates of industrial production, respectively, via the automobile industry.



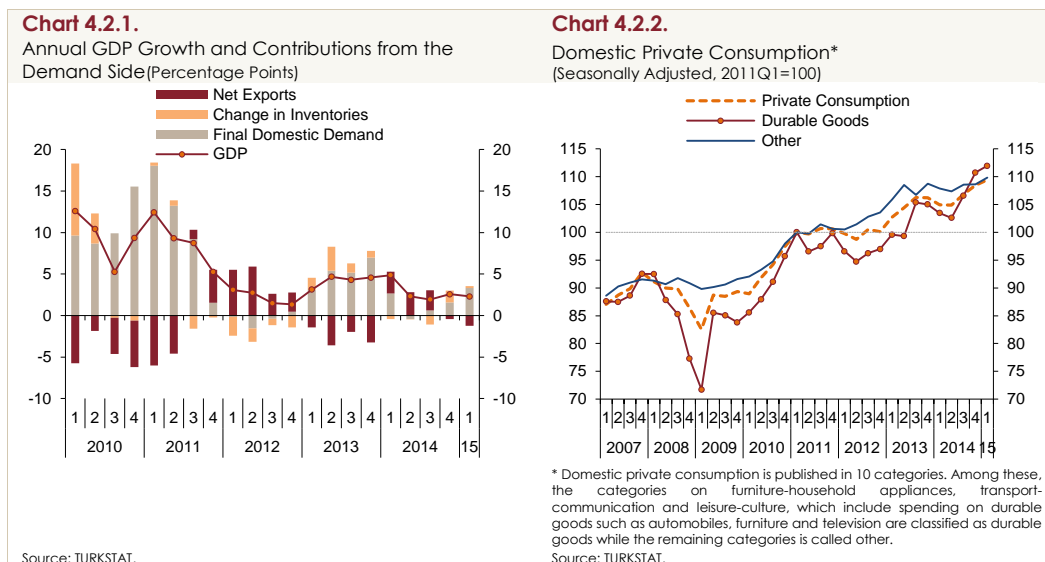
The automobile industry is expected to compensate for most of May's output loss in June, helping production to improve modestly. In fact, AMA's data suggest that vehicle production came closer to the April level in June on a seasonally adjusted basis. Yet, survey indicators signal no significant improvement. PMI and PMI production indices hit well below 50. The BTS production index for the last quarter and three-month-ahead production expectations showed some improvement but remained

low (Charts 4.1.5 and 4.1.6). Therefore, the course of industrial production is expected to be moderate in the upcoming period. Moreover, adverse effects on domestic demand driven by vague global monetary policies and volatile exchange rates coupled with languishing exports due to the parity effect and the lack of recovery in external demand suggest that the growth in industrial production may remain moderate for the rest of the year.

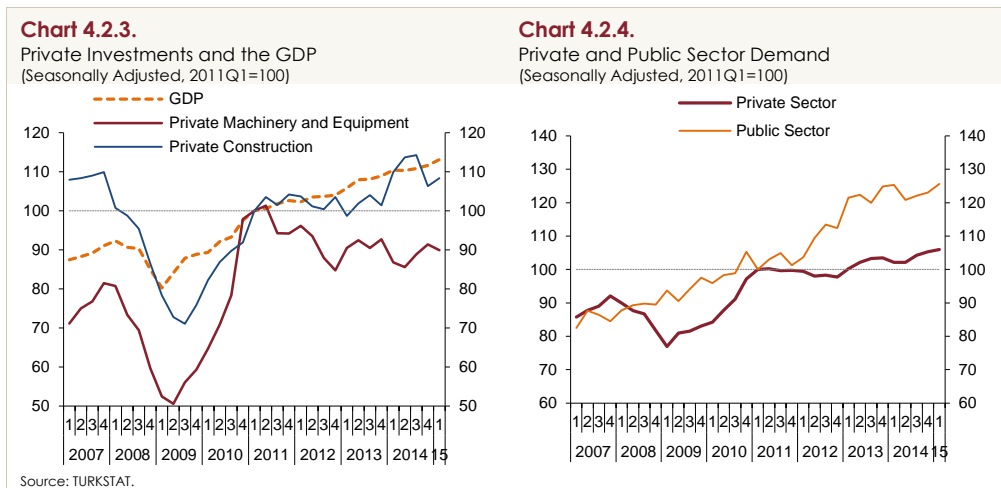


4.2. Demand Developments

The GDP data for the first quarter of 2015 on the expenditure side indicate that net exports made an increased negative contribution to annual growth compared to the previous quarter, while the contribution of final domestic demand to growth increased compared to the preceding two quarters particularly owing to private consumption (Chart 4.2.1). Spending on durable goods, especially vehicles, was the main driver of private consumption growth in this period. In seasonally adjusted terms, both net exports and final domestic demand contributed positively to quarterly growth.



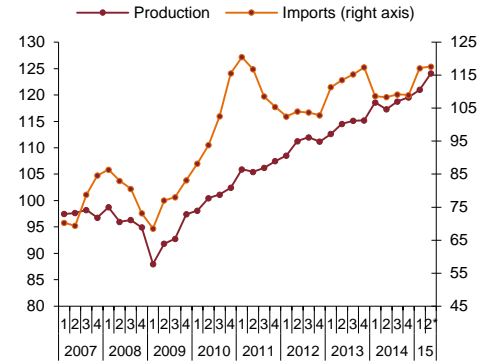
After starting to rise modestly on waning uncertainties and eased financial conditions by mid-2014, private consumption continued to climb in the first quarter, albeit at a slightly slower pace. This rise was mostly due to increasing expenditures for durable goods despite major hikes in the past two quarters (Chart 4.2.2). However, the quarterly growth rate for consumer goods excluding durables was lower. Having recovered in the second half of 2014, private investments on machinery and equipment posted a quarter-on-quarter fall in the first quarter. Meanwhile, private construction investments were up in the first quarter, yet this increase failed to compensate for the fourth-quarter fall due to adverse weather conditions (Chart 4.2.3). Thus, total private investments declined in the first quarter. On the public sector front, consumption spending rose dramatically quarter-on-quarter on the back of purchases of goods and services, while investment spending was down from the fourth quarter of 2014 mainly due to falling machinery and equipment investments. Overall, seasonally adjusted public spending was up by a total of 2.1 percent and contributed to the quarterly growth (Chart 4.2.4).



Data regarding the second quarter of 2015 show that the rebound in domestic demand, which started in the second half of 2014, may continue into the second quarter largely on the back of consumption. Both production and imports of consumption goods expanded in the April-May period. Automobile sales that supported private consumption growth in the first quarter remained solid in the second quarter (Chart 4.2.5). The weak consumer confidence stood out as a key risk to consumption demand in this period. Meanwhile, investment indicators are not as positive as consumption. The rapid growth in sales of light commercial vehicles halted in this period (Chart 4.2.6). Production and imports of machinery and equipment also registered a decline (Chart 4.2.7). Among construction indicators, production and imports of minerals have yet to signal a robust increase for construction investments (Chart 4.2.8).

Chart 4.2.5.

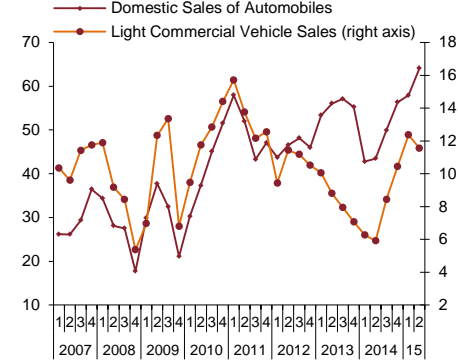
Production and Import Quantity Indices of Consumption Goods (Seasonally Adjusted, 2010=100)



* As of February.
Source: TURKSTAT, CBRT.

Chart 4.2.6.

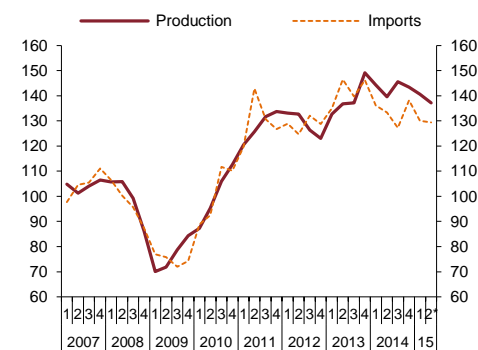
Domestic Sales of Automobiles and Light Commercial Vehicle Sales (Seasonally Adjusted, Thousand)



Source: AMA, CBRT.

Chart 4.2.7.

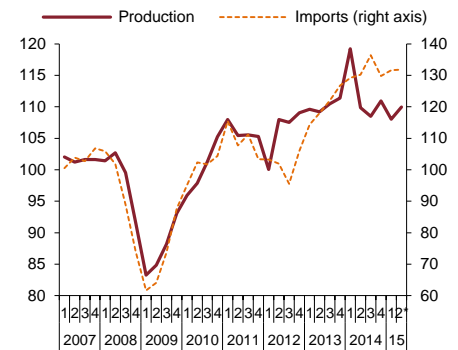
Production and Import Quantity Indices of Machinery and Equipment (Seasonally Adjusted, 2010=100)



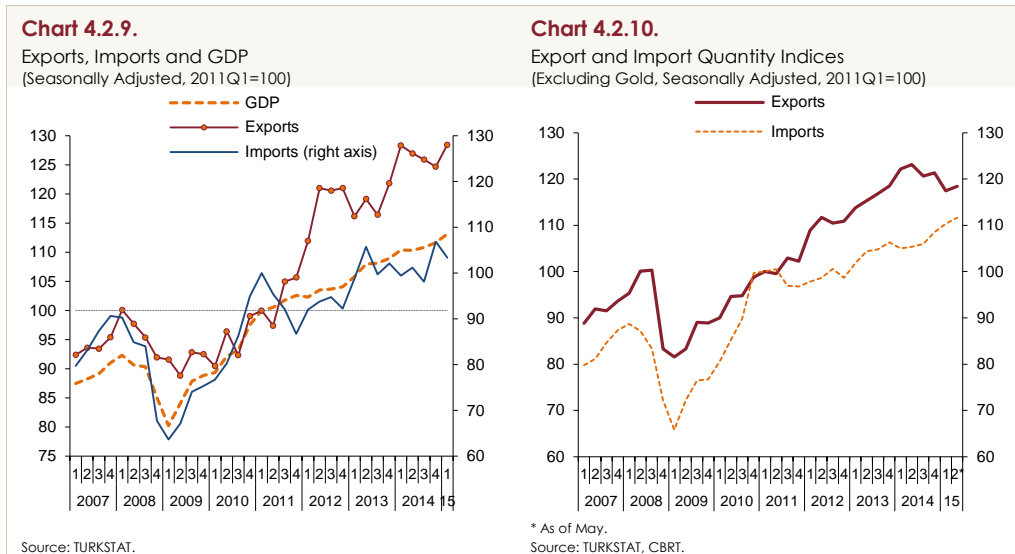
* As of May.
Source: TURKSTAT, CBRT.

Chart 4.2.8.

Production and Import Quantity Indices of Mineral Products (Seasonally Adjusted, 2010=100)



The downturn that started in the second half of 2014 due to the global economic slowdown and geopolitical developments continued to have implications for external demand in the first quarter of 2015. Although exports of goods and services were up in this period after three consecutive quarters, this growth was mostly driven by massive gold exports. Imports of goods and services, on the other hand, declined on the notable quarter-on-quarter drop in gold imports (Chart 4.2.9). An analysis of the export quantity index excluding gold, to give a better understanding of the effects of global economic developments on exports, reveals that exports were down in the first quarter while imports were up (Chart 4.2.10). Accordingly, the deterioration in the balancing of goods excluding gold that started in mid-2014 continued in the first quarter. This deterioration appears to have lost pace starting from May, but the small increase in exports suggests that external demand made a limited contribution to growth.

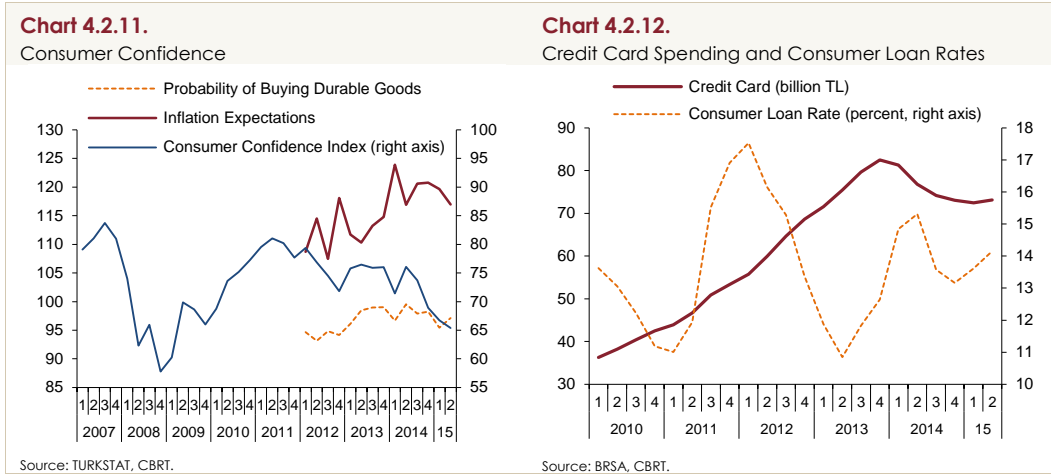


In sum, economic activity posted a stronger-than-expected growth in the first quarter of 2015 thanks to the favorable course of consumption. However, tight financial conditions and the still-high level of perceived uncertainty pulled growth down through both consumption and investments. In addition, changes in the EUR/USD parity, the slowing growth in Turkey's major trading partners and geopolitical tensions are among other external demand factors that restrained growth in this period.

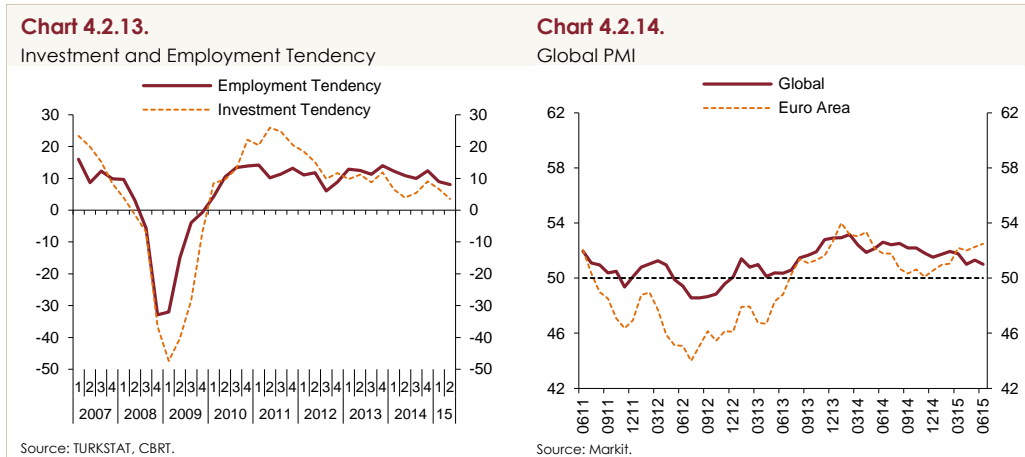
Outlook for 2015

The April Inflation Report outlook for 2015 that assumes a domestic-demand-driven growth is still valid. Exports are expected to weaken due to decelerating growth across Turkey's trading partners, parity-related cost hikes and geopolitical risks. However, downside risks to growth seem to be more balanced compared to the previous period.

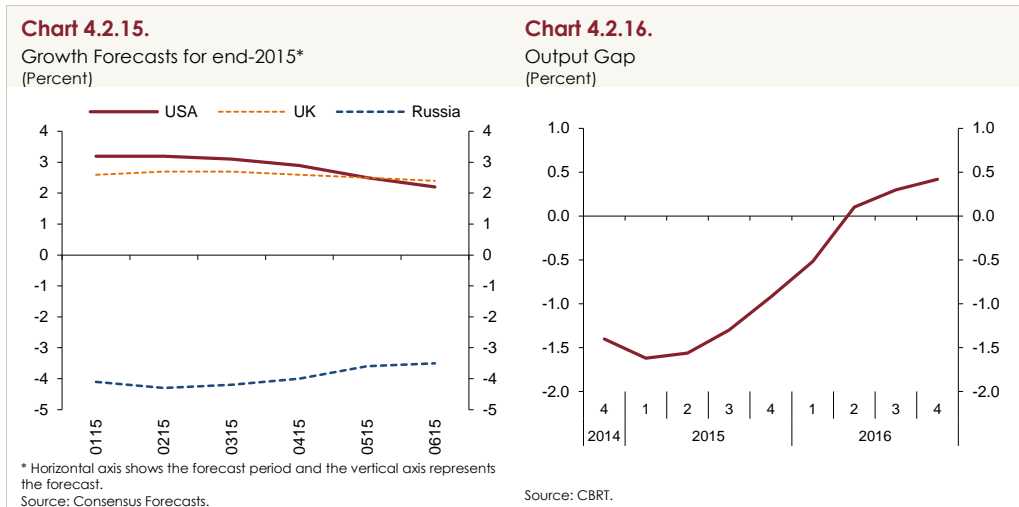
In line with improved sales of automobiles, household appliances and houses, the probability of buying durable goods, a TURKSTAT-CBRT consumer confidence survey indicator, increased in the second quarter (Chart 4.2.11). Moreover, inflation expectations of households decreased. In this period, financial conditions tightened slightly. In fact, consumer loan rates continued to edge up in the second quarter (Chart 4.2.12). Additionally, firms' expectations for employment weakened. Thus, private consumption spending is likely to rise in the second quarter, but financial conditions and consumer confidence might put a lid on this rise. Therefore, private consumption spending is expected to grow at a slightly slower pace in the second quarter and remain moderate for the second half of the year depending on how these constraints may evolve.



The Turkish lira continued to depreciate in the second quarter. Thus, Turkish lira exposed further downward pressure on investment demand through the balance sheet channel as well as via the prices of investment goods. Given the low level of capacity utilization, the increase in exchange rate volatility continued to affect private investments negatively. Due to the level and the volatility of the exchange rate, investment tendency declined in the second quarter (4.2.13). In addition, the downtrend of the EUR/USD parity causes reduced profitability for exporters, thus curbing investments. Although private investments are likely to weaken in the second quarter, they may remain moderate in the second half of the year if no additional tightening is implemented on financial conditions.

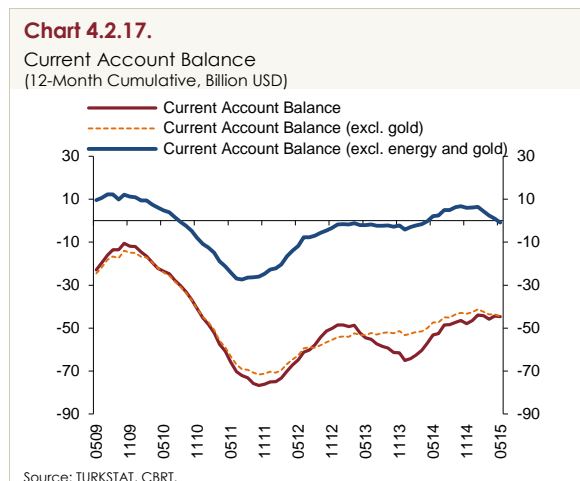


The recovery observed in the European economies during the fourth quarter of 2014 and the first quarter of 2015 lost some momentum in the second quarter (Chart 4.2.14). Meanwhile, growth expectations for 2015 in Turkey's major non-EU trading partners have been revised downward largely due to geopolitical developments (Chart 4.2.15). Meanwhile, the downward movement in the EUR/USD parity may curb exports in some sectors by negatively affecting competitiveness. Against this background, exports are expected to continue to provide a limited contribution to growth in the short term.



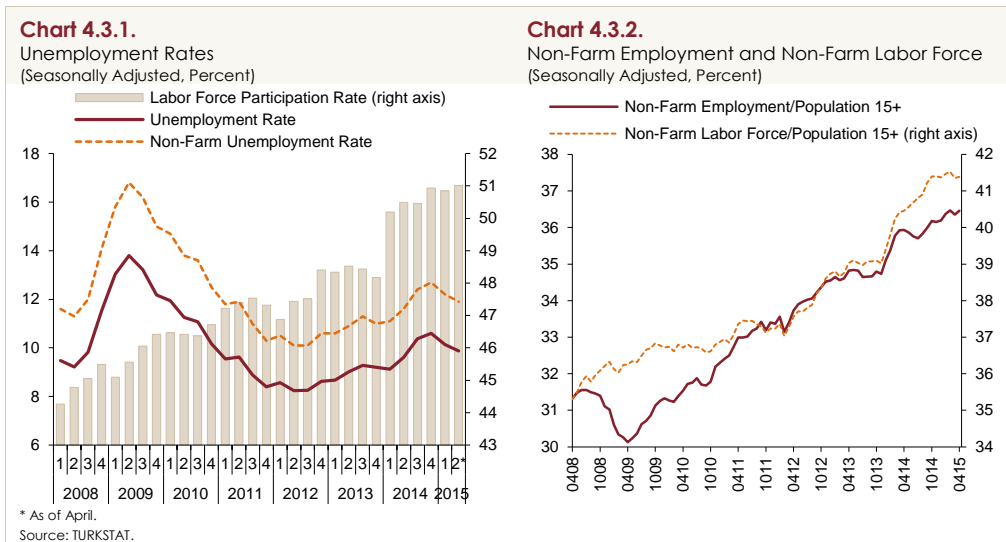
Due to factors elevating uncertainty such as reduced predictability over global economy and divergence across monetary policies of advanced economies, risk appetite and capital flows continue to fluctuate, which remains as a major downside risk to growth in 2015. Additionally, the ongoing domestic uncertainty has negative implications for firms' investment and employment decisions and for consumer confidence, posing another downside risk to growth. However, the strong post-crisis employment performance, greater room for maneuvering economic policies amid the expected decline in the current account deficit and inflation as well as the anticipated correction in the agricultural value added are among factors to support growth.

In conclusion, demand conditions are likely to support disinflation in 2015 (Chart 4.2.16). Improved terms of trade and moderate consumer loans are expected to contribute to the improvement in the current account balance but the export outlook might restrain this improvement (Chart 4.2.17).

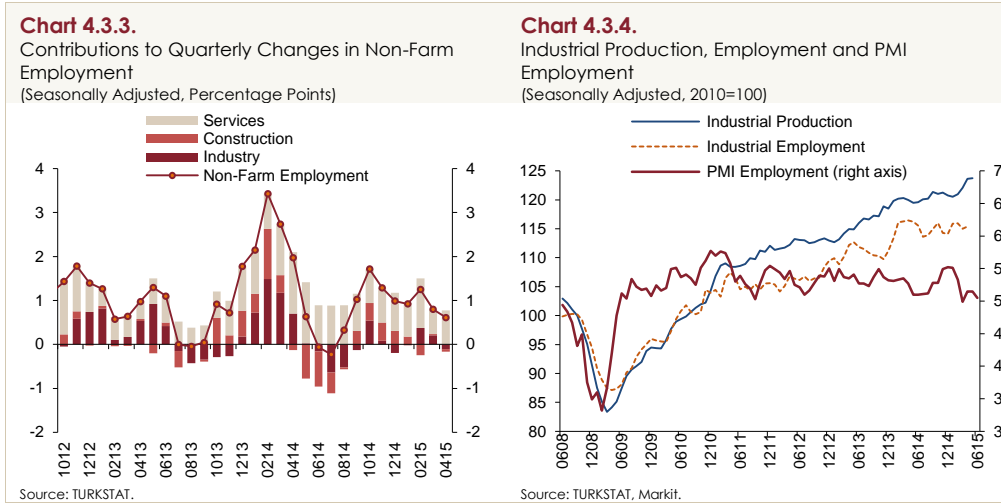


4.3. Labor Market

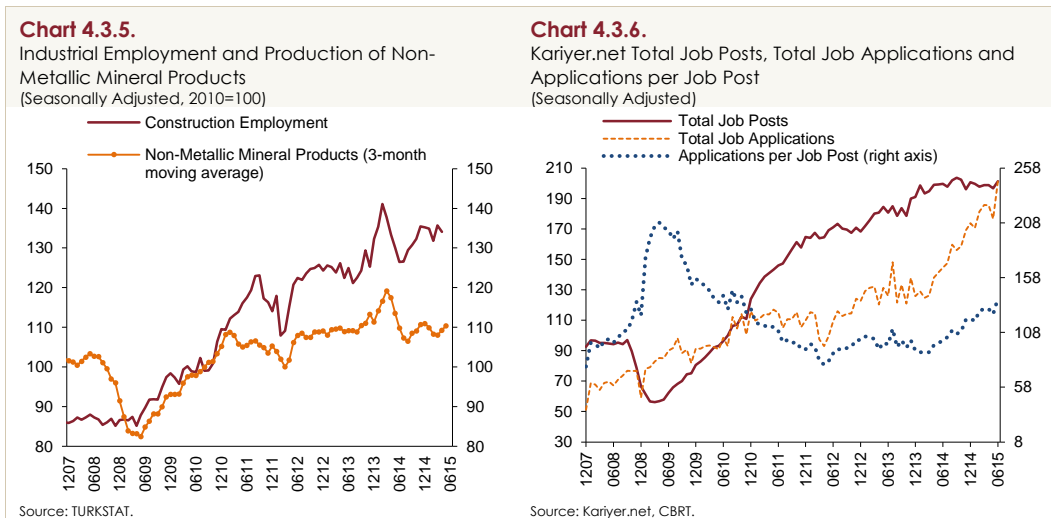
After increasing in 2014, total and non-farm unemployment rates declined in the first quarter of 2015 amid the changing outlook of the labor supply (Chart 4.3.1). Having displayed a rapid rise, the non-farm labor force has remained flat since November 2014 (Chart 4.3.2). This stagnation caused unemployment rates to drop despite any acceleration in employment growth compared to the fourth quarter of 2014. Although non-farm employment growth was not strong during March-April, the ongoing weakening of the labor supply helped unemployment rates to decline further.



The analysis of non-farm employment by sectors indicates that the services sector continued to be the main driver of non-farm employment growth (Chart 4.3.3). However, employment growth was not evident across all sub-sectors. As of April, the 2015 growth in services unemployment was mostly driven by community services including trade, restaurants-hotels, administrative services and public administration. On the other hand, technical services, information-communication, real estate and financial activities saw employment losses. The recent sluggishness in tourism caused by geopolitical tensions is considered to be a threat against trade and transport, as well as restaurants and hotels. In line with the slowing pace of production, industrial employment has been almost horizontal since mid-2014 (Chart 4.3.4). Meanwhile, in cumulative terms, industrial employment witnessed no rise during the past year. Leading indicators fail to hint at a significant improvement in the outlook for industrial employment over the second quarter. Although industrial production continues to increase, survey indicators curb the expectation of a growth in employment. Industrial production declined on May's automobile industry strikes, yet its April-May average still remains above the first-quarter average. However, during the April-June period, the PMI employment has remained close to the neutral mark, which indicates that the ratio of firms lowering employment are equal to the ratio of firms increasing employment, thus pointing to a flat course for employment.



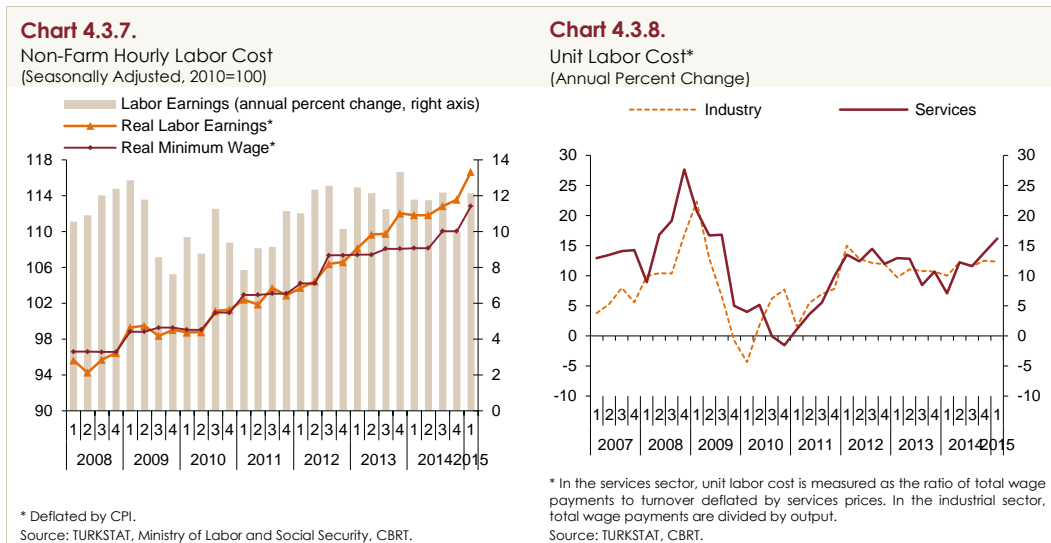
After receding in the first quarter, construction employment recovered slightly during March-April (Chart 4.3.5). The production of non-metallic minerals, a key indicator for construction employment, has been climbing as of May, which confirms increasing employment in the construction sector. Meanwhile, according to data obtained from Kariyer.net, the total number of job posts increased slightly in June, which continues to signal a moderate employment growth (Chart 4.3.6). Moreover, due to the rapid June increase in applications, the number of applications per job post, a leading indicator for non-farm unemployment, is trending upward.



Despite the weak employment outlook in the first quarter of 2015, hourly wages remained on the rise. After 2014, wage hikes posed further upward pressure on firm costs in the first quarter of 2015. Having increased by 11.4 percent in 2014, a rate higher than the annual CPI inflation, hourly wages continued to rise in real terms in the first quarter of 2015 (Chart 4.3.7). This hourly wage growth was on par with the minimum wage growth. Given inflation forecasts, the minimum wages set for 2015 signal a rise in real wages for the entire year.

The absence of productivity gains in 2014 caused the increase in hourly wages to be directly reflected on unit wages. On the other hand, the industrial sector saw some productivity gains in the first

quarter of 2015, whereas slowing economic activity caused the trade and services sector to face additional productivity losses, which have been experienced since the second quarter of 2014. Changes in productivity somewhat curbed the rise of unit labor costs in the industrial sector but accelerated the upsurge of unit labor costs in the trade and services sector (Chart 4.3.8). Assuming that wage growth moves in line with minimum wage growth and that the current pace of productivity is maintained, the annual growth of unit labor costs is not expected to fall below 10 percent. This outlook suggests that labor costs might be a factor, which adds to inflation inertia, particularly in the labor-intensive services sector.



In sum, despite no acceleration in non-farm employment growth, unemployment rates declined in the first quarter of 2015 on the back of the slowing labor supply. The services sector was the main driver of non-farm employment growth, with the industrial sector providing some contribution as well. The services sector remained as the main driver of non-farm employment growth during March and April. In this period, unemployment rates continued to fall due to non-farm employment growth and the weak labor supply. Based on the assumption of a moderate economic recovery, employment may see some gains across industrial and construction sectors over the upcoming period. However, services employment is likely to grow at a slightly slower pace due to the vulnerability of the tourism sector to geopolitical tensions. On the other hand, sluggish investments pose a downside risk to employment. Thus, unemployment rates are not expected to decline significantly in the remainder of the year.

Box
4.1

Using Survey Data in Near-Term GDP Forecasts

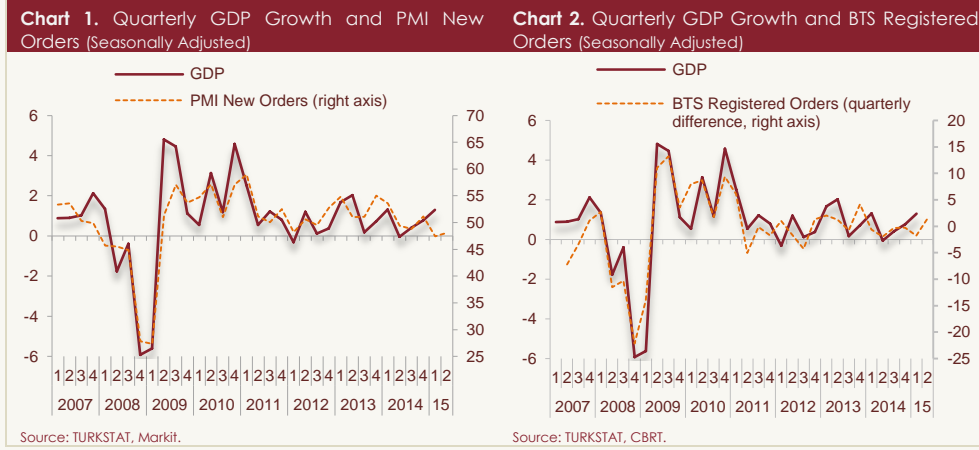
GDP data is an indicator that presents a comprehensive outlook for economic activity. Yet, GDP data is released in 70 to 90 days after the quarter ends. This increases the importance of near-term growth forecasts. Meanwhile, the monthly industrial production index and external trade data are closely associated with GDP data and play a major role in short-term forecasts. However, they are announced about 40 days after the respective month, and therefore, if a forecast depends solely on these indicators, forecast errors can drop significantly only after the quarter ends.

Contrary to GDP and production/trade data, survey data contain quite timely information. For example, BTS data are released before the end of the respective month, while PMI data are released on the next working day after the end of the respective month. Thus, it is necessary to incorporate more timely survey data that signal not only the past but also the future into the forecasting process. The positive correlation of PMI and BTS indicators with the quarterly change in GDP indicates that these surveys can be used for GDP projection (Table 1).

Table 1. Correlations with Quarterly GDP Growth

	PMI New Orders (level)	BTS Registered Orders (quarterly difference)	Industrial Production (quarterly growth)	Import Quantity Index (quarterly growth)
2008Q1-2009Q4	0.93	0.95	0.96	0.96
2010Q1-2012Q4	0.78	0.70	0.80	0.64
2013Q1-2015Q1	0.30	0.34	0.52	0.48

In the first quarter of 2015, GDP increased at a higher pace than implied by survey data. An analysis of the changes in past periods shows that although growth and survey data had differing signals in some quarters, they showed a similar pattern in the following periods (Charts 1 and 2). Specifically, in times of sharp and elevated economic volatility, surveys may entail more information. Yet, the correlation between GDP growth and survey data weakened lately, a pattern also valid for the industrial production index (IPI) and the import quantity index excluding gold (QM). This is due to the agricultural value added that caused a fluctuation in GDP growth. In other words, forecasts based solely on survey indicators can be misleading. However, survey indicators might contain up-to-date information, and thus, it would be useful to incorporate them into the GDP forecasts along with production and trade data. This box summarizes the results of such a method that utilizes survey data in GDP forecasts.



Several issues arise while forecasting the GDP if survey data are used along with industrial production and external trade data. First of all, GDP data are published quarterly while production, external trade and survey data are released monthly. Secondly, data available on a certain date would refer to different months. For instance, IPI data for a specific month are generally announced on the 8th of the subsequent second month while PMI data are released on the first working day of the next month. Accordingly, December's PMI data are released on 1 January whereas November's IPI data are published on 8 January. Since GDP data are released quarterly, even if monthly data are used as a quarterly average, the January dataset would lack December's IPI data. Finally, GDP and IPI have been released for a very long time whereas PMI data have been announced only since May 2005 and new BTS data are available from January 2007. Thus, a 1998-based GDP data forecast relies on IPI data available since 1998, whereas a least squares estimation involving PMI data may start from 2005, which means that a pre-2005 GDP-IPI relationship cannot be integrated into estimations if the PMI is used. Therefore, although survey data are likely to entail timely information, issues such as mixed frequency (the release of survey data at different frequencies with the GDP), missing data (data may not be available at the beginning of the sample period because of later release compared to some data such as industrial production) and ragged ends (some production and external trade data may be missing at the end of the sample because of the timely release of survey data) need to be resolved for the effective use of information in estimations.

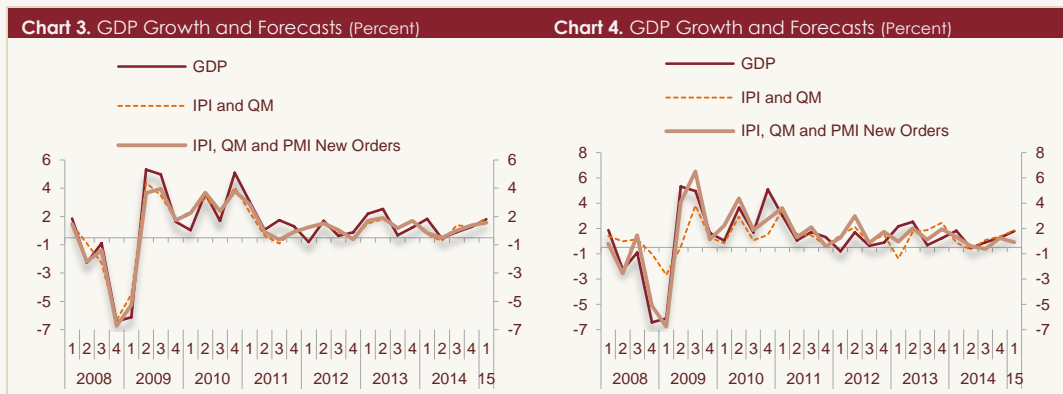
Akkoyun and Günay (2013) analyze the information value of PMI and BTS indicators for near-term GDP forecasts by using a dynamic factor model that can process data released at different frequencies with different starting and ending dates. In this model, series are decomposed into their common factor and idiosyncratic component. The common factor, which is used in producing forecasts, is obtained using the Kalman filter.¹

¹ For further details, see Akkoyun and Günay (2012).

Using seasonally adjusted data, this box shows an analysis of the pseudo-out-of-sample forecasting based on a dynamic factor model by using quarterly changes in GDP, monthly changes in IPI and QM since 1998 and monthly PMI data in levels since May 2005. In this analysis, forecasts are made based on the data release calendar and the sample is later is expanded to obtain new forecasts. For example, in the forecasts presented in Chart 3, the factor is first obtained from the data available since May 2008 to produce the forecasts for the first quarter of 2008, and then a new factor is obtained from the data until August 2008 to produce the forecast for the second quarter of 2008.

To see the effect of survey data on forecasting, we first take into account the forecasts generated two months after the end of the forecast quarter (Chart 3). As seen in the chart, incorporating survey data into the baseline model consisting of quarterly GDP growth, industrial production and non-gold import quantity index data merely affect forecasts. This is not surprising as industrial production and external trade data are used directly while estimating GDP growth. If these variables are released for all months of the forecast quarter, the additional information value of the survey indicators is limited.

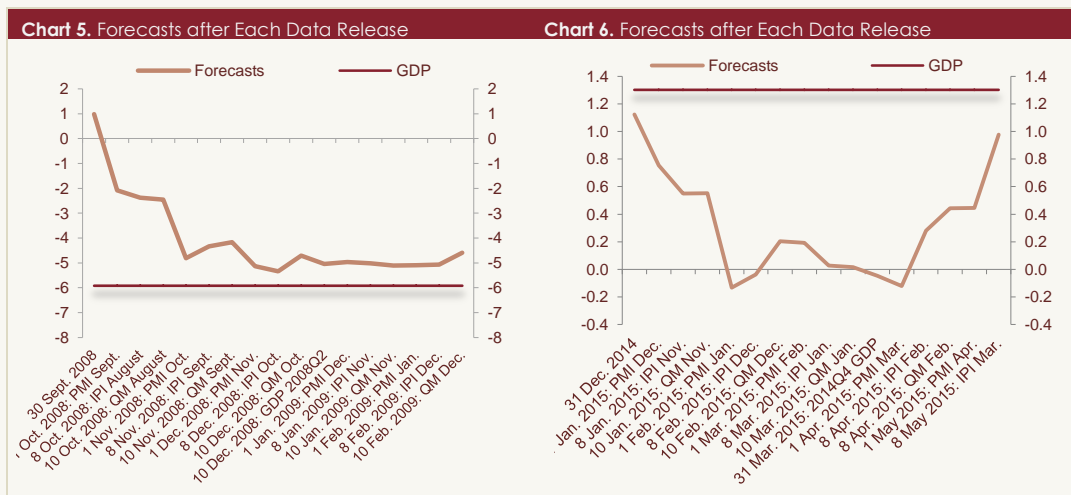
As emphasized above, the main contribution of survey indicators to forecasting is their timeliness advantage. The forecasting performance of the baseline model where no survey indicator is incorporated into forecasts that are generated using data in the middle of the forecast quarter shown in Chart 4 is notably weak, particularly in times of crisis. Adding PMI data into the baseline model reduces forecast errors. In Chart 4, using data available as of the mid-quarter implies that PMI data for the first month of the quarter is in the information set while no data is available for IPI and QM for that quarter. Using survey data provides quite timely information about the course of economic activity, especially during the 2008 global crisis. In fact, the sharp contractions in the fourth quarter of 2008 and the first quarter of 2009 as well as the strong rebound in the second quarter of 2009 can be forecasted even in the middle of the respective quarter using survey data.



Another advantage of the method that is used in Akkoyun and Günay (2012) is that forecasts can be updated as new data are released. The following examples (one from the crisis episode and the other from the recent past) are presented to clarify how this can be used in near-term GDP forecasts. Chart 5 shows how forecasts changed after each data release between 30 September (the day before the quarter starts) when forecasts were generated using available data for the fourth quarter of 2008 and 10 February when

IPI and QM data were announced for the three months of the respective quarter. Accordingly, forecasts before the start of the quarter about the GDP that narrowed by 5.9 percent quarter-on-quarter due to the global economic crisis indicate a positive growth. Re-running the model on 1 October after the release of September PMI data, forecasts point to a 2-percent quarterly contraction. Here, it should be noted that no data is available for the last quarter as of 1 October, and the latest data for IPI and QM are from July. However, forecasts were not revised substantially after the release of August QM data on 8 October and 10 October. Yet, when October's PMI New Orders data, which was announced on 1 November, were included in the dataset, the model envisions a stronger contraction than implied by the forecasts produced using October data. Forecasts saw some revisions with subsequent data flow. Considering that the data for the fourth quarter of 2008, the forecasts of which are shown, were announced on 31 March 2009, it is rather outstanding that there are clear signals about the economic contraction even during the quarter and before production and external trade data were announced.

The second example is from a more recent period (Chart 6). As emphasized above, the relationship between survey data and GDP weakens in certain periods, which may worsen the performance of forecasts. In fact, forecasts generated through these model show that, with the release of data for the first quarter of 2015, the quarterly GDP forecast was revised to negative after the announcement of January PMI data on 1 February. This is because the PMI New Orders indicator fell below 50 in January. In the following period, after the announcement of December's IPI and QM data, the GDP forecast was revised slightly upwards. However, after March PMI data were released on 1 April, the revised GDP forecast signaled a quarterly contraction. Yet, with the release of the IPI data in the following period implying robust economic activity, the GDP forecast re-nearred the figure announced on 10 June.



In sum, survey data are announced earlier than industrial production and external trade data, and contain signals about the future. However, the relatively shorter sample of the survey data is a constraint; yet, incorporating the early-release advantage of survey data into forecasting is another problem to be resolved. Dynamic factor models enable the evaluation of a forecast outlook after each data release

when the system consists of data with different frequencies and different starting and ending dates. As this system is automatic, there is less judgement in forecasting, and the effect of each data release on the forecast performance can be assessed objectively. The forecast performance can be affected negatively when the relation between survey data and GDP weakens occasionally. Yet, the joint use of survey data with IPI and QM reduces the forecast error, albeit with a lag. For simplicity, the survey data used in this box were restricted to the data on PMI New Orders. As presented in Chart 2, when transformed appropriately, BTS data can also be used to forecast GDP growth. Accordingly, one can conclude that analyzing the contribution of indicators, such as exports and employment, and various surveys to GDP forecasts and evaluating their performance dynamically over time will reduce errors in near-term forecasts.

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- Akkoyun, H.Ç. and M. Günay, 2012, Nowcasting Turkish GDP Growth, CBRT Working Paper No. 12/33.
- Akkoyun, H.Ç. and M. Günay, 2013, Milli Gelir Büyümesi Tahmini: PMI ve İYA Göstergelerinin Rolü (in Turkish), CBT Research Notes in Economics No. 13/31.

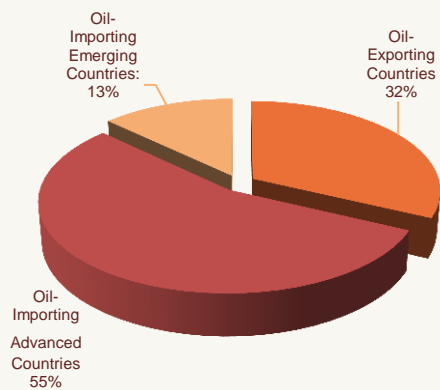
Box
4.2

The Effect of Oil Prices on Exports

The plunge in oil prices since mid-2014 has caused debates about its effects on the external balance. These debates are mostly centered on the effects, which are manifested via the external trade channel. Given that energy items make up almost 20-25 percent of Turkey's import bill on average, these effects are viewed to be favorable in terms of the current account balance.² Yet, by creating an income effect, falling oil prices might also have a two-side effect on Turkey's exports. On one hand, lower oil prices may dampen exports to oil-exporting countries whose real revenues are down, and, on the other hand, the demand growth in oil-importing countries whose purchasing power has relatively increased can counterbalance such negative effects. Accordingly, this box presents an analysis of the direct impact of the change in international oil prices on Turkey's exports through the income effect. To this end, firstly, the effect of oil prices on the growth rates of oil-exporting/importing countries is analyzed. Then the effect of growth on exports in these countries is examined by using an export demand function. Finally, the effect of oil prices on exports is calculated by using the estimated oil price-growth and growth-exports elasticities.

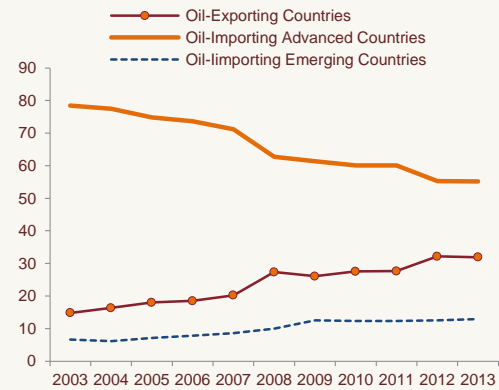
Almost one third of Turkey's exports are destined to oil-exporting countries (Chart 1). Moreover, the share of exports to oil-exporting countries increased during the 2000s, when oil prices rose due to higher demand. Therefore, such countries, which are more sensitive to oil revenues, diverge from other countries, such as oil-importing EU members (Chart 2). Thus, when analyzing how changes in oil prices may affect Turkey's exports, it is important to take into account the differing effects of oil prices on growth rates of oil-exporting/importing countries.³

Chart 1. Share of Countries in Turkish Exports in 2013* (Percent)



* Includes 67 countries, which compose 90 percent of Turkey's exports.
Source: TURKSTAT, Authors' calculations.

Chart 2. Share of Countries in Turkish Exports* (Percent)



² For further details, see World Bank (2014) and Baffes et al. (2015).

³ For regional differences in export demand models, see Çulha and Kalafatçılar (2014) and Bozok et al. (2015).

The analysis is based on annual data from 2003 to 2013, where 67 countries that account for about 90 percent of Turkey's exports are included in the analysis. Among them, 27 countries are categorized as "oil-exporting".⁴ Among the rest, classified as oil-importing, 28 countries are "oil-importing advanced countries", and 12 are "oil-importing emerging countries".

In the first stage where the oil price elasticity of growth is measured for each country, the following equation is estimated in the spirit of Rasmussen and Roitman (2011), by using dynamic panel methodology as follows:

$$g_GDP_{i,t} = c + \alpha * g_GDP_{i,t-1} + \beta_1 * g_Oil_t + \beta_2 * g_Oil_{t-1} + \gamma * g_World_t + \varepsilon_{i,t}$$

Here, $g_GDP_{i,t}$ represents the growth rate of country i in year t ; g_Oil_t shows the percentage change in the average oil price in year t with respect to the average oil price in year $t-1$; and g_World_t denotes the global growth rate in year t . The coefficients β_1 and β_2 are important in this analysis as they show the oil price elasticity of growth.⁵

In the second stage, a standard export demand function including external demand and relative prices is estimated for Turkey using a fixed effects model as below:⁶

$$g_Exports_{i,t} = c + \alpha * g_GDP_{i,t} + \beta * g_Exch_{i,t} + \varepsilon_{i,t}$$

Here, $g_Exports_{i,t}$ shows the annual growth rate of Turkey's real exports excluding gold to country i in year t ; $g_GDP_{i,t}$ refers to the growth rate of country i in year t ; and $g_Exch_{i,t}$ represents the annual change in the real exchange rate between country i and Turkey in year t . Coefficients are weighted by the export volume.⁷

Results obtained in the first stage show that the lagged values of oil prices have a statistically significant effect on growth (Table 1). As expected, a rise in oil prices brings the growth rate up in oil-exporting countries and down in oil-importing countries. Yet, in absolute terms, the growth rate in oil-exporting countries has higher sensitivity to oil prices. On the other hand, the effect of changes in oil prices on the growth rates of oil-importing emerging countries is not statistically significant.

Table 1. Oil Prices and Growth⁽¹⁾

	Dependent Variable: Annual GDP Growth					
	Country Groups					
	Oil-Exporting Countries		Oil-Importing Advanced Countries		Oil-Importing Emerging Countries	
	(a)	(b)	(a)	(b)	(a)	(b)
$g_GDP_{i,t-1}$	0.0299 (0.215)	-0.145 (0.144)	0.344*** (0.0901)	0.482*** (0.115)	0.502*** (0.138)	0.579*** (0.172)
g_Oil_t	-0.0135 (0.0375)	-0.0088 (0.0412)	0.00610 (0.0069)	0.00098 (0.0074)	-0.0205 (0.0165)	-0.0250 (0.0177)
g_Oil_{t-1}	0.0560** (0.0252)	0.0703** (0.0290)	-0.0160** (0.0068)	-0.0280*** (0.0078)	-0.0115 (0.0146)	-0.0147 (0.0147)
g_World_t	1.374*** (0.401)	1.408*** (0.422)	1.091*** (0.0834)	1.105*** (0.0853)	0.901*** (0.280)	0.936*** (0.264)
Constant	2.192 (1.500)	3.085** (1.265)	-1.652*** (0.315)	-1.697*** (0.290)	0.312 (0.608)	-0.0700 (0.699)
Number of Observations	269	269	280	280	120	120
Number of Countries	27	27	28	28	12	12

(1) Adjusted standard errors are reported in parentheses. ***, **, * denote 99, 95 and 90 percent statistical significance, respectively. Column (a) reports the estimation results where all possible lagged values are used as instruments. Column (b) shows the estimation results where restricted number of lagged values is used as instruments. Hence, the estimated coefficient is assumed to lie between the two.

⁴ Based on IMF-World Economic Outlook classification. For a list of all countries in each category, see Çulha et al. (2015).

⁵ The GDP data is USD-denominated GDP data published by UNCTAD with base year 2005. The oil price is the USD-denominated Brent oil prices deflated by the US consumer price index.

⁶ For a conceptual background, see Goldstein and Khan (1985).

⁷ Real exports are measured as the ratio of USD-denominated (single-digit) sectoral exports to the unit value index for each sector with base year 2005. Data on exports are obtained from the TURKSTAT. Price indicator is the CPI-based real exchange rate series for each country. Price indices used in estimations are retrieved from UNCTAD. Higher real exchange rate means the appreciation of the Turkish lira.

As expected, the second stage estimation results suggest that there is a simultaneous and positive relation between the growth rates of countries and Turkey's exports (Table 2). The growth elasticity of exports differs across country groups. The income elasticity of oil-importing advanced countries is higher than that of oil-exporting countries.

The effect of oil prices on Turkey's exports (real exports-oil price elasticity) was calculated by multiplying two different elasticities (the effect of oil prices on growth and the effect of growth on exports). Accordingly, for oil exporters, this elasticity lies between 0.08 (0.056*1.510) and 0.11

(0.070*1.510). For oil-importing advanced countries, this elasticity is between -0.06 (-0.016*3.555) and -0.10 (-0.028*3.555). This implies that a 10-percent rise in oil prices increases Turkey's real exports to oil-exporting countries by 0.8 to 1.1 percent, whereas its real exports to oil-importing advanced countries decline by 0.6 to 1.0 percent. Assuming that the elasticities are symmetric, a 10-percent drop in oil prices will have an equivalently opposite impact.

The overall effect on Turkey's exports will depend on the relative share of each country group in total exports. As shown in Chart 1, in 2013, oil-exporting countries had a total share of 32 percent out of 67 countries; whereas oil-importing advanced countries had a 55 percent share. Consequently, oil prices had no significant effect on real exports through the income channel.

To sum up, this box shows that certain points should be taken into account when making inferences during periods of plunging oil prices. First of all, coefficients estimated during periods of rising oil prices are different than those estimated during times of decrease. Secondly, coefficients estimated in this box measure the direct effects of oil prices on exports only through the income channel. In other words, this estimation does not include other macroeconomic variables or the indirect effects that may emerge due to concerns related to the financial stability of oil exporters.

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Table 2. Growth and Exports⁽¹⁾

	Dependent Variable: Annual Export Growth		
	Country Groups		
	Oil-Exporting Countries	Oil-Importing Advanced Countries	Oil-Importing Emerging Countries
$g_GDP_{i,t}$	1.510*** (0.162)	3.555*** (0.375)	1.632 (1.360)
$g_EXCH_{i,t}$	0.0656 (0.230)	-0.176 (0.107)	-0.169 (0.396)
Constant	7.565** (3.635)	1.597*** (0.424)	14.42* (7.284)
Number of Observations	293	308	132
Number of Countries	27	28	12

(1) Adjusted standard errors are reported in parentheses. ***, **, * denote 99, 95 and 90 percent statistical significance, respectively. The equations include the change in oil prices as the control variable. Estimations are weighted by countries' share in exports.

