4. Supply and Demand Developments

In the last quarter of 2014, GDP grew by 2.6 percent on an annual basis. Thus, growth rate in 2014 reached 2.9 percent, also supported by the upward revisions in the data pertaining to preceding periods. On the production front, the value added of sectors excluding construction displayed a year-on-year increase in the last quarter. Agricultural value added pulled annual growth downwards due to the loss in products upon drought, whereas the value added of construction, industrial and services sectors increased in 2014. On the expenditures side, in the second half of the year, private sector consumption and the demand for machinery and equipment increased on a quarterly basis and contributed to growth, while the contribution of the public sector proved milder. Imports grew faster than exports in the last quarter, causing net exports to add negatively to growth. Across 2014, the low growth rate in Europe and geopolitical problems in the peripheral countries put a cap on exports. Meanwhile, net exports proved the largest contributor to growth among demand components in 2014.

Data released in the first quarter of 2015 suggest a weak outlook in economic activity. Industrial production in the January-February period remained unchanged since the last quarter of 2014. PMI and BTS indicate a low production level in March. Current indicators reveal a decline both in domestic and external demand in the first quarter, that in the latter being stronger. In fact, as imports excluding gold posted a mild increase, while exports excluding gold receded, the deterioration seen in the re-balancing among demand components as of the second half of 2014 continued in the January-February period. Accordingly, economic activity is expected to post low figures in the first quarter.

The outlook for 2015 indicates that the contribution of consumer confidence, financial conditions and income channels to domestic demand will be lower than envisioned in the January Inflation Report. The rise in consumer loan rates and the depreciation of the Turkish lira in the first quarter indicates that financial conditions do not support the consumption demand, while the decline in confidence indices points to lower propensity to spend. Attenuated employment expectations indicate that the income channel may also be less supportive than projected. Against this background, private consumption is estimated to remain weak in the first quarter and register a mild and gradual improvement later on. The analysis of the factors affecting investment demand in the first quarter suggests a persistence of the depreciation in the TL, elevated volatility in the exchange rate and weakened investor confidence. Accordingly, investments are estimated to remain low in the first half, and may improve in the second half, should financial conditions exhibit some recovery. Downside risks to external demand stemming from geopolitical developments persist, while signs of recovery in Europe are considered to be a positive development for our exports. Domestic demand is still expected to be stronger than external demand in 2015, and the current outlook suggests elevated downside risks to growth compared to the previous reporting period.

Output gap indicators show that demand conditions were more accommodative of disinflation in the first quarter of 2015. In fact, capacity utilization rate in the manufacturing industry has remained unchanged on a quarterly basis in the first quarter, yet decreased in February and March. Among the most recent indicators pertaining to the labor market, BTS and PMI surveys suggest a weak outlook in employment in the manufacturing industry in the first quarter. All in all, aggregate demand conditions are expected to give further support to the disinflation process in 2015. It is also projected 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 data, the GDP posted a year-on-year increase of 2.6 percent in the last quarter of 2014 (Chart 4.1.1). Thus, the growth rate stood at 2.9 percent in 2014. On the production side, the value added in non-construction sectors increased on an annual basis, while that of construction contracted by 2.0 percent. Adjusted for seasonal and calendar effects, the GDP grew by 0.7 percent quarter-on-quarter. In this period, the agricultural value added proved the largest contributor to growth with an increase of 4.8 percent compared to the third quarter (Chart 4.1.2). Meanwhile, contribution of industrial and services sectors remained limited, whereas the value added of construction fell by 1.7 percent.

Chart 4.1.1.
Annual GDP Growth and Contributions from the Production Side (Percentage Points)

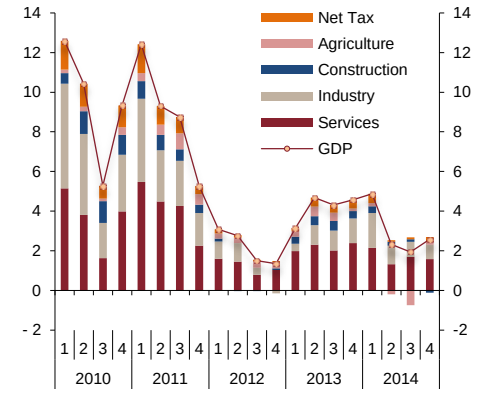
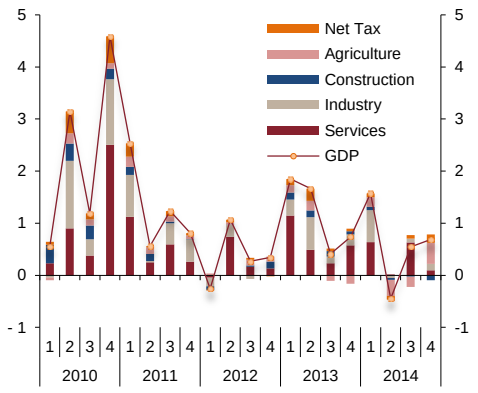


Chart 4.1.2.
Quarterly GDP Growth and Contributions from the Production Side (Seasonally Adjusted, Percentage Points)



Source: TurkStat.

Losses in agricultural production due to drought in 2014 curbed growth in 2014. In fact, the agricultural value added fell by 1.9 percent year-on-year and pulled growth down by 0.2 percentage points (Chart 4.1.3). Growth excluding agriculture proved higher with 3.4 percent. Meanwhile, construction, industrial and services sectors posted a growth rate of 2.2, 3.8 and 3.4 percent, respectively, in 2014. These figures assert that 2014 growth lagged behind that of 2013 also due to the construction and services sectors (Chart 4.1.4). In particular, the contraction in public construction caused a marked deceleration in the value added of construction. On the other hand, industrial value added rose notably despite the deterioration in domestic and external demand across the year.

Chart 4.1.3.
Annual GDP Growth and Contributions from the Production Side (Percentage Points)

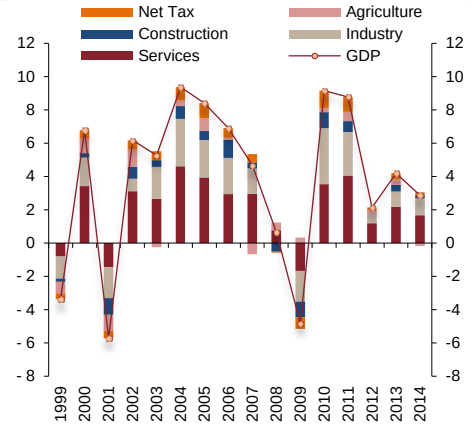
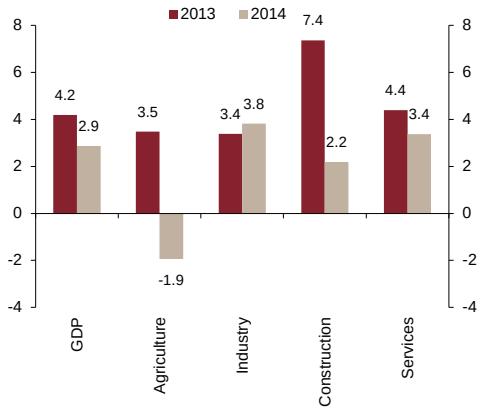


Chart 4.1.4.
Annual Growth Rates
(Percent)



Source: TurkStat.

The slowdown in the annual growth rate of industrial production in the last quarter of 2014 continued with a stronger pace in the January-February period (Chart 4.1.5). Data adjusted for seasonal and calendar effects suggest no increase in industrial production in the January-February period compared to the last quarter of 2014 (Chart 4.1.6). Adverse effects on domestic demand driven by vague global monetary policies and volatile financial markets particularly stemming from exchange rates coupled with languishing exports due to the parity effect and the lack of recovery in external demand restricted the increase in industrial production. Besides, severe weather conditions in January and February had an additional downward effect on industrial production through the sectors directly related to construction activities. March indicators signal that the sluggish outlook in January and February may persist. In fact, PMI indicators hit below 50, while BTS production index for the last quarter also maintained its downtrend (Charts 4.1.7 and 4.1.8). Moreover, the power cut experienced across Turkey on the last day of March is expected to reduce industrial production in March. Against this background, industrial production data adjusted for seasonal and calendar effects are estimated to dwindle in the first quarter.

Chart 4.1.5.
Industrial Production Index
(Annual Percent Change)

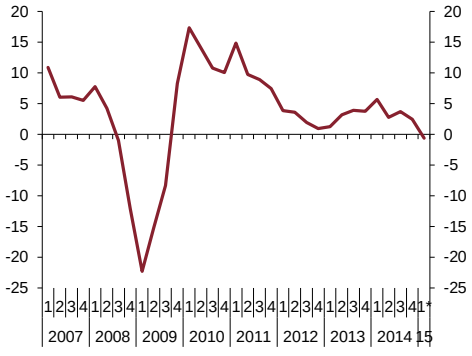
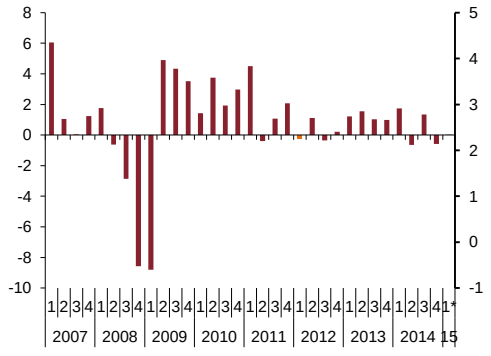
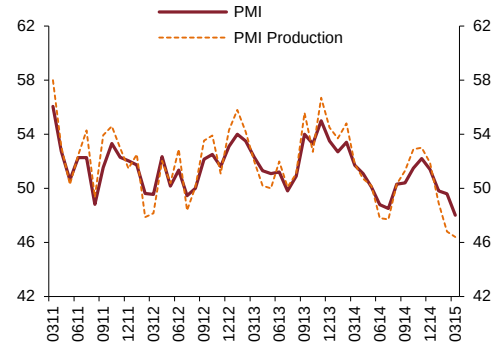


Chart 4.1.6.
Industrial Production Index
(Seasonally Adjusted, Quarterly Percent Change)



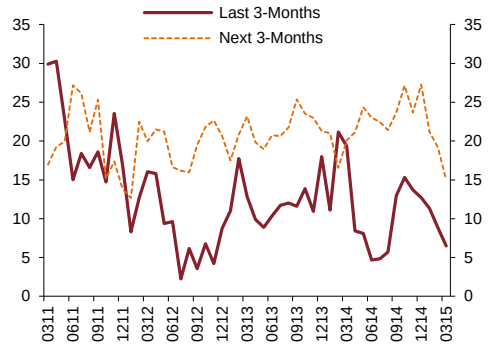
* As of February.
Source: TurkStat.

Chart 4.1.7.
PMI and PMI Production
(Seasonally Adjusted)



Source: Markit.

Chart 4.1.8.
BTS Production Level and Production Expectations
(Seasonally Adjusted, Increase-Decrease)



Source: CBRT.

Should the current outlook in aggregate demand conditions persist, no fast recovery is expected in the value added of industrial production and services. However, if uncertainties lessen in the second half of the year and the anticipated recovery occurs in external demand, then industrial production may see some acceleration. On the other hand, agricultural production is estimated to improve in 2015, and the agricultural value added is expected to support growth. As a result, GDP is projected to register a mild increase in 2015.

4.2. Demand Developments

The GDP data of the last quarter of 2014 on the expenditures side indicate that contrary to the first three quarters of the year, net exports contributed negatively to annual growth, while final domestic demand added remarkably higher to growth than the preceding two quarters particularly owing to private consumption (Chart 4.2.1). A thorough analysis of the year suggests a change in growth composition since 2013. Upon tightened financial conditions and macroprudential measures, private consumption expenditures contracted and public expenditures lost pace, which led the final domestic demand growth to decelerate compared to 2013 and contribute to growth merely by 1.1 percentage points. On the other hand, the net exports started to add positively to growth by 1.8 percentage points due to the rise in exports and the stable course of imports (Chart 4.2.2). Meanwhile, changes in inventories had no contribution to growth in 2014.

Chart 4.2.1.
Annual GDP Growth and Contributions from the Demand Side (Percentage Points)

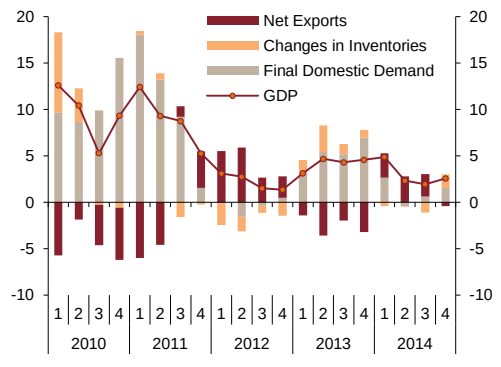
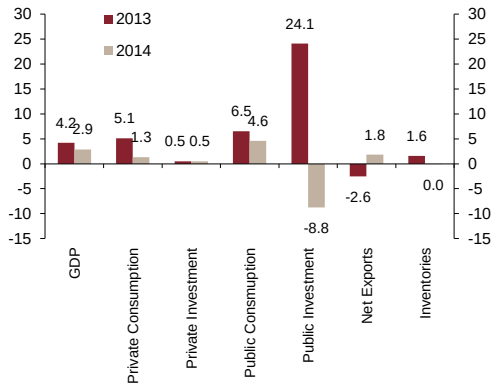


Chart 4.2.2.
Annual Growth Rates
(Percent)



Source: TurkStat.

In the first half of the year, elevated uncertainties, tightened financial conditions and macroprudential measures caused private consumption expenditures to recede. However, in the second half, those uncertainties waned and financial conditions eased, resulting in a recovery in private consumption expenditures, especially in the last quarter. Despite the fall in private construction investment in the last quarter, private investment expenditures remained almost flat upon the sustained recovery in private investments on machinery and equipment (Chart 4.2.3). Meanwhile, public consumption remained flat in this period, while public investment, which has declined since the start of 2014, soared by 2.8 percent. Despite the rise in the last two quarters, public sector demand lagged behind the first-quarter readings (Chart 4.2.4). Public sector demand added 0.1 points to growth in 2014, which is quite below past years and historical averages.

Chart 4.2.3.
Private Investments and the GDP
(Seasonally Adjusted, 2011Q1=100)

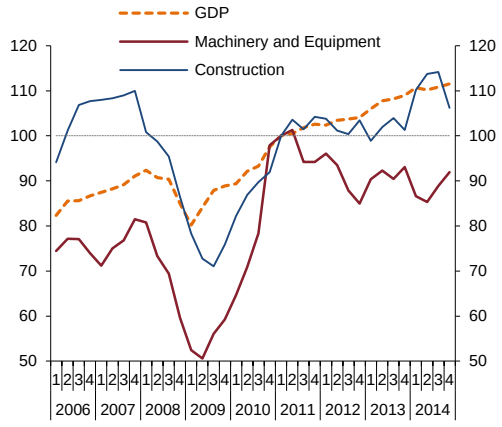
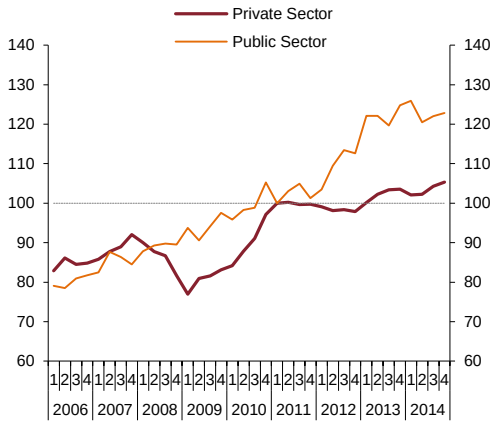


Chart 4.2.4.
Private and Public Sector Demand
(Seasonally Adjusted, 2011Q1=100)



Source: TurkStat.

Data regarding the first quarter of 2015 show that the rebound in domestic demand, which started in the second half of 2014, may halt in this period. Production of consumption goods contracted in the January-February period, while imports of consumption goods increased due to automobiles (Chart 4.2.5). Among investment indicators, production and imports of machinery and equipment also registered a decline in this period (Chart 4.2.6). On the other hand, the rate of increase in automobile sales lost some pace, whereas sales of light commercial vehicles remained on a trend of fast increase (Chart 4.2.7). Tumbling of consumer confidence in this period appears as the major risk factor on consumption demand. Similarly, producers' expectations of orders are also on the decline (Chart 4.2.8).

Chart 4.2.5.
Production and Import Quantity Indices of Consumption Goods
(Seasonally Adjusted, 2010=100)

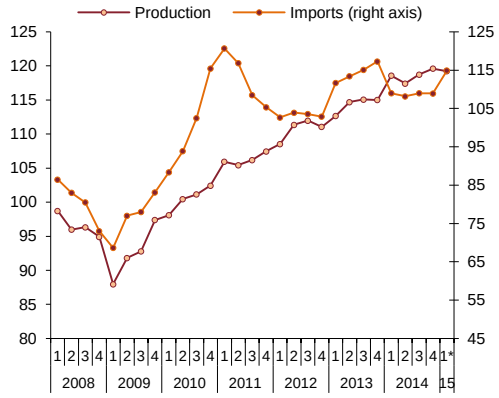
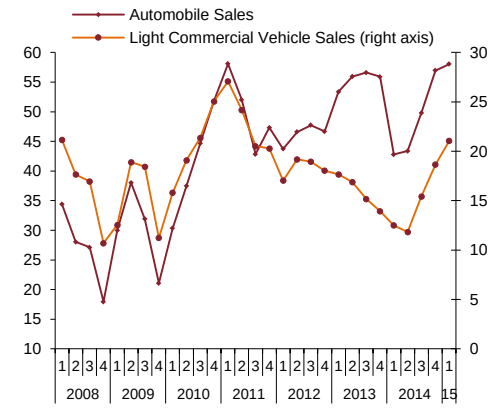


Chart 4.2.6.
Production and Import Quantity Indices of Machinery and Equipment
(Seasonally Adjusted, 2010=100)

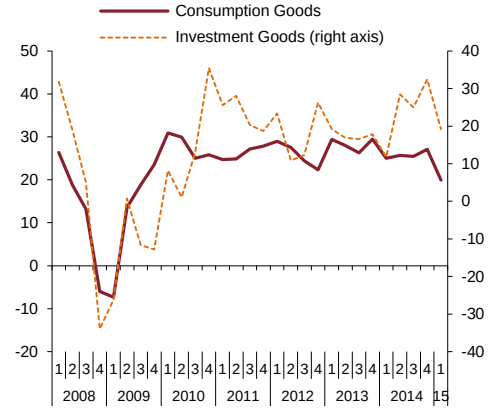
* As of February.
Source: TurkStat, CBRT.

Chart 4.2.7.
Domestic Sales of Automobiles and Light Commercial Vehicles
(Seasonally Adjusted, Thousand)



Source: AMA, CBRT.

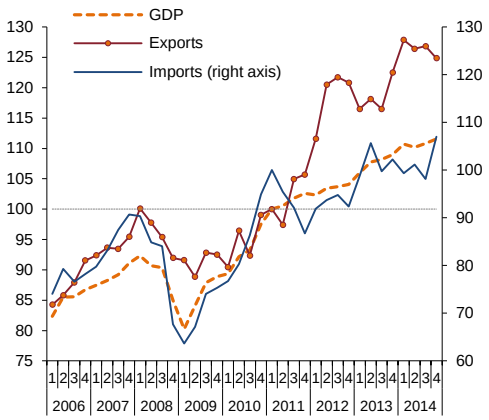
Chart 4.2.8.
BTS Domestic Order Expectations
(Seasonally Adjusted, Increase-Decrease)



Source: CBRT.

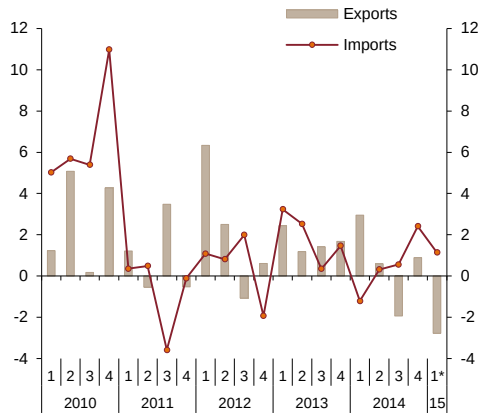
External demand, which restricted the adverse effects on growth born by the domestic demand, which attenuated upon global and domestic uncertainties in the first half of the year, contracted due to the global economic slowdown and geopolitical developments in the second half. The rise in exports of goods and services was replaced by a decline as of the first quarter of 2014, while imports trended upwards amid the rebound in domestic demand and the uptick in gold imports (Chart 4.2.9). Analyzing export quantity index excluding gold, for a better understanding of the effects of global economic developments on exports, reveals that the index edged up in the last quarter. On the other hand, exports excluding gold plunged, while imports excluding gold recorded a mild increase in the first quarter (Chart 4.2.10). This outlook suggests that the re-balancing among demand components has recently discontinued.

Chart 4.2.9.
Exports, Imports and GDP
(Seasonally Adjusted, 2011Q1=100)



Source: TurkStat.

Chart 4.2.10.
Exports and Imports Quantity Indices
(Quarterly Percent Change)



* As of February.
Source: TurkStat, CBRT.

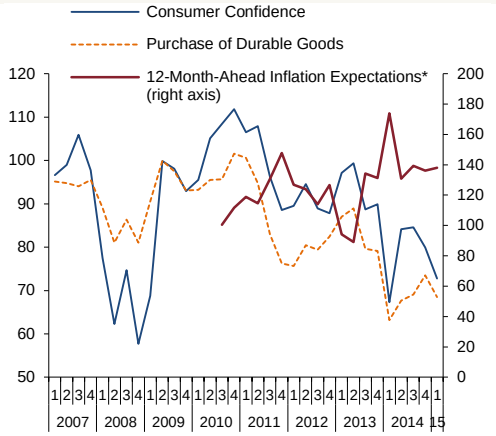
In sum, in the last quarter of 2014, economic activity posted a moderate growth. However, tightened financial conditions, elevated perception of uncertainty and attenuated external demand pulled demand down. In addition, negative supply-side shocks like weather and precipitation conditions caused growth to post lower figures than in 2013. Data regarding the first quarter of 2015 hint at downside risks both to domestic and external demand. Overall, economic activity is believed to have remained weak in the first quarter due also to adverse factors like weather conditions.

Outlook for 2015

The outlook for 2015 in comparison to the January Inflation Report points to a weaker-than-projected support from confidence, financial conditions and income channels to domestic demand. Downside risks to external demand stemming from geopolitical developments still persist, while the European economy displays favorable data. Accordingly, it is estimated that the contribution of domestic demand in the first half of the year will be weak and the rebound in economic activity may become stronger following the second quarter. Meanwhile, downside risks to recovery increased in the inter-reporting period.

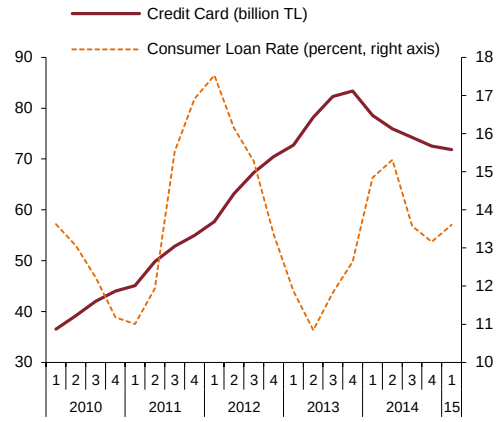
The recovery in the convenience of purchasing durable goods against the decline in consumer confidence was emphasized in the January Inflation Report, which also stated that the confidence channel was expected to support consumption demand also through the projected fall in inflation. Analysis of the first-quarter data suggests that among CNBC-e Consumer Confidence survey indicators, perception of the convenience of purchasing durable goods deteriorated significantly, while inflation expectations have not signaled an improvement (Chart 4.2.11). Meanwhile, financial conditions did not see any easing. In fact, consumer loan rates edged up in the first quarter, while the fall in credit card spending continued, albeit at a slower pace (Chart 4.2.12). Lower employment expectations implied by surveys show that the support from the income channel may also be weaker than projected. Accordingly, private consumption, which improved robustly in the second half of 2014, is estimated to stay weak in the first quarter, and then recover mildly and gradually.

Chart 4.2.11.
Consumer Confidence



* Inflation expectations reflect the answer to the question "Do you think prices will go up, go down or stay constant in the next 12 months?" within the CNBC-e Consumer Confidence Survey. An increase in the index shows deterioration of the inflation expectations.
Source: CNBC-e.

Chart 4.2.12.
Credit Card Spending and Consumer Loan Rates*

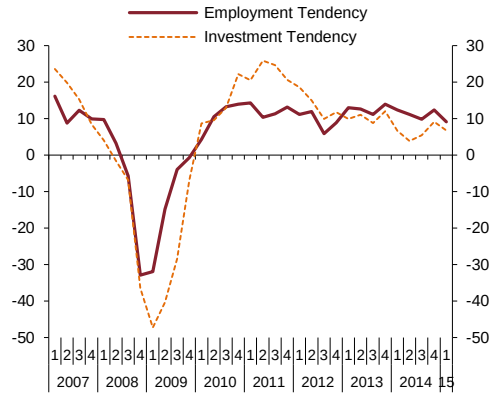


* Average of the housing, automobile and personal loan rates.
Source: BRSA, CBRT.

The January Inflation Report stated that if investor confidence did not deteriorate and financial conditions did not tighten, investments would trend upwards. Movements in these two indicators affect investments through various channels. The depreciation of the Turkish lira can curb investment demand both through the balance sheet channel and the prices of investment goods. As the low course of capacity utilization rates curbs the need for additional investment, factors elevating uncertainty like the exchange rate volatility may cause firms to act more prudently in investment. The Turkish lira depreciated in the first quarter, the exchange rate became more volatile and investor confidence became weaker (Chart 4.2.13). Accordingly, investments are estimated to remain low in the first half, and trend upwards in the second half if financial conditions register an improvement.

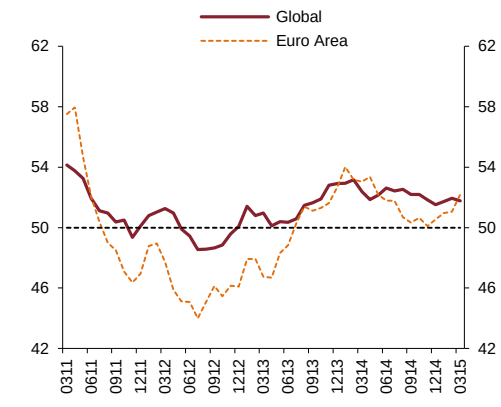
Geopolitical developments continue to pose downside risks to external demand, whereas the recent signs of recovery in Europe are favorable developments regarding exports (Chart 4.2.14). On the other hand, the downward movement in the EUR/USD parity despite the depreciation of the TL stood out as a factor that may curb exports of some sectors.

Chart 4.2.13.
Investment and Employment Tendency



Source: CBRT.

Chart 4.2.14.
Global PMI

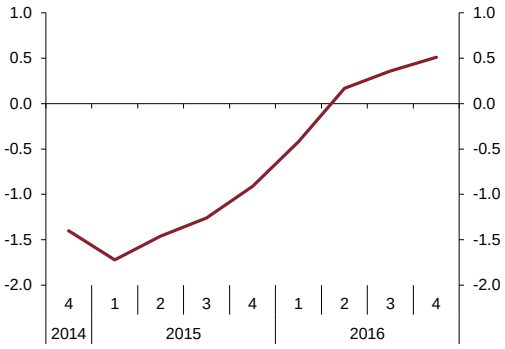


Source: Markit.

To summarize, the weak growth in the European economies due to structural problems, the likely worsening of the growth performances of oil-exporting countries and the vagueness in capital flows and financial conditions following the Fed's announcements remain to be the major downside risks to growth in 2015. The strong post-crisis employment performance, lower oil prices compared to 2014 as well as greater room for maneuvering the monetary policy amid the expected decline in the current account deficit and inflation and the expected correction in the agricultural value added are among the factors to support growth.

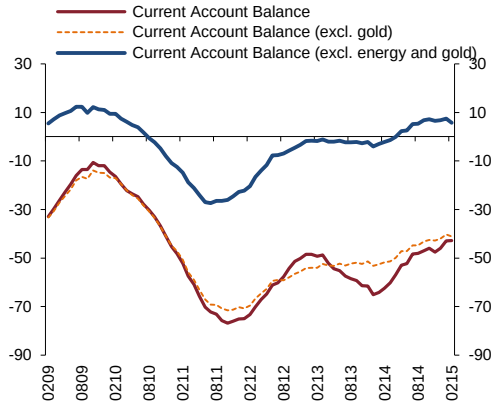
In conclusion, demand conditions underpin the decline in inflation, while the correction in the current account balance continues. Aggregate demand conditions are estimated to remain supportive of disinflation in 2015 (Chart 4.2.15). Improved terms of trade and the current macroprudential framework are expected to contribute to the improvement in the current account balance (Chart 4.2.16).

Chart 4.2.15.
Output Gap
(Percent)



Source: CBRT.

Chart 4.2.16.
Current Account Balance
(12-Month Cumulative, Billion USD)

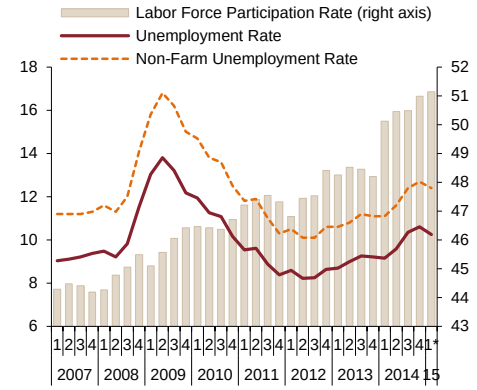


Source: TurkStat, CBRT.

4.3. Labor Market

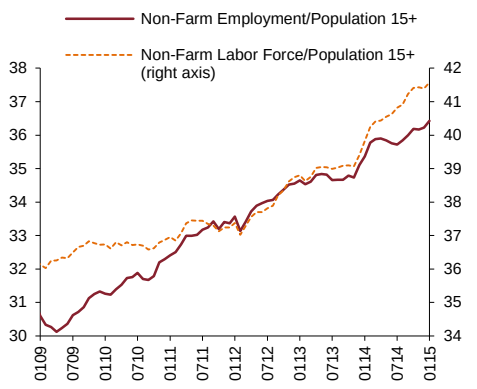
Unemployment rates surged in 2014, exceeding the pre-crisis levels. Increase in the labor participation rate on the one hand, and the deceleration in the non-farm employment in the middle of the year, on the other, drove unemployment rates upward. Non-farm employment posted a recovery in the last quarter, yet this fell short of the rise in the labor participation rate, and unemployment rates remained elevated. The upward trend in unemployment rates following the first quarter of 2014 halted amid the decline in the labor participation rate in December and the surge in employment in January 2015 (Charts 4.3.1 and 4.3.2).

Chart 4.3.1.
Unemployment Rates
(Seasonally Adjusted, Percent)



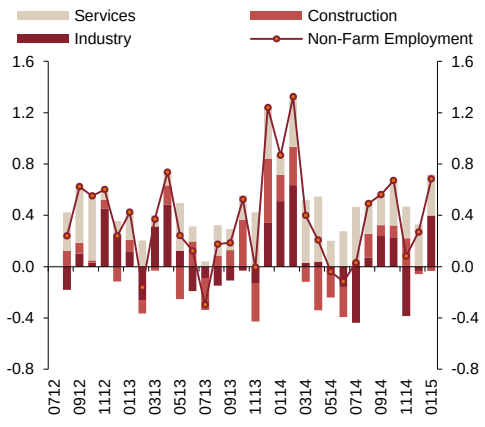
* As of January.
Source: TurkStat.

Chart 4.3.2.
Non-Farm Employment and Non-Farm Labor Force
(Seasonally Adjusted, Percent)



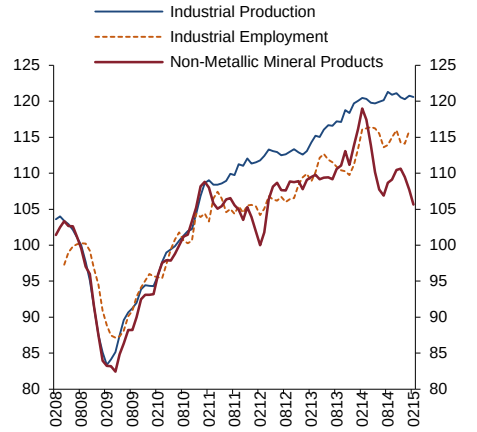
The analysis of non-farm employment by sectors indicates that the services sector became the main driver of non-farm employment growth in 2014 (Chart 4.3.3). In line with the sluggish course of production, industrial employment did not record a notable change in the last quarter after the fall in the third quarter of 2014. Then, having risen in January 2015, it re-settled on its flat path from the previous year (Chart 4.3.4). The construction sector, which remained stable in the third quarter, contributed to the rise in employment in the last quarter, yet edged down in January 2015. As hinted by developments in economic activity, industrial production hovered around the average of the previous quarter in the January-February period of 2015 (Chart 4.3.4). As leading indicators of domestic demand did not experience an improvement and exports remained weak, production is estimated to stay steady in the first quarter. Accordingly, the rise in industrial employment in January is believed to be temporary. The production of non-metallic minerals, which is closely associated with the construction sector, posted a quarter-on-quarter decline in the January-February period of 2015 (Chart 4.3.4). This decline is also attributed to adverse weather conditions, which will probably affect construction employment in the first quarter as well.

Chart 4.3.3.
Contributions to Quarterly Changes in Non-Farm Employment
(Seasonally Adjusted, Percentage Points)



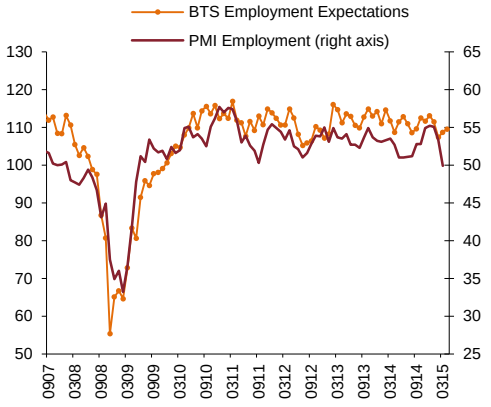
Source: TurkStat.

Chart 4.3.4.
Industrial Production, Employment and Production of Non-Metallic Mineral Products
(Seasonally Adjusted, 2010=100)



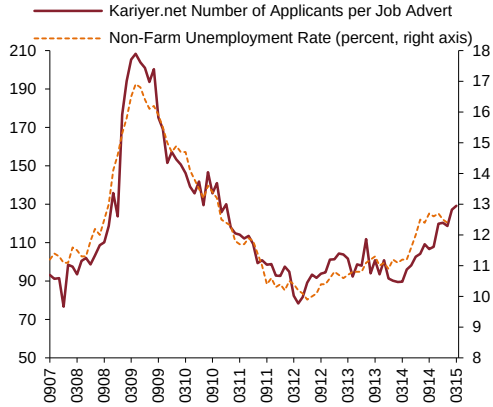
Survey indicators on manufacturing industry firms also point to a slowdown in industrial employment in the first quarter. Survey indicators exhibit a rather negative outlook than that implied by industrial production. The total employment expectation, which is among the BTS indicators reflecting the views of private manufacturing industry firms, posted a slight recovery in March and April, yet still hovers below the last-quarter reading in 2014 (Chart 4.3.5). Similarly, the PMI employment that reflects the assessments of the private manufacturing industry firms declined. Given the poor course of production and the deterioration in survey indicators, downside risks to industrial employment still persist. Meanwhile, according to data obtained from Kariyer.net, a human resources firm, the total number of new job posts followed a flat course in the first quarter, while the rise in the number of applications continued. Accordingly, the number of applications per job post, which is a leading indicator for unemployment, continued to rise in the first quarter (Chart 4.3.6).

Chart 4.3.5.
BTS Employment Expectations and PMI Employment Index
(Seasonally Adjusted)



Source: Markit, CBRT.

Chart 4.3.6.
Number of Applicants per Job Post and Non-Farm Unemployment Rate (Seasonally Adjusted)

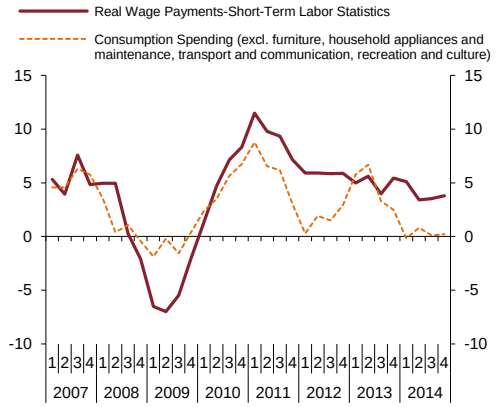


Source: Kariyer.net, TurkStat, CBRT.

Following the first quarter of 2014, employment growth slowed. Still, the increase in employment and wages across the year led total wage payments to support domestic demand. Meanwhile, household domestic consumption spending, which excludes expenditures on durable goods, posted a slight rise in the same period (Chart 4.3.7).

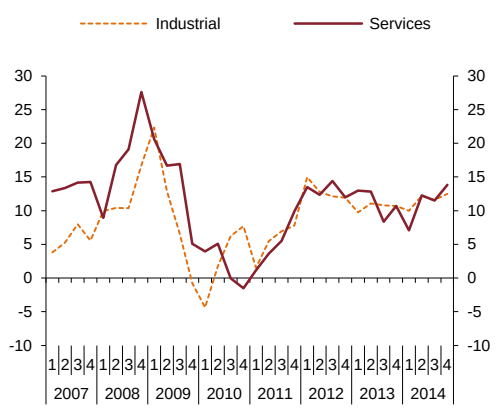
Increases in wages were a probable factor that put upward pressure on firms' costs in 2014. In this period of no productivity gains, hourly wages increased at a faster pace than the projected inflation rate in 2014. Unit wages rose around by 11 percent in 2014 amid the rise in hourly wages (Chart 4.3.8). Based on inflation forecasts, the minimum wage to apply in 2015 implies a real increase in wages. Should productivity remain steady, the rate of increase in unit wages is not anticipated to decline in the upcoming period. Considering their weight in firms' costs, labor costs are of secondary importance, but in the absence of productivity gains, wage hikes might be a factor that adds to inflation inertia, particularly in the labor-intensive services sector.

Chart 4.3.7.
Household Domestic Consumption and Real Wage Payments* (Annual Percent Change)



* Calculated as the weighted average of total wages paid in industrial, construction, trade-services activities. Deflated by CPI.
Source: TurkStat, CBRT.

Chart 4.3.8.
Unit Labor Cost*
(Annual Percent Change)



* In the services sector, unit labor cost is calculated by dividing total wage payments by turnover adjusted by services prices. In the industrial sector, total wage payments are divided by output.
Source: TurkStat, CBRT.

In sum, unemployment rates discontinued to rise amid the surge in non-farm employment in January 2015. The steady support of services employment and the growth of industrial employment, albeit volatile, also had an impact on the declining unemployment rate. Expansion of active labor market policies and the expected increase in public employment, particularly in education, may improve employment after the first quarter. However, given the projected mild increases in the value added and the labor participation rate, unemployment may rise in 2015 compared to 2014.

Box 4.1 Effects of Parity and Energy Prices on the Non-Gold Export and Import Prices

The energy item, which is composed of products such as oil, natural gas, coal and electricity, corresponds to around 20 percent of imports and 4 percent of exports in the Turkish economy. Hence, changes in energy prices are considered to be effective on exports, and more remarkably on imports prices. However, considering that Turkey's exports and imports are not only denominated in the US dollar, appreciation or depreciation of other trading currencies, especially the EUR, against the USD may lead to ups and downs in closely monitored USD-denominated unit value indices (Charts 1 and 2).

Chart 1. Shares of Currencies within Exports (2011-2015 Average, Percent)

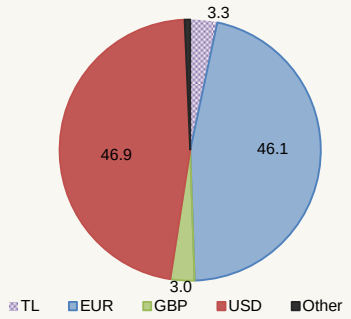
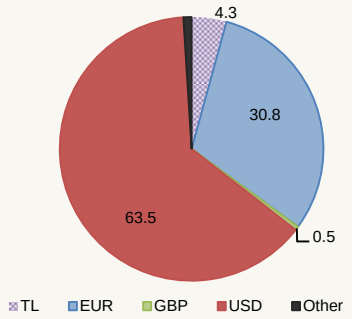


Chart 2. Shares of Currencies within Imports (2011-2015 Average, Percent)



Source: TurkStat.

This effect, called the parity effect, is particularly prevalent in times of radical changes in the value of EUR against the USD. This box attempts to quantify the effect of the changes in parity and energy prices on unit value indices of non-gold exports and imports. Analyzing these effects in quantitative terms will help understand the observed changes in export and import unit value indices more clearly.

The main dataset includes foreign trade statistics and unit value and quantity indices released by TurkStat. The data is of monthly frequency and covers the period 2011M1-2015M2. Foreign trade figures and unit value indices are denominated in USD. The analysis excludes non-monetary gold (SITC 97). Unit value indices for non-gold exports and imports are obtained by using the headline indices and gold sub-indices released by TurkStat.

Contribution of the sub-categories to the change in the headline index is calculated simply by considering that current exports or imports are equal to the sum of sub-categories in each period, which yields the following expression:

$$p_t = \sum_{i=1}^{L} w_{i,t-1} p_{i,t}. \qquad (1)$$

Where L is the number of sub-categories, p_t is the change in the overall price level; $p_{i,t}$ is the percentage change in the price of sub-category i between t and $t-1$; and $w_{i,t-1}$, denotes the share of sub-category i in current exports or imports at $t-1$. Accordingly, $w_{i,t-1}p_{i,t}$ term corresponds to the contribution of sub-category i to p_t in percentage points.

Using only the energy category and the category that excludes both gold and energy would suffice to measure the effect of the annual changes in parity and energy prices on the non-gold unit value indices. Multiplying the annual change in energy prices by the share of energy in the non-gold exports or imports will yield the contribution of this item in percentage points. Similarly, multiplying the annual change in parity by the share of exports or imports excluding gold and energy will return the contribution of the parity in percentage points. The annual change in parity is obtained by weighing the annual changes in each currency against the USD with the shares of the respective currencies within the category that excludes both gold and energy.

As explained above, contributions of changes in energy prices and parity were obtained for the period between 2012M1 and 2015M2 by using the equation number (1). In this period, average annual change in exports (imports) prices excluding gold hovered around -1.7 (-2.7) percent, while the average contribution of energy prices and parity were calculated as -1.2 (-1.0) and -0.2 (-1.0) points, respectively. The average decline in import prices proved approximately 1 point higher than that in export prices. As the share of energy in imports is almost 3 times bigger than that in exports, the contribution of energy to import price changes turns out to be relatively higher.

Both oil prices and EUR/USD parity recorded a tremendous fall especially following the first half of 2014. Meanwhile, export and import prices also trended downwards in this period (Charts 3 and 4). The contribution of the parity to the changes in both indices was positive in the first half of the year, but turned negative as of August at an accelerating pace. Following August, the contribution of energy prices to the changes in both indices also appeared to be negative at an increasing course.

Chart 3. Contributions to Annual Changes in Export Prices (Percent)

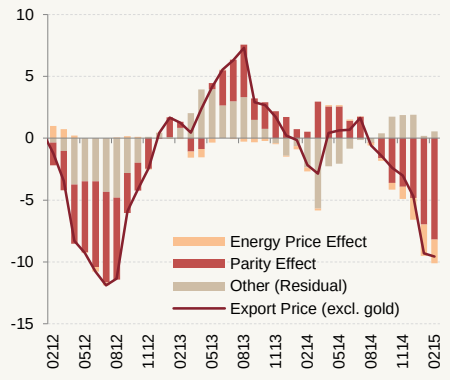
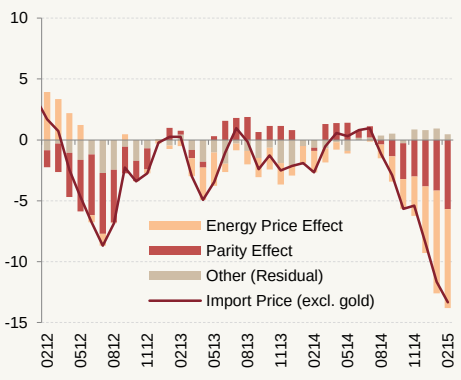


Chart 4. Contributions to Annual Changes in Import Prices (Percent)



Source: TurkStat, CBRT.

In the period 2014M8-2015M2, annual decline in the exports unit value index was about 4.4 percent on average, while the contribution of the change in parity was 4.2 percentage points, and that of the change in energy prices hovered around 1.2 percentage points. Parity appeared as the main driver of export prices in this period. The average annual change in the imports unit value index hovered around -6.9 percent. The average contribution of the changes in energy prices was -4.4 percentage points, while that of the parity stood at -3.0 percentage points. In this period, import prices were mostly affected by energy prices, and secondly the parity, whereas the changes in other prices proved to be minor.

As suggested by findings, recently, annual changes in the unit value indices for exports and imports excluding gold have been mainly determined by parity and energy prices especially in the period 2014M8-2015M2. These results reflect the share of energy item and currencies other than the US dollar (especially the euro) within Turkish exports and imports besides the magnitude of the change in respective prices.

Box 4.2 Minimum Wage and Wage Distribution

Minimum wage practices, which aim at securing a certain state of welfare and life standard for workers concern a considerable part of the Turkish labor market. Around 35 percent of all wage employees earn minimum or below-minimum wages. This fact can be confirmed through wage distributions. Chart 1 illustrates wage distributions for 2005 and 2013 using the micro datasets of the TurkStat Household Labor Force Survey (HLFS). Minimum wages for the respective years are depicted by vertical lines. Accordingly, there is significant degree of concentration around the minimum wage, which indicates that minimum wage policies affect wage distribution; all wages saw a real increase in the 2005-2013 period and wages cumulated more around the minimum wage in 2013.

Although the minimum wage policy applies to the formal labor market, increases in minimum wage affect unregistered workers as well.[1] Wage distribution of registered employees resembles that of employees overall with a second peak formed around the minimum wage (Chart 2). On the other hand, a quasi-normal wage distribution can be seen for unregistered employees, where the average wage is close to the minimum wage. Wage distributions have trended upwards both for registered and unregistered workers since 2005. This common movement in formal and informal labor markets reflects the fact that the minimum wage is taken as a reference value even for unregistered workers who are not bound by the minimum wage regulations, which implies that the two markets are not independent from each other.

Chart 1. Wage Distributions
(Kernel Density Estimation)

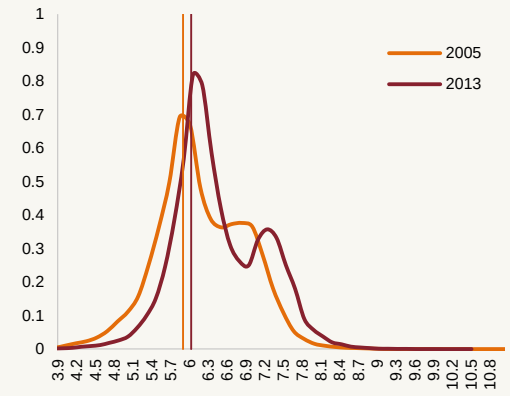
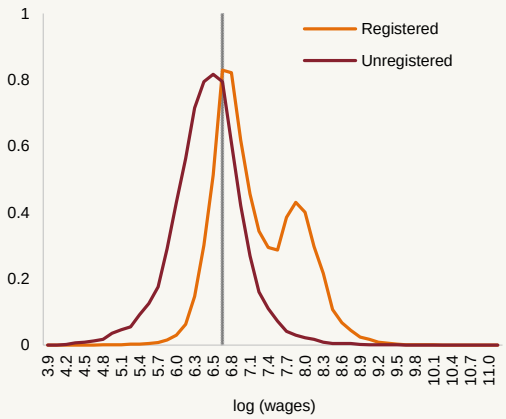


Chart 1. Wage Distributions in 2013
(Kernel Density Estimation)



Source: TurkStat HLFS, Authors' calculations.

The Share of Workers at and below the Minimum Wage by Sectors

Table1 shows the share of employees working at and below the minimum wage for the 2011-2013 period using HLFS micro datasets by sectors. The measurements are based on wage and per diem workers. Accordingly, the share of employees working at and below the minimum wage varies significantly across

[1] Khamis (2013) discusses the effects of increases in the minimum wage on the informal labor market.

sectors. The share of employees working at and below the minimum wage in the overall economy is 35 percent. This share is 38.2, 41.3 and 30.2 percent in industrial, construction and services sectors, respectively. This share goes up to 72 percent in the agricultural sector, and there are sub-sectors under industrial and services sectors where employees working at and below the minimum wage account for more than 50 percent of all employees. Across sub-sectors, those which are mostly dominated by employees working at and below the minimum wage are classified as other services, which include dry cleaning and personal care like hairdressing, food and beverage services and trade sectors. On the industrial sector front, those sectors which mostly employ minimum or below-minimum wage workers are manufacture of food, clothing, furniture, fabricated metal products and textiles, which also happen to be labor-intensive sectors. Accordingly, minimum wage policies in these sectors are expected to be more influential in the labor cost and the pricing behavior in turn.

Table 1. The Share of Employees Working at and below the Minimum Wage* (NACE REV2 Sector Classification, 2011-2013 Average)

	Minimum wage earners (1)	Earners below minimum wage (2)	Minimum wage and less Earners (1)+(2)	Share of sector within wage employees
Total	**12.0**	**23.0**	**35.0**	**100.0**
Agriculture	11.7	60.3	72.0	2.8
Industry	17.4	20.7	38.2	27.0
Manufacture of food products	18.3	33.1	51.5	3.1
Manufacture of wearing apparel	21.7	28.4	50.1	4.7
Manufacture of furniture	18.0	25.2	43.2	1.4
Manufacture of fabricated metal products	15.5	22.5	38.0	1.5
Manufacture of textiles	25.6	21.1	46.7	2.9
Manufacture of other non-metallic mineral products	19.9	18.1	38.0	1.6
Manufacture of rubber and plastic products	17.7	17.8	35.5	1.1
Manufacture of basic metals	12.5	11.1	23.6	1.2
Manufacture of motor vehicles	11.0	6.5	17.5	1.4
Construction	13.4	27.9	41.3	8.0
Services	**9.6**	**20.6**	**30.2**	**62.2**
Other services	13.5	59.8	73.2	1.1
Catering services	16.1	46.0	62.1	4.3
Motor vehicles trade	14.4	39.7	54.1	1.9
Retail trade	17.1	39.1	56.2	8.3
Land transport	12.7	27.0	39.8	3.0
Accommodation	16.1	24.4	40.5	1.5
Wholesale trade	13.9	20.9	34.7	3.4
Security and investigation activities	15.6	13.7	29.3	1.4
Services to buildings	19.6	12.3	31.9	3.0

* Only wage and per diem employees are included in the calculations. Those who earn within the 5% neighborhood of the minimum wage in the respective year are considered to be minimum wage earners. Those who earn less than the 5% neighborhood of the minimum wage in the respective year per month are considered to be earners below the minimum wage. NACE REV2 accommodates 87 sectors. Due to space constraints, the table includes only the sectors with high shares of employees working at and below the minimum wage and at the same time those sectors with an employment share above 1 percent.
Source: TurkStat HLFS.

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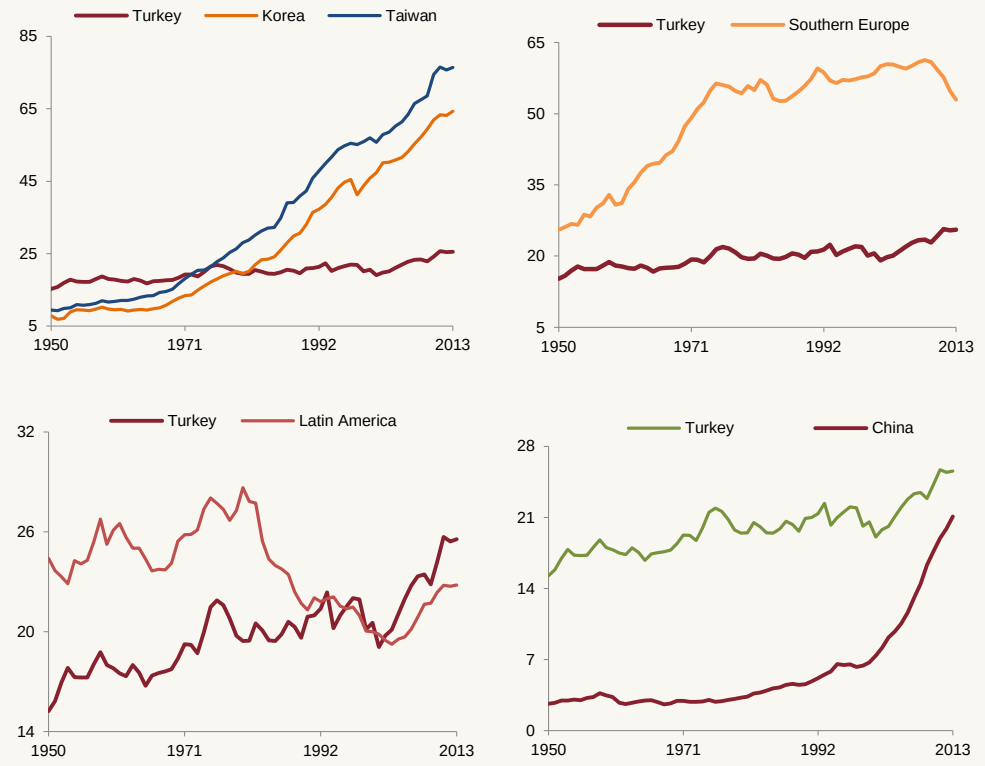
Khamis, M., 2013, Does the Minimum Wage Have a Higher Impact on the Informal than on the Formal Labour Market?, Applied Economics, 45(5): 477–495.

Box 4.3 Some Observations on the Convergence Experience of Turkey

This box presents some comparative information for a better understanding of the convergence experience of Turkey from a historical perspective. Accordingly, Chart 1 displays the ratio of per capita GDP in Turkey and various country groups to per capita GDP in the US during the period from 1950 to 2013. The data employed in the analysis are obtained from the latest version of the Conference Board Total Economy Database released in January 2014. Measurements are adjusted for purchasing power parity to correct for differences in relative price levels across countries. The ratio of per capita GDP in Turkey to that in the US rose from 15 percent in 1950 to 22 percent in 1976. The Turkish economy experienced a relative deterioration starting from 1977 and per capita income contracted to about 1/5th of that in the US in 2001.

Chart 1. Convergence to the US (Percent)



Source: The Conference Board Total Economy Database, Üngör (2014).

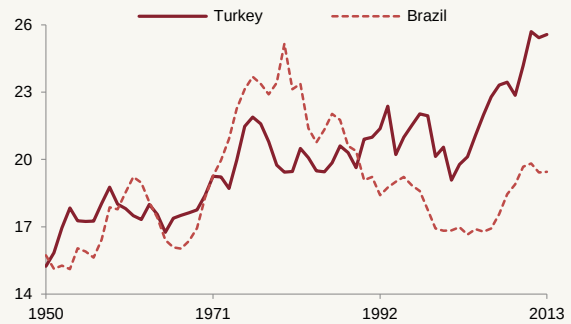
The Turkish economy improved notably on the back of the comprehensive economic reform program enforced right after the 2001 crisis. The institutional infrastructure of the economy was also enhanced through this program. Major reforms regarding the maintenance of fiscal discipline, the establishment of CBRT independence, the adoption of the inflation targeting regime and the implementation of the banking sector reform had effects on growth. Thus, per capita national income trended significantly upwards after 2002. Against this background, the ratio of per capita GDP in Turkey to that in the US reached 19.8 percent in 2002 and 23.4 percent in 2008. In 2013, in the aftermath of the global crisis, this ratio went above 25 percent.

Comparing Turkey's convergence experience to some country groups will provide clarification. Accordingly, the first country group is South Korea and Taiwan, the so-called Asian Dragons. Korea's per capita income hovered around 10 percent of that of the US until the second half of the 1960s, but now it is about 65 percent. Southern Europe, which comprises Spain, Portugal and Greece, was similar to Turkey in the 1950s with respect to per capita GDP. These countries caught up significantly with the US by the mid-1970s, while Turkey remained relatively stagnant (İmrohoroğlu et al., 2014).

Korea and Taiwan stand out as cases of growth and development, while Latin American countries (Argentina, Bolivia, Brazil, Colombia, Costa Rica, Mexico, Peru, Chile and Venezuela) present an opposite situation. Relative income in the Latin American countries neared 29 percent of that in the US in 1980, yet this ratio receded to 23 percent in 2013. Meanwhile, per capita income in China was less than 3 percent of the per capita income in the US in 1950. This relative income level persisted for a protracted period. As a result of the fast transformation process starting from end-1978, which spurred economic growth, structural changes and reforms, the ratio of per capita income in China to that in the US stood at 4.6 percent in 1990, reached 6.7 percent in 2000 and 14.4 percent in 2008. This ratio went above 21 percent in 2013.

This comparison presented in Chart 1 suggests that Turkey and especially the Latin American countries evolved on a similar path. This is particularly more apparent in the Turkey-Brazil comparison displayed in Chart 2. Turkey is closer to Brazil than to Korea with respect to per capita income. From the 1960s until now, Korea has been constantly closing the income gap with the richest countries of the world. On the other hand, neither Brazil nor Turkey displayed convergence in the last decades of the past century.

Chart 2. Convergence to the US (Percent)



Source: The Conference Board Total Economy Database, Üngör (2014).

Following the lost decades, the Turkish economy experienced a fast pace of growth in the post-2002 period. For example, Turkey was ranked the second fastest growing country in terms of real GDP growth (in local currency), and the fifth in terms of per capita GDP growth adjusted for purchasing power parity among OECD countries in the 2004-2012 period (Üngör and Kalafatcılar, 2014).

Üngör (2014) presents a growth-accounting analysis of the Turkish economy for the pre-2002 and post-2002 periods for a better understanding of growth dynamics. This analysis is based on a Cobb-Douglas production function as follows:

$$Y = AK^{\alpha}(Lh)^{1-\alpha}$$

In this equation, Y is real GDP, K is physical capital, L is employment, and h is average human capital per-worker. Physical capital elasticity of production is depicted as α. A represents the level of the technology, which corresponds to total factor productivity (TFP). TFP provides a comprehensive outlook of not only technological progress, but also the level of institutions and institutional structure in the country that affect the output both directly and indirectly. In this context, growth (increase in output) of a country depends on the growth of physical capital, human capital and labor factors besides technological progress. The above equation can be re-written as:

$$y = Ak^{\alpha}h^{1-\alpha}$$

In this expression, y is output per worker, and k is physical capital per worker. Taking the logarithms of both sides of the above production function enables to calculate growth rates. These rates are displayed for the Turkish economy in Table 1 for various sub-periods.[2]

Table 1. Sources of Growth in Turkey (Annual Percent Change)

		Contribution of components		
Period	Labor Productivity	Physical Capital Per Worker	Average Human Capital Per Worker	Total Factor Productivity
1972-1976	4.61	3.68	0.68	0.25
1977-2001	1.66	1.54	0.69	-0.57
2002-2007	5.34	2.30	0.46	2.59
2008-2010	-1.29	-0.11	0.59	-1.76

Source: Üngör (2014).

About 80 percent of the increase in labor productivity (output per worker) during 1972-1976 stemmed from increases in physical capital per worker. In the 1977-2001 period, the decline in the growth rate of physical capital per worker (compared to the previous period) and the fall in TFP growth caused the output per worker to remain low. The GDP per worker grew above 5 percent during 2002-2007. Accumulation of physical capital per worker and the improvement in TFP are considered to be the major drivers of this growth. The drop in output per worker in the global crisis between 2008 and 2010 was mainly fuelled by the TFP component.

In addition to Üngör (2014), Üngör and Kalafatcılar (2014) also examine the effects of productivity, employment and population on the per capita income in Turkey compared to other OECD countries in the 2004-2012 period. Per capita income is composed of three components: labor productivity, the ratio of employment to the working-age population and the ratio of the working-age population to the total population. Results displayed in Table 2 suggest that during 2004-2009, changes in labor productivity proved to be the leading factor affecting the growth of per capita income. On the other hand, increases in employment in the working-age population during 2009-2012 can account for nearly two thirds of the growth in per capita income. These findings indicate that the analyzed period can be divided as the period of growth driven by the pre-crisis productivity and the period of post-crisis growth fuelled by employment.

[2] For further details, see Üngör (2014) and Üngör and Kalafatcılar (2014).

Table 2. Composition of per capita income in Turkey, 2004-2012 (Annual Percent Change)

Period	Per capita income	Contribution of components		
		Labor productivity	Ratio of employment to working age population	Ratio of working-age population to total population
2004-2005	6.80	5.88	0.49	0.43
2005-2006	5.43	4.91	0.09	0.43
2006-2007	3.34	3.03	-0.12	0.43
2007-2008	-0.53	-1.52	0.63	0.36
2008-2009	-6.11	-5.34	-1.39	0.62
2009-2010	7.63	2.76	4.37	0.51
2010-2011	6.97	1.91	4.51	0.54
2011-2012	0.53	-0.69	0.82	0.41
2004-2007	**5.19**	**4.61**	**0.15**	**0.43**
2007-2009	**-3.32**	**-3.43**	**-0.38**	**0.49**
2009-2012	**5.05**	**1.33**	**3.23**	**0.49**
2004-2012	**3.01**	**1.37**	**1.17**	**0.47**

Source: Üngör and Kalafatcılar (2014).

In sum, this box presents selected observations from the past regarding the Turkish economy in the context of development economics, which seeks to answer why per capita GDP levels differ among countries. The results reveal that per capita income in Turkey, in a historical perspective, does not catch up with the per capita income in the US. Furthermore, a comparison of the convergence experience of Turkey with certain country groups presents similarities with Latin American countries, and Brazil, in particular. Finally, the last decades of the past century can be marked as the lost decades for the Turkish economy, whereas the subsequent 2002-2007 period is the period of (relatively) high growth.

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Box 4.4 Unobserved Differences in Firms' Decisions on Exports and Uncertainty

The variety of destination countries for our exports has increased in recent years. Meanwhile, the incentives for exports have also increased. Knowing whether selling products in various markets forms a synergy for firms, and if so, measuring this effect is useful for export subsidy policies.

This box gives a summary of the findings by Ulu (2014), which analyzes whether the variety of the destination countries has an effect on firms' entry to other markets and their performance in these markets by including unobserved abilities of firms into the econometric analysis.

In so doing, this box employs data on the Turkish manufacturing industry firms pertaining to the 2003-2008 period, which is based on the Structural Business Statistics and Foreign Trade Statistics of TurkStat. Structural Business Statistics include some selected annual balance sheet and income table items, while Foreign Trade Statistics provide data on commodity transactions occurring at customs.

$$D_{jt}^{d} = \beta X_{jt}^{d} + \gamma Z_{jt}^{d} + \alpha_{Dt}^{d} f_j + \varepsilon_{djt} \qquad (1)$$

In the above equation, D_{jt}^{d}, is the entry decision of firm *j* to the country *d* at time *t*. This decision depends on whether the firm's expected net current value is positive or negative after paying the entry cost into this market. Obviously, the firm will enter the market if it expects a positive net current value; otherwise, it will stay out. This decision depends on observable variables X_{jt}^{d}, which capture information regarding the firm, the destination country and the time, which all affect the turnover, as well as other observable variables, Z_{jt}^{d}, which affect the costs of entry to the market and operating in the market. Furthermore, firms' abilities, which are unobservable, are also important and hence the firm will also consider these factors while making its decision.

$$R_{jt}^{d} = \beta X_{jt}^{d} + \alpha_{Rt}^{d} f_j + \theta_{djt} \qquad (2)$$

In equation (2) R_{jt}^{d} represents the turnover obtained by the firm *j* following its entry to the market of the country *d* at time *t*. α_{Dt}^{d} and α_{Rt}^{d} show the interaction of f_j's, which are the unobserved abilities of the firm affecting the decision of the firm to enter the market and the turnover obtained by the firm with the destination country and time, respectively.

Information on the balance sheets of firms facilitates the calculation of total factor productivity for these firms. Assuming that total factor productivity is a function of unobserved abilities of the firm, estimated firm productivity can be projected onto unobserved firm abilities through the functional form expressed in Equation (3).

$$z_{jt} = \alpha_{zt} f_j + \vartheta_{jt} \qquad (3)$$

Results of simultaneous estimations of Equations (1), (2) and (3) are presented in Tables 1 and 2. Accordingly, the real effective exchange rate obstructs firms' entry into foreign markets in all sectors except for the automotive sector. Appreciation of the domestic currency in real terms makes the domestically produced commodities more expensive for foreigners. Thus, when the price elasticity of demand is greater

than 1, the turnover of firms is expected to contract in the respective markets along with the appreciated exchange rate. However, the turnover of firms increases alongside the rise in the real exchange rate in all analyzed sectors. If the demand for commodities in a market in a certain country is inelastic, a decline in the number of firms exporting products from that country to the market leads to a rise in the average demand and sales revenues of the firms that manage to send products. Real exchange rate elasticity of sales revenues in a foreign market is the lowest in the machinery sector with 0.07 and highest in the apparel sector with 0.17.

Table 1. Parameter Estimations for Market Choice*

	Food		Apparel		Metal		Machinery		Automotive	
	NF	F	NF	F	NF	F	NF	F	NF	F
Constant	−3.018**	−3.428**	−3.767**	−3.013**	−1.209**	−1.211**	−0.804**	−0.825**	−1.972**	−1.579**
	-0.001	-0.273	-0.001	-0.202	-0.001	-0.161	-0.001	-0.129	-0.001	-0.187
Exchange Rate	−0.061**	−0.087**	−0.019**	−0.107**	−0.025**	−0.022**	0.002**	−0.007	0.015**	0.015
	0.000	-0.014	0.000	-0.022	0.000	-0.008	0.000	-0.006	0.000	-0.009
Unit Cost	−0.036**	−0.057**	−0.003**	0.051**	−0.030**	−0.025**	0.003**	0.006	0.062**	0.095**
	0.000	-0.008	0.000	-0.010	0.000	-0.010	0.000	-0.008	0.000	-0.012
Market Size	0.055**	0.031**	0.170**	0.156**	0.043**	0.046**	0.044**	0.027**	0.161**	0.138**
	0.000	-0.008	0.000	-0.008	0.000	-0.007	0.000	-0.005	0.000	-0.008
Previous Period	2.050**	2.114**	1.671**	1.703**	1.853**	1.940**	1.745**	1.775**	2.116**	2.156**
	0.000	-0.024	0.000	-0.018	0.000	-0.024	0.000	-0.017	0.000	-0.024
Distance	−0.053**	−0.009	−0.116**	−0.154**	−0.251**	−0.263**	−0.254**	−0.224**	−0.253**	−0.219**
	0.000	-0.036	0.000	-0.028	0.000	-0.021	0.000	-0.016	0.000	-0.024
Distribution Margin	0.140**	0.118**	0.186**	0.166**	0.126**	0.105**	0.118**	0.112**	0.115**	0.111**
	0.000	-0.004	0.000	-0.004	0.000	-0.003	0.000	-0.002	0.000	-0.003
Tariff	−0.032**	−0.047**	−0.067**	−0.122**	0.034**	0.027**	0.009**	0.014	−0.011**	−0.066**
	0.000	-0.018	0.000	-0.021	0.000	-0.015	0.000	-0.013	0.000	-0.021

* Parameter estimations are based on the simultaneous estimation of equations (1), (2) and (3). NF represents the specification that excludes unobserved abilities of firms, while F represents the model including these abilities in the specification. Standard deviations of parameters are given under the parameters. ** denote 1 percent statistical significance level. Exchange rate is the real exchange rate. Unit cost is the unit production cost. Market size is the total imports of the destination country. Previous period is the dummy variable which takes value 1 if the firm exported to the destination country in the previous period. Distance is the distance between Turkey and the destination country in kilometers. Distribution margin is the number of countries in which the firm operated within the respective period. Tariff is the average tariff rate effective in the destination country. For further details, see Ulu (2014).

Rising unit production costs are an obstacle to selling food and metal products in foreign markets. However, the opposite applies to the apparel and automotive sectors. This may be due to our inability to observe the quality of the products included in the analysis. If producing higher quality products increases unit production costs, producing higher quality products with higher unit costs may render it easier to sell goods in foreign markets. Following the entry to the market, we see that rising unit production costs lower the turnover in all sectors. The impact of a 1-percent increase in costs is most apparent in the automotive sector with a decline by 0.762 percent in the turnover, while the food sector stands out as the least affected one with a turnover falling only by 0.038 percent.

The market size of the destination country increases the possibility of entering the respective market and also raises the turnover in all sectors after the entry. Results indicate a positive correlation between the market size and unobserved abilities of the firm. The inclusion of unobserved abilities of firms causes the turnover elasticity of market size to decline from 0.237 to 0.043; from 0.289 to 0.109; from 0.057 to 0.047 and from 0.213 to 0.067 in food, apparel, metal and automotive sectors, respectively. These figures also enable a ranking of the competitiveness of Turkish manufacturing firms in foreign markets. In other words, if the market potential in the destination country doubles, the turnover of the apparel sector in that market grows

by 10 percent, whereas a market expansion of the same size pushes the sales revenues of the food manufacturing firms up by 4 percent. These figures also signify that Turkish firms operating in the apparel sector are more competitive or have a higher market power in foreign markets than the Turkish firms in the food sector.

The previous presence in the market facilitates re-entering the market during the current period in all industries. Sunk costs of selling goods in a market such as learning about distribution channels, packaging and legal procedures may form the basis of this effect. When unobserved factors are introduced, the parameter estimates of the previous presence in a market increase slightly in all sectors. This indicates that at least one of the firm-specific ability factors is negatively correlated with this variable. If these abilities serve to overcome the obstacles in entry into foreign markets and reduce sunk costs, then this increase in the parameter estimates is quite plausible. It is also clear from the parameter estimates that as the destination country is more distant from the origin country, the entry becomes harder.

Analyzing whether there are economies of scale when operating in diversified markets reveals that the positive demand effect of being in one additional market is an increase in demand between 1 to 3 percent depending on the sector. The coefficient estimates may be subject to the endogeneity problem due to exclusion of unobserved abilities of firms in the analysis. If these abilities are not included in the analysis, the synergy effect will vary between 7 to 11 percent depending on the sector. Since demand shocks and the synergy impact of being in numerous markets are expected to be positively correlated, possible estimations in analyses that exclude unobserved abilities of firms are biased upwards both in market choice equations and turnover equations. Increased tariff rates impede entry in food, textile, and automotive industries, whereas the coefficient estimates are insignificant in metal and machinery sectors.

Table 2. Parameter Estimations of Revenues*

	Food		Apparel		Metal		Machinery		Automotive	
	NF	F	NF	F	NF	F	NF	F	NF	F
Constant	8.126**	9.894**	4.699**	7.629**	6.230**	6.467**	5.771**	8.078**	−2.569**	1.558**
	-0.007	-0.083	-0.009	-0.104	-0.008	-0.105	-0.005	-0.077	-0.007	-0.129
Exchange rate	0.052**	0.096**	0.155**	0.174**	0.069**	0.090**	0.053**	0.070**	0.055**	0.102**
	0.000	-0.004	-0.001	-0.005	0.000	-0.004	0.000	-0.002	0.000	-0.003
Unit cost	0.033**	−0.038**	−0.195**	−0.148**	−0.334**	−0.343**	−0.301**	−0.205**	−0.934**	−0.762**
	-0.001	-0.006	-0.001	-0.008	-0.001	-0.009	0.000	-0.006	-0.001	-0.011
Market size	0.237**	0.043**	0.289**	0.109**	0.057**	0.047**	0.068**	−0.003	0.213**	0.067**
	0.000	-0.005	0.000	-0.005	0.000	-0.005	0.000	-0.003	0.000	-0.004
Distribution margin	0.115**	0.029**	0.079**	0.007**	0.070**	0.013**	0.101**	0.008**	0.092**	0.010**
	0.000	-0.002	0.000	-0.002	0.000	-0.002	0.000	-0.001	0.000	-0.002

* Parameter estimations are based on the simultaneous estimation of equations (1), (2) and (3). NF represents the specification that excludes unobserved abilities of firms, while F represents the model including these abilities in the specification. Standard deviations of parameters are given under the parameters. ** denote 1 percent statistical significance level. Exchange rate is the real exchange rate. Unit cost is the unit production cost. Market size is the total imports of the destination country. Distribution margin is the number of countries in which the firm operated within the respective period. For further details, see Ulu (2014).

Attempting to explain the unexplained portion of exports by the interaction of unobserved abilities of the firm with the country and time as well as via firm-specific, country-specific or time-specific uncertainty shocks implies systematic variations among sectors and countries. Firstly, in relatively less technology-intensive industries like food and apparel sectors and in exports to countries with lower per capita income, a large portion of the variance that cannot be explained by observed variables are explained by uncertainty

shocks, and the share of unobserved abilities of firms is low. However, in technology-intensive industries like machinery and automotive industries and in exports to countries with higher per capita income, a large portion of exports that cannot be explained by observed variables are explained by unobserved abilities of firms, whereas uncertainty shocks can account for only a small part. Therefore, while supporting the abilities of the firms to enhance export performance in these sectors and markets, enforcing incentives to reduce the costs of entry of firms to these markets in sectors with lower technology intensity and in countries with lower per capita income will be more useful. This is because of the fact that export performance in these sectors is determined by uncertainty shocks rather than firms' abilities. Another conclusion is that the residual variance that cannot be explained by observed variables in the model facilitates the decomposition between unobserved abilities of firms and uncertainty shocks. This decomposition leads to interesting findings. Many countries, including Turkey, attempt to push their export figures upwards through various incentives.

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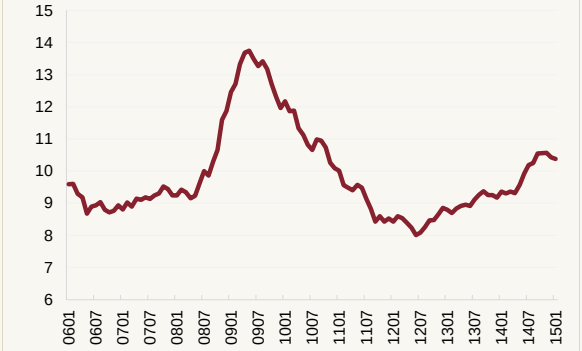
Box 4.5 Unemployment Flow Dynamics in Turkey

The unemployment rate followed a relatively stationary course between 2006 and the first half of 2008, and then trended upwards in mid-2008, and declined from mid-2009 until mid-2012. Despite occasional falls, the unemployment rate has been increasing as of mid-2012 (Chart 1). This box analyzes the course of unemployment through flow dynamics.

Chart 1. Unemployment Rate
(Percent)



Source: TurkStat, Authors' calculations.

Changes in unemployment over time may stem from changes in flows from employment to unemployment and out-of-the labor force (inflows) and/or changes in flows from unemployment to employment and out-of-the labor force (outflows). Therefore, unemployment dynamics can be monitored by analyzing the inflows to unemployment and outflows from unemployment over time. This relation is mathematically depicted by the evolution of an unemployment equation as follows:

$$\dot{U}_{t+\tau} = (L_{t+\tau} - U_{t+\tau})s_t + (N_{t+\tau} - L_{t+\tau})a_t - U_{t+\tau}f_t.$$

In the above equation, $U_{t+\tau}$ is unemployment; $\dot{U}_{t+\tau}$ is the change in unemployment; $L_{t+\tau}$ is labor force; and $N_{t+\tau}$ is the population, all at time $t+\tau$. It follows that changes in unemployment may stem from three reasons: s_t, which denotes the fraction of those that are employed can become unemployed; a_t, which denotes the fraction of those that are out of the labor force can become unemployed; and f_t, which denotes the fraction of those that are already unemployed can be employed or may be left out of the labor force.[3] As apparent in the equation, the effect of (s_t+a_t), entry to unemployment, and (f_t), the exit from unemployment on the unemployment stock are inversely related. An increase in inflows to unemployment increases unemployment, while the increase in outflows from unemployment decreases unemployment.

[3] This equation models outflows from unemployment independently from the destination point. This is due to the inability of the analysis to distinguish whether the destination of outflows from unemployment is towards employment or out-of-labor force.

Rates of ins and outs of unemployment for Turkey are calculated using the above equation as suggested by Şengül (2014) and Şengül and Taşçı (2014). This calculation requires data on labor force population, total population and number of unemployed people by duration and reason, which are compiled using the Household Labor Force Survey released by Turkstat. The dataset comprises the period from January 2005 to January 2015. Flow (inflow-outflow) rates estimated through the analysis cover the period starting from January 2006.

Charts 2-3 shows flow probabilities estimated by the analysis. In Turkey, the average probability of leaving unemployment between 2006 and 2014 was 10 percent per month, and the probability of transitioning from employment to unemployment was 1 percent. Although these average values are lower compared to countries with dynamic labor markets like the US, they are close to those of continental Europe (Elsby et al., 2013). While the probability of leaving unemployment trended upwards from the beginning of the sample to mid-2008, it hovered below its long-term average, then decreased from the second half of 2008 to mid-2009, and trended upwards as of the second half of 2009 This increase continued until the first quarter of 2012. Even though the probability of leaving unemployment started to decline from that date, it has stayed above its long-term average until the first quarter of 2014.

The probability of transitioning from employment to unemployment inclined upwards in the start of the sample. This increase accelerated even more in the second half of 2008. Before mid-2009, the rate of flows from unemployment to employment tumbled, neared the long-term average in the year-end, and fluctuated around this average for a while. The rate of flows from employment to unemployment increased in the second half of 2014 and remained above its long-term average. The rate of flows from the labor force to unemployment is quite lower than the rate of flows from employment to unemployment. This series fluctuates around its long-term average across the sample period.

Chart 2. Unemployment Flow Probabilities
(6-Month Moving Average, Percent)

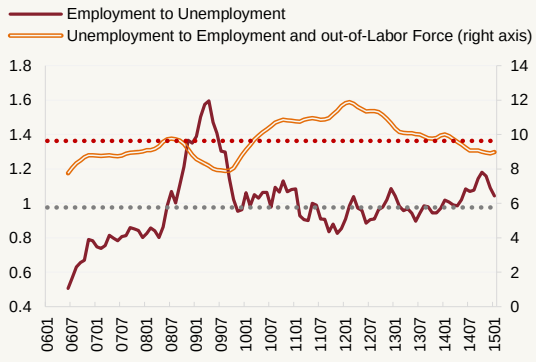
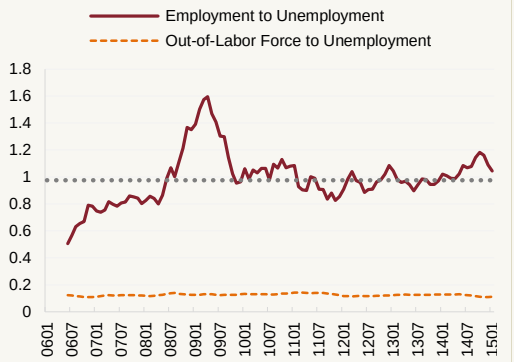


Chart 3. Unemployment Flow Probabilities
(6-Month Moving Average, Percent)



Source: TurkStat, Authors' calculations.

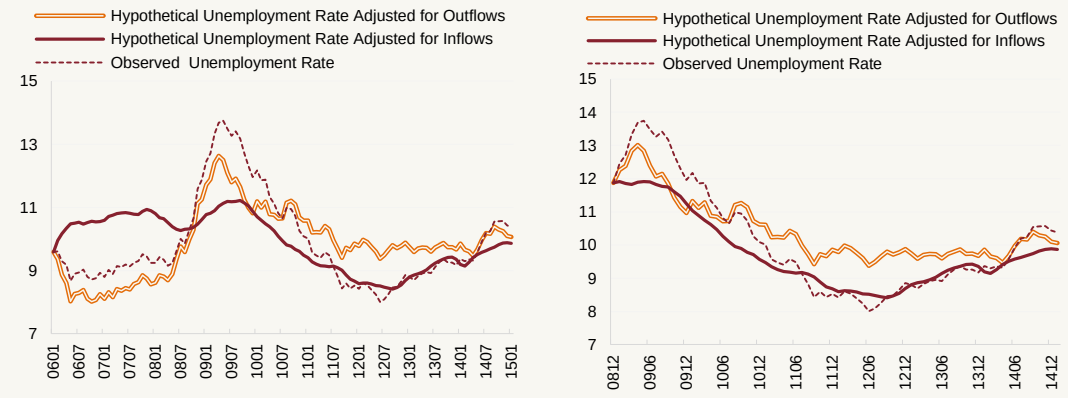
Using the above equation for the evolution of unemployment, the unemployment rate of the subsequent period can be derived as a function of the unemployment rate of the current period and flow rates.[4] Using this new equation, a hypothetical unemployment rate series implied by the alternative paths of flow rates

[4] For further details, see Şengül (2014) and Şengül and Taşçı (2014).

between unemployment and other labor phases (employment and out-of-labor force) can be computed. Thus, it is possible to analyze how the changes in ins and outs of unemployment around their long-term averages affect the movement of unemployment around its own long-term average. The unemployment rate series adjusted for the movement of outflows from unemployment around its long-term average is the hypothetical unemployment rate series, in which the rate of outflows from unemployment is assumed to remain unchanged around its own long-term average throughout the sample, and other flow rates are the actual series. The difference between the unemployment rate series calculated as such and the actual unemployment rate stems from the fluctuations in outflows from unemployment. Similarly, the hypothetical unemployment rate calculated under the assumption that flows from employment to unemployment remains unchanged at its own long-term average and other rates are set to the actual values, gives the hypothetical unemployment rate adjusted for inflows from employment to unemployment.[5]

Chart 3 shows the hypothetical unemployment rate and the actual unemployment rate implied by two different scenario analyses. Outflows from unemployment increase unemployment, whereas inflows thereto decrease unemployment up to the crisis period. Both outflows and inflows are below long-term averages and both rates increase in this period. Relatively balanced flows in both directions prevent unemployment from moving too much. In the second half of 2008, both outflows from unemployment and inflows to unemployment start to push the unemployment stock upwards. Hypothetical unemployment rates adjusted for the flow effect prove to be lower than the actual unemployment rate in this period. The difference between the unemployment rate adjusted for inflows to unemployment and the actual value is higher than the difference between the unemployment rate adjusted for outflows from unemployment and the actual rate. This indicates that the rise in unemployment around 2009 was mostly driven by the increase in flows from employment to unemployment. The fall in the unemployment rate following 2009 was driven by the high rate of exits from unemployment.

Chart 3. The Effect of Flow Rates on Unemployment
(Percent)



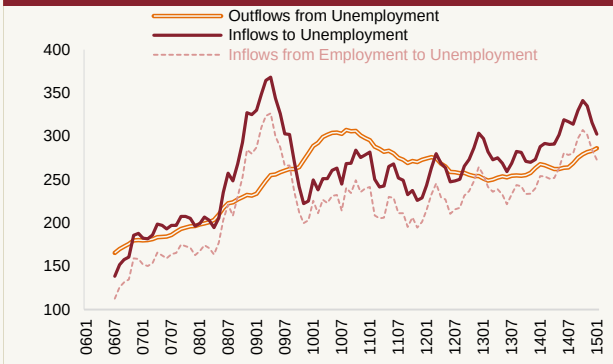
Source: TurkStat, Authors' calculations.

[5] Similarly, inflows from out-of the labor force to unemployment are evaluated under the assumption for an unchanged course on its own long-term average, and the difference to appear under such circumstances between the hypothetical unemployment rate and the actual unemployment rate proved to have no significance.

The right-hand side panel of Chart 3 repeats the same analysis starting from December 2008. It is confirmed here that both flow rates increase unemployment up to the second half of 2010. Then, the reducing effect of the relatively high course in outflows from unemployment on the unemployment rate appears to be dominant. From late 2010 to the first quarter of 2014, the course of unemployment was shaped by outflows from unemployment as opposed to inflows from employment to unemployment. Following the first quarter of 2014, this was reversed, and flows from employment to unemployment proved more influential.

The analysis so far utilizes rates of ins and outs of unemployment. Through the unemployment evolution equation, which shows the movement of unemployment over time, ins and outs of unemployment can also be depicted in numbers.[6] Chart 4 shows the flows between unemployed and employed and out-of-labor force in numbers. Similar to the flow rate analysis, the number of ins and outs of unemployment hovers close until mid-2008 and goes up over time. The number of persons transitioning into unemployment gains pace as of the second half of 2008, and inflows to unemployment start to decline with a similar momentum in mid-2009. The number of persons transitioning into unemployment remains relatively flat in 2010 and 2011 and trends upwards as of 2012. Outflows from unemployment remains on an upward track up to mid-2010. The number of persons who exits unemployment declines in 2011 and 2012, and trends upwards in early 2013. The number of persons transitioning into unemployment remains above those leaving unemployment as of the second half of 2012.

Chart 4. Flow Dynamics of Unemployment
(Thousand People, 6-Month Moving Average)



Source: TurkStat, Authors' calculations.

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[6] For further details, see Elsby et al. (2013).