

4. Supply and Demand Developments

GDP data for the second quarter of 2015 show that economic activity was stronger than anticipated in the July Inflation Report and national income posted a quarterly and annual growth of 1.3 and 3.8 percent, respectively. The annual GDP growth was mainly driven by industrial value added that exhibited a stronger rise than industrial production; agricultural value added that rose upon favorable weather conditions; and net taxes that have remained robust since the first quarter. The quarterly GDP growth on the other hand, was fueled by the rising industrial value added. On the expenditures side, annual growth was pushed upwards by the significant contribution of final domestic demand via the private sector, while the quarterly growth was induced by private investments. Meanwhile, net exports put a cap on growth in this quarter.

Data released for the third quarter of 2015 point out that quarterly GDP growth may decelerate compared to the first half of the year. Industrial production has grown by 0.7 percent in July-August period compared to the previous quarter. On the domestic demand front, elevated domestic and external uncertainties led to an additional tightening in financial conditions and lagged effects of the exchange rate kept prices of core goods on the rise, causing expectations of a mild course in private consumption in the third quarter. On the other hand, the export quantity index excluding gold, which declined slightly on a quarterly basis in the July-August period, is expected to rise in the third quarter. Accordingly, external demand is projected to provide higher support to quarterly growth.

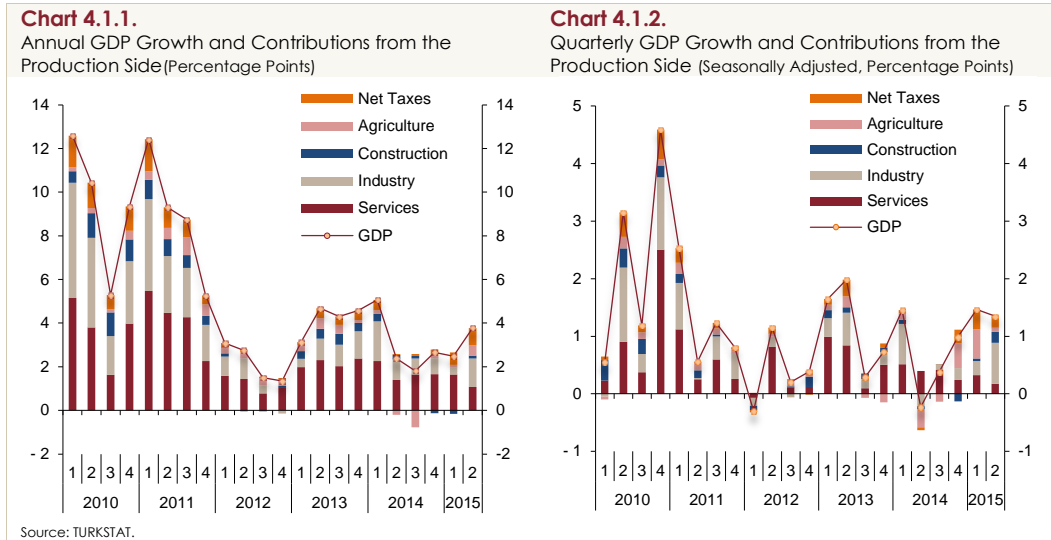
In the upcoming period, GDP growth is expected to follow a moderate course, yet downside risks still persist. Due to the weak course of the confidence indices, the support from the confidence channel may remain weak for some time. Amid domestic and external uncertainties, financial conditions have tightened some more lately. Regarding external demand, both geopolitical developments and the vague global monetary policy keep the downside risks brisk. On the other hand, the rebound in European countries is likely to underpin external demand.

In case of alleviated uncertainties in domestic and global markets, the probable improvement in financial conditions in addition to a possible rise in confidence will stand out as factors to stimulate growth in 2016. Accordingly, it is expected in 2016 that domestic demand will contribute mildly to growth and the support from external demand will expand amid the ongoing recovery in European economies. Thus, the contribution of aggregate demand conditions to disinflation is expected to continue in 2015 and 2016. It is anticipated that the lagged effects of the improvement in terms of trade coupled with the current macroprudential framework will support the recovery in the current account balance.

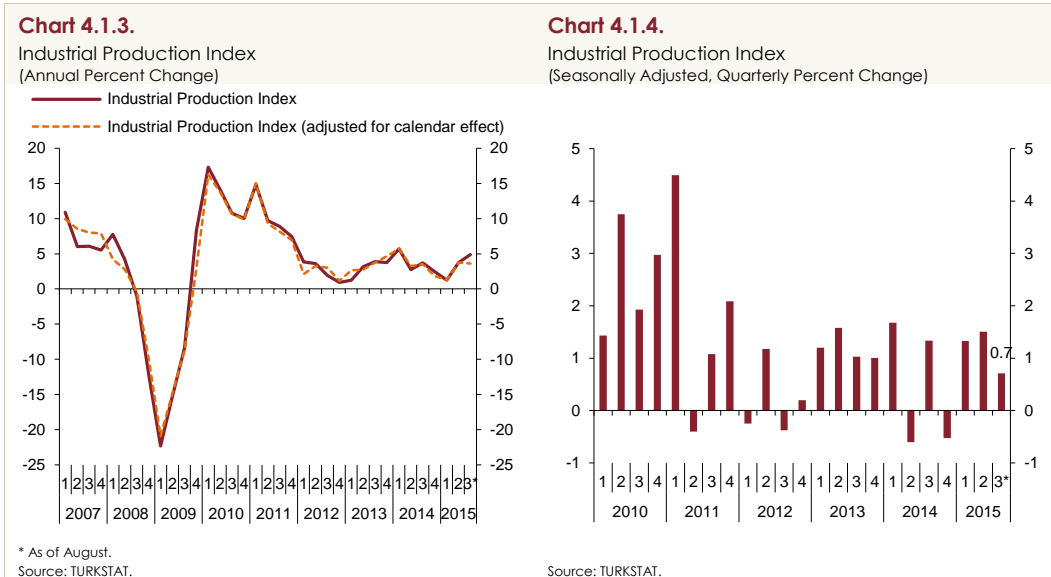
4.1. Supply Developments

According to the data released by TURKSTAT, economic activity in the second quarter of 2015 proved stronger than projected in the July Inflation Report, and the GDP posted a year-on-year increase by 3.8 percent (Chart 4.1.1). This higher-than-expected increase in the GDP was driven by industrial value added that increased faster than the annual industrial production and net taxes that continued to expand considerably above the industrial value added in this quarter. In seasonal and

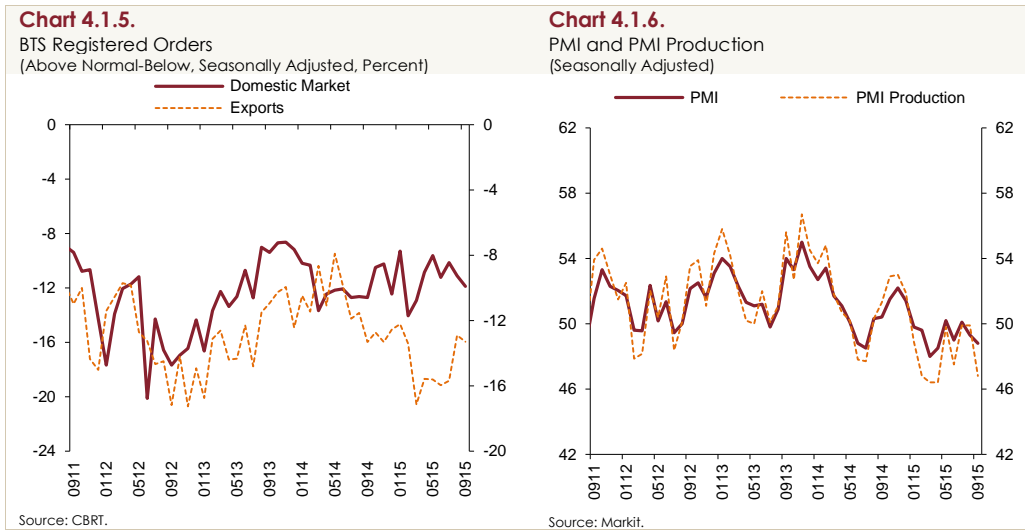
calendar effect adjusted terms, the GDP grew by 1.3 percent quarter-on-quarter. Adding 2.7 percent more compared to the first quarter, the industrial value added was marked as the pioneering contributor to quarterly growth in the third quarter. Other sectors also contributed positively to quarterly growth (Chart 4.1.2).



Industrial production adjusted for calendar effects maintained its first-quarter pace from July to August, posting a year-on-year increase by 3.6 percent (Chart 4.1.3). The industrial production data adjusted for seasonal and calendar effects suggest a surge in August following a fall in July and a rise by 0.7 percent above the second quarter average in the July-August period (Chart 4.1.4).



In September 2015, the 3-business day difference compared to September 2014 due to the Eid coupled with the bridge day effect owing to the announcement of extra days off before the religious holiday are expected to plunge the data in annual percentage change terms. Thus, in order for a better evaluation of the economic activity, September data should be interpreted using the annual percentage changes adjusted for calendar effects. Accordingly, production is likely to shrink considerably in September on an annual basis. The data adjusted for seasonal and calendar effects suggest a decline in production of vehicles in September. On the other hand, survey indicators also show that production will follow a modest course on a monthly basis due to the domestic market developments in September. In fact, the BTS suggests a more significant weakening in registered orders for the domestic market than export orders. PMI and the PMI production index indicators posted a month-on-month decline and stood below 50 (Charts 4.1.5 and 4.1.6). The BTS questions on the investment tendency and the overall course of industry, which capture investor confidence, also indicate some deterioration. Hence, industrial production is projected to fall in September and post a modest quarter-on-quarter rise in the third quarter. Moreover, the fact that the domestic and external uncertainties may restrict the contribution of the confidence channel in the second half of the year, besides the volatility in the exchange rate and tightening in financial markets pose a downside risk on domestic demand. In the upcoming period, it is envisaged that growth composition will change gradually in favor of net exports owing also to the rising demand from the EU countries, and increases in industrial production will remain mild for the rest of the year with the support from exports.

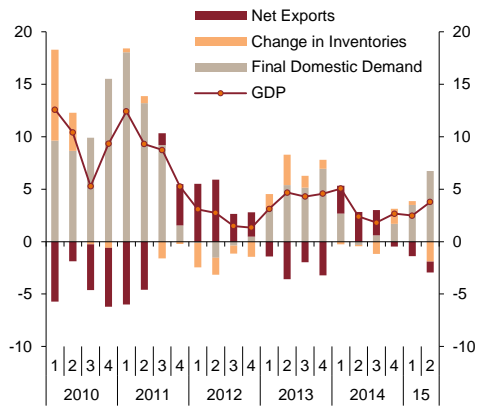


4.2. Demand Developments

The GDP data for the second quarter of 2015 on the expenditures side indicate that final domestic demand offered an increased contribution to annual growth compared to the previous quarter, whereas net exports continued to pull it down (Chart 4.2.1). The acceleration in final domestic demand in this quarter resulted from both consumption and investment expenditures. In seasonally adjusted terms, quarterly growth was supported by domestic demand but deteriorated by exports.

Chart 4.2.1.

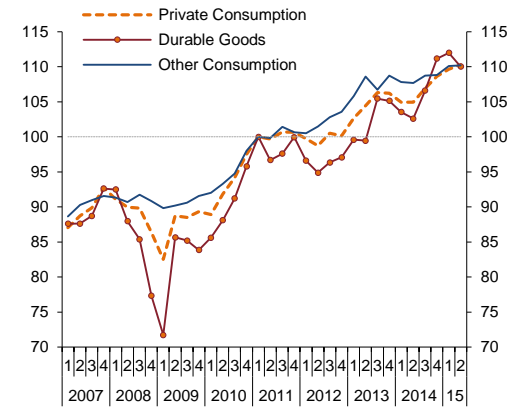
Annual GDP Growth and Contributions from the Demand Side (Percentage Points)



Source: TURKSTAT.

Chart 4.2.2.

Domestic Private Consumption by Sub-Components* (Seasonally Adjusted, 2011 Q1=100)

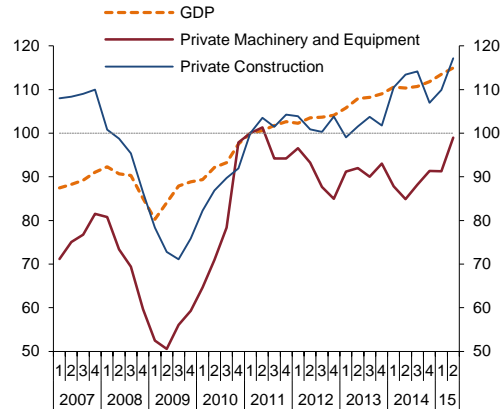


* Domestic private consumption is categorized under 10 listings by the TURKSTAT. Accordingly, spending on furniture and household appliances, transport and communication as well as leisure and culture, which include items such as automobiles, furniture and television, are classified as durable goods, while the remaining is called other consumption.
Source: TURKSTAT.

Private consumption expenditures recorded a quarter-on-quarter uptick in the second quarter. Expenditures on durable goods declined, while expenditures on other consumption goods followed a flat course in this quarter (Chart 4.2.2). Meanwhile, the relatively sluggish course of expenditures on durable goods in the last two quarters curbed the growth of private consumption. Private machinery and equipment and private construction investments displayed a stronger-than-expected upsurge in the second quarter (Chart 4.2.3). Thus, private investments registered the highest quarterly growth in this quarter since 2011. On the public sector front, public consumption remained on an uptrend in the second quarter, and public investments also rose due to machinery and equipment investments. Quarterly growth in total government spending remained unchanged from the previous quarter (Chart 4.2.4).

Chart 4.2.3.

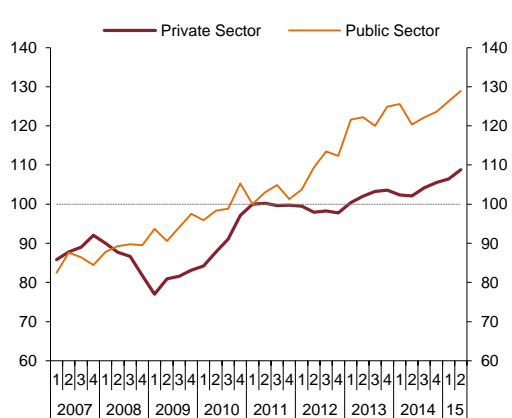
Private Investments and the GDP (Seasonally Adjusted, 2011 Q1=100)

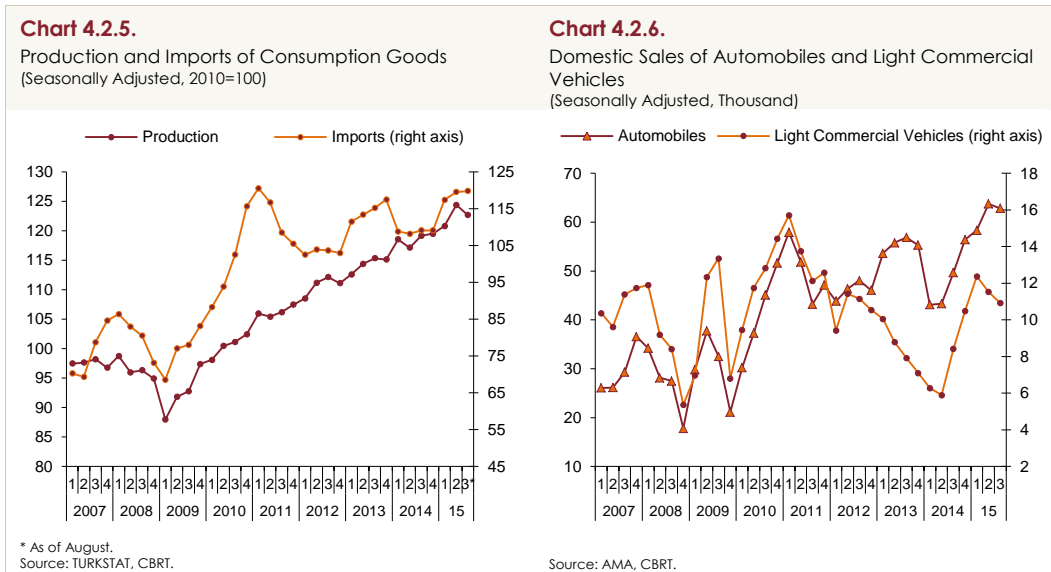


Source: TURKSTAT.

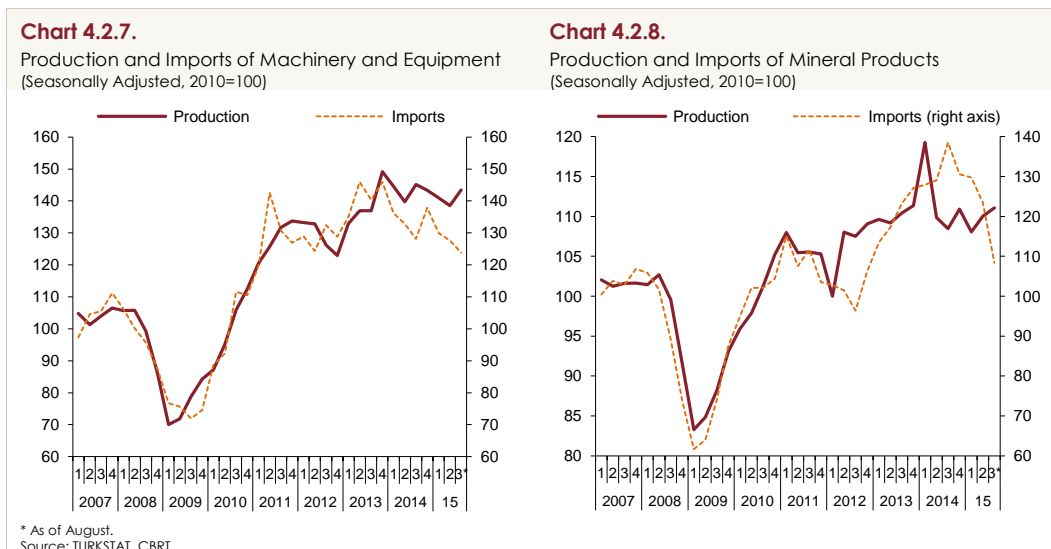
Chart 4.2.4.

Private and Public Sector Demand (Seasonally Adjusted, 2011 Q1=100)



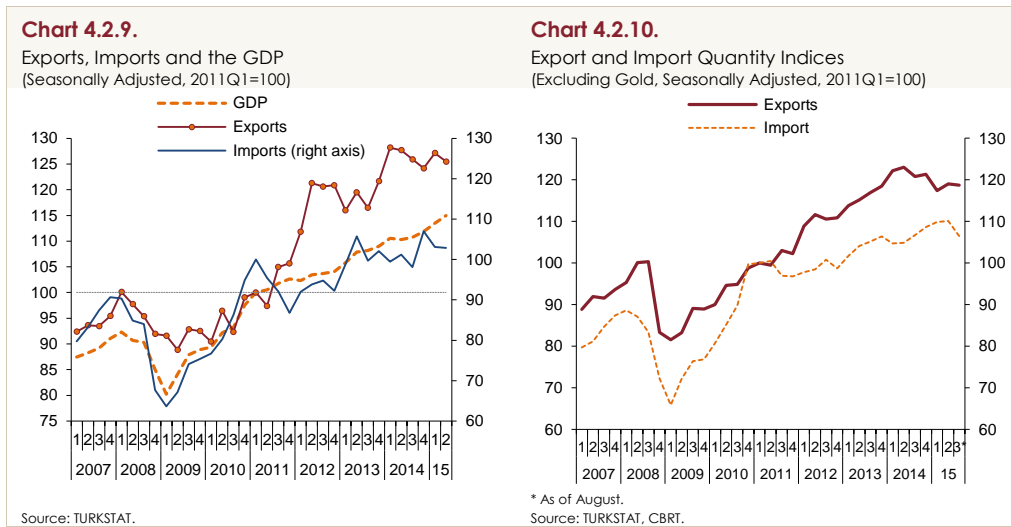


In the first half of 2015, domestic demand provided higher support to growth than external demand. Hence, growth was mainly driven by domestic demand. The third-quarter data signal a slowdown in domestic demand and a rebound in exports, which implies a probable change in growth composition in favor of net exports. In fact, production of consumption goods, which is one of the private demand indicators, decreased from July to August, while their imports edged up (Chart 4.2.5). Sales of automobiles declined in the third quarter (Chart 4.2.6). Consumer confidence remained on a downtrend. In the July-August period, production of machinery and equipment increased, whereas their imports declined compared to the previous quarter (Chart 4.2.7). As for construction indicators, production of mineral products increased, while the imports thereof decreased (Chart 4.2.8). Despite a slight increase in the third quarter, investor confidence remained low. All in all, current indicators suggest a moderate contribution by domestic demand to growth in the third quarter.



Amid the downturn in global economy and geopolitical developments, exports of goods and services declined in the second quarter on a quarterly basis. Imports of goods and services edged

down in this period (Chart 4.2.9). On the other hand, the analysis of quantity indices excluding gold, which give a better understanding of the underlying trend of external trade, points to an increase in exports, but a relatively flat course in imports in the second quarter (Chart 4.2.10). In August, export and import quantity indices excluding gold recorded a decline compared to the previous quarter. However, the fall in the export quantity index excluding gold remained limited. In the upcoming period, the adverse effects of geopolitical developments notwithstanding, exports are expected to improve on the back of rising demand from the EU countries. Given this and the fact that import demand may decelerate depending on the course of domestic demand, net exports may strengthen the improvement in the current account balance in the upcoming period.

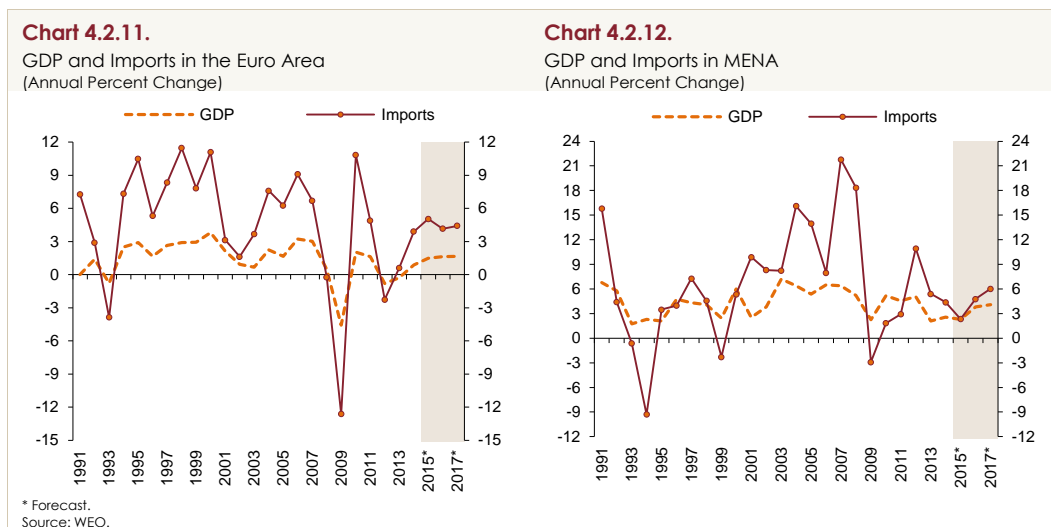


In sum, economic activity posted a brisk growth in the second quarter of 2015 thanks to the stronger-than-expected and notable growth in private investments. In the first half of 2015, domestic demand added more to growth than external demand. However, the second half is expected to witness a change in growth composition in favor of net exports. On the other hand, vagueness in global markets coupled with the languishing course of confidence indices pose a downside risk on growth. Against this background, demand conditions are projected to support the improvement in the current account balance and pull inflation down.

Outlook for 2016

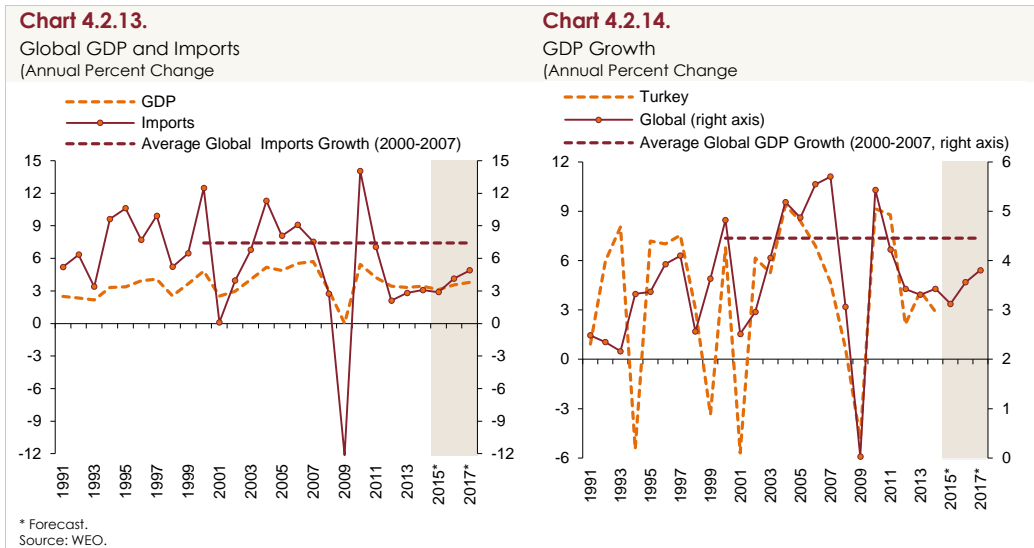
Recently, consumer and investor confidence have subsided, financial conditions have tightened and global capital flows have grown more volatile and sluggish. Moreover, ambiguity regarding the Fed's policy rate hike persisted, the Chinese economy lost pace and geopolitical developments continued to affect our trading partners adversely. All these are expected to have an impact on growth and demand composition through various channels in 2016. The extent to which domestic demand will be influenced by these developments will depend on the future course of domestic and external uncertainties that had an effect on economic activity throughout 2015. On the other hand, signals of recovery in the European economies and progress towards the solution of Greek debt problems stand out as favorable developments.

The economic growth is projected to increase slightly in 2016 under the assumption that exports are supported by the European recovery and the real exchange rate depreciation through the income and the price channel, respectively, and that domestic uncertainties lessen and geopolitical developments do not pose an additional negative effect via the confidence and trade channel. The demand outlook for 2016 suggests a slight weakening in domestic demand and an uptick in exports. Against this background, downside risks to external demand are more apparent, while risks on domestic demand are more balanced.

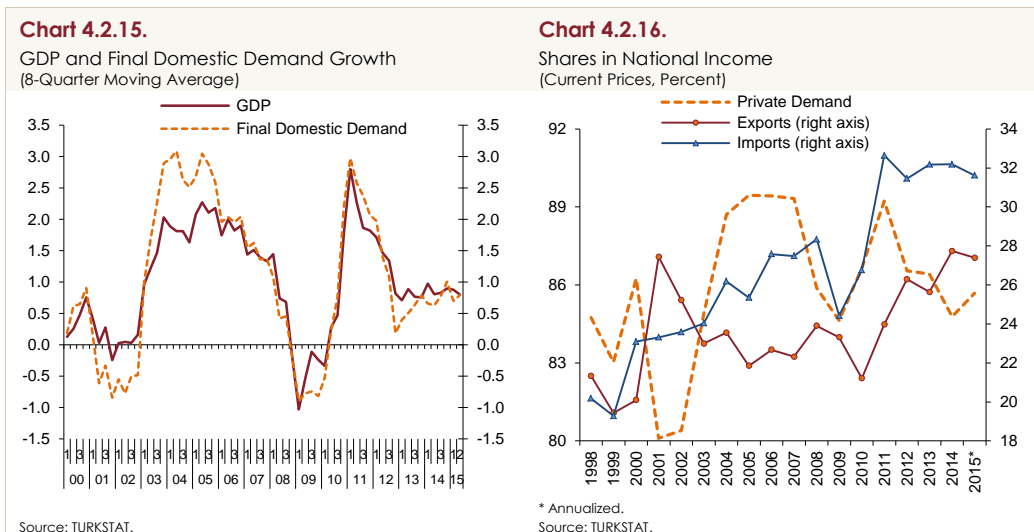


External demand is projected to improve, yet downside risks still persist. Developments pertaining to economic activity in advanced economies play an important role in the Turkish export dynamics. Accordingly, the rebound in the European economies is envisaged to support exports in 2016 (Chart 4.2.11). Despite the expected recovery in the MENA countries, geopolitical developments indicate apparent downside risks to our exports to this region (Chart 4.2.12). Vagueness regarding exports to Russia and Iraq is another factor feeding into downside risks. The impact of the Fed's decisions and the effect of the deceleration in the Chinese economy on the global economy accompanied by the blurred destiny of the rebound in Europe also mark downside risks to external demand.

Global growth forecasts signal milder growth in 2016 and also over the medium term (Chart 4.2.13). Accordingly, the likelihood of global potential growth to narrow slightly may stand out as a constraint against domestic economic growth. Meanwhile, global goods trade, which record higher growth rates than global GDP growth, has recently posted a relative deceleration. More specifically, global goods imports, which surged by 1.6 times of growth on average in the 2002-2007 period, lagged below growth by 80 percent on average from 2012 to 2014. This suggests that the competition in exports may have risen higher than implied by the weakening in global growth. Due to the structural transformation experienced in the 2000s as well as the increased integration into the global economy, the GDP growth in Turkey has been more closely linked to global growth (Chart 4.2.14). Yet, in this environment of increasing global competition, the enforcement of the structural reforms in the MTP is still more important to the achievement of a sustainable and balanced growth even if external demand growth and real exchange rate developments seem favorable.

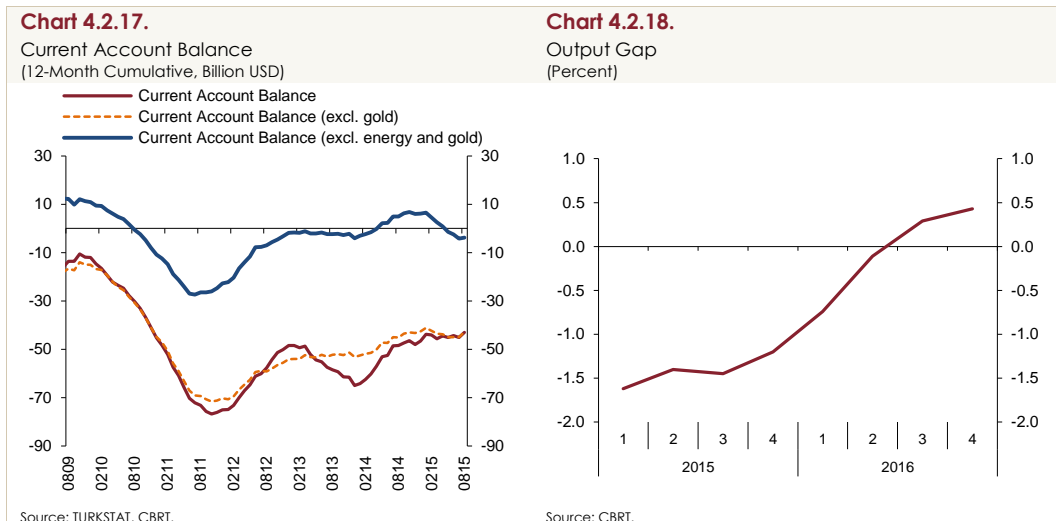


Risks regarding domestic demand are balanced. Thanks to macroprudential measures implemented after 2010, the national income displayed a balanced and relatively less volatile growth, while final domestic demand followed a moderate course after a gradual recovery (Chart 4.2.15). Domestic demand is expected to maintain its mild course in 2016 as well. Tightening in financial conditions driven by domestic and external developments poses a downside risk on domestic demand. However, in the case that domestic uncertainties alleviate, this tightening is expected to neither last nor cause a notable slowdown in domestic demand. On the other hand, should domestic uncertainties wane, the possible rise in consumer and investor confidence may pose upside risks to domestic demand. In addition, the strong employment performance after the global crisis is expected to support domestic demand via the income channel and the projected fall in the current account deficit accompanied by the robust public finances create room for policy maneuvering, which may also support domestic demand.



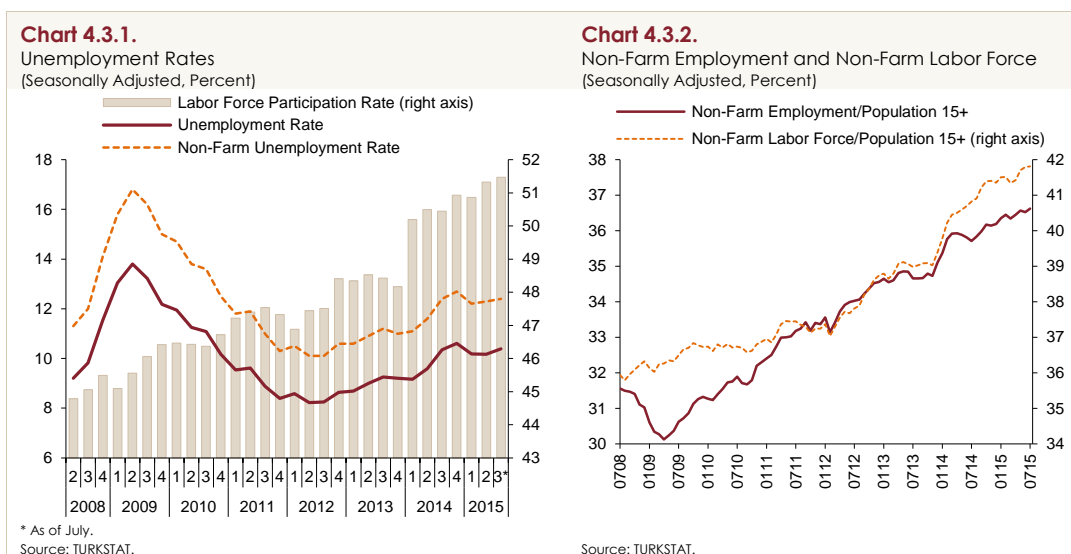
The macroprudential measures adopted after 2010 caused domestic demand to grow slower than the GDP. Accordingly, the share of the private sector within the GDP contracted, while that of

imports remained unchanged (Chart 4.2.16). Conversely, the share of exports increased in this period. It is anticipated that domestic demand will follow a mild course; external demand will exhibit a rebound; and hence, the growth composition will be balanced further in 2016. Thus, the current macroprudential framework will continue to support the improvement in the current account balance (Chart 4.2.17). Against this background, aggregate demand conditions are expected to contribute to disinflation in 2016 (Chart 4.2.18).

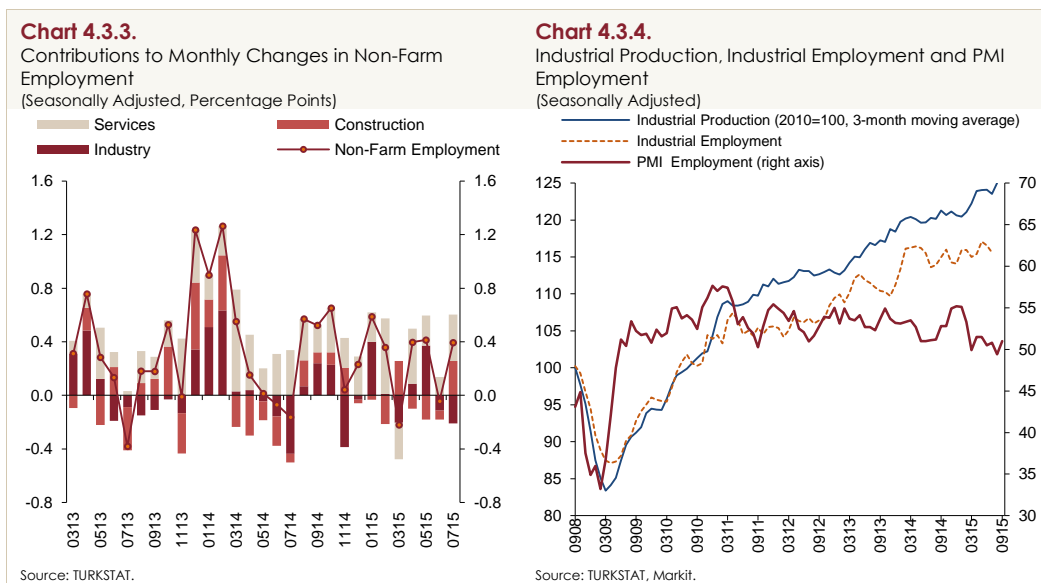


4.3. Labor Market

Unemployment rates have trended upwards in 2015 due to mild economic growth. Non-farm unemployment rate, which receded in the first quarter of 2015, increased in the second and third quarters (Chart 4.3.1). Non-farm employment surged in the first quarter of 2015, yet lost momentum in the pursuing period. On the other hand, the labor participation rate, which paused in the first two quarters, has re-settled on an increasing trend in April (Chart 4.3.2). Combined with the modest outlook in employment, this caused unemployment rates to soar.



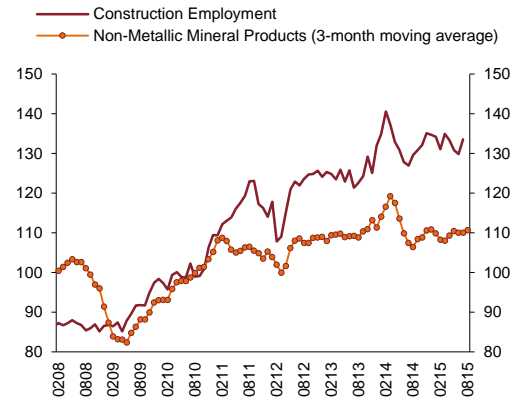
The analysis of non-farm employment by sectors indicates that the services sector continued to be the main driver of employment growth (Chart 4.3.3). Public administration, education, health and administrative services offered further contribution to services employment. On the other hand, moderate economic activity and the stagnant tourism sector restrict services employment. In general, industrial employment posted a limited increase in 2014 and the first half of 2015 amid the deceleration in production. Fluctuating industrial employment recorded a decline in June and July (Chart 4.3.4). Leading indicators do not signal an additional deterioration in industrial employment in the third quarter. Quarterly averages reveal a mild increase in industrial production. Having crept up in September, PMI employment has still remained close to the neutral mark in the last 6 months, indicating that the ratio of firms lowering employment is equal to those increasing employment.



After receding in the first half of the year, construction employment posted an uptick in July (Chart 4.3.5). Following the flat course in April, the August recovery in production of non-metallic minerals, a key indicator for construction employment, is consistent with the rise in construction employment. Indicators related to industrial employment do not point to a decline. On the other hand, unemployment expectations of households are worsening. The CBRT Consumer Confidence Index and the expectation of the number of unemployed, one of the sub-items of the index, plunged in the third quarter, suggesting that a recovery in unemployment is yet to appear (Chart 4.3.6).

Chart 4.3.5.

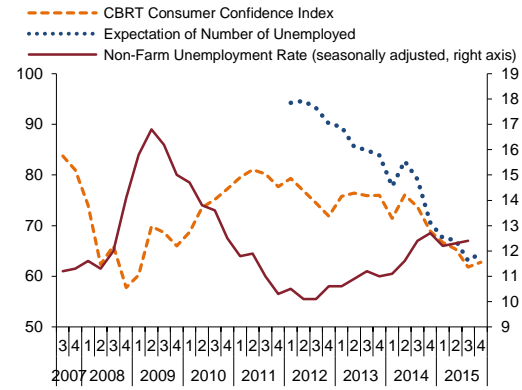
Construction Employment and Production of Non-Metallic Mineral Products
(Seasonally Adjusted, 2010=100)



Source: TURKSTAT.

Chart 4.3.6.

Consumer Confidence, Expectation of Number of Unemployed and Non-Farm Unemployment Rate*

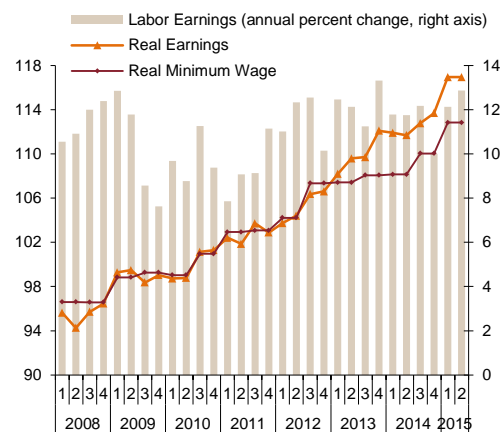


* Declining expectation of number of unemployed denotes worsening expectations.
Source: TURKSTAT, CBRT.

Wage developments reveal that hourly wages, which surged in the first quarter of 2015, lost some pace in the second quarter (Chart 4.3.7). Also due to inflation developments, wages remained unchanged in real terms in this period. Hourly wages continued to move in tandem with the minimum wage. A rise in hourly wages above expected inflation and productivity gains is a factor that pushes firm costs up. Accordingly, productivity gains in the second quarter balanced the rise in hourly wages in the first half of the year. In the second quarter of 2015, hourly wages increased, whereas unit labor costs receded due to the productivity gains amid the rise in production. The annual growth of unit labor costs in industrial and services sectors stood around 10 percent.

Chart 4.3.7.

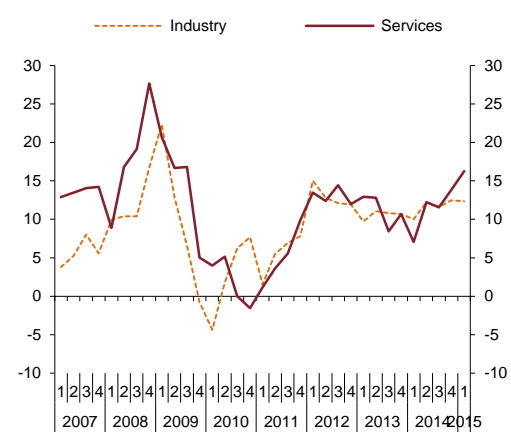
Non-Farm Hourly Labor Cost*
(Seasonally Adjusted, 2010=100)



* Real earnings and real minimum wage are deflated by CPI.
Source: TURKSTAT, Ministry of Labor and Social Security, CBRT.

Chart 4.3.8.

Unit Labor Cost*
(Annual Percent Change)



* In the services sector, unit labor cost is measured as the ratio of total wage payments to turnover deflated by services prices. In the industrial sector, total wage payments are divided by output.
Source: TURKSTAT, CBRT.

In sum, amid the relatively low rate of increase in non-farm employment, the unemployment rate posted a quarter-on-quarter surge during June and July. The services sector, the leading driver of non-farm employment, contributed further to the rise in employment in this period. Industrial

employment receded, while construction employment rose in July, partially compensating for the losses in the first half of the year. Leading indicators signal probable limited increases in non-farm employment for the upcoming period. Given both the mild course of employment and the rise in the non-farm labor force, unemployment rates are not expected to decline the rest of the year. Domestic and external uncertainties remain as downside risk factors against economic activity and the labor market.

Box
4.1

Determinants of Consumer Confidence Index in Turkey

The literature offers strong evidence that the consumer confidence index can be used to estimate consumption expenditures. Studies along this line have become more popular after Katona (1968) who showed that willingness to buy is at least as important as purchasing power on consumption decisions. Many empirical studies such as Carroll et al. (1994) for the US, Nahuis and Jansen (2004) for some European countries, Delorme et al. (2001) for the UK, and Belessiotis (1996) for France showed that consumer confidence is a leading indicator for household consumption. A limited number of studies on Turkey find a similar result that consumer confidence plays a crucial role in estimating household consumption (Arsoy, 2012; Karasoy and Yüncüler, 2015).

The fact that consumer confidence correlates with consumption expenditures necessitates a better understanding of the factors determining its dynamics. The literature often classifies these factors into two groups: macroeconomic variables (such as industrial production, inflation and unemployment rate) and financial variables (such as exchange rate, interest rates and stock market index). By adopting the methodology in Gürgür and Kılınc (2015), this box identifies the short-run and long-run determinants of consumer confidence in Turkey.

The study utilizes the consumer confidence index constructed by CBRT and TURKSTAT. The dataset covers observations between January 2004 and April 2015. The explanatory variables are industrial production index, unemployment rate, consumer price index, TL/USD exchange rate and consumer loan rate. Table 1 displays the description of variables along with their sources.

Table 1. Data Description

Variable	Abbreviation	Source	Range	Notes
Consumer Confidence Index	CCI	TURKSTAT	2004:01-2015:04	
TL/USD Exchange rate	EXCH	CBRT	2004:01-2015:04	Average of the first two weeks of each month, log
Consumer Loan Rate	INT	CBRT	2004:01-2015:04	
Unemployment Rate	UNEMP	TURKSTAT	2005:01-2015:03	Seasonally adjusted
Industrial Production Index	IPI	TURKSTAT	2005:01-2015:03	Seasonally adjusted, log
Consumer Price Index	CPI	TURKSTAT	2004:01-2015:04	Seasonally adjusted, log

Unit root tests show that the set of variables is not balanced; i.e. the series have different orders of integration. This result, coupled with the relatively low number of observations, necessitates the use of Pesaran's bounds test technique for analyzing the long-run relationship.¹ The bounds test uses the ARDL approach to investigate the presence of cointegration through an unrestricted error correction model. Accordingly, the existence of cointegration is tested using the following equation:

$$\Delta CCI_t = \alpha_0 + (\beta CCI_{t-1} + \theta' X_{t-1}) + \sum_{i=1}^{p-1} \beta_{1i} \Delta CCI_{t-i} + \sum_{i=0}^{p-1} \gamma' \Delta X_{t-i} + \varepsilon_t$$

¹ For further details, see Gürgür and Kılınc (2015).

Where CCI_t is the consumer confidence index, X_t is the vector of explanatory variables, Δ is the first-difference operator and p is the number of lags. The F-test based on the significance of coefficients for the lagged values points to the presence of a cointegration among variables. Therefore, an ARDL model is formed to estimate the long-run relationship between the variables. The model controls for autocorrelation and the simultaneity between variables by including the first differences and lagged values of the explanatory variables. The long-run relationship is formulated as below:

$$CCI_t = \alpha_0 + \theta'X_t + \sum_{i=1}^p \beta_{1i}CCI_{t-i} + \sum_{i=0}^q \gamma' \Delta X_{t-i} + \varepsilon_t \quad (2)$$

The above model is estimated following Pesaran et al. (2001) and results are presented in Table 2. Accordingly, all variables except industrial production index are found to be statistically significant. A rise of 1 percent in the exchange rate reduces the consumer confidence by 0.28 points in the long term, while an equal increase in the CPI lowers confidence by 0.61 points. Similarly, a 1-percent increase in consumer loan rates and the unemployment rate decreases the confidence index by 1.74 and 3.51 points, respectively.

Table 2. ARDL and Long-Run Model Estimation Results

Variable	Parameter	Standard Deviation	t-statistics
EXCH	-0.28	0.06	-4.69***
INT	-1.74	0.31	-5.56***
UNEMP	-3.51	0.75	-4.70***
IPI	0.09	0.19	0.47
CPI	-0.61	0.12	-5.20***

*, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively. All estimations are conducted by Least Squares Estimator.

As a final step, the short-run determinants of consumer confidence are estimated using an error correction model. The estimation results presented in Table 3 show that any disequilibrium between consumer confidence and its correlates is restored quite rapidly as evidenced by the relatively high parameter estimate for Δect , which denotes the first-differenced error correction term. In fact, the half-life of the shocks is as low as 2 months. Moreover, increases in the exchange rate, interest rate, unemployment rate and the CPI lead to an immediate effect on consumer confidence.

Table 3. Short-Run Parameter Estimations

Variable	Parameter	Standardized Parameters	t-statistics
Δect	-0.35	-0.67	-7.56***
$\Delta CCI(-1)$	0.09	0.9	1.29
$\Delta CCI(-2)$	0.04	0.04	0.50
$\Delta CCI(-3)$	0.27	0.27	3.61***
$\Delta CCI(-4)$	0.15	0.15	1.61
$\Delta CCI(-5)$	0.27	0.27	2.92***
$\Delta CCI(-6)$	0.31	0.31	3.35***
$\Delta EXCH$	-0.42	-0.54	-7.40***
$\Delta EXCH(-1)$	-0.08	-0.10	-1.81*
$\Delta EXCH(-2)$	-0.06	-0.07	-0.90
$\Delta EXCH(-3)$	0.14	0.18	2.30**
$\Delta EXCH(-4)$	0.11	0.15	1.82*
$\Delta EXCH(-5)$	0.21	0.28	4.08***
$\Delta EXCH(-6)$	0.15	0.19	2.93***
ΔINT	-0.83	-0.34	-5.14***
$\Delta UNEMP$	-1.55	-0.15	-2.71***
$\Delta UNEMP(-1)$	2.16	0.22	3.78***
$\Delta UNEMP(-2)$	2.85	0.29	3.49***
ΔIPI	0.01	0.00	0.04
ΔCPI	-0.87	-0.18	-3.82***

*, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively. All estimations are conducted by Least Squares Estimator. Standardized parameters are obtained by multiplying parameter estimates by the ratio of their standard deviations to the standard deviation of the dependent variable.

A 1-percent increase in the exchange rate and CPI reduces the confidence index in the short run by 0.42 and 0.87 points, respectively. A similar increase in the consumer loan rates and unemployment rate lowers the confidence index by 0.83 and 1.55 points, respectively. The negative effect of the exchange rate on consumer confidence is counterbalanced partially in the subsequent periods, which points to a complex and non-monotonic relationship between the exchange rate and the consumer confidence index. While depreciation of the Turkish lira lowers consumer confidence due to loss of purchasing power and worsening expectations, it also boosts consumer confidence via the wealth effect owing to the FX-denominated deposits held by consumers. The unemployment rate also has an ambiguous effect on the confidence index. However, this may be due to the measurement of the unemployment rate series in 3-month moving average terms.

In sum, consumer prices, the unemployment rate, consumer loan rates and the exchange rate are found to have both short-term and long-term effects on the consumer confidence index, whereas industrial production index does not have any impact. In the short run, the exchange rate and consumer prices are more effective on the consumer confidence index than the other variables. This shows that, besides providing other benefits, maintaining price stability plays a great role in raising consumer confidence as well.

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Box
4.2

Estimating Income and Price Elasticity of Turkish Exports with Heterogeneous Panel Time Series Methods

Estimation of price and income elasticity of exports is crucial due to its implications on growth, international competitiveness, balance of payments and industrial policies. Price elasticity shows the relative competitive power of a country's production, while income elasticity captures the effects of other factors like export composition, distance and market strategy (Baiardi et al., 2014). Sustainable growth in exports is of great importance regarding the balancing process and stable growth. Moreover, accurate measurement of price and income elasticity of exports produces an important input for designing a sustainable export policy.

This study estimates long-term income and price elasticity of Turkish exports for country groups using panel time series techniques. Country groups are determined on the basis of geographical region (EU27, Other Europe, Asia, MENA) and the level of economic development (developed and developing countries). The study uses bilateral trade data on a country basis by also taking into account the cross-sectional dependence between countries. There are various studies on income and price elasticity of Turkish exports, but most of them utilize aggregate data on exports. Using aggregate data, on the other hand, may cause missing of important movements in micro data due to aggregation bias (Bahmani-Oskooee and Goswami, 2004; Marquez, 2005). In fact, Halicioğlu (2007) and Kaplan and Kalyoncu (2011) show evidence of aggregation bias for the Turkish economy. Aggregation bias is attributed to the heterogeneous structure of both exported goods and the export destination. Various studies exist for the Turkish economy, which consider the heterogeneity on a product basis, while only a few studies are present that allow heterogeneity across country groups. Halicioğlu (2007), Uz (2010) and Berument et al. (2014) estimate export elasticity on a country basis, without making an inference on country groups and considering the inter-country cross-sectional dependence. On the other hand, Çulha and Kalafatçılar (2014) estimate elasticity by country groups, yet employ aggregate data on a regional basis rather than using bilateral trade data on a country basis. This empirical analysis aims to fill this gap in the literature by using data on a country basis and taking cross-sectional dependence between countries into consideration.

The analysis covers the 2005-2013 period and utilizes quarterly data of 67 countries in seasonally adjusted terms, which account for more than 80 percent of Turkish exports. In order to measure the long-term price and income elasticity coefficient of Turkish exports, a standard export demand function is estimated following Goldstein and Khan (1985), which includes external demand and relative prices as follows:

$$\text{Exports}_{i,t} = c + \beta_1 * \text{GDP}_{i,t} + \beta_2 * \text{RER}_{i,t} + \varepsilon_{i,t}$$

Where $\text{Exports}_{i,t}$ denote real exports from Turkey (excluding gold) to country i ; $\text{GDP}_{i,t}$ is real national income of country i in time t ; $\text{RER}_{i,t}$ is the bilateral real exchange rate between country i and Turkey. Real exports and real exchange rate are based on the authors' calculations.²

² For further details, see Bozok et al. (2015).

The above equation is estimated using 3 alternative panel time series methods: Dynamic Ordinary Least Squares (DOLS), Mean Group (MG) and Common Correlated Effects Mean Group (CCEMG). The DOLS method assumes that parameters are homogeneous for all countries; MG and CCEMG allow for heterogeneous parameters among countries, while CCEMG also takes cross-sectional dependence between countries into account. DOLS is implemented in order to assess to what extent the heterogeneity and cross-sectional dependence affect coefficient estimations. To our knowledge, this constitutes the first formal attempt, which uses MG and CCEMG techniques in estimating long-run price and income elasticity of Turkish exports.

Panel data methods used in this study necessitate variables to be $I(1)$, i.e. integrated of order 1 and cointegrated. Unit root tests indicate that country-specific data on exports, real exchange rate and external income are $I(1)$.³ This permits us to apply cointegration tests, the results of which indicate the presence of a stable long-term relationship among these variables.⁴

Table 1. Estimation Results for Developed and Developing Countries

	Income Elasticity			Price Elasticity		
	DOLS	MG	CCEMG	DOLS	MG	CCEMG
Overall	2.46***	2.43***	2.17***	-0.21**	-0.55**	-0.72***
Developed	3.37***	2.57***	2.56**	-0.11	-0.39**	-0.29
Developing	2.16***	2.25***	1.82***	-0.31*	-0.82	-1.26***

*, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively. Dummy variables were included to capture the effects of the global crisis of 2008 and the European debt crisis of 2011 in MG estimation. All dummy variables are significant at 5 percent.

Table 1 presents the estimation results for the overall sample as well as for the developed and developing countries. Income and price elasticity coefficients vary among country groups depending on the selected method of estimation. For example, price elasticity of exports for the developing countries is found to be -0.31 by the DOLS method assuming a homogenous coefficient, while the same elasticity is -0.82 by the MG method assuming heterogeneity in coefficients. On the other hand, the CCEMG method, which takes into account the cross-sectional dependence across countries, shows price elasticity to be -1.26. These findings indicate how results differ when heterogeneity and cross-sectional dependence across countries are not taken into account. According to the CCEMG results, income and price elasticity of exports for the overall sample are 2.17 and -0.72, respectively. The income elasticity of exports for developed countries, which is found to be 2.56, is higher than that for developing countries, which equals 1.82; while the price elasticity of exports for developing countries, which is estimated as -1.26, is higher than that for developed countries, which is -0.29. On the other hand, price elasticity of exports for developed countries is found to be statistically insignificant.

³ Before conducting unit root tests, cross-sectional dependence tests are conducted as the unit root test results may be affected by heterogeneity and cross-sectional dependence. The findings indicate the presence of cross-sectional dependence for all variables. The unit root tests developed by Pesaran (2007) that take cross-sectional dependence into account show that series are not stationary and are integrated of order 1.

⁴ For further details, see Westerlund (2007).

Table 2. Estimation Results by Geographical Regions

	Income Elasticity		Price Elasticity	
	DOLS	MG	DOLS	MG
EU27	2.64***	2.55***	0.16	-0.27**
Other Europe	2.74***	3.35***	-1.30***	0.01
Asia	1.47***	2.14***	-0.12	-0.12
MENA	1.91***	1.44**	-0.49**	-1.56*

*, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively. Dummy variables were included to capture the effects of the global crisis of 2008 and the European debt crisis of 2011. All dummy variables are significant at 5 percent.

Table 2 displays income and price elasticity of exports by geographical regions. Due to low number of cross sections, which prevents the use of the CCMEG method, the table only reports results pertaining to the DOLS and MG methods. The estimation results indicate that price and income elasticity coefficients for Turkish exports vary considerably across geographical regions. MG results suggest statistically significant income elasticity coefficients in all country groups, while the coefficients are higher for EU27 and other European countries. On the other hand, price elasticity coefficients are statistically significant for only EU27 and MENA countries. Income elasticities are higher than price elasticities in all country groups except MENA countries. In other words, Turkish exports are quite sensitive to the income of the destination countries, but less sensitive to relative price changes. This reveals that income of exporting countries is much more influential on exports than exchange rate developments. On the other hand, exports to MENA countries are more sensitive to relative prices.

The differences in coefficient estimates among country groups are attributed to the dissimilarities in the composition of exports to these countries. Besides, varying degrees of vertical integration with each country group as well as distance, cultural proximity and consumer preferences may also play a role in these differences.

In sum, the empirical findings point out that region-specific measures should be taken into consideration for designing trade policies. In addition, the sustainability of exports growth is much more dependent on the income of the trading partners rather than the depreciation of the real exchange rate.

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Box
4.3

Use of Leading Indicators in Forecasting Unemployment Rates

The non-farm unemployment rate is an indicator that entails reliable information about the overall tendency of economic activity. Yet, non-farm unemployment data, which is published within the Household Labor Force Survey, is released with a three-month lag. This increases the importance of finding an accurate leading indicator for timely assessment and forecasting of the labor market developments. Following Gürçihan et al. (2013), this box identifies relevant variables for computing a composite index, which can be used as a leading indicator for the non-farm unemployment rate in Turkey.

In constructing the composite index, the aggregate economic activity, labor market conditions, expectations over future economic activity, credit conditions and variables indicating global economic trends are taken into account. The variables are selected based on their economic justification, release frequency (higher frequency), availability (longer duration) and the need for revision (minimal major backward revision). The series are adjusted for seasonal effects and short-term fluctuations, while extreme values are excluded. Furthermore, the series are normalized and de-trended from their long-run trend using the Hodrick-Prescott filter. Gürçihan et al. (2013) find that the out-of-sample forecast criterion out-performs other methods in variable selection for constructing a composite index to forecast the unemployment rate. Accordingly, this box uses the out-of-sample forecast performance of the series in measuring their information value.

Forecast performance of the series is evaluated by comparing the root-mean-squared-error (RMSE) of the model including the series with that of the baseline model, which is only comprised of the lagged unemployment term. In other words, in the baseline model, the unemployment rate is explained solely by its statistically significant lagged values. In the alternative model, the unemployment rate is explained by its lagged values and also by the candidate series, the forecast performance of which is investigated. Obviously, the number of lags to be included in the model is determined by the statistical significance.

Employing the above method, the unemployment rate for the next month is estimated using each candidate series for all months in the subsequent 12-month period starting from August 2014. Furthermore, the RMSE for each alternative is computed. Accordingly, Table 1 presents the selected series, which return a lower RMSE value compared to the baseline model.

Table 1. Selected Variables and their Relative RMSE Values

	Relative RMSE		Relative RMSE
Kariyer.net Job Posts/Non-Farm Labor Force	0.870	FX Commercial Loans/Nominal GDP	0.964
Consumer Confidence Index	0.917	BTS 3-Month-Ahead Employment Expectations	0.981
Domestic VAT/Nominal GDP	0.866	BTS 3-Month-Ahead Expectation of Orders	0.984
VAT on Imports/Nominal GDP	0.866	Kariyer.net Applications/Non-Farm Labor Force	0.951
Real Exchange Rate Index for Emerging Economies	0.839	Quarterly Change in Consumer Loans/Quarterly Nominal GDP	0.897
Consumer Loans and Credit Cards/Nominal GDP	0.915	Quarterly Change in Mortgage Loans/Quarterly Nominal GDP	0.798

Series in Table 1 are later employed to construct the composite index, which is based on the simple averaging method in accordance with the OECD methodology. In order to represent the labor market developments, Kariyer.net job posts and applications are included in the index. The consumer confidence index and the BTS expectation of employment and orders that reveal firms' expectations are included as survey indicators. Also, loans are included as a financial market indicator to reflect the financing of the real sector via markets. In addition, domestic VAT and VAT on imports are added to account for the economic activity.

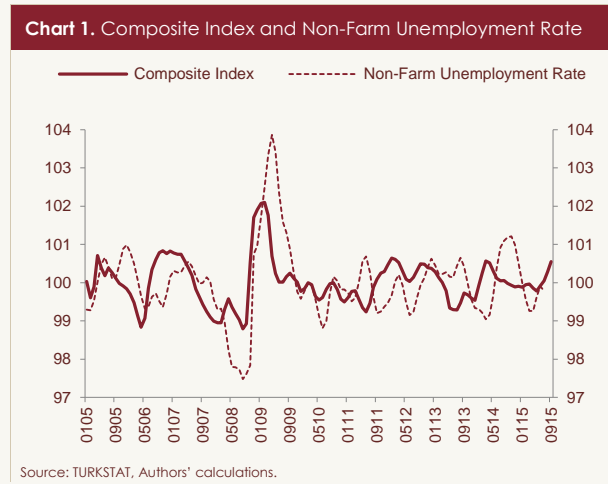


Chart 1 displays a comparison of the composite index and the unemployment rate. Despite showing similarities, the two series seem to display occasional differences as the index may underestimate the high-rated changes in unemployment rate. In sum, the composite index constructed by the series selected by their out-of-sample forecast out-performs the baseline model that explains unemployment rate only with its lagged values.

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Box
4.4

Projections on Labor Force Participation Rate

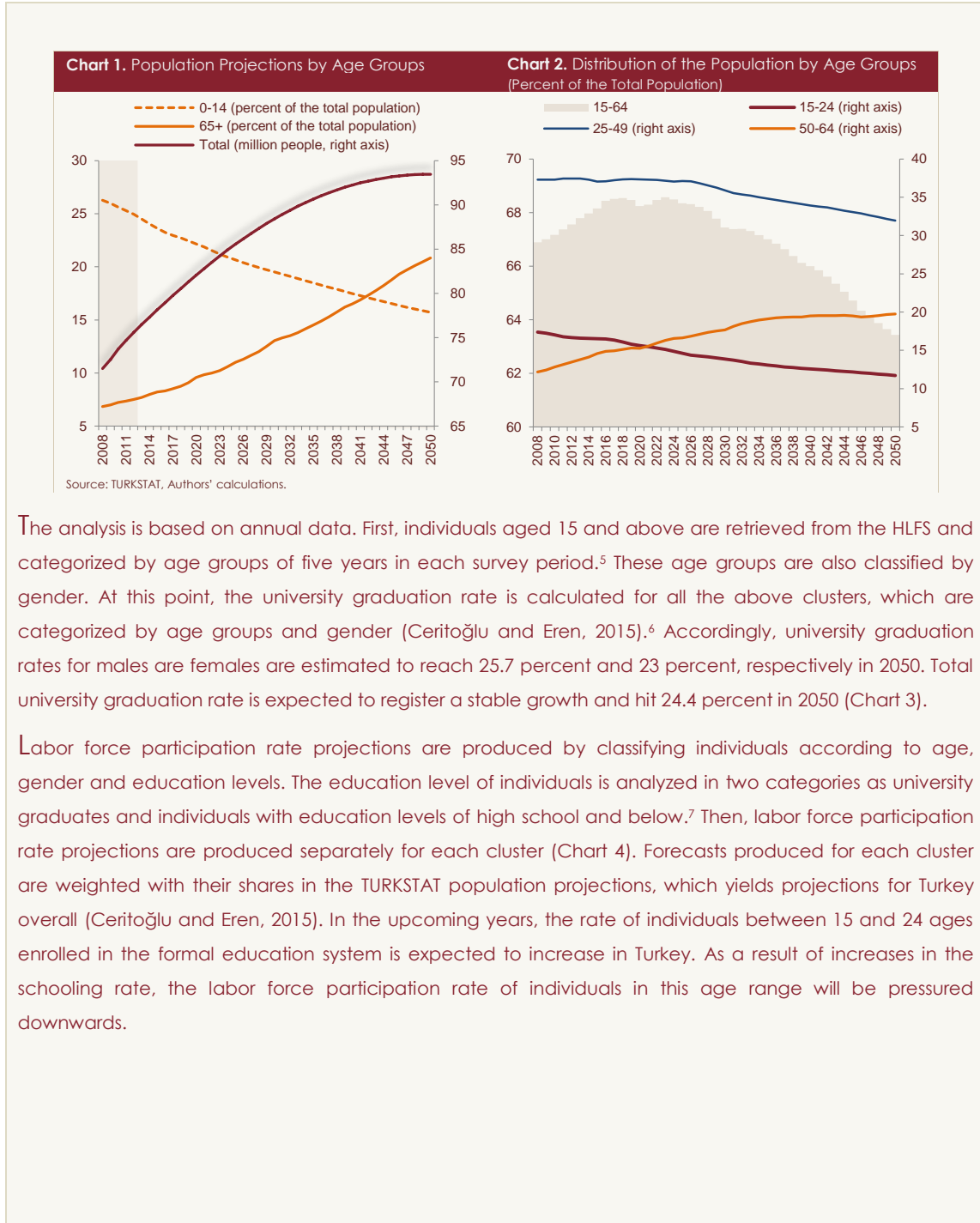
This box presents labor force participation rate projections for the Turkish economy during the 2014–2050 period. Labor force participation rate projections are produced by age, gender and education level using micro data from the Household Labor Force Survey (HLFS) released by the TURKSTAT. The study employs the HLFS data for the 2004–2013 period in addition to the population projections from 2014 to 2050 produced by the TURKSTAT.

TURKSTAT population projections suggest that the aging rate and age distribution of the Turkish population will exhibit considerable changes from 2014 to 2050. Within the total population, the share of the population between 15 and 64, considered as the working age, is expected to fall by around 5 points to 63.4 percent; while the share of the population aged 65 and above is envisaged to rise by 13 points to 20.8 percent until 2050. Concentration of the labor force participation rate of the population at lower age groups may pose a downside risk to the total labor force participation rate. Thus, taking into account this projected change in the demographic structure is considerably important to the labor force participation rate projections. Moreover, the fact that the average retirement age, which was 51 in 2013, will be raised gradually to 65 in the upcoming years is also taken into consideration in this box.

Another factor to be considered when making labor force participation rate projections is the education level of individuals as a measurement of human capital accumulation. According to the data from 2013, the labor force participation rate of university graduates is around 80 percent, while that of individuals with high school and lower education level is 46.7 percent. Given this difference, a rise in the education level can push the labor force participation rate up across the country. With a continued increase in the education level, the university graduation rate in Turkey is expected to catch up with that of developed countries over time.

The analyses are based on the population projections produced under the baseline scenario by the TURKSTAT. The baseline scenario assumes that the total fertility rate per woman, which was around 2 in 2013, will naturally fall to 1.85 in 2023 and 1.65 in 2050. Accordingly, it is expected that total population in Turkey will increase further, yet at a decelerating pace (Chart 1).

The median age, which was 30.4 in 2013, is predicted to rise to 34 in 2023. The Turkish labor market will be one of the most affected areas by the aging of the population. The share of the population of the working age within the total population is anticipated to post a mild increase in the 2013–2023 period, but decline by around 5 points up to 2050 (Chart 2). This projection mainly relies on the decline in the share of individuals between the ages of 25–49 with a higher labor force participation rate within the total population. On the other hand, it should be noted that the share of individuals between 50–64 ages with a lower labor force participation rate is expected to rise within the total population. In addition, the share of the population aged 65 and above is expected to rise by around 13 points.



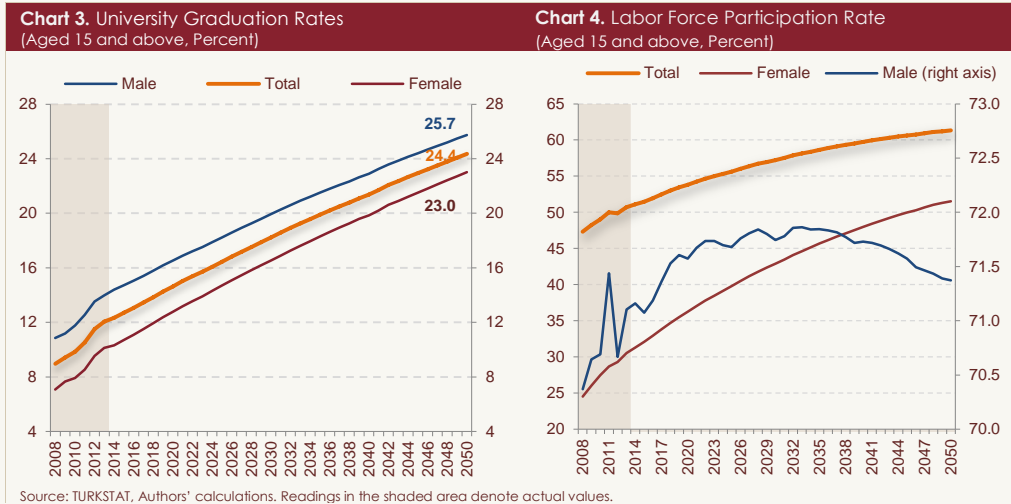
The analysis is based on annual data. First, individuals aged 15 and above are retrieved from the HLFS and categorized by age groups of five years in each survey period.⁵ These age groups are also classified by gender. At this point, the university graduation rate is calculated for all the above clusters, which are categorized by age groups and gender (Ceritoğlu and Eren, 2015).⁶ Accordingly, university graduation rates for males and females are estimated to reach 25.7 percent and 23 percent, respectively in 2050. Total university graduation rate is expected to register a stable growth and hit 24.4 percent in 2050 (Chart 3).

Labor force participation rate projections are produced by classifying individuals according to age, gender and education levels. The education level of individuals is analyzed in two categories as university graduates and individuals with education levels of high school and below.⁷ Then, labor force participation rate projections are produced separately for each cluster (Chart 4). Forecasts produced for each cluster are weighted with their shares in the TURKSTAT population projections, which yields projections for Turkey overall (Ceritoğlu and Eren, 2015). In the upcoming years, the rate of individuals between 15 and 24 ages enrolled in the formal education system is expected to increase in Turkey. As a result of increases in the schooling rate, the labor force participation rate of individuals in this age range will be pressured downwards.

⁵ Labor force participation preferences are analyzed by dividing individuals into 11 age groups as 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64 and 65+.

⁶ For every age and gender group, HLFS 2004 – 2013 realizations and the university graduation rates are separately estimated by power functions.

⁷ In this study, university graduates imply undergraduates (2, 3 or 4-year college graduates) as well as individuals having obtained a graduate degree. Likewise, high school graduates denote individuals with high school diploma or lower education levels.



On account of the social security reform, the average retirement age is anticipated to gradually approach 65 until 2050. Accordingly, the labor force participation rate of individuals in the 50-64 age range is assumed to increase linearly. Moreover, the labor force participation rate of high school graduate females is expected to record a steady increase by starting from a low level and approach the developed country averages afterwards. In this context, high school graduate females are anticipated to provide higher contribution to the expected increase in the labor force participation rate in Turkey in the upcoming years (Table 1).

Table 1. Labor Force Participation Rate Projections by Age Groups (Percent)

	Male				Female				Total			
	15-24	25-49	50-64	Total	15-24	25-49	50-64	Total	15-24	25-49	50-64	Total
2013	53.6	93.0	57.0	71.1	27.9	40.6	22.0	30.5	41.0	67.1	39.4	50.7
2025	53.4	94.0	67.2	71.7	32.2	56.4	33.3	39.8	43.0	75.4	50.2	55.6
2030	53.7	94.3	72.5	71.7	34.1	62.1	39.2	42.9	44.2	78.4	55.8	57.2
2035	53.2	94.6	76.3	71.8	35.6	67.5	44.0	45.7	44.6	81.2	60.1	58.7
2040	52.9	94.8	80.1	71.7	37.0	72.5	49.0	48.0	45.2	83.8	64.6	59.8
2045	52.7	94.9	84.4	71.6	38.6	77.2	53.8	50.0	45.8	86.2	69.1	60.7
2050	52.6	95.0	88.1	71.4	40.2	81.0	58.7	51.5	46.5	88.2	73.4	61.3

Source: TURKSTAT, Authors' calculations.

Under the alternative scenario, which assumes that the distribution of the population by age remains unchanged at 2013 levels, the male labor force participation rate will hit 77.9 percent rather than 71.4 percent in 2050. Moreover, under the same assumption, the total labor force participation rate will increase to 68.9 percent rather than 61.3 percent in 2050. The alternative scenario clearly reveals the strong and adverse effect of the aging of the population on the labor force participation rate.

In sum, this box estimates male, female and total labor force participation rates for Turkey for the 2014-2050 period. Total labor force participation rate is expected to rise in the upcoming years, but at a decelerating pace owing to the aging of the population. This effect is more evident for males, causing a decline in the labor force participation rate.

Lastly, a deceleration or acceleration in the fertility rate in the upcoming years may cause a change in the demographic structure, which may affect the total labor force participation rate. Particularly, a larger-than-expected decline in the fertility rate might lead to a lower total labor force participation rate due to faster aging of the population.

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