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Boosting Regional Competitiveness in Turkey

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Foreword

Regions play an increasingly important role in OECD economies. They are responsible for delivering policies that directly affect citizens' lives and the business environment. Accordingly, it is essential that policy makers and practitioners understand their economies and benchmark them with the most appropriate tools. The growing importance of regional and local policy makers also makes it ever more important to efficiently coordinate national and regional policy making.

With wide disparities in the economic development of its regions Turkey is among the OECD countries now taking an active interest in regional development policies and regional competitiveness. In 2006, its Ministry of Development put in place 26 Development Agencies (DAs). Three years later they were fully operational. They carry out research, analysis and economic planning at the regional level, administer grant programmes directed at enterprises and educational institutions, and promote local investment through investment support offices (ISOs). The recently created DAs are expected to deliver all-important regional economic development policies, while finding their place in the Turkish policy and institutional environment.

Against that background, the OECD conducted its project, Boosting Regional Competitiveness in Turkey, to improve regional and sectoral competitiveness policies and to make coordination between development agencies, the Ministry of Development and other relevant institutions more effective. The OECD implemented the 22 month project (from November 2014 to September 2016), cofinanced by the European Union and Turkey, in close collaboration with the Ministry of Development.

Project activities included primary and secondary data collection and analysis, together with numerous missions, workshops and training courses covering all 26 regions of Turkey as well as in Ankara. In total, the project team was able to collect input from more than 600 participants. Project activities comprised four thematic components, plus a crucial capacity-building component that cuts across all four. The four substantive components were:

- **Component 1. Measuring, benchmarking and monitoring competitiveness in the regions through a tailored set of indicators.**
- Component 2. Identifying dominant and dynamic sectors in the country's 26 NUTS II regions through a standardised framework.
- Component 3. Enhancing coordination between central institutions and Development Agencies.
- Component 4. Strengthening the spatial dimension in national sector competitiveness strategies.

In line with the project's four-component structure, its findings are examined in four thematic reports. This report deals with Component 1 and focuses on assessing regional competitiveness in Turkey. It is hoped that further analyses and policy discussions can build on the findings of this report, with the objective to identify suitable policies to support competitiveness depending on the regions' strengths and weaknesses.

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Acronyms and abbreviations

BDDK	Banking Regulation and Supervision Agency
DA	Development agency
EBRD	European Bank for Reconstruction and Development
ETF	European Training Foundation
EXPY	Export sophistication
EU	European Union
FDI	Foreign direct investment
GCI	Global Competitiveness Index
GDP	Gross domestic product
GVA	Gross value added
ICT	Information and communications technology
ILO	International Labour Office
ISCED	International Standard Classification of Education
JRC	Joint Research Centre
KILM	Key indicators of the labour market
KOSGEB	Small and Medium Sized Industry Development Organisation
MAI	Multimode Accessibility Index
MNE	Multinational enterprise
MVA	Multivariate analysis
PAC	Project Advisory Committee
PCA	Principle Component Analysis
PISA	Programme for International Student Assessment
RDP	Regional Development Plan
R&D	Research and development
RCI	Regional Competitiveness Index
SBS	Structural business statistics
SEECEL	South East European Centre for Entrepreneurial Learning
SBA	Small Business Act
SITC	Standard International Trade Classification
SME	Small and medium enterprise
TEDAŞ	Turkish Electricity Distribution Company
TEİAŞ	Turkish Electricity Transmission Company
TPE	Turkish Patent Institute
TRY	Turkish lira
WEF	World Economic Forum

Executive summary

Since the 2000s Turkey has experienced robust growth, macroeconomic stabilisation and structural change. However, before the country can secure a sustainable, inclusive long-term growth path, it must rise to some important competitiveness challenges. With disparities in gross value added (GVA) per capita* between its best and lowest performing regions that are among the widest among the OECD member countries, regional development stands high on Turkey's policy agenda.

Framework

In order to be effective, regional policy analysis requires sound evidence of the performance of each region and thorough understanding of their strengths and weaknesses. To support evidence-based policy making at the regional level in Turkey, this report seeks to develop a framework for assessing and benchmarking competitiveness in the country's 26 NUTS II regions.† The framework is built on two pillars divided into eight dimensions:

1. The economic performance pillar pertains to key economic outcomes, i.e. factors that generate economic progress and prosperity. It comprises two dimensions:
   - Income and productivity;
   - Productive structure.
2. The determinants of competitiveness pillar is made up of factors that shape regional economic performance and points to areas where the Turkish regions could improve competitiveness through national and regional policies. The pillar comprises six dimensions:
   - SMEs and entrepreneurship;
   - Technology and innovation;
   - Education and skills;
   - Labour market;
   - Infrastructure;
   - Health and environment.

The indicators presented in this report only represent a starting point towards measuring and benchmarking the competitiveness performance of Turkish regions. However, a more thorough understanding of regional competitiveness in Turkey requires further analysis and policy discussion of region-specific features and economic structures. The standardised and therefore limited approach taken in this report should be complemented, for example, by regional stakeholders who have the local knowledge needed to discuss and address relevant issues.

Data limitations are often a heavy constraint on analysis at the regional level. In Turkey, gaps in regional statistics are most pronounced in the areas of regional economic activity, SMEs and entrepreneurship, and innovation. With no recent data on GDP available for Turkish regions, the most common indicator of economic performance is missing. The scarcity of data on sub-sector related value added, business and R&D activity also hinders the assessment and understanding of regional performance. By addressing these shortcomings, analysis of regional performance in Turkey could become an even stronger foundation for evidence-driven development policies at the sub-national level.

* Recent data on GDP per capita for Turkey's 26 regions are not available. GVA is therefore used as a proxy.
† Turkey's 26 regions are defined as such by Level II of the Nomenclature of Territorial Units for Statistics (NUTS II). The 26 regions cover a total of 81 NUTS III provinces.

Key findings

There are wide disparities between Turkish regions in most of the dimensions of competitiveness studied in this report, and they are often linked to the geographic characteristics of each region. Regions located around the Sea of Marmara – particularly TR10 Istanbul and TR51 Ankara, home to the capital city – are the most competitive on most counts. Most of the Central Anatolian regions perform mid-level, while those in the east of the country have the largest potential to catch up.

Income and productivity disparities are one of the key challenges to regional development in Turkey. After Chile, Mexico and the Slovak Republic, Turkey had the highest regional GINI inequality score of GDP in 2010. Equivalised disposable household income in constant Turkish lira is currently TRY 10 000 higher in TR51 Ankara than in the TRA2 Ağrı, Kars, Iğdır and Ardahan region – one of the widest gaps in any OECD country. GVA per capita in constant TRY is four times higher in TR10 Istanbul than in the TRB2 Van, Muş, Bitlis and Hakkari region, and labour productivity (measured by GVA in constant USD per worker as a proxy) in 50% of the regions is only half that of the best performing region.

Developing a more productive structure in many regions – by promoting industrial production and higher value-added activities in general, encouraging economic diversification and further opening up to international trade and investment – could help drive convergence. There is particularly wide scope for structural transformation in eastern regions. Agriculture remains an important economic sector in some regions, representing nearly 25% of GVA in TRA2 Ağrı, Kars, Iğdır, Ardahan, for instance. Activity in the manufacturing sector, in contrast, represents less than 10% of employment in several eastern regions. Openness to trade and investment remains limited in some regions, with exports and imports making up less than 10% of GVA and with less than one out of 10 000 enterprises being multinational in ten regions. Rural regions, in particular those in remote areas, can face difficulties in connectivity and market access.

Key determinants of regional growth vary from one region to the other. They are influenced by factors such as population density, location and connectivity, and the level of human capital development. As a consequence, bottlenecks to competitiveness in rural regions differ considerably from challenges in more urban areas, and the most productive regions have to contend with issues that are different from the obstacles that lagging regions must surmount. Such differences highlight the need for complementary policy action that reflects different levels of development across Turkey's regions and the country's overall geographical diversity.

There is scope in many Turkish regions for further developing a climate conducive to the development of SMEs and entrepreneurship and enhancing the technology and innovation capacity. High levels of informality reaching more than 50% of non-agricultural employment in some regions hamper business development and entrepreneurial activity. With the number of new businesses registered usually above the Turkish average, the business environment seems more dynamic in western regions or in those near the sea in the south-east of Turkey than in eastern regions, notably the rural ones. High technology sectors' share of total employment is lower than the EU average of 3.4% in all Turkey's regions. And the medium- or high-tech activity that does exist is centred chiefly on a few western regions, such as TR10 İstanbul and TR41 Bursa, Eskişehir and Bilecik.

Education and skills development as well as labour market performance are serious challenges to regional development in Turkey and many regions suffer from out-migration. Some regions could do more to increase attainment in higher education – the share of educational attainment in tertiary education in total labour force is over three

times higher in TR51 Ankara than in TRB2 Van, Muş, Bitlis and Hakkari. With 60% of the labour force in Turkey having completed elementary school only, compared to 20% in the OECD, addressing the plight of the low-skilled may be an even more important policy priority in a number of Turkish regions. Unemployment rates of over 15% of the total labour force are a serious issue in TRC3 Mardin, Batman, Şırnak and Siirt, TRC2 Şanlıurfa and Diyarbakır, and TR31 İzmir. Youth unemployment is also high – up to 30% in the TRC3 region.

Developing women's skills and increasing their inclusion in the labour market could be a further driving force of job creation and competitiveness. Female labour force participation in Turkey was the lowest in the OECD in 2014, averaging 34.4% compared to the OECD average of 51.5%. It is only 12.5% in TRC3 Mardin, Batman, Şırnak and Siirt, where female literacy is also the lowest of all Turkeys regions, at 76.9%.

In many regions, particularly remote rural ones that are far from big towns and cities, accessibility and connectivity are the heaviest constraint on growth and competitiveness. Improving access to the internet and transportation by road, air, rail and sea could help unlock their competitiveness potential, particularly in eastern Turkey. The same holds true of healthcare and the environment: a good health system and a clean environment can help attract the skilled workforce needed for sustained economic development.

Introduction

Background and rationale

Since the 2000s, Turkey has experienced relatively robust growth, macroeconomic stabilisation and rising productivity, driven by "growth-enhancing structural change" (McMillan and Rodrik, 2011). Yet, while the country's performance has improved over previous decades, it must rise to a number of competitiveness challenges before it can embark on a sustainable, inclusive long-term growth path.

One of Turkey's key challenges today is disparities in regional development. Traditionally, national economic performance has been driven by western regions, particularly productive commercial hubs like Istanbul, Ankara and Izmir and the industrial strongholds of the Marmara region. In recent years the socalled "Anatolian Tiger"[1] regions have also succeeded in strengthening their industrial base, with significant rises in employment in manufacturing and the services sector (OECD, 2014a). Most of the eastern regions, however, still perform much more weakly, with agriculture continuing to be a key sector of economic activity.

Inter-regional disparities are a common policy challenge worldwide. Indeed, measured in GDP per capita, they are often wider within OECD countries than between them (OECD, 2011a) – particularly when it comes to middle-income economies. Among OECD countries and OECD Key Partners, emerging economies like China, the Russian Federation, India and Brazil showed the greatest disparity in 2007, followed by Mexico, Chile, the Slovak Republic and Turkey (ibid.). The financial and economic crisis of 2008 has even aggravated inter-regional disparities, widening the GDP per capita gap between leading and lagging regions in half of all OECD countries (OECD, 2013a).

Regional and local governments control many policy levels for promoting prosperity and well-being. They were responsible for around 40% of total public expenditure and 60% of public investment in 2014 in the OECD area (OECD, 2016a). Education, health, general public services, economic affairs and social expenditure are the core of this expenditure (85%). To be effective, regional policy requires sound evidence of regions' contribution to national performance and of the magnitude and nature of disparities between them. Although Turkey has conducted such analysis in recent years, its regional and national policy makers still require a more solid understanding of regional performance if they are to achieve development objectives across the country.

Against that background, this report seeks to build composite indicators that assess and benchmark the competitiveness of Turkey's 26 NUTS II regions.[2] The aim is to shed light on the overall economic performance of the regions in income, productivity levels and productive economic structures. The composite indicators also measure several determinants of competitiveness like SMEs and entrepreneurship, technology and innovation, education and skills, labour market, infrastructure, and health and the environment.

The indicators are a first step towards measuring and benchmarking the competitiveness performance of Turkey's 26 regions. They could be a starting point for further analysis and policy discussion of region-specific features and economic structures in the search for fuller understanding of regional performance. Turkey's Regional Development Plans (RDP),[3] key documents that define strategic objectives at the regional level, would provide an adequate framework for additional analysis. Furthermore, the indicators in this report can paint only a static picture of competitiveness in Turkish regions. Yearly comparisons would help to grasp the dynamics of competitiveness in each region in the future.

OECD work on territorial statistics and regional typology

Detailed, reliable, timely and comparable regional data is a key prerequisite for evidence-based policy making at the regional level – not only in Turkey but in other OECD member countries. In response to the growing demand for statistical information at the regional level and to facilitate cross-country comparisons of regional performance, the OECD has developed statistical databases and tools. They include:

- The **OECD Regional Database**.[4] It provides comparable statistics and indicators on about 2 000 regions in 34 countries. It currently encompasses yearly time series for around 40 indicators on demography, economic accounts, labour market, social and innovation themes in the OECD member countries and other economies.
- The series **OECD Regions at a Glance**.[5] It compares major regional patterns and trends across OECD countries and draws possible policy conclusions. It also diffuses the statistics of the OECD Regional Database and the statistical tools developed by the Working Party on Territorial Indicators for the analysis of regional economies.
- The OECD Metropolitan Database. It provides a set of economic, environmental, social, labour market and demographic estimated indicators on the 281 OECD metropolitan areas (functional urban areas with 500 000 or more inhabitants).
- The **OECD eXplorer visualisation tools**, Regional eXplorer and Metro eXplorer. They display socio-economic information at detailed territorial level on small and large regions and cities with more than 500 000 inhabitants. Their multiple data visualisation options and interactive maps afford insight into regional differences and performance within countries and across countries. They thus enable comparisons of demographic trends and economic, social and environmental performance.
- The OECD **Regional Well-Being web tool**.[6] It measures regional well-being and allows for comparison among 362 OECD regions based on nine topics central to the quality of life, including income, jobs, housing, health, education, environment, safety, civic engagement and accessibility of services.

The OECD also developed a regional typology to classify regions into Predominantly Urban, Intermediate and Predominantly Rural to take into account geographical differences among them. The OECD regional typology is applied only to regions at Territorial Level 3 (TL3), which corresponds to the NUTS III classification of the nomenclature of territorial units for statistics, and it is based on criteria of population density and size of the urban centres located within a region. Comparing the socioeconomic performance of regions of the same type (whether urban or rural) across countries is useful in detecting similar characteristics and development paths (OECD, 2011b).

The OECD has recently adopted an extended regional typology which distinguishes between rural regions that are located close to larger urban centres and those that are not. The result is a four-group classification of TL3 regions – predominantly urban (PU), intermediate regions (IN), predominantly rural regions close to a city (PRC) and predominantly rural remote regions (PRR).

Table 1. **OECD classification of TL3 regions in Turkey**

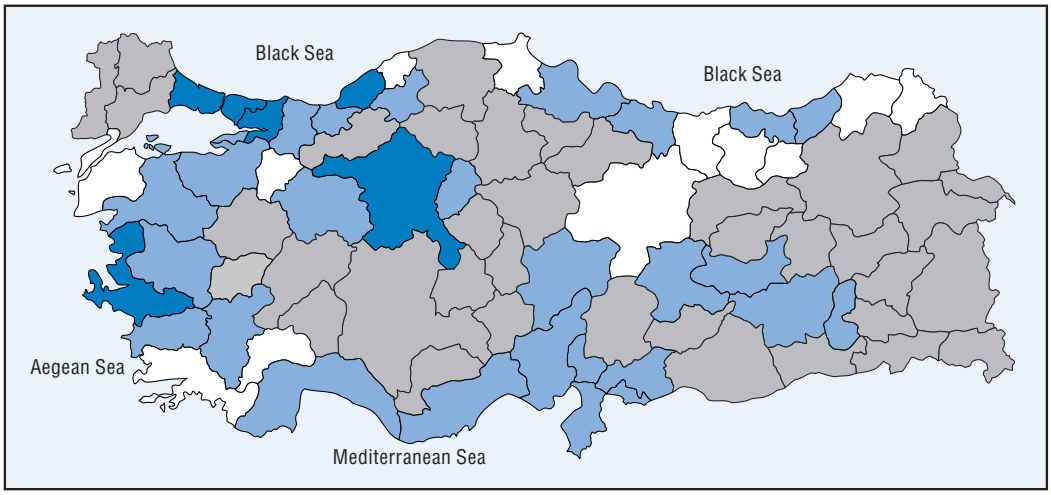
	PU	IN	PRC	PRR
Number of TL3 regions (i.e. provinces)	5	27	37	12
Population, in millions	24.54	27.89	19.57	3.77
Percentage of total population	33.32	36.38	25.39	4.91

Source: Classification based on OECD Regional Statistics (2015).

According to the OECD classification, more than half of Turkey's provinces are rural, with nearly 5% of the total population living in PRRs where it takes approximately 60 minutes of driving to reach a populated centre with at least 50 000 inhabitants. INs account for the highest share of the population – approximately 36%. One-third lives in one of the five PU areas, where economic activity is usually facilitated by better connectivity and easier access to markets.

Predominantly urban areas include the provinces of Istanbul, Izmir, Kocaeli, Ankara and Zonguldak, all located in western Turkey, although some provinces in that part of the country are classified RR – e.g. Çanakkale and Muğla. Most eastern provinces, especially those close to Turkey's east and south-east borders are classified as rural. Most rural remote provinces are coastal, with the highest concentration lying along the Black Sea. Poor connectivity and access to international markets can be a critical obstacle to competitiveness in PRRs.

Figure 1. **Map of Turkish provinces classified according to the OECD regional typology**



Source: Classification based on OECD Regional Statistics (2015).

How the report is structured

The main body of this report comprises three chapters. Chapter 1 develops the conceptual framework – the foundation of the composite indicators – to assess and benchmark regional competitiveness in Turkey. Chapter 2 presents the results and main policy conclusions that can be derived from the assessment. Chapter 3 reflects on a possible way forward for Turkey to reduce regional disparities, based on the results of the analysis. The Annex profiles each of the 26 Turkish regions and provides technical notes explaining the methods used to compute the composite indicators, data tables, and descriptions and sources of the indicators.

Chapter 1

A multidimensional framework for assessing regional competitiveness in Turkey

1.1 Developing the framework

There are different approaches to the assessment of regional performance, such as the OECD framework for regional and local well-being. Looking at regional competitiveness can shed further light on what countries can do to be more successful in global markets and international competition. This may be particularly relevant in emerging markets like Turkey, which has undergone promising structural transition, but has yet to promote convergence and help lagging regions catch up to ensure long-term and inclusive growth.

The framework developed in this report is based on a multidimensional understanding of competitiveness. It builds on commonly used definitions and concepts of competitiveness, which will be presented in the following sections. The framework was developed specifically for the project, Boosting Regional Competitiveness in Turkey, conducted by the OECD in co-operation with the Turkish Ministry of Development. A key objective of the project was to develop a tool to measure and benchmark competitiveness in the 26 NUTS II regions that would support evidence-based policy making at the subnational level. The framework is thus tailored to project requirements. It does not claim to set a new universal standard for measuring competitiveness.

Also closely involved in the project were the Development Agencies (DAs) of the 26 NUTS II regions and other national and regional stakeholders:

- The OECD methodically collected input from the DAs. Their feedback voiced their views of the draft methodology and helped understand their priorities and objectives;
- Workshops in three pilot regions in Turkey (TR31 İzmir; TR52 Konya, Karaman and TRA1 Erzurum, Erzincan, Bayburt) were held to present the draft methodology and collect more detailed feedback. Besides the DAs concerned, the workshops were attended by key regional stakeholders who represented, among others, academia, regional branches of the Turkish Statistical Institute (Turkstat), and the regional chambers of commerce;
- The OECD and Ministry of Development consulted important national institutions – like Turkstat and the Ministry of Science, Industry and Technology – to define meaningful indicators and identify sources. Where indicators were unavailable, relevant proxies were sought. For example, regional GDP was replaced by regional GVA, expressed in constant Turkish lira (TRY);
- Several meetings of the Project Advisory Committee (PAC) were held. The first was designed to provide overall guidance and the second (in July 2015) to validate the draft framework.

1.2 Common definitions and concepts of competitiveness

There is no generally accepted definition of competitiveness. The OECD once described it as "the ability of a country to generate relatively high factor income and factor employment levels on a sustainable basis, while being exposed to international competition" (Hatzichronoglou, 1996). The World Economic Forum (WEF) defines competitiveness as the "set of institutions, policies, and factors that determine the level of productivity of an economy" (WEF, 2015), framing it as the combination of micro- and macroeconomic factors linked to institutional performance. Drawing on its definition, the WEF developed the Global Competitiveness Index (GCI) to offer insight into the drivers of productivity and prosperity in 140 economies. Other studies define competitiveness simply as the factors underpinning wealth creation and economic performance (Porter, 1990; Aiginger, 2006).

Although there is no single definition of competitiveness, most encompass common aspects. The majority of views see competitiveness in rising productivity levels which, in turn, is linked to economic performance. In that sense, prosperity, growth, development and living standards are central to a competitive economy. Recent studies emphasise individual well-being as the foundation of societal progress, which encompasses material living conditions (e.g. income, wealth and jobs) and the quality of life – e.g. health status, work-life balance, education and skills. Most definitions also point to the importance of sustainability, on the assumption that to be sustainable, growth needs to be economically, socially, territorially and environmentally balanced (OECD, 2014c). Other core drivers of competitiveness are firm and industry-level performance, and a buoyant private sector is widely acknowledged as a driving force of growth and employment creation (OECD, 2006).

The concept of competitiveness is increasingly being applied at the regional level, to achieve territorially balanced development within countries. A competitive region is one that has the ability to "offer an attractive and sustainable environment for firms and residents to live and work" (Dijkstra et al., 2011). Regions are also increasingly seen as drivers of national competitiveness, and analysis of regional contributions to national growth, productivity and innovation has therefore gained importance. Furthermore, regional differences in gross domestic product (GDP) per capita within OECD countries are often wider than between them (OECD, 2013a), which highlights the fact that regional economic disparities can undermine a country's competitiveness.

Different institutions have developed approaches to measuring national and regional competitiveness. They have been carefully studied to develop indicators of regional competitiveness that assess the performance of Turkey's regions. Table 2 overviews selected approaches to measuring competitiveness at the global and national level and compares different methodologies of assessing the performance of countries and regions, including for Turkey.

Table 2. **Overview of selected concepts to measure competitiveness**

Name / Institution	Areas covered	Brief description of methodology	Coverage
GLOBAL ASSESSMENTS AT THE NATIONAL LEVEL			
Global Competitiveness Index (GCI) by World Economic Forum	Composite index – comprises 114 indicators grouped in 12 pillars subdivided in 3 sub-indexes: 1) Basic requirements sub-index, includes institutions, infrastructure, macroeconomic environment, health and primary education; 2) Efficiency enhancers sub-index, includes higher education and training, goods and labour market efficiency, financial market development, technological readiness, market size; 3) Innovation and sophistication factors sub-index.	The sub-indices are weighted to calculate an overall index that measures a country's level of development expressed in GDP per capita thresholds (i.e. factor-driven economies, efficiency-driven economies and innovation-driven economies). Like statistics from recognized institutions – e.g. IMF, the UN, and the WHO – the WEF's Executive Opinion Surveys are used as data sources to capture more qualitative assessments or assessments for which comprehensive and internationally comparable statistical data are not available.	Global (140 economies included in 2014-2015)
Doing Business by World Bank	Ranking – comprises11 areas in 2 broad dimensions: 1) Complexity and cost of regulatory processes, which includes starting a business, dealing with construction permits, getting electricity, registering property, paying taxes and trading across borders 2) Strength of legal institutions, which includes getting credit, protecting minority investors, enforcing contracts, resolving insolvency, labour market regulation	Rankings are calculated as arithmetic averages, based on "distance to frontier". Study of domestic laws, regulations and administrative requirements and Enterprise Surveys are the main data sources.	Global (189 economies included in 2015)
World Competitiveness Scoreboard by IMD	Composite ranking for 4 factors (and 20 sub-factors): 1) Economic Performance (73 criteria) 2) Government Efficiency (70 criteria) 3) Business Efficiency (71 criteria) 4) Infrastructure (115 criteria)	Scores (0 to 100) based on indexes, hard data and survey data aggregate ranking based on equal weight for all sub-factors (5%).	Global (61 economies included in 2015)
Better Life Index by OECD	Composite index for 11 pillars in two areas: 1) Quality of life: health status, work-life balance, education and skills, social connections, civic engagement and governance, environmental quality, personal security, subjective well-being 2) Material conditions: income and wealth, jobs and earnings, housing	The Better Life Index is an interactive web-tool that allows users to weight and rate topics as they build and customise their own indices to obtain aggregate scores. The result is many different indices. Data sources include OECD or national accounts, United Nations statistics and national statistics offices. *Note:* The Better Life Index currently does not yield comparisons over time.	OECD members + Brazil and Russian Federation
ASSESSMENTS AT THE REGIONAL (i.e. SUBNATIONAL) LEVEL			
EU Regional Competitiveness Index by the European Commission / Joint Research Center	Covers similar areas to those covered by GCI (see above)	Like the GCI, indicators are divided into competitiveness sub-indices – basic requirements, efficiency enhancement, innovation and sophistication – that are weighted for aggregation. The main data source is Eurostat, but other international and national sources are also used.	EU Member States
How is Life in your Region? by OECD	Composite scores for 9 topics divided into 2 areas, like the OECD Better Life Index: 1) **Quality of life:** health, education, environment, safety, civic engagement, accessibility of services 2) **Material conditions:** income, jobs, housing	The methodology is based on the OECD's Better Life Index, see above. However, no composite indexes are built, so the tool yields composite scores by topic.	OECD members
EXISTING ANALYSIS ON REGIONAL COMPETITIVENSS OR SIMILAR TOPICS IN TURKEY			
Socio-Economic Development Index (SEDI) by Ministry of Development (Özaslan, M., Dincer, B., Özgür, H., 2006)	Based on 58 indicators: 1) Social dimension: population, employment, education, health, infrastructure, other welfare 2) Economic dimension: manufacturing, construction, agriculture, financial sector	The indicator framework was thoroughly assessed by Principle Component Analysis, which yielded the weights of the indicators.	NUTS II-III regions in Turkey
Competitiveness Index for Turkey by Edam and Deloitte (Deloitte and EDAM, 2009)	Based on 6 sub-indicators, each composed of a set of 7 to 10 variables: 1) Economic viability and effectiveness 2) Labour market 3) Creativity 4) Human capital 5) Physical infrastructure 6) Social capital	An index is calculated to rank all provinces against each sub-indicator separately and produce an overall competitiveness index.	Nuts III regions in Turkey
Turkey Competitiveness Index by Istanbul University	1) General indicators (e.g. demography, health, education) 2) Economic activity (e.g. macroeconomic environment, labour market, foreign trade and industry 3) Innovation (e.g. entrepreneurship, higher education, technology infrastructure)	Uses numerous statistical methods to analyse 338 indicators. Weighting is built on the expert opinion of business representatives expressed in interviews.	NUTS I/ IIIprovinces of Istanbul

Source: OECD conceptualisation based on the studies presented in the table.

1.3 Understanding competitiveness as outcomes and determinants

The different concepts and definitions outlined above illustrate that competitiveness has a multidimensional nature, i.e. it captures a complex reality that cannot be explained by a single factor. A rise in economic performance, measured by household income and productivity levels, for instance, may be seen as a primary outcome of competitiveness. Policy makers can foster economic performance by concentrating on its determinants, which include among others the overall business environment and infrastructure for international trade – in other words, everything that makes an environment attractive to live and work in.

1.3.1 Competitiveness outcomes

Competitiveness outcomes comprise a multitude of economic performance factors, traditionally captured in measurable variables such as higher incomes, robust and sustainable growth, and rising productivity levels. Achieving better overall economic performance is one of the main goals of public policies that seek to foster national and regional competitiveness. Accordingly, policy makers have accorded growing importance in recent years to how economic growth is distributed in society, placing greater emphasis on inclusiveness and reducing inequalities (OECD, 2015b).[7]

Productive structures, too, matter for a strong economic performance. In most competitive economies, high productivity sectors generate higher value added and income than activities in traditional sectors. Structural transformation – i.e. the shift of resources such as capital and labour to more productive activities – is consequently a desirable development goal. In other words, "growth-enhancing structural change" is a key driving force of competitiveness, particularly in emerging economies (McMillan and Rodrik, 2011).

1.3.2 Determinants of competitiveness

Disparities in competitiveness outcomes reflect differences across regions. But only a closer look at the determinants of competitiveness can point to areas for policy action. What helps explain discrepancies in cross-country and inter-regional competitiveness, then? In other words, why are there wide disparities in income, growth, productivity and productive structures between different countries or between regions in the same country?

Many definitions underline the importance of the determinants of competitiveness, i.e. those macro- and microeconomic factors that contribute to shaping a favourable business and investment climate and developing a buoyant private sector. They include a stable political and macroeconomic environment, sound political, legal and regulatory institutions that promote the rule of law, good public and corporate governance, market efficiency, supportive business regulation and organisational structures and clustering (Industry Canada, 1995; Delgado et al., 2012; Porter, 2007). Moreover, trade and investment openness, labour market efficiency and flexibility, enhanced infrastructure, financial sector development, a sound innovation environment, and an educated and skilled workforce are widely recognised as factors in environments that are conducive to business activity and private investment (OECD, 2015b). Such a horizontal view of competitiveness opens up a wide array of areas for policy interventions that seek to create enabling environments for competitive firms and industries.

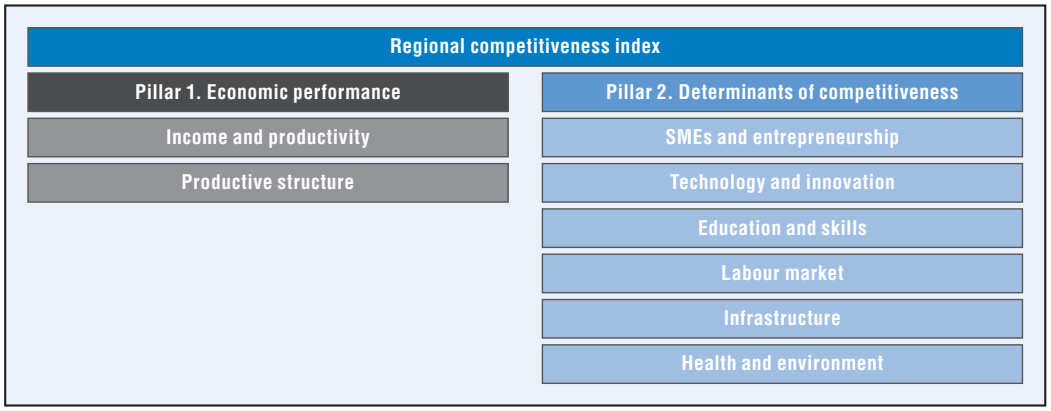
Regional governments and institutions can take measures to enhance competitiveness by complementing national policies and programmes and responding to specific local challenges. They can thus help less developed regions catch up with more competitive peers, for example by implementing policies to strengthen the regional business environment and promote entrepreneurship. In this regard, regional institutions can work to facilitate business registration procedures (to obtain investment licence, for example) and offer local enterprises a range of consultancy services, technical support,

training and financial assistance. Moreover, clusters – "geographically close groups of interconnected companies and associated institutions in a particular field" (OECD, 2007) – are regional in nature and therefore belong to the sphere of sub-national policies. Clusters can benefit regional economies by lowering production costs, prompting innovation and increasing productivity growth. They can also facilitate knowledge sharing and specialisation, and contribute to the creation of a competitive business environment (Garcia Villareal, 2010).

1.4 The regional competitiveness framework's structure, key indicators and data constraints

The framework for assessing regional competitiveness in Turkey is structured in two pillars: economic performance (pillar 1) and determinants of competitiveness (pillar 2) (Figure 2). Economic performance refers to key economic outcomes that are generally features of a competitive economy, economic progress and prosperity. As for determinants of competitiveness, they include factors that shape regional economic performance, i.e. ways of promoting regional competitiveness that usually fall within the scope of national and regional policies.

Figure 2. **The regional competitiveness framework**



Source: OECD conceptualisation.

Pillar 1, economic performance, is measured through two dimensions:

- **Income and productivity.** Encompasses key indicators that measure final competitiveness outcomes, such as income, production and productivity.
- **Productive structure.** Assesses the role of activity in high value added sectors (e.g. manufacturing) in relation to low value added sectors (e.g. agriculture). It also measures the degree of trade openness, export diversification and sophistication, which can be seen as "interim" competitiveness outcomes, instrumental in facilitating economic performance. For instance, a number of studies have empirically proven the link between export sophistication and higher GDP per capita (Hausmann et al., 2007 and Hausmann and Hidalgo, 2011).

Pillar 2, determinants of competitiveness, measures key determinants of regional competitiveness. Regional policy makers can influence competitiveness by promoting selected determinants – SME development or innovation, for example. Pillar 2 comprises six dimensions:

- **SMEs and entrepreneurship.** Assesses the contribution of SMEs and entrepreneurial activity to the regional economy and the size of the informal sector;
- **Technology and innovation.** Measures R&D and innovation and the scale of high technology sectors;
- **Education and skills.** Measures regions' education levels and basic skills that are relevant to succeed in the labour market;
- **Labour market.** Focuses on labour market participation, including women, and unemployment;
- **Infrastructure.** Measures regions' access to good connectivity and transport infrastructure, such as the internet, road networks, airports, railways and waterways;
- **Health and environment.** Measures the health of citizens in Turkey's regions and the quality of the environment – both of which are conducive to productive business activity.

Table 3. **Examples of OECD studies in the eight dimensions of Turkey's regional competiveness index, selected key indicators and sources**

Dimension	Examples of relevant OECD publications	Selected key indicators	Source
Pillar 1. Economic performance			
Income and productivity	*Going for Growth* (2014) *Policies for Productivity Growth* (2015)	Regional Gross Value Added (GVA) in constant TRY	Turkish Statistical Institute
		Regional labour productivity	OECD Regional Statistics
Productive structure	*Supporting Investment in Knowledge Capital, Growth and Innovation* (2013) *Interconnected Economies: Benefiting from Global Value Chains* (2013)	Employment in manufacturing (% of total employment); Trade openness	Turkish Statistical Institute
		Number of MNEs	Ministry of Economy
Pillar 2: Determinants of competitiveness			
SMEs and entrepreneurship	*Financing SMEs and Entrepreneurs 2016: An OECD Scoreboard* (2016) *The Missing Entrepreneurs 2015: Policies for Self-employment and Entrepreneurship* (2015) *SME Policy Index: Western Balkans and Turkey*	Number of SMEs per 1 000 people	KOSGEB
		New businesses registered	Union of Chambers and Commodity Exchanges of Turkey (TOBB)
		Total credit in constant TRY	Banking Regulation and Supervision Agency (BDDK)
Technology and innovation	*Creating our Common Future through Science, Technology and Innovation* (2015) *OECD Science, Technology and Industry Scoreboard 2015: Innovation for growth and society* (2015)	Number of patents applications	Turkish Patent Institute (TPE)
		Persons employed in science and technology	OECD Regional Statistics; Eurostat
Education and skills	*PISA 2012 Results: Creative Problem Solving (Volume V): Students' Skills in Tackling Real-Life Problems* (2014) *OECD Skills Outlook 2015 – Youth, Skills and Employability* (2015) *Education at a Glance 2015: OECD Indicators* (2015)	Higher education level of labour force Lower education level of labour force	OECD Regional Statistics
		Female literacy rate	Turkish Statistical Institute
Labour market	*OECD Employment Outlook (2015)* *Off to a Good Start? Jobs for Youth* (2010)	Labour force participation rate (LPR) and female LPR; unemployment rate	OECD Regional Statistics
Infrastructure	ITF Transport Outlook 2015 (2015) Road Safety Annual Report 2015 (2015)	Road density	Ministry of Development
		Frequency of electrical power failures	Turkish Electricity Transmission Company (TEİAŞ)
Health and environment	*OECD Environmental Outlook to 2050: The Consequences of Inaction* (2012) *The Health Costs of Inaction with Respect to Air Pollution* (2008)	Life expectancy and air pollution	OECD Regional Well-Being indicators

Note: The indicators in the table are used in the assessment, drawing on the data source as indicated. A full list of all indicators, descriptions and sources is to be found in the Annex C.
Source: OECD iLibrary, OECD analysis.

The indicators used in this assessment meet, to different degrees, a number of quality criteria, such as conceptual and policy relevance, the quality of the underlying data, and international comparability. The OECD project team selected them in consultation with the Ministry of Development of Turkey, and based on feedback from Development Agencies and Turkstat. The main sources of regional data are:

- Turkstat's regional database;
- OECD regional statistics;
- Eurostat regional statistics;
- Various line ministries and national institutions (e.g. Small and Medium Sized Industry Development Organisation (KOSGEB) supplies SME-related data).

Some data were not publicly available and were provided by the Ministry of Development. A number of indicators had to be aggregated from NUTS III to NUTS II level and, in some cases, they were constructed and/or scaled for the purpose of the assessment.

Other data limitations, too, constrained the assessment framework – some relevant data were either not available, unreliable or out-of-date. The most important data gap at the regional level in Turkey relates to GDP, which is lacking since 2001. Together with Israel, Turkey is the only OECD member country that does not record recent data on regional GDP, which undermines comparative international studies. Data on regional gross value added (GVA) in constant TRY, used as a proxy for GDP in this assessment, are available only up to 2011 and regional value added statistics by economic sub-sector are not yet publicly available.

Data are especially scarce when it comes to the dimensions, "SMEs and entrepreneurship" and "technology and innovation". With regard to SMEs and entrepreneurship, the only internationally comparable data available at the regional level relate to the total number of SMEs in each region. In contrast to most EU member and accession countries, Eurostat does not yet collect regional-level structural business statistics (SBS) on Turkey – e.g. enterprise birth and death rates, density of high-growth enterprises in the business economy, and business concentration. In addition, besides total credit, no indicator could be identified for assessing access to finance in the absence of regional data on microfinancing, early stage financing and stock markets. The technology and innovation dimension also suffers from considerable limitations, due to the paucity of data on R&D and ICT expenditure.

Nor was there any data on regional inequalities and social exclusion in Turkey until recently. Since 2016, Turkstat has published figures on the number of poor people and poverty rates, as well as GINI coefficients for NUTS II regions. However, lack to time ruled them out of consideration in the present assessment.

Data limitations also impinged on the very structure of the framework presented in this report. If further data becomes available in the future the framework could be expanded to additional dimensions and to further indicators in existing dimensions. For example, a separate dimension on access to finance could be added if further indicators on alternative finance were identified. A dimension on social exclusion, too, would enrich the framework, if it were to contain regional GINI indices, poverty rates and/or measurements of disparities within individual regions, for example.

1.5 Constructing composite indicators: steps, scope and limitations

The framework outlined above forms a base on which to build composite indicators for assessing regional competitiveness in Turkey. The composite indicators aim to account for the complex, multidimensional reality of competitiveness in a comprehensive manner, enabling comparisons between the performances of the 26 regions in the framework's eight dimensions. The results are presented in chapter 2.

From a technical perspective, building the composite indicators drew on the procedure recommended in the *Handbook on Constructing Composite Indicators* (OECD/EU/JRC, 2008), set out in Box 1. Section 1.4 described the theoretical framework and the data selection process. Detailed explanations of the methodological choices regarding the treatment of indicators, aggregation and multivariate are included in the technical notes annexed to this report (Annex B).

Box 1. **Constructing composite indicators, step by step**

The OECD and the Econometrics and Applied Statistics Unit of the Joint Research Centre (JRC) of the European Commission recommend 10 steps that should be followed when constructing a composite indicator. They are:

1. **Theoretical framework.** A theoretical framework should be developed to provide the basis for the selection and combination of single indicators into a meaningful composite indicator under a fitness-for-purpose principle.
2. **Data selection.** Indicators should be selected on the basis of their analytical soundness, measurability, country coverage, relevance to the phenomenon being measured and relationship to each other. The use of proxy variables should be considered when data are scarce.
3. **Imputation of missing data.** Consideration should be given to different approaches for imputing missing values. Extreme values should be examined as they can become unintended benchmarks.
4. **Multivariate analysis.** An exploratory analysis should investigate the overall structure of the indicators, assess the suitability of the data set and explain the methodological choices, e.g. weighting, aggregation.
5. **Normalisation.** Indicators should be normalised to render them comparable. Attention needs to be paid to extreme values as they may influence subsequent steps in the process of building a composite indicator. Skewed data should also be identified and accounted for.
6. **Weighting and aggregation.** Indicators should be aggregated and weighted according to the underlying theoretical framework. Correlation and compensability issues among indicators need to considered and either be corrected for or treated as features of the phenomenon that need to retained in the analysis.
7. **Robustness and sensitivity.** Analysis should be undertaken to assess the robustness of the composite indicator in terms of, e.g., the mechanism for including or excluding single indicators, the normalisation scheme, the imputation of missing data, the choice of weights and the aggregation method.
8. **Back to the real data.** Composite indicators should be transparent and fit to be decomposed into their underlying indicators or values.
9. **Links to other variables.** Attempts should be made to correlate the composite indicator with other published indicators, as well as to identify linkages through regressions.
10. **Presentation and visualisation.** Composite indicators can be visualised or presented in a number of different ways, which can influence their interpretation.

Source: Taken from the Handbook on Constructing Composite Indicators (OECD/EU/JRC, 2008, p.15).

When interpreting the results of the assessment of regional competitiveness in Turkey, it is important to bear in mind the scope and limitations of the composite indicators. By allowing the integration of large amounts of information into easily understandable formats, composite indicators can be effective communication and policy tools (Freudenberg, 2003). The objective of the regional competitiveness assessment is two-fold:

1. To provide an overview of the overall economic performance of the regions, measured by key economic outcome indicators of prosperity and progress. That aim relates to pillar 1 of the assessment framework, economic performance.
2. To shed light on regional strengths and weaknesses in key determinants of competitiveness, providing insights into what national and regional policies can do to enhance competitiveness. That is the objective of pillar 2, determinants of competitiveness.

Taken together, the two pillars form the regional competitiveness index of Turkey. It was built from the most recent data available, with most of the indicators spanning the years 2011 to 2015.

The composite indicators have limitations that need to be taken into account when interpreting the results of the analysis. They have been built on a pilot basis, using the framework developed specifically for the project, Boosting Regional Competitiveness in Turkey. In line with the standardised approach applied across all regions in Turkey, the indicators neither can nor seek to capture the complex characteristics of each region or the quality, use and impact of regional competitiveness policies in Turkey. Moreover, they are dependent on numerous methodological choices that influence the results (see Box 1). Such limitations make it unadvisable to base policy choices solely on the composite indicators.

This report considers that the indicators it develops should be viewed as a first step towards measuring and benchmarking the competitiveness performance of Turkey's 26 regions. They are a starting point for further analysis and policy discussion. More thorough understanding of regional competitiveness as a basis for informed policy-making would require further analysis of region-specific features and economic structures such as clusters, special endowments and resources, natural and/or political risks and other location-specific and geographical features. Regional stakeholders, for example, who have the local knowledge required to address and discuss further important issues could provide complementary data and information.

Policy makers should also bear in mind that the analysis presented in this report stops short of providing policy recommendations or guidance on measures to improve regional competitiveness in Turkey. It uses only quantitative indicators in the form of output/outcome measurements that capture the goods and services activities produced or a change as a result of an intervention – e.g. GVA per capita, the number of multinational enterprises (MNEs) that have moved into a region or the length of roads built.[8] In that sense, the composite indicators may be able to inform regions' strong and weak points, in SME development or innovation, for example. However, they do not assess the effectiveness of specific policies and schemes – such as SME support programmes or laboratories for innovation activities, etc. In addition, because of differences in the years covered, structural indicators were preferred over indicators of a more cyclical nature. As a result, the framework is not necessarily suited to assessing resilience to economic shocks or crisis, even though it is a crucial factor in competitiveness.

For all these reasons, the analysis would benefit from complementary input like detailed policy reviews, assessments of regional institutional and administrative structures, and specific support programmes in the eight dimensions of the framework. The recent publication, *Competitiveness in South East Europe: A Policy Outlook,* (OECD, 2016b), which covers Western Balkan economies, is a good example of a multidimensional policy review of competitiveness, in accordance with a methodology based on qualitative indicators that measure policy processes in 15 dimensions.[9]

As Box 1 explains, the first step in constructing composite indicators is always to define a conceptual framework on the basis of a thorough review of the relevant theoretical and empirical literature on the subject matter. The next step is a reality check, which involves collecting data and assessing quality, indicator coverage, conceptual relevance and statistical correlations, and making a series of modelling choices. In this context, it should be stressed again that, in the absence of a generally accepted definition and concept of competitiveness, the framework only represents a possible approach to understanding and measuring competitiveness. The conceptual basis of the composite indicators may be imperfect – it might omit elements that are important to an adequate assessment of regional competitiveness be it in Turkey or elsewhere. Econometric testing could be a response, providing evidence of key omitted variables.

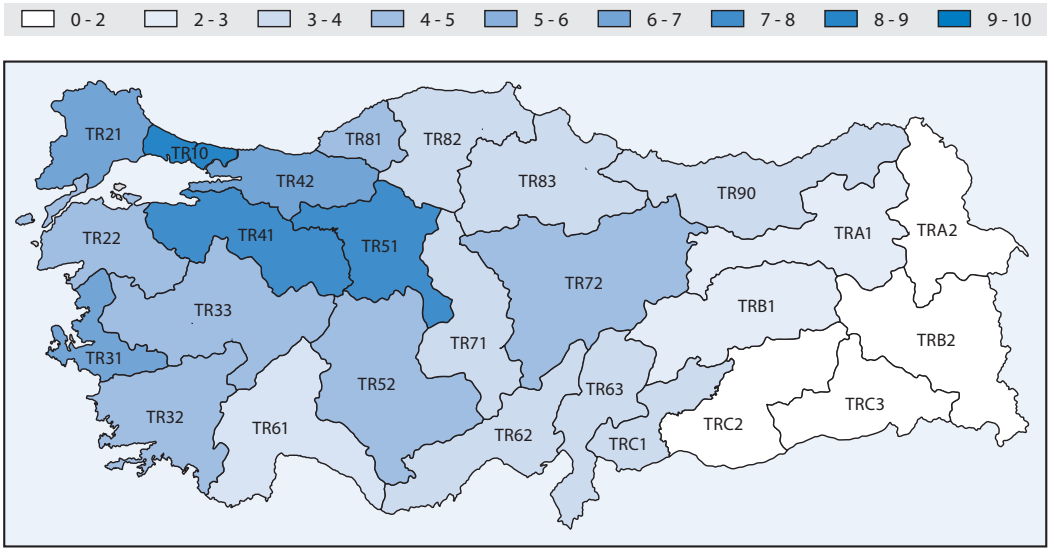
Chapter 2

Regional competitiveness in Turkey: Results and key findings

2.1 A snapshot of aggregate results

The regional competitiveness index provides an overview of the performance of Turkish NUTS II regions, referring to the most recent data available. It not only summarizes the results in a single score, but also considers regional strengths and weaknesses in each of the index's eight dimensions. Figure 3 shows the aggregate performance of each region in Turkey's regional competitiveness index. A detailed summary of results in the overall regional competitiveness index, both pillars and the eight dimensions is included in Annex B (Tables B4 and B5).

Figure 3. **Results at a glance from the regional competitiveness index of Turkey**
Index scores (0 to 10)



Note: The index is structured in: The economic performance pillar, which includes the dimensions on income and productivity and productive structures; The determinants of competitiveness pillar, which includes the dimensions on SMEs and entrepreneurship, technology and innovation, education and skills, labour market, infrastructure, and health and environment.
Source: All data sources are included in Annex C.

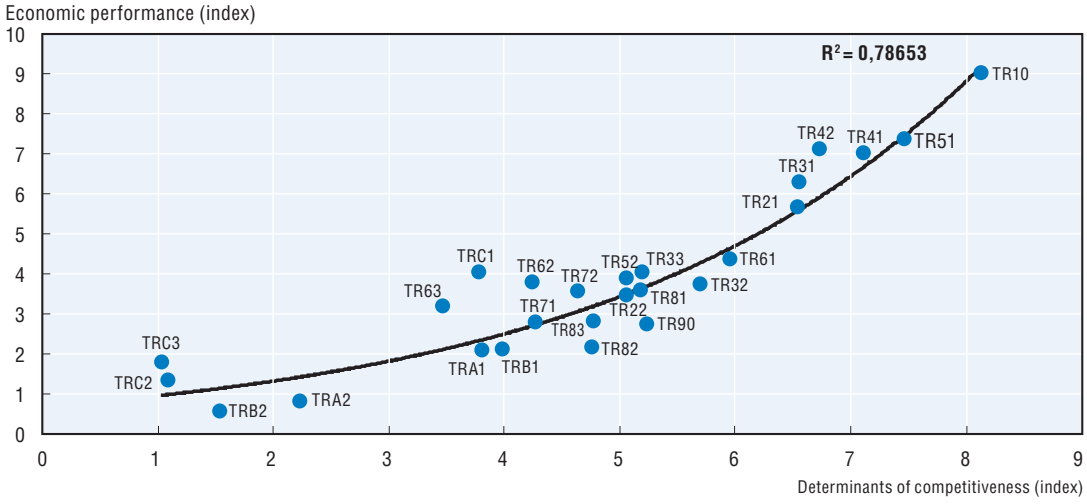
Key findings from the regional competitiveness index of Turkey

- Overall, competitiveness differs considerably across the country, as wide variation in scores shows. The TR10 İstanbul region is the most competitive, followed by Turkey's capital, TR51 Ankara. TR41 Bursa, Eskişehir, Bilecik and TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova – both located on the coast of the Sea of Marmara – are also among the top performers, as is the western region of TR31 İzmir. Most of the central Anatolian regions perform mid-level, while eastern regions are generally positioned at the lower end of the ranking (Figure 3). The picture is a mixed one, with advanced regions on one side and regions with room to catch up on the other.
- Location is an important factor in regional competitiveness in Turkey. The top performing regions (TR10, TR51, TR41, TR42 and TR31) are all composed of provinces classified by the OECD as either predominantly urban or at least intermediate (see Table 1). Gaps in regional competitiveness in Turkey can thus be explained – to a considerable extent – by agglomeration economies where benefits arise from the presence of large cities or regions lying close to large urban centres. Rural regions, particularly those located in the east of the country struggle with issues of connectivity and market access, which translates into their weaker competitiveness.
- Substantial differences in performance also emerge in pillar 1, economic performance. The best-performing regions are characterised by high income and productivity levels, a stronger manufacturing than agricultural sector, openness to international trade, and high degrees of economic diversification and foreign investment.

- Top performers in pillar 2, determinants of competitiveness, have developed a favourable environment for SMEs and entrepreneurship, characterised by a sizable SME sector, low levels of informality and robust business dynamics. They also show innovative capacity and activity in high or medium-high technology sectors. Levels of education attainment are also high in the best-performing regions, with a considerable share of the population enrolled in higher education, and very high levels of female literacy. Top pillar 2 performers also boast higher labour market participation rates than other regions, among both men and women. They enjoy ease of access to infrastructure, both broadband internet and transportation, which is conducive to a dynamic business environment and trade relationships. Finally, citizens in competitive regions are healthier and enjoy a cleaner environment.
- Some regions could seek to further improve their competitiveness performance and help narrow existing inter-regional disparities in Turkey. Results in the determinants of competitiveness pillar are positively correlated with the scores in the economic performance pillar (Figure 4), which suggests that regions that have strengthened competitiveness also boast more robust economic performance. Yet the link between determinants of competitiveness and economic performance appears to follow an exponential trend, with improvements in determinants of competitiveness exerting a smaller impact on the economic performance of lower-performing regions than on that of their high-performing peers. The inference might be that barriers in the poorer-performing regions prevent competitiveness policy efforts from translating into economic growth. Barriers may include remoteness, notably in the east of Turkey, poor connectivity and limited access to markets. Scarce human resources, aggravated by migratory outflows may well be a further important restriction on growth.

Summing up the key findings of Turkey's regional competitiveness index, the bottlenecks to growth vary across regions, depending on their geography and level of development. That is why regional policies that reflect this diversity are so important. Chapter 3 of this report undertakes some reflections on how Turkey could move forward in reducing inter-regional disparities by taking into account regional diversity.

Figure 4. **Relation of the economic performance and determinants of competitive pillars**



Source: All data sources are included in Annex C.

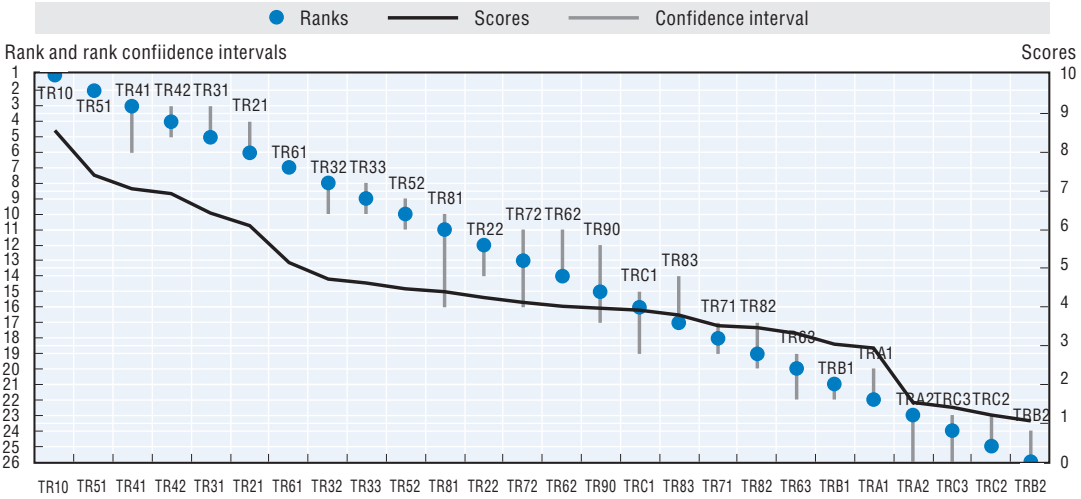
Robustness of the regional competitiveness index

Given the choices involved in constructing composite indicators – regarding data normalisation, and weighting and aggregation, for example – it is crucial to evaluate the confidence in the model. Figures 5, 6 and 7 depict the results of the robustness analyses of Turkey's regions' rankings in the regional competitiveness index as a whole, and in

pillars 1 and 2, economic performance and determinants of competitiveness. Each figure reveals that the top to bottom rankings often hinge on narrow differences in scores. Rankings may therefore be less robust in intervals where the score curve is flat. In the middle ranges of the economic performance pillar (Figure 6), for example, TRC1 Gaziantep, Adıyaman, Kilis lies 10 places higher than TR83 Samsun, Tokat, Çorum, Amasya, yet only 1.26 points separate them. Figure 7 also shows wide intervals between mid-ranking regions in the determinants of competitiveness pillar which call for further analysis.

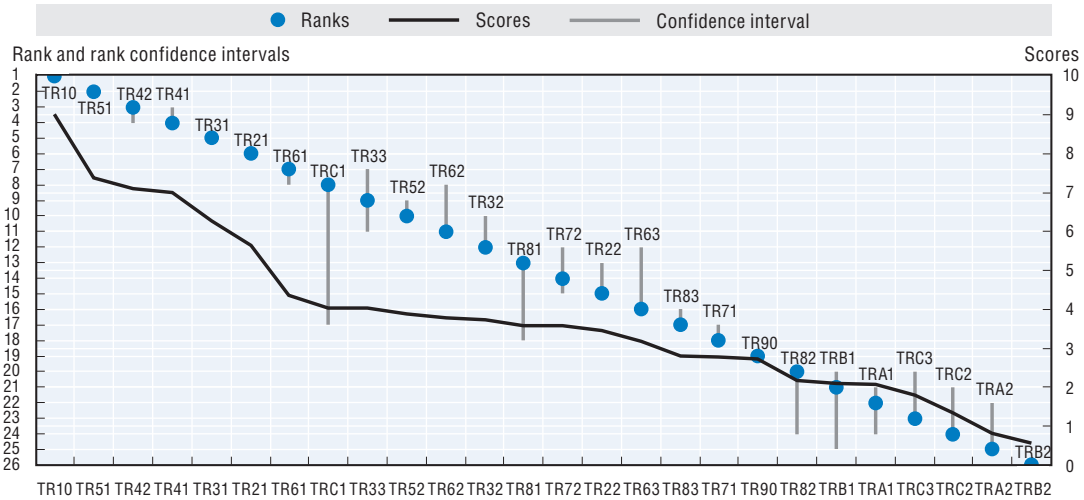
Compared to its ranking in the overall index, TRC1 Gaziantep, Adıyaman, Kilis ranks relatively high in economic performance, albeit with wide confidence intervals between its actual rank (8th) and lowly 17th position. The region's high score in economic performance is driven chiefly by high exports and its large number of multinational enterprises.

Figure 5. **Robustness analysis of rankings in the regional competitiveness index**
Regions ranked in descending order



Note: Regions ordered by their rank in the overall index.
Source: All data sources are included in Annex C.

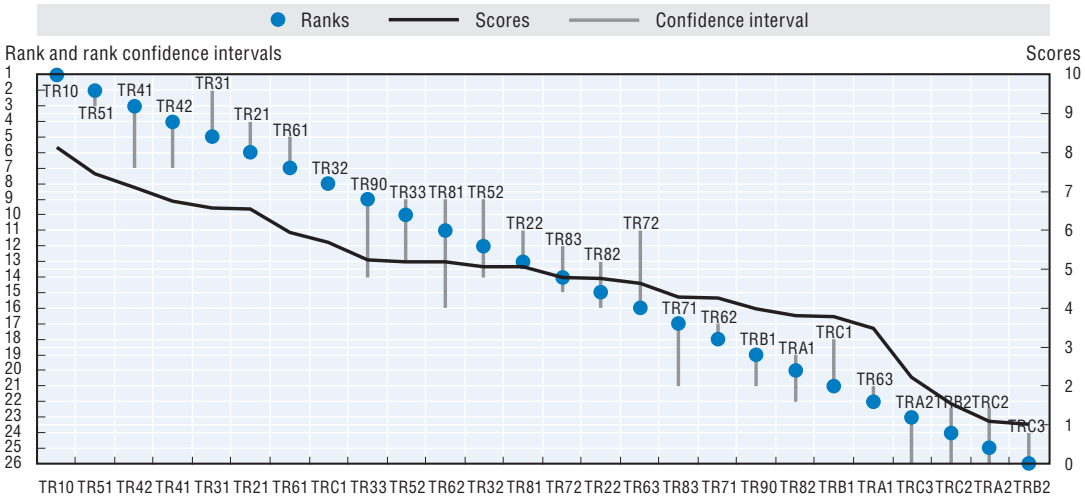
Figure 6. **Robustness analysis of rankings in the economic performance pillar**
Regions ranked in descending order



Note: Regions ordered by their rank in the overall index.
Source: All data sources are included in Annex C.

Figure 7. **Robustness analysis of rankings in the determinants of competitiveness pillar**

Regions ranked in descending order



Note: Regions ordered by their rank in the overall index.

Source: All data sources are included in Annex C.

2.2 Regional economic performance

Pillar 1, economic performance, is measured by a set of indicators structured in two dimensions:

1. **Income and productivity.** Encompasses key indicators to measure "final" competitiveness outcomes, such as income, production and productivity.
2. **Productive structure.** Assesses the role of activity in high value-added sectors (e.g. manufacturing) in relation to low value-added sectors (e.g. agriculture), as well as the degree of trade openness, export diversification and sophistication.

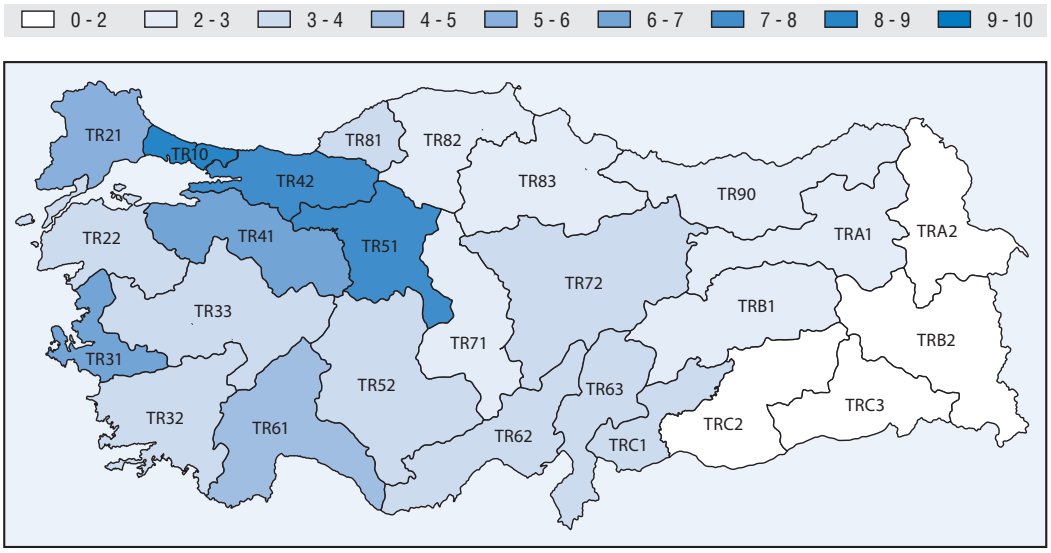
Mapping Economic Performance reveals a mixed picture and wide disparities across Turkey (Figure 8)

Key findings from the regional economic performance pillar

- While a handful of regions boast income and productivity levels similar to the OECD average, they are rather low in most other regions. Policy efforts in Turkey could seek to narrow the income and productivity gaps and enhance regional competitiveness by boosting productivity growth and inclusiveness especially in the regions which perform more poorly.
- As for productive structure, there are again gaps. Some regions, have succeeded in shifting their economic activity to productive sectors such as manufacturing, have opened up to international trade, diversified their economies, developed sophisticated export baskets and attracted foreign investors. Other regions, however, mainly rural ones, boast less advanced economic structures, with agriculture continuing to play a strong role. In order to build on resource endowment and the existing productive structure, the less advanced regions could benefit from further developing tradable sectors by, for example, expanding agri-food production and food processing.

Figure 8. **Map of regions' results against Pillar 1 of the regional competitiveness index and economic performance**

Index scores (0 to 10)



Source: All data sources are included in Annex C.

2.2.1 Income and productivity

Economic growth and greater well-being are the ultimate goals of policies that seek to foster national and regional competitiveness. Policy makers need to be aware of what contributes to and detracts from economic performance if they are to develop policies tailored to improving national and regional competitiveness.

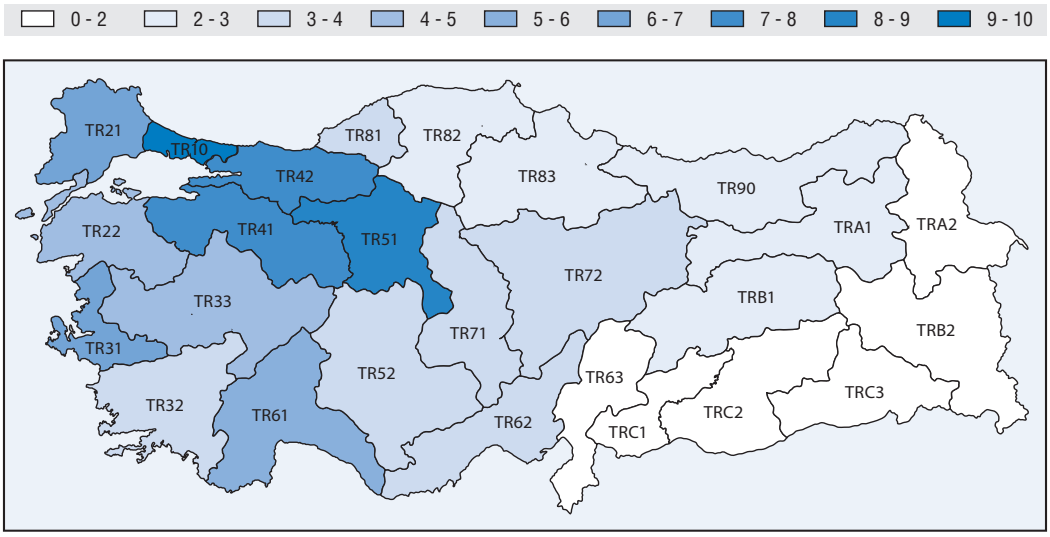
Household income, gross value added (GVA) and productivity are three telling measures of the economic performance of a country or region. Household income is a measure of individual economic well-being, while regional gross value added can afford insight into the productive activities of individuals, industries or sectors across regions. Labour productivity is also key to understanding a region's economic performance. An increase in labour productivity can indicate that employees work more efficiently thanks to machinery and equipment, the modernisation of organisation and infrastructure, improved health and skills ("human capital"), and to new technology.

This section seeks to snapshot income and productivity across the 26 Turkish regions by looking at three core indicators, namely:

- **Household income** in constant TRY. Measures the material well-being of citizens;
- **GVA per capita** in constant TRY. A proxy for GDP which is currently not available for Turkey's Nuts II regions. Measures the difference between output and intermediate consumption;
- **Labour productivity** in constant USD. Accounts for the effectiveness of the workforce in the 26 Turkish regions.

Figure 9. **Map of results in the income and productivity dimension of the economic performance pillar**

Index scores (0 to 10)



Source: All data sources are included in Annex C.

Key findings from the income and productivity dimension

- Disposable household income in constant TRY varies substantially across regions, ranging from TRY 17 300 in TR51 Ankara to TRY 7 300 in TRC3 Mardin, Batman, Şırnak, Siirt – a discrepancy of TRY 10 000 between the poorest and the richest region. Average household income in Turkey is less than half the OECD average.
- GVA per capita in constant TRY ranges even more significantly – from TRY 21 700 in the TR10 İstanbul region to TRY 5 400 in TRB2 Van, Muş, Bitlis, Hakkari. Half of the regions have GVA per capita of below TRY 11 000. Indeed, Turkey is one of the OECD countries with the largest disparities in terms of GVA between top and bottom performing regions (see chapter 3).
- TR10 İstanbul also leads in regional labour productivity, with GVA of total activities per worker reaching TRY 68 900 in 2011, compared to the lowest regional labour productivity at TRY 20 760 in TRA2 Ağrı, Kars, Iğdır, Ardahan. Labour productivity in half of the regions is only half as efficient as their most productive peer, Istanbul. On average, Turkey's labour productivity is only two third of the one of the average OECD region.
- With a rather high GINI index of regional inequality, measured in GDP per capita, regional inequalities in Turkey are among the widest in OECD member countries, after Chile, Mexico and the Slovak Republic (see chapter 3).

Policy efforts in Turkey should seek to narrow the wide disparities in regional income and productivity levels and enhance regional competitiveness by boosting productivity growth and inclusiveness across the country. Furthermore, according to the OECD Economic Survey of Turkey, reducing labour costs and encouraging formal employment, especially among older workers and women, would help boost potential growth in Turkey (OECD, 2014a). Product market reforms are also needed to stimulate competition and productivity growth in sheltered sectors.

2.2.2 Productive structure

The productive structure dimension measures the economic contribution of high value-added sectors (e.g. manufacturing) compared to lower value-added sectors (i.e. most agricultural activities), as well as the degree of export diversification and sophistication.[10] Additional crucial elements of an internationally competitive economy measured in this dimension are the degree of trade openness and the number of multinational enterprises (MNEs) operating in a region.

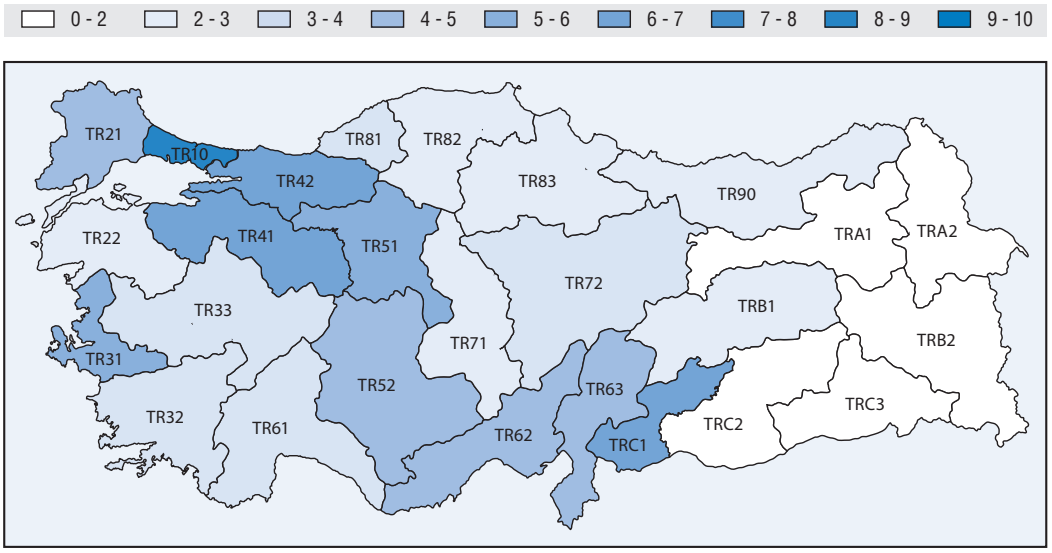
This section analyses the productive structure of the 26 Turkish regions through seven indicators that paint a comprehensive picture.

- **Trade openness.** Measures the importance of international transactions relative to domestic ones;
- **Number of products exported.** Measures the degree of economic diversification;
- **Export sophistication (EXPY).** Assesses the degree of sophistication in regional exports by measuring the level of income associated with a region's export basket;[11]
- **Agriculture.** Assesses the contribution of the agricultural sector to the regional economy;
- **Manufacturing and enterprises in manufacturing.** Measure the contribution of manufacturing sector to the regional economy;
- **Number of multinational enterprises (MNEs).** Gives an indication of a region's attractiveness to foreign investors.

However, a full understanding of the productive structure would require further analysis, and this list of indicators presented is not exhaustive. Mapping productive structure in Turkey (Figure 10) reveals how productive economic structures are across Turkey.

Figure 10. **Map of results in the productive structure dimension of the economic performance pillar**

Index scores (0 to 10)



Source: All data sources are included in Annex C.

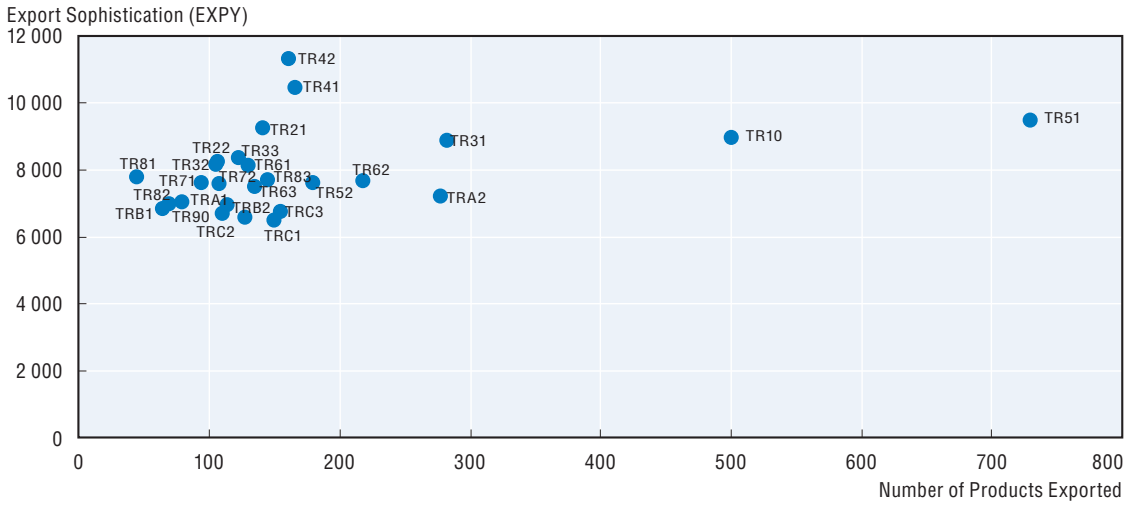
Key findings from the productive structure dimension

- The development of productive sectors varies substantially across Turkish regions. In TRA2 Ağrı, Kars, Iğdır, Ardahan, agriculture still accounts for 24.8% of GVA in current TRY, compared to less than 3% in the most industrialised regions of TR10 İstanbul and TR51 Ankara. The importance of agricultural activity relative to other sectors has dipped slightly in Turkey over the past decade – from 10.6% of GVA in 2005 to 9% in 2011. In 2005, agriculture still made up more than 31% of GVA in TRA2 Ağrı, Kars, Iğdır, Ardahan.

- Activity in the manufacturing sector paints a similar picture of disparities. The TR21 Tekirdağ, Edirne, Kırklareli region has the strongest manufacturing base in Turkey. It accounts for nearly 50% of total employment, excluding agriculture. In TR41 Bursa, Eskişehir, Bilecik and TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, respectively 44% and 41% of the workforce is employed in manufacturing. On the other hand, the most competitive regions of Turkey, TR10 İstanbul and TR51 Ankara, have a relatively low employment level in manufacturing (28% and 17% respectively). The share of registered manufacturing enterprises as a ratio of all registered firms in the region is highest in TR10 İstanbul, TR41 Bursa, Eskişehir, Bilecik, TR52 Konya, Karaman, and TRC1 Gaziantep, Adıyaman, Kilis – approximately 15% across all four regions.
- Turkish regions have succeeded to different degrees in attracting foreign investors. Data from 2014 found that 13% of all companies in Turkey were MNEs. In TR10 İstanbul there were around 35 MNEs per 10 000 enterprises, significantly higher than the national average, owing to the region's strategic location as Turkey's key trade and investment hub. In TRC1 Gaziantep, Adıyaman, Kilis, there are 28 MNEs per 10 000 enterprises, compared to approximately 20 in TR61 Antalya, Isparta, Burdur and TR62 Adana, Mersin. Conversely, a number of regions are currently home to no MNEs – namely, TR82 Kastamonu, Çankırı, Sinop; TRA1 Erzurum, Erzincan, Bayburt; TRA2 Ağrı, Kars, Iğdır, Ardahan; and TRB2 Van, Muş, Bitlis, Hakkari. Formerly hosts to a small number of MNEs, they are all classified by OECD regional typology as rural and sometimes remote and seem to suffer from poor connectivity, which may detract from their attractiveness to foreign investors.
- Trade openness in TR10 İstanbul and TRC1 Gaziantep, Adıyaman, Kilis – at 111% and 101% of GVA respectively – significantly outperforms the Turkish average at approximately 55% of GVA. TRC1's trade openness is in sharp contrast to its middling overall competitiveness performance. The answer may lie in its geographic location in the Mediterranean region and its closeness to the Port of Adana, a driving force of the region's strong trade relationships with the Middle East. A number of regions, on the other hand, show limited openness to international trade, particularly rural regions in the east of Turkey.
- Turkey's regions have different degrees of economic diversification. Most export between 100 and 200 products. However, the best-performing regions export far more: TR51 Ankara – 729, TR10 İstanbul – 500, TR31 İzmir – 282, TRA2 Ağrı, Kars, Iğdır, Ardahan – 277, and TR62 Adana, Mersin – 218. By contrast, regions at the opposite end of the spectrum export far less: TR81 Zonguldak, Karabük, Bartın – 44, TRB1 Malatya, Elazığ, Bingöl, Tunceli – 64, TR90 Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane – 79, TR82 Kastamonu, Çankırı, Sinop –69, and TR71 Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir – 94.
- The number of products and the level of export sophistication show a weak positive link across Turkey. In other words, a higher degree of economic diversification, measured in the number of products exported, points to a slightly higher degree of export sophistication (Figure 11). TR41 Bursa, Eskişehir, Bilecik and TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova are not among the top in terms of number of products exported, yet they have the most sophisticated export baskets in Turkey, specializing on the automotive industry for instance.

Figure 11. **Results from the export sophistication and diversification indicator**

Sophistication data relate to 2011 and diversification to 2014



Note: Number of products exported (a proxy for export diversification) was calculated by the Ministry of Development. Export sophistication (EXPY) was calculated by Turkstat. See the Annex B for technical explanations.
Source: Turkstat.

There are significant differences in productive structure across Turkey's regions. The TR10 İstanbul region shows the strongest productive structure – its economic activity focuses on industry or services rather than agriculture. The region is highly attractive to foreign investors and boasts high degrees of trade openness and economic diversification. TR41 Bursa, Eskişehir, Bilecik and TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova have also developed competitive manufacturing bases and have the most sophisticated export baskets in Turkey. TRC1 Gaziantep, Adıyaman, Kilis performs rather well in this dimension, due to its high degree of trade openness, the strong presence of international investors, and a relatively important share of economic activity in manufacturing.

Many regions, especially rural ones, could further develop their productive structures by building up comparative advantages to move up the value chain. Transforming resources into tradable goods could help grow industries and develop new capabilities in the workforce. Three regions – TR61 Antalya, Isparta, Burdur in 15th place, TR32 Aydın, Denizli, Muğla in 12th, and TR33 Manisa, Afyon, Kütahya, Uşak in the 11th spot – are ranked at lower-mid level in the productive structure dimension – below their upper or mid-level overall competitiveness performance (7th, 8th and 9th, respectively). Eastern regions notably TRB2 Van, Muş, Bitlis, Hakkari, TRA2 Ağrı, Kars, Iğdır, Ardahan, and TRA1 Erzurum, Erzincan, Bayburt – could seek to increase industrial production, modernise agriculture or further develop more productive sectors, such as agri-food. Such policy could be a driving force of convergence across Turkey.

Overall, Turkey's economy is dominated by the industry and services sectors. However, agriculture continues to play an important role, accounting for 22% of total employment. Manufacturing, for its part, employs 19% of the workforce in Turkey, with output concentrated in products with low- and medium-technology content. Nevertheless, new sectors, such as the automotive industry and electronics are emerging. The service sectors has experienced rapid growth over recent decades, and accounted for 50% of total employment in 2014.

2.3 Regional performance for key determinants of competitiveness

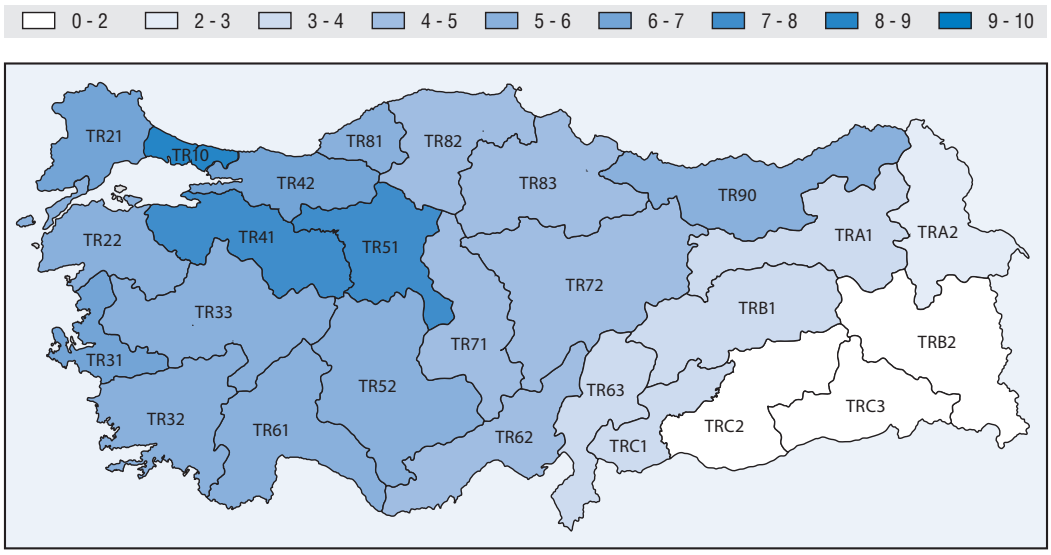
Regional policy makers can influence competitiveness by promoting selected determinants – investment, SME development or innovation, for example. These aspects are captured by pillar 2, which comprises six dimensions:

1. **SMEs and entrepreneurship**. Assesses the contribution of SMEs and entrepreneurial activity to the regional economy, the size of the informal sector, and levels of financial intermediation to enable access to finance for entrepreneurial activity.
2. **Technology and innovation.** Measures R&D and innovation and the presence and size of high technology sectors.
3. **Education and skills.** Measures regions' education levels, which includes female participation, and the relevance of skills to the labour market.
4. **Labour market.** Focuses on labour market participation, including women, and unemployment.
5. **Infrastructure.** Measures regions' access to good connectivity and transport infrastructure, such as the internet, road networks, airports, railways and waterborne transport.
6. **Health and environment.** Measures the health of citizens in Turkey's regions and the quality of the environment – both of which are conducive to productive business activity.

Regions' rankings in pillar 2, determinants of competitiveness, are similar to those in the overall regional competitiveness index (Figure 12), which suggests that the determinants do indeed shape regional competitiveness. The TR10 İstanbul region performs best, followed by TR51 Ankara and TR41 Bursa, Eskişehir, Bilecik. Half of the regions perform to a lower mid-level standard, scoring between 3.8 and 6.1. There is room for improvement, particularly among the lowest-performing eastern regions like TRC3 Mardin, Batman, Şırnak, Siirt, TRC2 Şanlıurfa, Diyarbakır, and TRB2 Van, Muş, Bitlis, Hakkari.

Figure 12. **Mapping the results for Pillar 2 of the regional competitiveness index, determinants of competitiveness**

Index scores (0 to 10)



Source: All data sources are included in Annex C.

Key findings from the Determinants of Competitiveness Pillar

- Regional performance in the **SMEs and entrepreneurship** dimension varies considerably, which indicates that SMEs and entrepreneurs face rather different business environments and opportunities across Turkey. Although most regions' scores are low compared to the top performance, many regions could take steps to reduce informality, foster the creation of businesses and ease access to finance, which would significantly improve the environment for SMEs and entrepreneurship. The relatively high shares of informal employment of up to 52% are a particularly pressing issue for SME development and entrepreneurship – particularly in the rural regions in the east of the country.
- **Innovation** is highly concentrated in a few closely connected Turkish regions that benefit from economies of agglomeration. Regions that lie outside these innovative clusters show to this day somewhat limited innovation capacity. Policies to help regions unlock their potential and measures to encourage initial innovation activities could help strengthen regional competitiveness in Turkey. They would be most effective in emerging regions that lie close to those regions that are innovative and in those struggling to escape the middle-income trap. Complementarity policies are highly important to successfully build regional innovation capacities, which are dependent on decent infrastructure, a conducive SME and entrepreneurship environment and skills, notably. Moreover, collaboration and networking, including across borders, are crucial to realize innovation-driven growth opportunities.
- Performance in **education and skills** shows relatively little regional differences. Nevertheless, in some regions there is scope for improving education levels, as large shares of the labour force have completed only elementary education levels and enrolment rates in higher education are relatively low. Education policies should seek to take into account regional labour market and interregional migration dynamics (see Box 2). In recent years, some regions have experienced largely negative net migration rates, which include outflows of highly skilled workers. If the best educated and most highly skilled students and workers systematically leave, regional development may be in jeopardy. There are also wide regional disparities in female literacy. Although some regions boast rates of nearly 100%, they still lie below 80% in four regions. Policy makers could well consider addressing the gap, as literacy is a key to women's success in the labour market.
- The overall performance of Turkey in key **labour market** indicators is still way below the OECD average. Varying between 4.7% and 21.1%, unemployment rates in Turkey present large inter-regional differences. Both unemployment and youth unemployment rates are higher than the OECD average, which suggests that – although this assessment finds positive developments in the Turkish labour market – key challenges still need to be tackled. A number of regions, notably the mid-performing regions in the overall competitiveness index, show relatively higher labour force participation rates (among women, too), higher labour utilisation and lower dependency ratios. Many eastern regions could increase their labour market performance.
- Assessment of the **infrastructure** dimension suggests that infrastructure is relatively well developed across regions in Turkey. A number of regions ranked in the middle of the competitiveness index show a relatively stronger performance in infrastructure, which could further boost their competitiveness in the future. Eastern regions could further develop an infrastructure framework conducive to competitiveness if they improved access to broadband internet and roads, air, rail and seaborne transportation. Such policy would help increase connectivity and access to key markets and would be most effective if implemented hand-in-hand with efforts to further specialise in the production of tradable goods in which they have a comparative advantage.

- Performance in **health and environment**, too, is relatively strong across Turkey. Some regions fare substantially better in this dimension than in others and in the overall regional competitiveness index. Yet, there is substantial room for improvement in some regions grappling with relatively low life expectancy, high infant mortality and bad air pollution. Better access to health and a clean environment would not only improve well-being in such regions, it would also create a more favourable business environment.

Box 2. **OECD research on interregional mobility and labour market dynamics**

Demographic trends and migration dynamics show wide regional differences and are key challenges to regional policy makers. Labour market shortages, for example, can emerge as a consequence of ageing and high rates of out-migration. While in the short-term result of such outflows can be reflected in falls in unemployment rates, employment and productivity growth suffer in the long term if those leaving are the most talented and best educated.

According to OECD findings, regions with persistent out-migration tend to share a number of characteristics, such as higher unemployment, lower income per capita, and greater shares of employment and lower productivity in agriculture. Populations in such regions also have higher shares of old people and lower density than regions where incoming migration is prevalent. Areas affected by depopulation are usually peripheral and specialise in traditional and declining industries, lack climate amenities, boast few business locations, and have public services that are hard to access and of poor availability.

Recent OECD research into labour mobility and development dynamics shows that migration-induced drops in labour supply do not reduce regional unemployment, which points to a downward spiral that links outgoing migration and economic distress. The effects of out-migration on unemployment tend to be greater in low-income regions, suggesting that more economically fragile regions are prone to more selective out-migration, which could reinforce their relative weakness. In other words, migrant outflows tend to be from out of the same areas over periods of time, and, after initial short-term increases in employment, regions may struggle to improve local labour conditions if those migrating are more productive than those staying.

The OECD empirical analysis points out to the importance of the productive structure of regions for mobility patterns and to links between out-migration and economic distress. A number of consequences for regional policy can be drawn. Targeting demographic changes, retaining labour and upgrading skills, innovating public goods and local service delivery can be instrumental in improving living conditions and well-being. Regional policy could implement place-based actions and coordinate policy responses between different levels of government to exploit the benefits of labour mobility.

Source: Brezzi and Piacentini, 2010.

2.3.1 SMEs and entrepreneurship

A dynamic, vibrant SME sector drives entrepreneurship (Audretsch and Thurik, 2001). Many empirical studies have shown that SME activity and entrepreneurship can boost economic growth and job creation, as the birth of new firms and the development of existing ones lead to productivity gains and the use of new or under-utilised resources (OECD, 2010). Policies enabling SME development and entrepreneurship are therefore critical to sustainable economic growth, especially in the context of recovery from the global financial crisis (ibid.).

SMEs lie at the core of the Turkish economy. If agriculture is excluded, they make up 99.8% of Turkey's total business population and contribute 75.5% of total private sector employment. Furthermore, the number of SMEs in Turkey increased by 5% between 2009 and 2012. Yet, challenges to SME development and entrepreneurship in Turkey remain – gaining access to finance, for example, establishing entrepreneurship as a key competence in the education system, and promoting SME skill needs analysis.

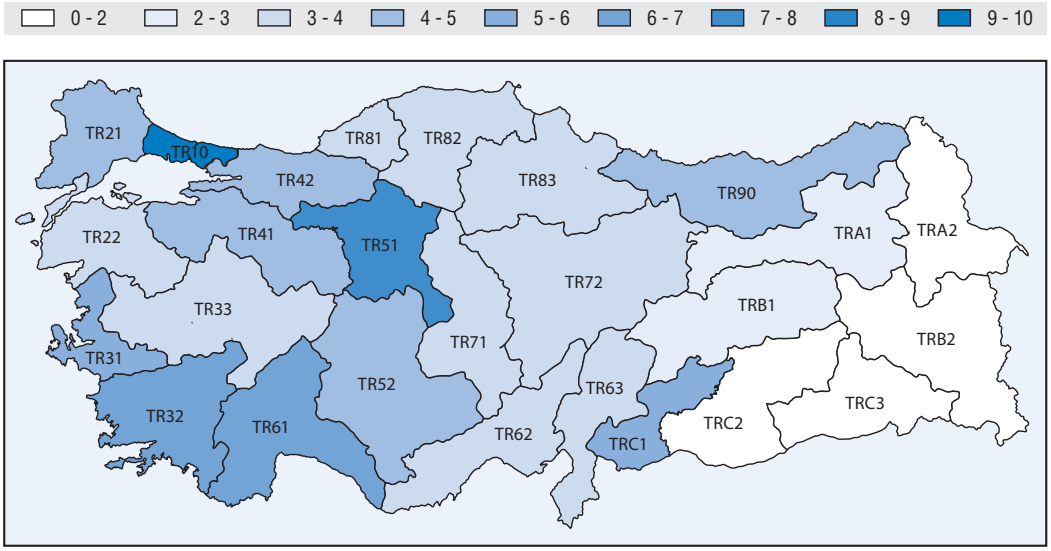
These findings stem from an application of the SME Policy Index, a benchmarking tool to monitor SME policy implementation over time in the Western Balkans and Turkey, mainly at the national level (OECD/EU/EBRD/ETF/SEECEL, 2016).[12] The SME Policy Index is based on the "Small Business Act" (SBA) for Europe, which aims to strengthen SMEs' sustainable growth and competitiveness in accordance with the "Think Small First" principle (European Commission, 2008).

This section offers a snapshot of SMEs and entrepreneurship in Turkey's 26 regions (Figure 13) through the prism of four indicators:

- **Number of SMEs.** Measures the size of the SME sector in regional economies;
- **New businesses registered.** Uses the number of new SMEs created as a yardstick of business environment dynamism;
- **Informal economy employment.** Assesses how challenging the business environment is to the creation and operation of SMEs;
- **Total credit as a percentage of GVA** in current TRY. Measures the level of financial intermediation in the regions.[13]

Figure 13. **Map of results from the SMEs and entrepreneurship dimension in the determinants of competitiveness pillar**

Index scores (0 to 10)



Source: All data sources are included in Annex C.

Key findings from the SMEs and entrepreneurship dimension

- The number of SMEs per 1 000 inhabitants shows large differences across regions – between 41.6 in TRB2 Van, Muş, Bitlis, Hakkari and 87.6 in TR61 Antalya, Isparta, Burdur. The TR32 Aydın, Denizli, Muğla region also boasts a relatively well developed SME and entrepreneurship environment, characterised by a relatively high number of SMEs (86.3 per 1 000 inhabitants).
- The enterprise creation rates vary considerably across the country as well, from 8.1 new business formally registered per 10 000 people in TRA1 Erzurum, Erzincan, Bayburt in 2014 compared to nearly 50 in TR10 İstanbul. Some regions located

near the sea in the south-east of Turkey – TR61 and TR32 – stand out when it comes to the dynamism of the business environment, ranked second and fourth respectively. Eastern regions, particularly rural ones, show the greatest potential for improvement, with enterprise creation rates usually significantly below the Turkish average of 24.4 new business registered per 10 000 people.

- High levels of informality can hamper the creation of new businesses. Informality is relatively widespread in TRB2 Van, Muş, Bitlis, Hakkari and TRC2 Şanlıurfa, where the informal economy outside agriculture accounts for more than 50% of total employment. On the other hand, TR51 Ankara, TR41 Bursa, Eskişehir, Bilecik and TR10 İstanbul boast lower levels.

There are wide disparities in the SME and entrepreneurship dimension between the top- and the lower-performing regions. The inference is that SMEs and entrepreneurs deal with different business environments from one region to another. The TR10 İstanbul region performs best – ranked first for the number of new businesses registered and third for the number of SMEs created. It also has to contend with less informality, with 19.1% of the labour force in informal employment. TR51 Ankara and TR61 Antalya, Isparta, Burdur are the second and third best-performing regions respectively in SMEs and entrepreneurship, followed by TR32 Aydın, Denizli, Muğla and TR31 İzmir. Most of the 26 regions register mid-table scores of between 2 and 5.[14]

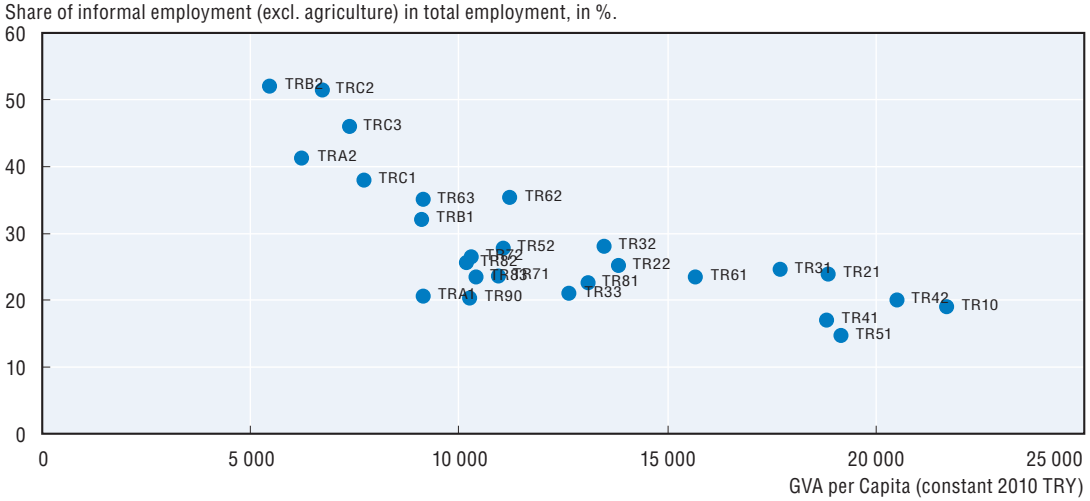
Four regions score less than 1: TRA2 Ağrı, Kars, Iğdır, Ardahan, TRC3 Mardin, Batman, Şırnak, Siirt; TRC2 Şanlıurfa, Diyarbakır and TRB2 Van, Muş, Bitlis, Hakkari. They are also ranked lowest in Turkey's regional competitiveness index. Other regions that have plenty of room for improving their SME and entrepreneurship environment are: TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR21 Tekirdağ, Edirne, Kırklareli, TR33 Manisa, Afyon, Kütahya, Uşak and TR81Zonguldak, Karabük, Bartın.

Most of the eastern regions could improve the environment for SMEs and entrepreneurship by taking important measures to curb informality, create a more favourable business environment and improve access to finance. In general, SMEs and entrepreneurs in the predominantly rural eastern regions may struggle with more restricted access to support services, such as training or access to finance tools, than urban and less remote areas. Regions could address the issue through further comparative policy analysis followed by targeted policy responses. An example of good practice is the Western Investment Fund put in place by the Western Region in Ireland to provide seed and venture capital for SMEs – a policy intervention that created or sustained over 1 500 jobs, mainly at the graduate level and outside urban centres (Brezzi and Piacentini, 2010).

Informal employment is one of biggest obstacles for SMEs and entrepreneurship in many regions – indeed, there is a negative correlation between informality and GVA per capita in the regions (Figure 14). The OECD (2014a) finds that Turkey has a highly rigid, costly labour regulation framework – particularly in such crucial areas like temporary employment, employment through work agencies, and severance costs. This gives rise to informal employment (ibid.), with informal and semi-formal business becoming more cost-competitive and flexible. If Turkey were to adopt more modern labour market rules, labour markets would allow formal firms, which usually benefit from scales economies and other drivers of productivity, to increase their competitiveness, maintain their flexibility, and employ a higher share of the labour force. Addressing the causes of informality could thus help improve economic performance across Turkish regions.

Figure 14. **Informal employment and GVA per capita**

Informal employment data relate to 2012 and GVA per capita to 2011



Source: Turkstat

2.3.2 Technology and innovation

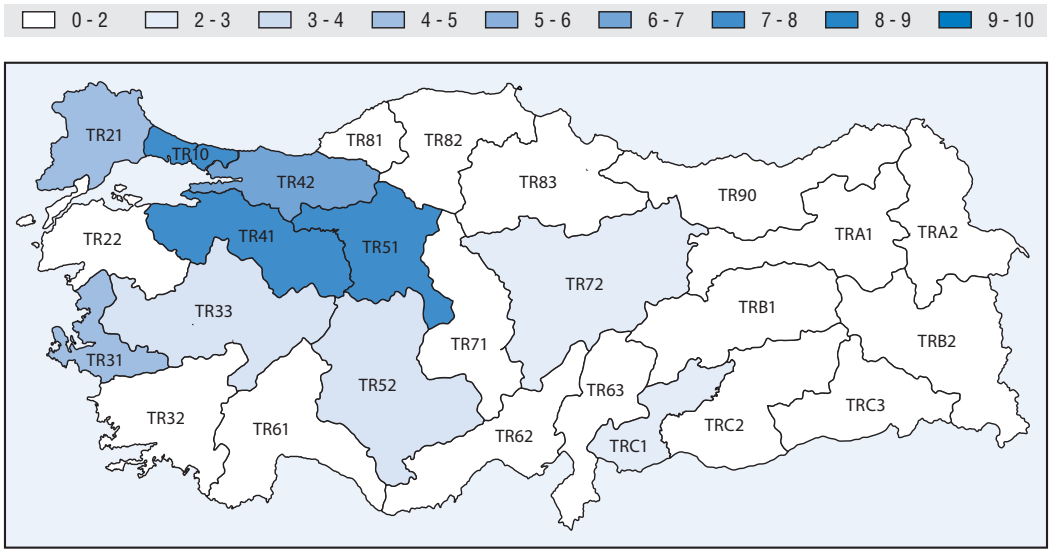
Innovation and the use of high technology are key for regional economies if they are to move up global value chains, escape the middle-income trap and transition towards knowledge-based economic activities. Innovation is also a driver of income growth, can help address poverty and directly improve the well-being of different groups in society, such as the excluded and people on lower incomes (OECD, 2015c). Innovation is an interactive process, involving collaboration and partnerships among firms and other actors such as educational and research organisations and communities. Geographic proximity therefore remains important for the innovation process, due to benefits arising from agglomeration and clustering. Labour market pooling, for instance, can give access to a broad range of potential employers and employee skills, variety and specialisation by providers of intermediate goods and services, and knowledge spillovers, whereby firms benefit from being near each other (OECD, 2011c).

Investment in research and innovation across OECD countries has intensified in recent years. It grew by 2.7% in real terms to USD 1.1 trillion in 2013 from 2012, and a new generation of technologies – such as those related to big data and quantum computing – are laying the ground for profound societal transformations (OECD, 2015d).

This section analyses results in the technology and innovation dimension in Turkey's 26 regions (Figure 14). It does not seek to be exhaustive, however. Accordingly, it concentrates on three indicators:

- **High-tech manufacturing** and **knowledge-intensive services;**
- **High and medium high-tech sectors**. Gauges employment in creative and innovative activities;
- **Number of patent applications**. Measures the intensity of scientific activities across regions and gives an indication of science and innovation hot spots.

Figure 15. **Map results measured against the technology and innovation dimension in the determinants of competitiveness pillar**



Source: All data sources are included in Annex C.

Key findings from the technology and innovation dimension

- The share of people employed in high-technology manufacturing and knowledge-intensive services is relatively low in Turkey, averaging 0.72% of total employment. The TR51 Ankara and TR10 Istanbul regions do best with 2.7% and 2.5%, respectively. Yet even those percentages remains low compared to the EU average of 3.4% (see Figure 16).
- The average share of persons employed in high and medium high-tech manufacturing (2.4%) is also quite low and below the EU28 average of 4.3% (Figure 16).The TR41 Bursa, Eskisehir, Bilecik region and TR42 Kocaeli, Sakarya, Duzce, Bolu, Yalova, however, perform relatively strongly. Respectively, they employ 10.4% and 9% of the workforce in high and medium high-tech manufacturing.
- The number of patent applications varies considerably across the regions, denoting disparities in scientific and innovative activities. The leading regions, with more than 100 patent applications per 1 million people are – TR10 Istanbul with 166 applications, TR41 Bursa, Eskisehir, Bilecik, TR51 Ankara and TR42 Kocaeli, Sakarya, Duzce, Bolu, Yalova. Some regions, by contrast, especially in the east of Turkey – e.g. TRA2 Agri, Kars, Iğdır, Ardahan with less than three patent applications per million people – have plenty of ground to make up.

Altogether, Turkish regions could further develop their medium- and high-technology sectors and innovative capacities. Some regions, however, do better than average. Four in particular – TR10, TR41, TR51 and TR42 – boast higher shares of people working in high-tech sectors and larger numbers of patents applications. Still, all four regions could look to further developing their high-tech sectors.

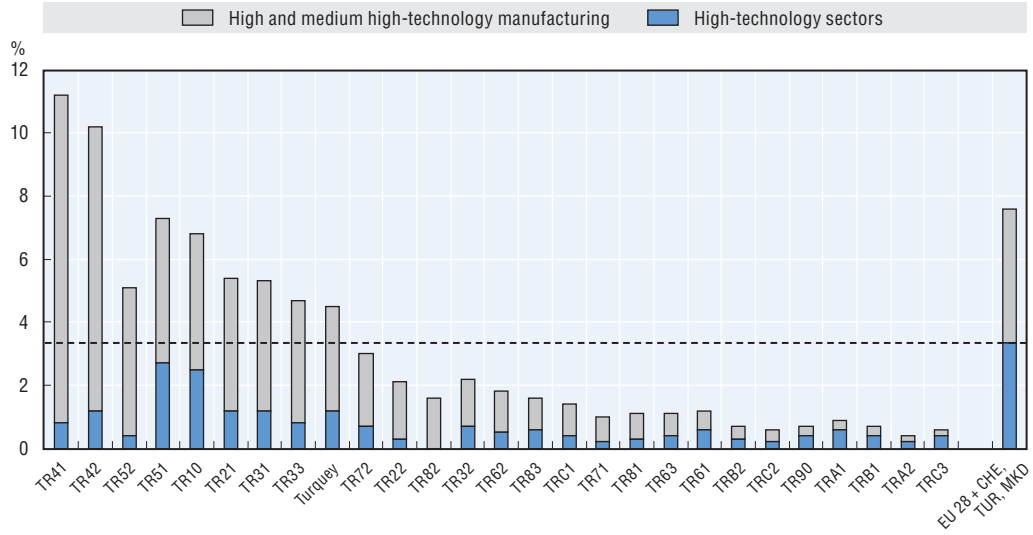
Many regions could take measures to build their high- and medium high-tech workforce and encourage patent applications as their scores are low. Most – 85% – score below 5, and 61% less than 2 (Figure 15). Policy makers could consider measures to promote transition to high technology, helping mid-tech regions such as TR31 İzmir and TR21 Tekirdağ, Edirne, Kırklareli to catch up with their high-performing peers. The low-tech regions could act to encourage some initial innovation and technology activity that answers specific local needs. Such regions are TRC2 Şanlıurfa, Diyarbakır, TRB2 Van, Muş, Bitlis, Hakkari, TRC3 Mardin, Batman, Şırnak, Siirt TR71 Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir, TR81Zonguldak, Karabük, Bartın, TR63 Hatay, Kahramanmaraş, Osmaniye, TRB1 Malatya, Elazığ, Bingöl, Tunceli and TR90 Trabzon, Ordu, Giresun, Rize,

Artvin, Gümüşhane. The following regions could also further strengthen their innovative capacities, as their performance is relatively low: TR61 Antalya, Isparta, Burdur, TR32 Aydın, Denizli, Muğla, TR81 Zonguldak, Karabük, Bartın and TR22 Balıkesir, Çanakkale.

To maximise the impact of regional innovation policies, recent OECD research on regional innovation has highlighted the importance of acknowledging the diversity of regional economic and innovation profiles (OECD, 2011c). In fact, the landscape of technology-based innovation is not flat, which is why policy measures should be tailored to the specific context of each region. Regions benefitting from key knowledge and technology endowments, for instance, could build on current advantages (e.g. sciences push, technology-led or a mix). Regions under threat, facing a potential failure of their development model could support socio-economic transformation (restructuring or identification of a new frontier). Potential transformation vectors might include attracting human capital, fostering productive use of regional traditions and knowledge and identifying potential partnerships in national strategies. Finally, regions lagging behind in income per capita, productivity growth and employment generation could take steps to catch up, by moving towards the creation of knowledge-based capabilities.

Complementary policies are highly important to the success of regional innovation policies, as decent infrastructure, a conducive SME and entrepreneurship environment and skills are prerequisites to regional innovation activity. Moreover, cross-border collaboration is beneficial in fostering innovation and technology development. In that regard, many Turkish regions could build on their location near international borders to realize innovation-driven growth opportunities.

Figure 16. **Employment in technology sectors by region as percentages of total employment**



Note: High technology sectors include high-technology manufacturing and knowledge-intensive high-technology services. Regions are arranged in descending order of their level of employment in "high and medium-high technology manufacturing".

Source: Eurostat.

2.3.3 Education and skills

Education and skills are conducive to innovation and knowledge-driven growth, helping to develop human capacities as sources of competitive advantage. Furthermore, a competent, well-educated workforce contributes to creating jobs, boosting productivity and generating prosperity. The latest findings of the OECD Programme for International Student Assessment (PISA) showed that students in Turkey performed below the OECD average in mathematics, reading and science in PISA 2012 (OECD, 2014d). However, OECD findings suggest that both, the average difference in performance between advantaged

and disadvantaged students and the degree to which students' socio-economic status predicts their performance shrank in Turkey between the first assessment in 2003 and 2012.

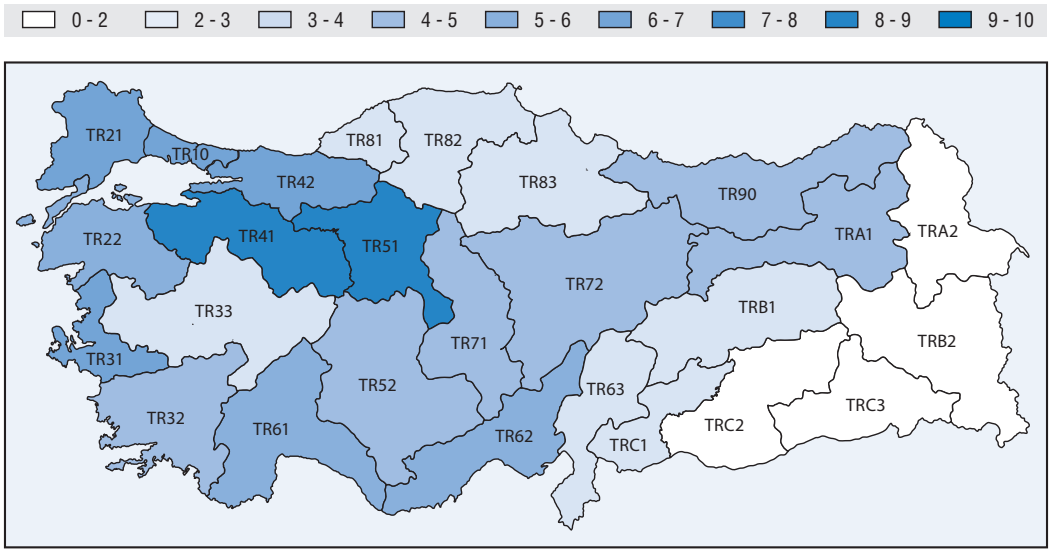
Some regions in Turkey suffer from sy stematic out-migration, especially among highly skilled and educated students and workers. This can pose significant long-term challenges of employment and productivity growth. Assessing the performance of each Turkish region in the areas of education and skills is therefore crucial to understanding the way forward in developing education and skills. Regional policies to that end need to be tailored to the specific constraints on regions at different levels of development.

This section proposes a basic analysis of education and skills in the 26 Turkish regions. It also looks at female literacy; in 2013 Turkey's female literacy rate was approximately 7% lower than that of men, which stood at 98.4% according to the World Bank Development Indicators. The section does not seek to be exhaustive, but considers four broad indicators:

- **Secondary education and tertiary education** as shares of the total labour force. This affords insight into the educational levels of the labour force;
- **Tertiary enrolment.** Measures proportions of students enrolled in tertiary education as a share of the total population;
- **Female literacy rate.** Assesses the proportion of women who can read and write in their daily lives.

Figure 17. **Mapping the results of the education and skills dimension in dimension in the determinants of competitiveness pillar**

Index scores (0 to 10)



Source: All data sources are included in Annex C.

Key findings from the education and skills dimension

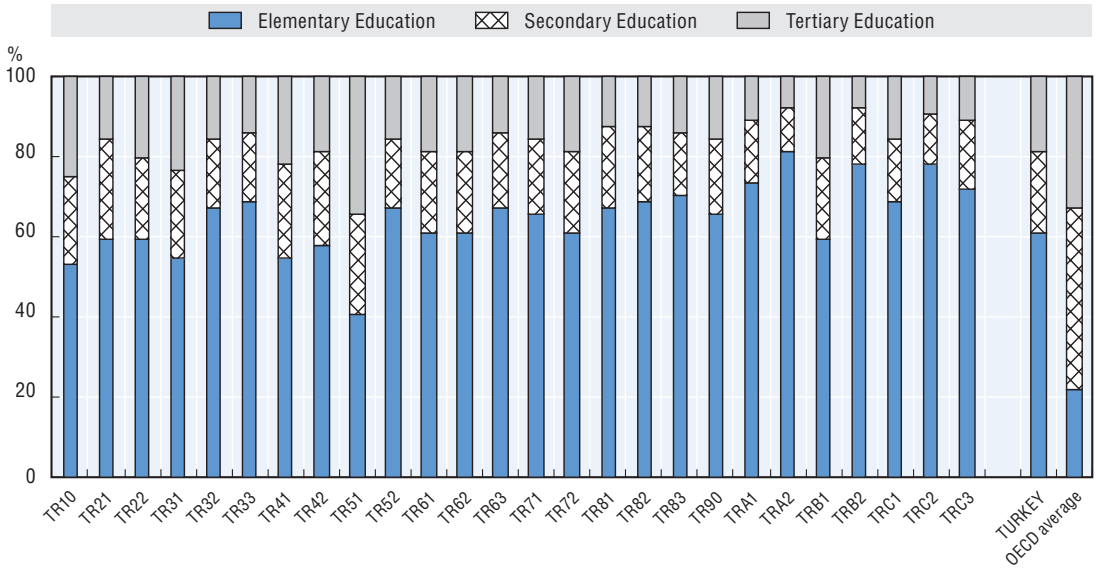
- On average, 20.5% of the Turkish labour force has a secondary education degree and 19% has completed higher education. The OECD averages are 46.6% and 32.6%, respectively. Regional differences in education are noticeable in Turkey, especially when it comes to higher education: the share of the labour force with tertiary-level education ranges from 33.8% in TR51 Ankara to 9.5% in TRB2 Van, Muş, Bitlis, Hakkari.
- Tertiary enrolment as a share of the total population also varies across regions, with TR41 Bursa, Eskişehir, Bilecik boasting the largest share compared to much lower shares in TRC2 Şanlıurfa, Diyarbakır and TRB2 Van, Muş, Bitlis, Hakkari.

- Although female literacy is relatively high in western regions, led by TR31 Izmir, 95.8% of whose female population is literate, it tends to be lower in the east of the country. In four regions the female literacy rate is below 80%, namely in TRC3 Mardin, Batman, Şırnak and Siirt (76.9%), TRC2 Şanlıurfa and Diyarbakır (77.2%), TRA2 Ağrı, Kars, Iğdır and Ardahan (78.2%) and TRB2 (79.2%) Van, Muş, Bitlis and Hakkari.

The 26 Turkish regions have an average score of 4.4, with TR41 Bursa, Eskişehir, Bilecik TR51 Ankara and TR10 Istanbul performing best in education and skills. They are followed by 13 regions with scores between 3 and 4. Eskişehir is an important university city in Turkey, with Anadolu University one of the largest in the world by number of students enrolled (due mainly to the high number of long-distance learners). This may partly explain TR41's lead in this dimension.

The high proportion of labour force with low skills weight heavily on competitiveness in Turkey. Some 60% has completed elementary education only, compared to 20% in the OECD. The proportion of the workforce with secondary and tertiary education is, accordingly, much higher in the OECD than in Turkey – by 25% and 14%, respectively. With 80% of its labour force having completed only elementary education, the TRA2 Ağrı, Kars, Iğdır, Ardahan region has the lowest education level of any region in the OECD, according to the OECD Regional Statistics. Policies to address the plight of the low-skilled in regions with very low education levels are crucial – according to OECD findings, they may be as important for growth as those aimed at expanding higher education. The regional dimension is critical here, since low-to-medium skilled workers tend to be less mobile than their high-skilled counterparts. Policies aimed at addressing skills gaps thus need to be well adapted to local conditions (OECD, 2013c).

Figure 18. **The percentages of the labour force with elementary, secondary and tertiary education, by region, 2014**



Source: OECD Regional Statistics.

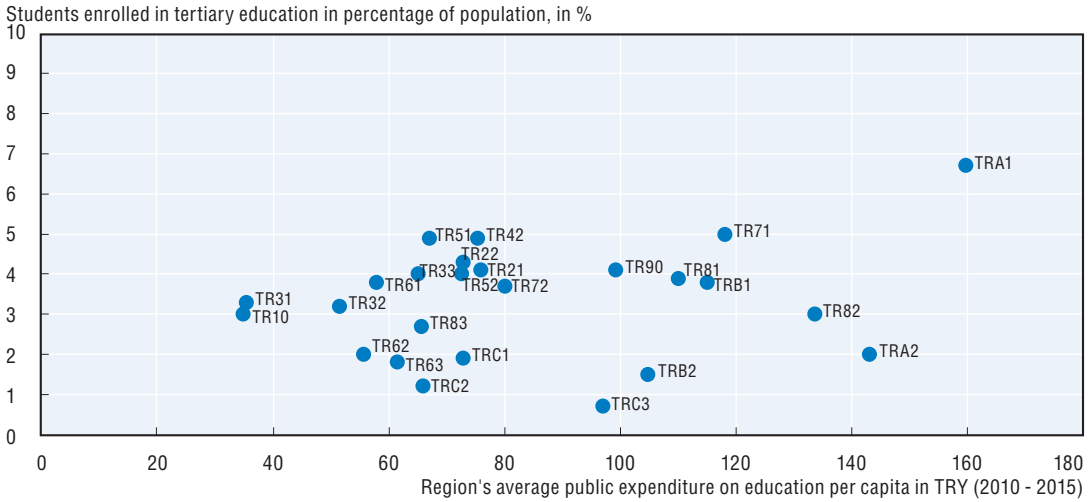
Regions that could strengthen their overall performance in skills and education are TRC2 Şanlıurfa, Diyarbakır, TRB2 Van, Muş, Bitlis, Hakkari, TRA2 Ağrı, Kars, Iğdır, Ardahan and TRC3 Mardin, Batman, Şırnak, Siirt. They could take action, for instance, to promote female literacy, which is below 80%, and enrolment in tertiary educational establishments, which is less than 2%. All four regions also show negative migration rates – i.e. more people are leaving than settling. Data from Turkstat show that in 2014, the largest negative net migration rates, were -26.9% in TRA2 Ağrı, Kars, Iğdır, Ardahan, -17.5% in TRB2 Van, Muş, Bitlis, Hakkari and -13.6% in TR82 Kastamonu, Çankırı, Sinop. In those regions, the proportions of the total population moving out were substantially

higher than those coming in. Out-migration among highly skilled workers heightens the risk of diminishing productivity if the most talented and skilled leave – indeed, outflows have been persistent in TRA2, TRB2 and TR82 over the last five years.

At 3.8% of GDP in current TRY, public expenditure on education is lower in Turkey than the OECD average at 4.7%, according to OECD data for 2012 (OECD, 2015f).[15] There is a weak link between public expenditure on education and the proportion of students enrolled in tertiary education in Turkey's regions – excluding some of the regions with the lowest tertiary enrolment levels, such as TRA2 Ağrı, Kars, Iğdır, Ardahan; TRC3 Mardin, Batman, Şırnak, Siirt; and TRB2 Van, Muş, Bitlis, Hakkari) (Figure 19). The weak link provides evidence that regional governments in Turkey seek to increase expenditure on education to help improve education levels in many regions. Yet, in some regions with relatively low regional competitiveness scores (such as TRC2 Şanlıurfa, Diyarbakır), public expenditure on education is still lower than in the above-mentioned regions.

Figure 19. **Expenditure on education and student enrolment in tertiary education**

Expenditure on education relates to 2010-15 and student enrolment in tertiary education to 2012



Note: The TR41 Bursa, Eskişehir, Bilecik region is not included because of its position as outlier in student enrolment in tertiary education.

Source: Ministry of Development (for public expenditure) and OECD Regional Statistics (for tertiary enrolment).

2.3.4 Labour market

An understanding of regional labour markets affords useful insight into regions' potential for economic growth and can be used as a tool for evidence-based employment strategies to achieve social and economic objectives – particularly as, in the aftermath of the global financial and economic crisis, countries worldwide have experienced sharp recession and steep increases in unemployment. In-depth understanding of labour market dynamics has to be supplemented with analyses of education and skills and migration patterns. Substantial out-migration is one of the major issues with which some regions in Turkey have to grapple. High shares of the well-educated youth population are leaving regions, especially in the east of the country, and moving to ones with more dynamic labour markets. While regional unemployment may fall in the short term as a result of outflows, employment growth and productivity may suffer in the long term if those leaving are the most talented, best educated and most entrepreneurial.

In general, labour market conditions are improving in OECD countries, albeit at an uneven pace, and employment is still growing too slowly to narrow the jobs gap caused by the crisis any time soon. Turkey is still struggling with a high unemployment rate of 10.2%, compared to the OECD average of 6.8%. With 18.5% of young people unemployed in Turkey in 2015, youth unemployment is also higher than the OECD average (13.9%), ranging from 9.4% in the TR52 Konya, Karaman region to 30.2% in TRC3 Mardin, Batman,

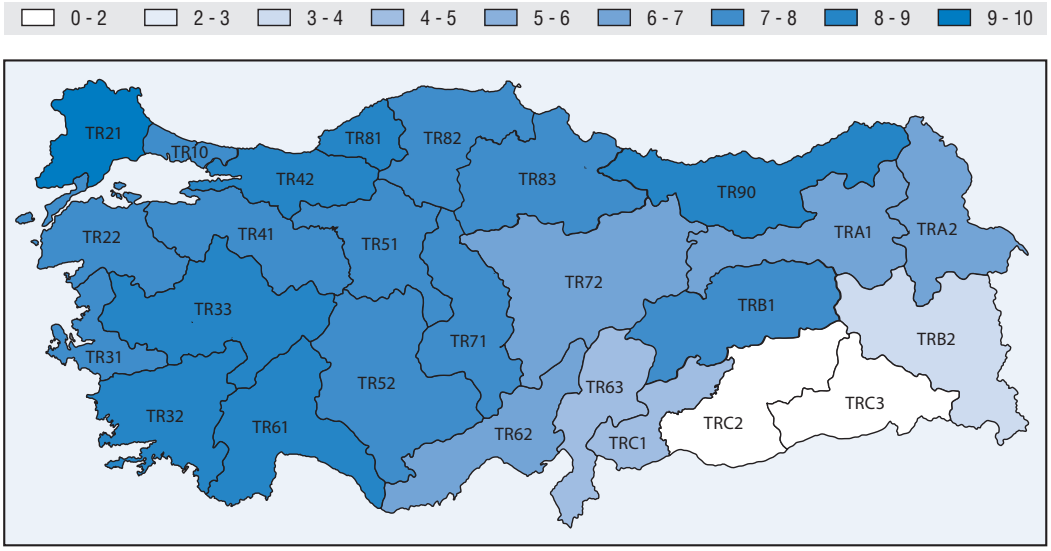
Şırnak, Siir according to Turkstat data for 2013. However, in recent years Turkey has taken steps to improve labour market conditions and performance (see Box 3).

This section examines the overall performance of the regions' labour markets against five core indicators, most of them being adapted from the ILO's key indicators of the labour market (KILM) (ILO, 2014):

- **Labour force participation rate.** Measures the proportion of the working-age population that actively engages in the labour market;
- **Female labour force participation rate.** Gauges the degree of inclusion of women in the labour market;
- **Labour utilisation rate.** Affords insights on labour productivity across the Turkish regions;
- **Dependency ratio.** Measures the age structure of the population by considering the number of individuals likely to be dependent on the support of others as a ratio of the number of individuals who are capable of providing such support;
- **Unemployment.** The most relevant indicator for measuring the labour market situation in Turkey's regions.

Figure 20. **Mapping the results of the labour market dimension of the determinants of competitiveness pillar**

Index scores (0 to 10)



Source: All data sources are included in Annex C.

Key findings from the labour market dimension

- In the average Turkish region, nearly 50% of the population aged 15 years and more participates in the labour force. According to the OECD Labour Force Statistics (2013) the figure is significantly lower than the OECD average of 60%, indicating that the active portion of Turkey's population is relatively low. Most Turkish regions have rates in excess of 40%, with the exception of TRC3 Mardin, Batman, Şırnak, Siirt, where labour force participation is 36.4%.
- However, in all Turkish regions women participate less than men in the labour force. Furthermore, Turkey's female labour force participation was the lowest in the OECD in 2014, averaging 34.4% nationwide compared to the OECD average of 51.5% according to the OECD Labour Force Statistics.

- Labour utilisation varies substantially across the 26 Turkish regions – from 40.4% of the total population in TR21 Tekirdağ, Edirne, Kırklareli to 17% in TRC3 Mardin, Batman, Şırnak, Siirt. The disparity suggests that, while large shares of the population participate in the labour market in some regions rather, the opposite is true in others.
- The dependency ratio averages 50.6% in Turkey. Eastern regions tend to have higher ratios, which points to relatively high shares of population under 15 or older than 65. High dependency ratios can cause greater spending on health, long-term care and pensions. Recent OECD research (Brezzi and Piacentini, 2010) also shows that regions with higher dependency ratios tend to experience migrant outflows (Box 2).
- Unemployment varies considerably across regions from 21.1% of the total labour force in TRC3 Mardin, Batman, Şırnak, Siirt to 4.7% in TR52 Konya, Karaman.

Turkey continues to perform below the OECD average in labour market indicators, although regional differences exist. For instance, female labour force participation ranges from 12.5% in TRC3 Mardin, Batman, Şırnak, Siirt to 47.4% in TR81 Zonguldak, Karabük, Bartın. Being the only region with a score higher than 9, TR21 Tekirdağ, Edirne, Kırklareli outperforms its peers in this dimension.

Eastern regions tend to have lower scores in the labour market dimension. TRC2 Şanlıurfa, Diyarbakır, which has relatively low female labour market participation rates and high dependency ratios, is the region with greatest scope for improvement. Cross-regional comparison also shows that TR10 İstanbul and TR51 Ankara, the two leading regions in the overall regional competitiveness index, are not among the top 10 performing regions in this dimension. Many eastern regions could increase their labour market performance, particularly through female labour force participation and lower dependency ratios if, for example, they could attract back people who have migrated to other regions.

Box 3. **National Employment Strategy of Turkey and action plans**

The National Employment Strategy of Turkey (2014-2023) aims to diagnose the challenges in the labour market, propose innovative solutions and measures to tackle them and contribute to creating more and better jobs in Turkey. It is complemented with a number of Action plans (2014-2016), which concretely specify how such strategy will be implemented.

The National Employment Strategy identifies four main policy pillars, namely: strengthening links between education and employment; ensuring security and flexibility in the labour market; increasing employment of vulnerable groups; and strengthening links between employment and social protection. Sector-specific employment strategies have also been defined for a number of sectors, including tourism, construction, finance, information technology, as well as labour intensive sectors of agriculture, textile and garment. For each pillar, the National Employment Strategy sets overall objectives, targets and specific policy measures. Action plans are foreseen for each pillar, including specific measures, specific bodies responsible for the implementation, partner institutions, timeline and explanation for the action.

The development of the strategy benefitted from a participatory approach, involving public institutions, professional organisations, employee and employer confederation, civil society, academics, media and politicians in two 3-day workshops.

Source: Ministry of Labour and Social Security (2014).

2.3.5 Infrastructure

Infrastructure is essential to promoting a region's connectivity and enabling local access to domestic and international markets. Infrastructure can also help attract foreign direct investment (FDI): in the OECD in 2012, the share of infrastructure in total inward FDI stocks ranged from less than 1% in Israel to 28% in Turkey (OECD, 2013b).

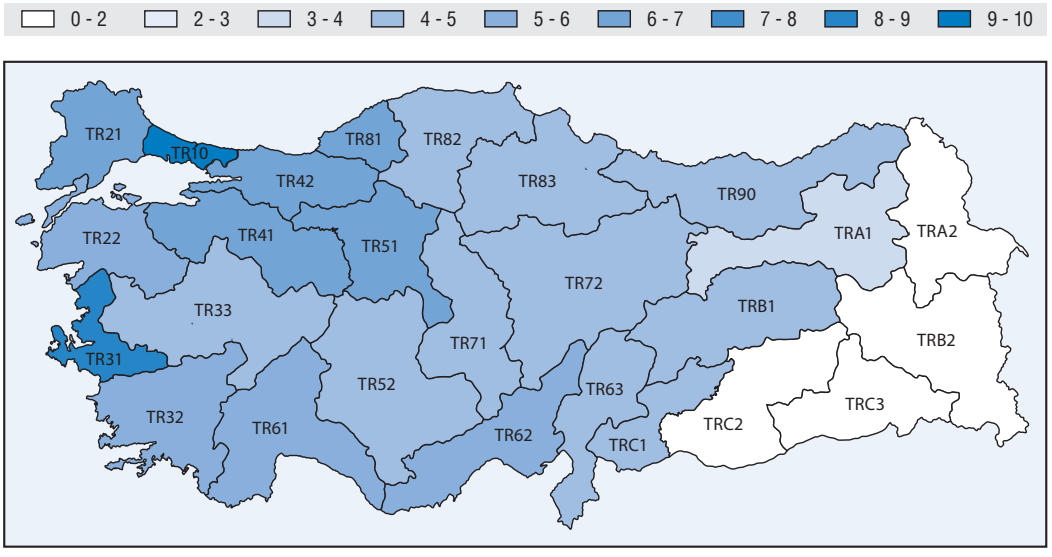
Addressing infrastructure challenges is high on the agenda of governments in developing and emerging economies. Furthermore, there is growing consensus on the need to expand private sector involvement in national infrastructure maintenance and development, ease pressure on public finances and increase resources for investment (OECD, 2015c).

This section proposes an analysis of infrastructure in the 26 Turkish regions. It is does not seek to be exhaustive, using five indicators to analyse regional performance:

- **Broadband penetration rate.** Measures the proportion of households with access to broadband internet;
- **Road density.** Measures the ratio of the length of a region's total road network to its land area;
- **Number of private cars** per 10 000 people. Measures a region's car ownership;
- **Electrical power failures.** Measures the incidence of power cuts and blackouts, which can hamper business;
- **Multimode Accessibility Index.** Assesses how accessible a province is by road, air, rail and sea.[16]

Figure 21. **Mapping the results of the infrastructure dimension of the determinants of competitiveness pillar**

Index scores (0 to 10)



Source: All data sources are included in Annex C.

Key findings in the infrastructure dimension

- Regional disparities in broadband penetration are wide. Only 15% of households have access to broadband internet connections in TRB2 Van, Muş, Bitlis, Hakkari, compared to 63% in TR10 İstanbul and TR21 Tekirdağ, Edirne, Kırklareli.

- Road density averages 91.1 km per 1 000 km^2 km in Turkey. Regional differences exist, but they are distributed differently to other dimensions. For instance, TR51 Ankara appears to have a lower density than average, while TRC3 Mardin, Batman, Şırnak, Siirt has a higher one.
- There are more private cars in the western and central regions than in the eastern ones. The number of private cars per 10 000 people may be up to 10 times higher in TR51 Ankara than in TRC3 Mardin, Batman, Şırnak, Siirt and TRB2 Van, Muş, Bitlis, Hakkari.
- There are, on average, 16 electrical power failures per million people in Turkey. TR31 İzmir outperforms the other regions, with a relatively more stable supply of electrical power. Electrical power cuts can, however, be a challenge in some regions, such as TRA2 Ağrı, Kars, Iğdır, Ardahan; TRC3 Mardin, Batman, Şırnak, Siirt and TRC2 Şanlıurfa, Diyarbakır.
- The TR10 İstanbul region is the most accessible by road, air, rail and sea, according to the Multimode Accessibility Index developed by the Ministry of Development. Accessibility can be a challenge in eastern regions, though, especially in TRB2 Van, Muş, Bitlis, Hakkari.

Scores in this dimension are, on average, higher than in the overall regional competitiveness index. TR10 İstanbul and TR31 İzmir have comparatively high scores of 9.21 and 8.22, respectively. TR81 Zonguldak, Karabük, Bartın, which is in the 5 top-performing regions, and TR62 Adana, Mersin (one of the top 10) also appear strong in this dimension.

Eastern regions could take further measures to develop an infrastructure framework conducive to competitiveness. Those that would benefit the most from taking additional action to address infrastructure constraints are TRC2 Şanlıurfa, Diyarbakır, TRB2 Van, Muş, Bitlis, Hakkari, TRA2 Ağrı, Kars, Iğdır, Ardahan and TRC3 Mardin, Batman, Şırnak, Siirt. They could seek to increase access to broadband internet and improve road, air, rail and sea transport. DAs have already taken initial steps in this direction.

2.3.6 Health and environment

Good health and a clean environment are key components of individual well-being and sustainable development. Longer lives and clean air and water also help create a good basis for productive business activity. Life expectancy in OECD countries has continued to rise, although differences remain across countries and socio-demographic groups. Average life expectancy was 80.5 years in 2013 (OECD, 2015e). Turkey, though, was one the lowest performers, with 74.2 years.

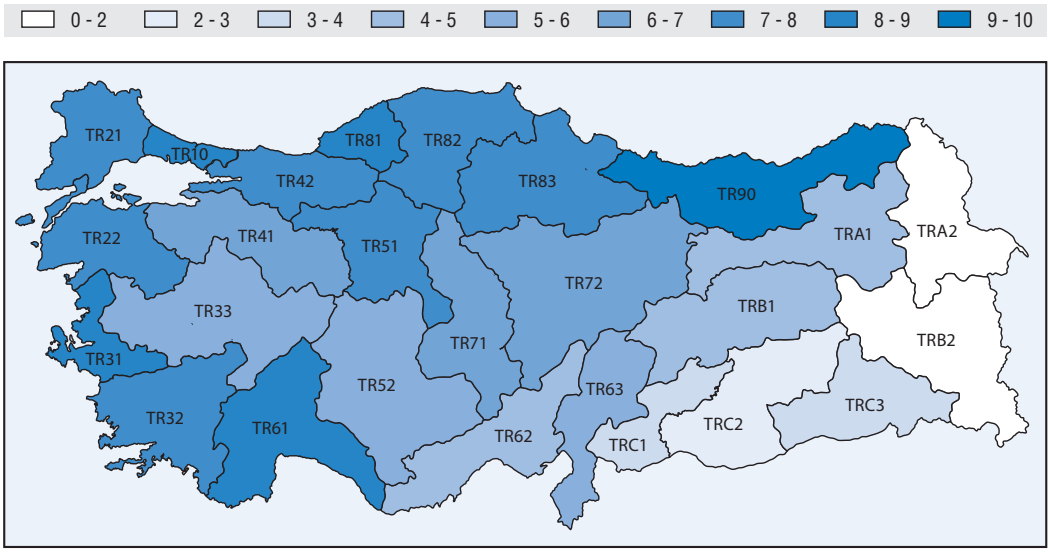
When governments address health and environmental challenges, such as climate change, not only can they mitigate risks to people's health and well-being, they can also reduce the incidence of floods and droughts, so helping to create a more certain business environment.

This section proposes an assessment of health and the environment in the 26 Turkish regions (Figure 22). It does not seek to be exhaustive, but to offer insight through three indicators:

- **Life expectancy at birth**. This is the most commonly used indicator to measure health;
- **Infant mortality**. This indicator helps identify vulnerable populations and compare socio-economic development across regions;
- **Air pollution**. Measures what the OECD Better Life Index defines as the greatest environmental cause of premature mortality by 2050.

Figure 22. **Mapping the results of the health and environment dimension of the determinants of competitiveness pillar**

Index scores (0 to 10)



Source: All data sources are included in Annex C.

Key findings from the health and environment dimension

- Life expectancy at birth is 74.2 years on average in Turkey. While 20 regions out of 26 have life expectancies at birth of between 73 and 75 years, there are differences between the highest and lowest performing regions.
- At 10.8 fatalities within the first year of life per 1 000 live births, infant mortality in Turkey is the second highest in the OECD countries, after Mexico, according to the OECD well-being indicators. Even in the Turkish regions where infant mortality is lowest, it is nevertheless almost twice as high as the OECD average – in TR31 İzmir, for example, where the rate is 7.1.
- Air pollution can pose a threat to health and the environment in Turkey. While the TR90 Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane region has the least polluted air in Turkey, levels can be twice as high in TRC3 Mardin, Batman, Şırnak, Siirt.

Scores in this dimension are relatively high in the 26 Turkish regions. Some fare substantially better than others in this dimension and the overall regional competitiveness index. TR90 Trabzon, for instance, emerges as the best performing region in the dimension, even though it is 15th out of 26 in the index. The regions TR82 Kastamonu, Çankırı, Sinop and TR83 Samsun, Tokat, Çorum, Amasya perform substantially better in the health and environment dimension than in the index as a whole.

Some regions could look to foster individual well-being and sustainable development and so further improve their performance. They include TRB2 Van, Muş, Bitlis, Hakkari, TRA2 Ağrı, Kars, Iğdır, Ardahan, TRC2 Şanlıurfa, Diyarbakır and TRC3 Mardin, Batman, Şırnak, Siirt.

Chapter 3

Reducing regional disparities in Turkey: A way forward

3.1 Despite constant growth, regional inequalities persist

GVA per capita in constant TRY has grown in all Turkish regions over the last decade, rising from an average of TRY 12.2 thousand in 2005 to TRY 14.4 thousand in 2011 (Table 4). Indeed, some of the regions with the lowest GVA per capita have grown at a faster pace than regions which had relatively high levels in 2005. TRC3 Mardin, Batman, Şırnak, Siirt shows the largest growth in GVA per capita over the last decade, growing by 49% from TRY 4.9 thousand in 2005 to 7.4 thousand in 2011. With 34%, TRA1 Erzurum, Erzincan, Bayburt had the second highest growth rate in GVA per capita between 2005 and 2011. TR81 Zonguldak, Karabuk, Bartın, with only 2% stands out as a region with a particular low GVA per capita growth. That being said, its GVA per capita was comparatively high in 2005.

Table 4. **GVA per capita and growth in constant TRY in Turkish regions, 2005-11**

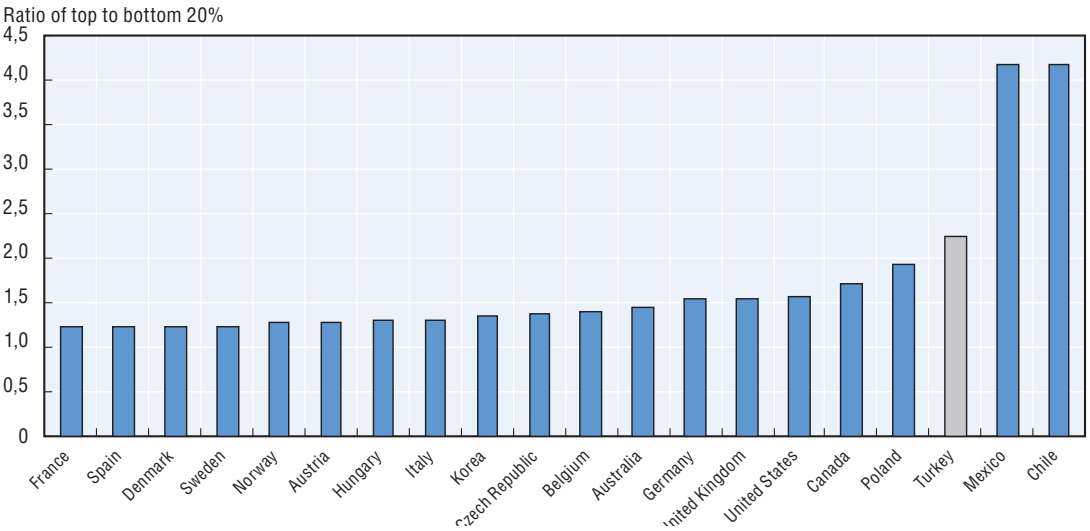
		2005	2011	Growth 2005-11
	Turkey	**12 166**	**14 372**	**15%**
TR10	İstanbul	19 048	21 708	14%
TR21	Tekirdağ, Edirne, Kırklareli	15 483	18 869	22%
TR22	Balıkesir, Çanakkale	10 863	13 819	27%
TR31	İzmir	15 312	17 708	16%
TR32	Aydın, Denizli, Muğla	12 265	13 485	10%
TR33	Manisa, Afyon, Kütahya, Uşak	10 019	12 657	26%
TR41	Bursa, Eskişehir, Bilecik	16 727	18 835	13%
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	17 036	20 505	20%
TR51	Ankara	16 359	19 167	17%
TR52	Konya, Karaman	9 255	11 056	19%
TR61	Antalya, Isparta, Burdur	14 331	15 689	9%
TR62	Adana, Mersin	9 686	11 233	16%
TR63	Hatay, Kahramanmaraş, Osmaniye	7 361	9 132	24%
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	8 634	10 941	27%
TR72	Kayseri, Sivas, Yozgat	8 507	10 297	21%
TR81	Zonguldak, Karabük, Bartın	12 769	13 082	2%
TR82	Kastamonu, Çankırı, Sinop	9 054	10 162	12%
TR83	Samsun, Tokat, Çorum, Amasya	8 468	10 399	23%
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	8 916	10 266	15%
TRA1	Erzurum, Erzincan, Bayburt	6 831	9 131	34%
TRA2	Ağrı, Kars, Iğdır, Ardahan	4 974	6 244	26%
TRB1	Malatya, Elazığ, Bingöl, Tunceli	7 388	9 095	23%
TRB2	Van, Muş, Bitlis, Hakkari	4 546	5 460	20%
TRC1	Gaziantep, Adıyaman, Kilis	6 567	7 738	18%
TRC2	Şanlıurfa, Diyarbakır	5 456	6 710	23%
TRC3	Mardin, Batman, Şırnak, Siirt	4 950	7 371	49%
	Ratio of top to bottom 20% of regions	**3.20**	**2.96**	

Source: Turkstat; OECD computations.

The relatively high growth of lagging regions is also reflected in narrowing interregional disparities between 2005 and 2011. The ratio of GVA per capita between the top and bottom 20% of regions closed continuously over the years – from 3.2 in 2005 to 2.96 in 2011 and is estimated to reach 2.78 in 2015. For example, the GVA per capita of TR10 İstanbul was 3.4 times higher than that of TRB2 Van, Muş, Bitlis, Hakkari in 2015, while in 2005 it was just over than four times greater.

However, despite the positive trend, disparities across Turkish regions remain significant and continue to be a policy challenge to regional development in Turkey. Turkey emerges as one of the OECD countries with the widest disparities in GVA between best- and worst-performing regions (Figure 23). Only Chile and Mexico have higher ratios, which suggests that the production activity is not evenly distributed across Turkey, but is concentrated in the top 20% performing regions.

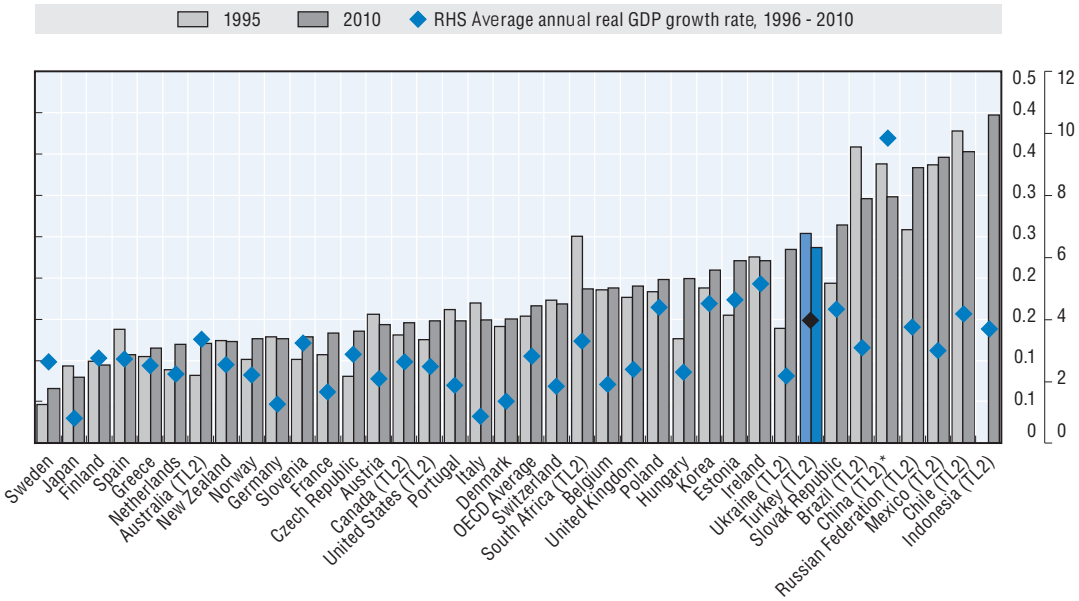
Figure 23. **Regional disparities in GVA in OECD countries, 2010**



Note: This analysis includes all OECD countries for which data were available for GVA in 2010 and which had more than seven regions. The remaining 14 member countries could not be included in this analysis.
Source: OECD calculations based on OECD (2016), OECD Regional Well-Being statistics (Database), OECD, Paris, http://stats.oecd.org/Index.aspx?DataSetCode=RWB.

Wide regional disparities in Turkey also emerge from comparing the GINI index of inequality of GDP across regions to the one of other OECD member countries. The GINI index measures the extent to which the distribution of GDP among individuals or households within the economy deviates from a perfectly equal distribution. After Chile, Mexico and the Slovak Republic, Turkey had the highest GINI inequality score of GDP across regions in 2010. Between 1995 and 2010, Turkey's GDP grew by an average of 3.95%, but the rise was not reflected in a substantial reduction of inequalities.

Figure 24. **GINI index of inequality of GDP per capita across TL3 regions, 1995 and 2010**

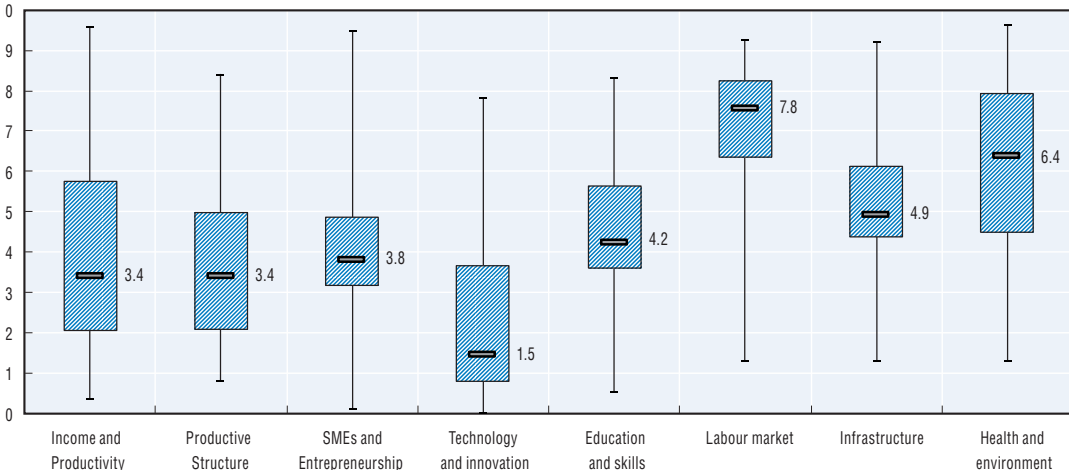


Source: OECD (2013).

The unequal distribution of wealth supports the results of the analysis developed in the earlier sections of this report. Regional disparities in Turkey exist and can be more

pronounced in some areas than in others. Figure 25 illustrates gaps between the top and the bottom performance in all eight dimensions of the regional competitiveness index. It is highest in the income and productivity dimension of pillar 1 and the SMEs and entrepreneurship dimension of pillar 2. With a median score of only 1.5, the innovation and technology score is also low. In both SMEs and entrepreneurship and innovation and technology, the scores of half of the regions are lower than mid-level, which suggests that the two determinants of competitiveness are among the mostly weakly developed in Turkish regions.

Figure 25. **Gaps between top and bottom regional scores in the eight dimensions**



Note: The box plot shows the variation in scores in each dimension of the regional competitiveness index. The median value is depicted by the bold horizontal line in the box, the third and second quartiles of the distribution of scores across regions by the edges of each box, and the extreme values by the two whiskers extending from the box.

Source: All data sources are included in Annex C.

3.2 Possible ways forward to improve competitiveness

Policy makers are invited to draw on the analysis in this report as they seek to address regional disparities in Turkey. While the report does not advocate concrete measures for improving regional competitiveness, a few general conclusions can be drawn that point to possible ways of moving forward.

Key determinants of regional growth vary from one region to the other. They are influenced by factors such as population density, levels of development, and human capital endowment. As a consequence, challenges in rural regions differ considerably from those in urban or intermediate regions, and the most productive regions have to contend with obstacles that are different from those which trouble regions that lag behind. Policy makers therefore should take measures that complement each other and respond to the specific conditions that prevail in each region and there is a need for coordination between different levels of government.

Previous OECD research shows that economic activity tends to concentrate in certain geographic spaces rather than others, mainly due to the benefits of economies of agglomeration: "People want to live where firms – and therefore job opportunities – are concentrated, and firms want to locate where demand – and therefore population – is large" (OECD, 2015g). Agglomeration economies are generated when firms enjoy increasing returns to scale in a particular place that stem from natural advantages, monopolistic protection, political factors and other reasons. Large cities and regions are therefore more attractive to more productive firms and highly skilled workers. This selection effect is magnified by agglomeration dynamics, whereby individuals and firms become more productive in denser environments.

A number of rural regions in Turkey, in contrast, especially those where there are no cities or which are not close to any, perform weakly in areas that are considered pre-requisites for competitiveness. Low-density cities and regions, located far from major markets tend to face a number of common problems. As previous OECD research shows, such challenges relate mainly to exogenous sources of growth and local markets with weak competition (OECD, 2015g). In the economic structures of remote regional economies, production is often concentrated in a few sectors – in fact the primary sector accounts for larger shares of employment, and there is limited diversification and relatively low levels of human capital.

Policies to improve competitiveness in rural regions, particularly remote ones, should take into account patterns of labour mobility.

Education and training emerge as critical factors for development in remote regions threatened by stagnation or decline. According to OECD findings, policies that address the plight of the low-skilled workers may be as important for growth as policies to develop higher education (OECD, 2013c). As low-to-medium skilled workers tend to be less mobile than their highly skilled peers, the regional dimension is critical in dealing with the twin challenge of skills and labour mobility.

The most straightforward policy response to the issue of remoteness is to invest in adequate infrastructure, although an initial consequence might be an increase in migrant outflows from less attractive areas (Brezzi and Piacentini, 2010). Regional development policy in Turkey has already made considerable progress in this area, as evidenced in the public investment plans drawn by the Ministry of Development, which address important infrastructure bottlenecks in rural regions.[18] Strengthening linkages between small and medium-sized cities to improve connectivity in peripheral regions would be a further policy response available to policy makers in Turkey. Access to urban functions and diverse employment opportunities would grant rural population framework conditions for competitiveness that are usually available only in regions that rank high in the regional competitiveness index (ibid.).

Promoting higher education has been identified in this report as a suitable policy for regions aiming to develop human capital as a key determinant of competitiveness. However, regions concerned about the brain drain and human capital loss should approach it with care, given that highly skilled workers tend to be more mobile than their low-skilled peers. In that regard, a good example of a policy that targets areas at grips with a declining population is the French practice of improving the provision of higher education in medium-sized towns and cities (villes moyennes) in order to retain more young people. Villes moyennes have become a destination for white-collar workers and executives, more of whom are flowing in than out, according to OECD research findings (ibid.).

OECD analysis has also pointed to the importance of the regional production structure in explaining patterns of mobility (ibid.). Structural transformation towards activity in high value-added rather than traditional sectors would create better jobs and perspectives in undiversified local economies. Gradually moving up the value chain by exploring sectors such as agri-food production and other resource-driven tradables, for example, could be a policy objective in regions dependent on agriculture. Fostering an environment conducive to SMEs and entrepreneurship could help undergo structural transformation, including in regions struggling with population decline. In that regard, a success story comes from Ireland's Western Region, where the Western Investment Fund provided seed and venture capital for SMEs. The Fund has helped create or sustained over 1 500 jobs, mainly at the graduate level and outside urban centres (ibid.).

Policies in the areas of SMEs and entrepreneurship and innovation and technology can help boost competitiveness across Turkey, in conjunction with other growth enhancing measures.

Poor accessibility and connectivity weigh heavily on SMEs, entrepreneurship and innovation. The regions affected should address the issue in conjunction with policy

measures to ease infrastructure bottlenecks and policy makers might consider the following questions:

- What is the overall environment for SMEs and entrepreneurship in the region like?
- Are any factors constraining business development?
- What can be done to create a more enabling environment for small business and entrepreneurial activity?

In the context of SME development, this report has pointed to Turkey's large informal economy, which accounts for up to 52% of employment in some regions and which can hamper the creation and development of businesses. A more flexible labour market regulation could help to address this challenge if it allowed formal enterprises to increase their competitiveness, maintain their flexibility and helped them to employ a higher share of the labour force (Chapter 2.3.1). The OECD's Economic Survey (2014) points to possible labour market reforms to that end.

There are a number of policy tools for creating an enabling environment for SMEs and entrepreneurship. Policy makers could examine whether Turkey's regions have adequate structures in place to facilitate doing business and entrepreneurial activity. To that end, they might consider the following questions:

- Are business registration processes simple enough and is it easy for investors to obtain an investment licence?
- Or are there any unnecessary steps that deter entrepreneurs and investors?
- Are regional institutions doing enough to promote their region to national and foreign investors?
- Is there enough technical and financial support in the region for SMEs and entrepreneurs wishing to start and develop their business?
- Are the services designed to properly fulfil needs on the demand side?
- Are there any services that meet the particular needs of female entrepreneurs who are often excluded from entrepreneurial activity?
- Are there measures in place to help young people start a business – for example, does a young person have the right skills set to meet the demands of the labour market?

In the innovation and technology dimension, it may be more difficult for policy makers to identify the measures that will help lagging regions to catch up. Innovation activity in Turkey currently seems to be focused on few regions, with most showing limited capacity to innovate. The same may be true of other countries, too: innovation usually depends on a number of factors that are prerequisites for innovation activity, e.g. a highly educated labour force and sound infrastructure which includes networks and clusters. Promoting innovation and technology may not, therefore, be a top policy priority in regions grappling with a number of other competitiveness challenges – particularly in the areas of education and skills, labour market and infrastructure – or in remote regions.

Nevertheless innovation activity is crucial to supporting transition in emerging markets, helping regional economies to move up the value chain, escaping the middle-income trap and transitioning towards knowledge-based economic activities. Policy makers might therefore look to promote innovation activity in emerging regions that have promising potential to catch up, e.g. the so-called "Anatolian tiger" regions located mainly in Central Turkey. Which tools could help such regions to step up their structural transition and become high value-added economies? Are they, for instance, successful in enabling clusters, defined by the OECD (2007) as "geographically close groups of interconnected companies and associated institutions in a particular field" (OECD, 2007). Clusters may benefit regional economies, by lowering production costs and fostering innovation and productivity growth. They can also facilitate knowledge sharing and

specialisation, and contribute to building a competitive business environment (Garcia Villareal, 2010). Clusters are regional in nature and, therefore, belong to the sphere of sub-national policies.

Next steps for regional competitiveness policy-making in Turkey

The analysis in this report has pointed at regional strengths and weaknesses, identifying areas that could be addressed by regional policy makers. The policy options it has outlined do not claim to be exhaustive and indicate merely how Turkey can start moving forward in reducing regional disparities. The findings can be used as a starting point for further analysis and policy discussion to identify optimal policy packages based on the different bottlenecks to growth regions in Turkey are facing and reflecting the country's geographical diversity.

Data limitations are often a heavy constraint on analysis at the regional level. In Turkey, gaps in regional data are most pronounced when it comes to measuring regional economic activity, SMEs and entrepreneurship, and innovation. With no data on regional GDP available for Turkish regions, the most widely used standard indicator for measuring economic performance is missing. The scarcity of data on sectors' value-added, business and R&D activity also limit knowledge of regional performance. If policy makers were to address the existing data shortcomings, they could make the analysis of regional competitiveness an even stronger foundation for evidence-based development policies at the subnational level in order to help regions unlock their competitiveness potential across Turkey.

Notes

1. Anatolian Tiger regions, as identified in OECD surveys include five NUTS 2 regions: TR32 Aydin, Denizli, Mugla; TR52 Konya, Karaman; TR63 Hatay, Kahramanmaras, Osmaniye; TR72 Kayseri,Sivas, Yozgat; TRC1 Gaziantep, Adiyaman, Kilis (OECD, 2014a).
2. NUTS 2 regions are defined by Level 2 of the Nomenclature of Territorial Units for Statistic. A table listing all NUTS 2 regions is included in Annex B.
3. Regional Development Plans (RDPs) are developed by the DAs of the 26 NUTS II regions under the responsibility of the Ministry of Development. The most recent RDPs, second generation RDPs, cover the period 201423.
4. For details on the OECD Regional Database, go to: http://stats.oecd.org/Index.aspx?datasetcode=REG_DEMO_TL2.
5. For more on the OECD series, Regions at a Glance, go to http://rag.oecd.org.
6. For more on the Regional Well-Being web-based tool, go to www.oecdregionalwellbeing.org/
7. A widely used measurement of inequality is the GINI index. It measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution.
8. An overview of different types of indicators is presented in OECD (2009).
9. The 15 dimensions from the *Competitiveness in South East Europe: A Policy Outlook* (OECD, 2016a) are Investment Policy and Promotion, Trade Policy and Facilitation, Education and Competencies, R&D and Innovation, Digital Society, Cultural and Creative Sectors, Transport, Environment Policy, Access to Finance, Tax Policy, Competition Policy, Employment Policy, Health Policy, Effective Public Services and Anti-Corruption Policy.
10. Regional exports are measured according to the province where the head office of the firm is located, not according to the place of production. While this may somewhat distort the actual production picture it was decided to nevertheless include exports in the framework as exports are commonly seen as a key measurement of competitiveness.
11. For a more detailed technical explanation regarding the construction of EXPY, see Annex C.
12. The most recent SME Policy Index assessment for Western Balkans and Turkey was released in April 2016 by the OECD in partnership with the European Commission, the European Bank for Reconstruction and Development (EBRD), and the European Training Foundation (ETF). The SME Policy Index is also applied on a regular basis to Eastern Partner Countries (2016), Middle East and North Africa (2014) and ASEAN economies (2014).
13. The descriptions and sources of the indicators are included in Annex C.
14. The exceptions are the following four regions: TR10 İstanbul, TR51 Ankara; TR61 Antalya, Isparta, Burdur; TR32 Aydın, Denizli, Muğla; and TRC1 Gaziantep, Adıyaman, Kilis. Their scores range between 5.12 (TRC1) and 9.47 (TR10).
15. Data on public expenditure for education in Denmark and Greece were not available.
16. Technical remarks on how the Multimode Accessibility Index was constructed are included in Annex C.
17. Values of GVA per capita in 2015 are estimates.
18. http://www.kalkinma.gov.tr/Lists/KamuYatirimProgramlari/Attachments/54/2016_Yili_Yatirim_Programi.pdf.
19. At the time of writing, legislation had been drafted and sent to the Turkish parliament to move the centres of two southeastern provinces, Şırnak and Hakkari, to Yüksekova and Cizre districts respectively and rename the provinces after these districts.

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Annex A.
Regional profiles

TR10 İstanbul

Table A.1 **Key Facts, 2015 or latest available year**

Total population (million people)	14.38	2015
Population density (per km²)	2 767.00	2015
Area (km²)	5 196.00	2015
Urbanization (%)	99.89	2014
Inflation (%)	9.14	2014
Gross Value Added (million constant 2010 TYR)	287 755.00	2011
Share in Turkey's GVA (%)	27.16	2011
Share in Turkey's exports (%)	52.06	2014

Figure A.1 **GVA per capita, constant 2010 TRY, 2005-2015**

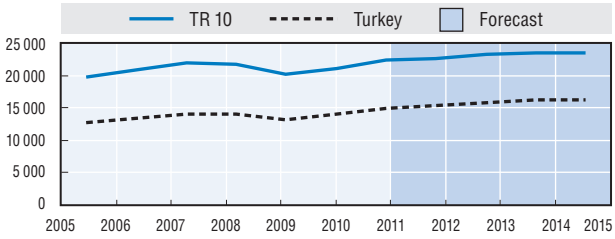


Figure A.2 **Scores by dimension**

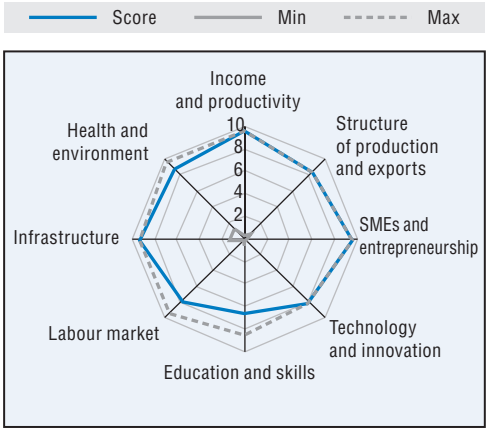


Table A.2 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		4.4	11	●
1.	Economic performance		9.0	1	●
2.	Determinants		8.1	1	●
1.1	Income and productivity		9.6	1	●
1.1.1	Household income (2005 TRY)	16 029.0	8.7	2	
1.1.2	GVA per capita (2010 TRY)	22 610.5	10.0	1	●
1.1.3	Labour productivity (2010 PPP USD)	73 218.0	10.0	1	●
1.2	Productive structure		8.4	1	●
1.2.1	Trade openness (%)	1.1	10.0	1	●
1.2.2	Number of products exported (SITC. 4-digit level)	500.0	8.7	2	
1.2.3	Export sophistication (EXPY)	8 973.4	5.1	5	
1.2.4	Agriculture (% of GVA)	0.2	10.0	1	●
1.2.5	Manufacturing (% of employment)	28.1	5.2	12	○
1.2.6	Enterprises in manufacturing (%)	15.8	10.0	1	●
1.2.7	Number of MNEs (per 10.000 enterprises)	34.6	10.0	1	●
2.1	SMEs and entrepreneurship		9.5	1	
2.1.1	Number of SMEs (per 1.000 people 15-64)	83.7	9.2	3	
2.1.2	New business registered (per 10 000 people 15-64)	49.6	10.0	1	●
2.1.3	Informal economy (% of employment)	19.1	8.8	3	
2.1.4	Total credit (% of GVA)		9.9	2	
2.2	Technology and innovation		7.8	1	●
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	2.5	9.5	2	
2.2.2	High and medium high-tech sectors (% of employment)	4.3	4.0	5	
2.2.3	Number of patent applications (per million people)	166.9	10.0	1	●
2.3	Education and skills		6.6	3	
2.3.1	Secondary education (% of labour force)	23.7	7.9	4	
2.3.2	Tertiary education (% of labour force)	25.8	6.8	2	
2.3.3	Tertiary enrolment (% of population)	3.0	3.0	17	○
2.3.4	Female literacy rate (%)	93.2	8.6	10	○
2.4	Labour market		7.7	11	○
2.4.1	Labour force participation rate (% of population 15+)	52.6	8.9	6	
2.4.2	Female labour force participation rate (% of population 15+)	31.2	5.4	18	○
2.4.3	Labour utilization rate (%)	35.7	8.0	10	○
2.4.4	Dependency ratio (%)	40.5	9.7	3	
2.4.5	Unemployment (%)	11.2	6.0	21	○
2.5	Infrastructure		9.2	1	●
2.5.1	Broadband penetration rate (% of households)	63.0	10.0	1	●
2.5.2	Road density (km/1 000 km2)	141.8	10.0	1	●
2.5.3	Number of private cars (per 10 000 people)	15.8	6.8	4	
2.5.4	Electrical power failures (per million people)		9.3	3	
2.5.5	Multimode Accessibility Index	100.0	10.0	1	●
2.6	Health and environment		8.8	2	
2.6.1	Life expectancy (years)	75.3	8.9	4	
2.6.2	Infant mortality (per 1 000 live births)	8.0	9.1	4	
2.6.3	Air pollution (Pm2.5 µg/m³)	14.7	8.3	5	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR21 Tekirdağ, Edirne, Kırklareli

Table A.3 **Key Facts, 2015 or latest available year**

Total population (million people)	1.65	2015
Population density (per km²)	88.00	2015
Area (km²)	18 665.00	2015
Urbanization (%)	82.84	2014
Inflation (%)	9.29	2014
Gross Value Added (million constant 2010 TYR)	28 707.00	2011
Share in Turkey's GVA (%)	2.71	2011
Share in Turkey's exports (%)	0.91	2014

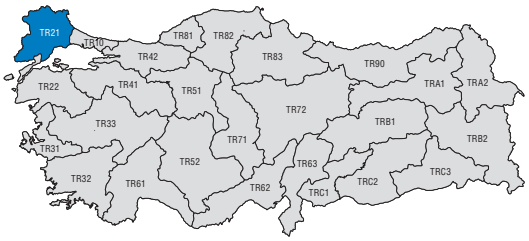


Figure A.3 **GVA per capita, constant 2010 TRY, 2005-2015**

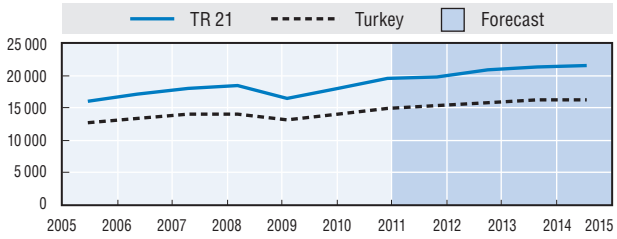


Figure A.4 **Scores by dimension**

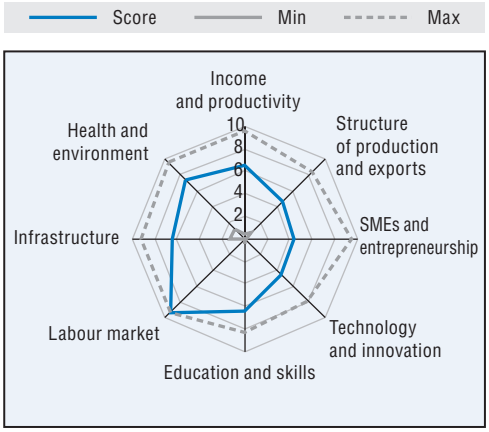


Table A.4 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		4.4	11	
1.	Economic performance		5.7	6	
2.	Determinants		6.5	6	
1.1	Income and productivity		6.6	6	
1.1.1	Household income (2005 TRY)	13 005.0	5.7	7	
1.1.2	GVA per capita (2010 TRY)	20 681.5	8.8	4	
1.1.3	Labour productivity (2010 PPP USD)	48 668.0	5.2	6	
1.2	Productive structure		4.7	7	
1.2.1	Trade openness (%)	0.1	1.1	16	○
1.2.2	Number of products exported (SITC. 4-digit level)	141.0	4.1	12	
1.2.3	Export sophistication (EXPY)	9 264.7	5.7	4	
1.2.4	Agriculture (% of GVA)	9.7	6.1	7	
1.2.5	Manufacturing (% of employment)	46.0	10.0	1	●
1.2.6	Enterprises in manufacturing (%)	8.9	2.6	19	
1.2.7	Number of MNEs (per 10.000 enterprises)	2.4	3.4	12	
2.1	SMEs and entrepreneurship		4.4	9	
2.1.1	Number of SMEs (per 1.000 people 15-64)	72.8	6.8	6	
2.1.2	New business registered (per 10 000 people 15-64)	19.5	2.7	8	
2.1.3	Informal economy (% of employment)	24.0	7.5	12	
2.1.4	Total credit (% of GVA)		0.5	24	○
2.2	Technology and innovation		4.5	5	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	1.2	5.5	3	
2.2.2	High and medium high-tech sectors (% of employment)	4.2	3.9	6	
2.2.3	Number of patent applications (per million people)	70.3	4.1	7	
2.3	Education and skills		6.4	4	
2.3.1	Secondary education (% of labour force)	25.1	8.9	3	
2.3.2	Tertiary education (% of labour force)	17.8	3.6	8	
2.3.3	Tertiary enrolment (% of population)	4.1	3.7	7	
2.3.4	Female literacy rate (%)	94.9	9.5	3	
2.4	Labour market		9.3	1	●
2.4.1	Labour force participation rate (% of population 15+)	53.9	9.6	2	●
2.4.2	Female labour force participation rate (% of population 15+)	43.3	8.8	7	
2.4.3	Labour utilization rate (%)	40.4	10.0	1	●
2.4.4	Dependency ratio (%)	39.6	10.0	1	●
2.4.5	Unemployment (%)	7.5	8.3	14	
2.5	Infrastructure		6.4	5	
2.5.1	Broadband penetration rate (% of households)	63.0	10.0	1	●
2.5.2	Road density (km/1.000 km2)	104.5	5.2	6	
2.5.3	Number of private cars (per 10.000 people)	12.8	5.3	12	
2.5.4	Electrical power failures (per million people)		8.0	14	
2.5.5	Multimode Accessibility Index	58.2	3.6	15	○
2.6	Health and environment		7.5	11	
2.6.1	Life expectancy (years)	74.1	6.4	17	○
2.6.2	Infant mortality (per 1.000 live births)	8.7	8.3	10	
2.6.3	Air pollution (Pm2.5 µg/m³)	15.5	7.7	8	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR22 Balıkesir, Çanakkale

Table A.5 **Key Facts, 2015 or latest available year**

Total population (million people)	1.70	2015
Population density (per km²)	70.00	2015
Area (km²)	24 232.00	2015
Urbanization (%)	79.94	2014
Inflation (%)	9.55	2014
Gross Value Added (million constant 2010 TYR)	22 700.00	2011
Share in Turkey's GVA (%)	2.14	2011
Share in Turkey's exports (%)	0.44	2014

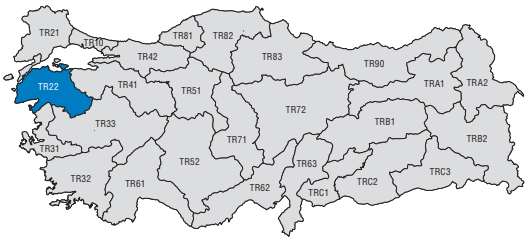


Figure A.5 **GVA per capita, constant 2010 TRY, 2005-2015**

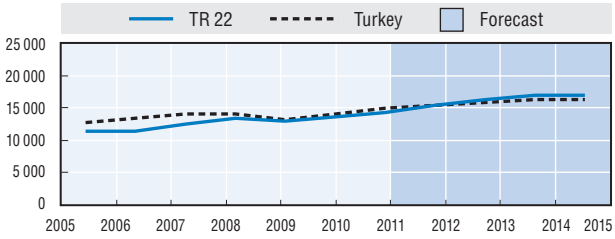


Figure A.6 **Scores by dimension**

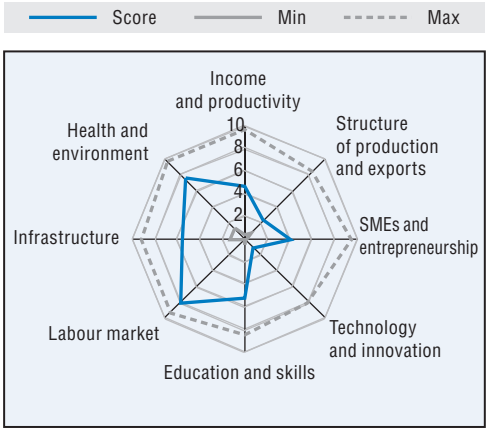


Table A.6 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		4.3	12	
1.	Economic performance		3.4	15	
2.	Determinants		5.1	13	
1.1	Income and productivity		4.6	8	
1.1.1	Household income (2005 TRY)	11 012.0	3.7	16	
1.1.2	GVA per capita (2010 TRY)	16 312.5	6.1	8	
1.1.3	Labour productivity (2010 PPP USD)	42 289.0	4.0	9	
1.2	Productive structure		2.3	18	
1.2.1	Trade openness (%)	0.1	0.6	21	○
1.2.2	Number of products exported (SITC, 4-digit level)	106.0	3.1	20	
1.2.3	Export sophistication (EXPY)	8 260.6	3.6	8	
1.2.4	Agriculture (% of GVA)	22.3	1.0	20	
1.2.5	Manufacturing (% of employment)	22.4	3.7	15	
1.2.6	Enterprises in manufacturing (%)	9.4	3.1	17	
1.2.7	Number of MNEs (per 10 000 enterprises)	0.5	1.1	22	○
2.1	SMEs and entrepreneurship		4.0	12	
2.1.1	Number of SMEs (per 1 000 people 15-64)	73.8	7.0	5	●
2.1.2	New business registered (per 10 000 people 15-64)	12.7	1.1	17	
2.1.3	Informal economy (% of employment)	25.2	7.2	14	
2.1.4	Total credit (% of GVA)		0.8	21	○
2.2	Technology and innovation		1.1	17	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.3	0.8	21	○
2.2.2	High and medium high-tech sectors (% of employment)	1.8	1.6	10	
2.2.3	Number of patent applications (per million people)	16.5	0.8	19	
2.3	Education and skills		5.2	8	
2.3.1	Secondary education (% of labour force)	18.4	4.2	16	
2.3.2	Tertiary education (% of labour force)	17.3	3.4	9	
2.3.3	Tertiary enrolment (% of population)	4.3	3.8	6	●
2.3.4	Female literacy rate (%)	94.8	9.5	4	●
2.4	Labour market		8.0	9	
2.4.1	Labour force participation rate (% of population 15+)	45.7	5.1	22	○
2.4.2	Female labour force participation rate (% of population 15+)	35.4	6.5	13	
2.4.3	Labour utilization rate (%)	35.7	8.0	10	
2.4.4	Dependency ratio (%)	43.1	9.0	7	
2.4.5	Unemployment (%)	6.0	9.2	3	●
2.5	Infrastructure		5.6	10	
2.5.1	Broadband penetration rate (% of households)	41.0	5.4	10	
2.5.2	Road density (km/1 000 km2)	92.7	3.7	9	
2.5.3	Number of private cars (per 10 000 people)	13.8	5.8	6	●
2.5.4	Electrical power failures (per million people)		8.2	9	
2.5.5	Multimode Accessibility Index	66.8	4.9	6	●
2.6	Health and environment		7.5	10	
2.6.1	Life expectancy (years)	74.2	6.6	13	
2.6.2	Infant mortality (per 1 000 live births)	9.1	7.9	12	
2.6.3	Air pollution (Pm2.5 µg/m³)	15.2	7.9	7	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR31 İzmir

Table A.7 **Key Facts, 2015 or latest available year**

Total population (million people)	4.11	2015
Population density (per km²)	342.00	2015
Area (km²)	12 012.00	2015
Urbanization (%)	99.47	2014
Inflation (%)	9.55	2014
Gross Value Added (million constant 2010 TYR)	69 924.00	2011
Share in Turkey's GVA (%)	6.60	2011
Share in Turkey's exports (%)	6.10	2014

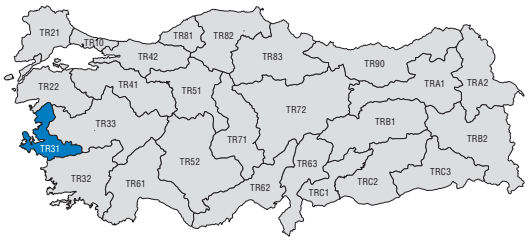


Figure A.7 **GVA per capita, constant 2010 TRY, 2005-2015**

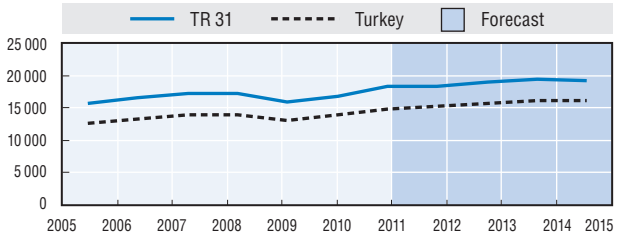


Figure A.8 **Scores by dimension**

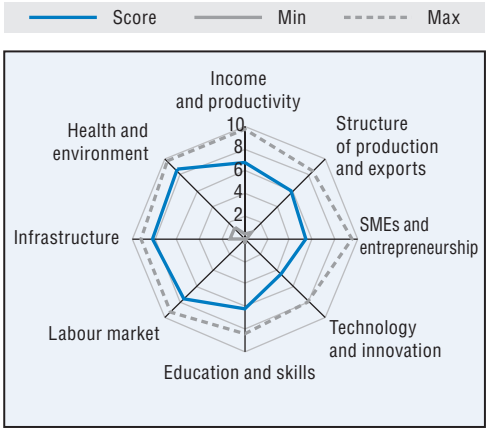


Table A.8 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		6.4	5	
1.	Economic performance		6.3	5	
2.	Determinants		6.6	5	
1.1	Income and productivity		6.7	5	
1.1.1	Household income (2005 TRY)	13 733.0	6.4	4	
1.1.2	GVA per capita (2010 TRY)	18 740.1	7.6	6	
1.1.3	Labour productivity (2010 PPP USD)	53 127.0	6.1	5	
1.2	Productive structure		5.9	5	
1.2.1	Trade openness (%)	0.4	3.6	6	
1.2.2	Number of products exported (SITC, 4-digit level)	282.0	6.6	3	
1.2.3	Export sophistication (EXPY)	8 899.5	5.0	6	
1.2.4	Agriculture (% of GVA)	5.4	7.9	3	
1.2.5	Manufacturing (% of employment)	29.7	5.6	10	○
1.2.6	Enterprises in manufacturing (%)	12.8	6.7	5	
1.2.7	Number of MNEs (per 10 000 enterprises)	6.5	5.6	8	
2.1	SMEs and entrepreneurship		5.4	5	
2.1.1	Number of SMEs (per 1 000 people 15-64)	74.1	7.1	4	
2.1.2	New business registered (per 10 000 people 15-64)	24.2	3.9	5	
2.1.3	Informal economy (% of employment)	24.6	7.4	13	○
2.1.4	Total credit (% of GVA)		3.2	10	○
2.2	Technology and innovation		4.5	6	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	1.2	5.5	3	
2.2.2	High and medium high-tech sectors (% of employment)	4.1	3.8	7	
2.2.3	Number of patent applications (per million people)	70.3	4.1	8	
2.3	Education and skills		6.2	5	
2.3.1	Secondary education (% of labour force)	21.4	6.3	7	
2.3.2	Tertiary education (% of labour force)	22.3	5.4	3	
2.3.3	Tertiary enrolment (% of population)	3.3	3.2	15	○
2.3.4	Female literacy rate (%)	95.8	10.0	1	●
2.4	Labour market		7.6	14	
2.4.1	Labour force participation rate (% of population 15+)	52.8	9.0	5	
2.4.2	Female labour force participation rate (% of population 15+)	43.6	8.9	6	
2.4.3	Labour utilization rate (%)	36.8	8.5	9	
2.4.4	Dependency ratio (%)	40.0	9.9	2	●
2.4.5	Unemployment (%)	15.4	3.5	24	○
2.5	Infrastructure		8.2	2	●
2.5.1	Broadband penetration rate (% of households)	57.0	8.8	3	
2.5.2	Road density (km/1 000 km2)	125.8	8.0	2	●
2.5.3	Number of private cars (per 10 000 people)	14.9	6.3	5	
2.5.4	Electrical power failures (per million people)		10.0	1	●
2.5.5	Multimode Accessibility Index	87.3	8.1	2	●
2.6	Health and environment		8.6	3	
2.6.1	Life expectancy (years)	74.7	7.7	9	
2.6.2	Infant mortality (per 1 000 live births)	7.1	10.0	1	●
2.6.3	Air pollution (Pm2.5 µg/m³)	15.1	8.0	6	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR32 Aydın, Denizli, Muğla

Table A.9 **Key Facts, 2015 or latest available year**

Total population (million people)	2.92	2015
Population density (per km²)	90.00	2015
Area (km²)	32 394.00	2015
Urbanization (%)	94.51	2014
Inflation (%)	8.84	2014
Gross Value Added (million constant 2010 TYR)	36 938.00	2011
Share in Turkey's GVA (%)	3.49	2011
Share in Turkey's exports (%)	2.47	2014

Figure A.9 **GVA per capita, constant 2010 TRY, 2005-2015**

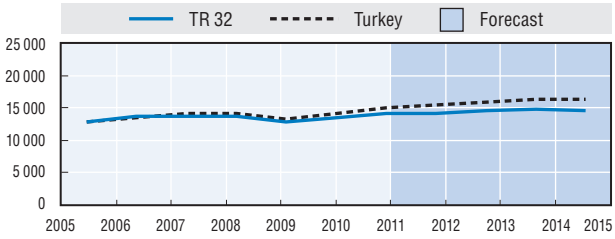


Figure A.10 **Scores by dimension**

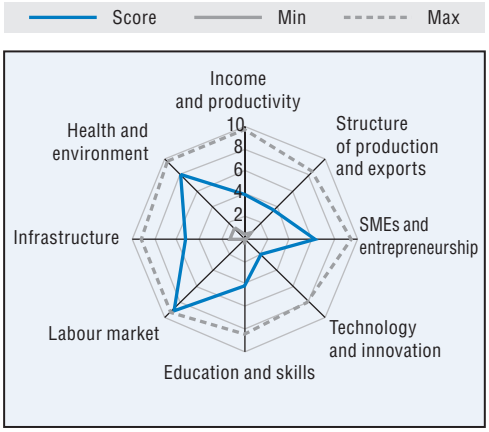


Table A.10 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		4.7	8	
1.	Economic performance		3.7	12	
2.	Determinants		5.7	8	
1.1	Income and productivity		3.9	11	
1.1.1	Household income (2005 TRY)	11 530.0	.2	13	
1.1.2	GVA per capita (2010 TRY)	13 875.1	4.5	10	
1.1.3	Labour productivity (2010 PPP USD)	36 367.0	2.8	13	
1.2	Productive structure		3.6	12	
1.2.1	Trade openness (%)	0.3	2.2	10	
1.2.2	Number of products exported (SITC, 4-digit level)	105.0	3.1	21	○
1.2.3	Export sophistication (EXPY)	8 177.7	3.5	9	
1.2.4	Agriculture (% of GVA)	16.7	3.3	15	
1.2.5	Manufacturing (% of employment)	24.3	4.2	14	
1.2.6	Enterprises in manufacturing (%)	10.4	4.2	13	
1.2.7	Number of MNEs (per 10 000 enterprises)	4.8	4.9	9	
2.1	SMEs and entrepreneurship		6.3	4	
2.1.1	Number of SMEs (per 1 000 people 15-64)	86.3	9.7	2	●
2.1.2	New business registered (per 10 000 people 15-64)	27.5	4.7	4	
2.1.3	Informal economy (% of employment)	28.1	6.4	18	○
2.1.4	Total credit (% of GVA)		4.5	5	
2.2	Technology and innovation		2.0	11	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.7	3.2	8	
2.2.2	High and medium high-tech sectors (% of employment)	1.5	1.3	12	
2.2.3	Number of patent applications (per million people)	26.1	1.4	12	
2.3	Education and skills		4.2	15	
2.3.1	Secondary education (% of labour force)	15.7	2.3	21	○
2.3.2	Tertiary education (% of labour force)	13.6	1.9	19	○
2.3.3	Tertiary enrolment (% of population)	3.2	3.1	16	
2.3.4	Female literacy rate (%)	94.9	9.5	2	●
2.4	Labour market		8.9	3	●
2.4.1	Labour force participation rate (% of population 15+)	52.2	8.6	7	
2.4.2	Female labour force participation rate (% of population 15+)	46.2	9.6	2	●
2.4.3	Labour utilization rate (%)	38.7	9.3	3	●
2.4.4	Dependency ratio (%)	44.0	8.7	10	
2.4.5	Unemployment (%)	6.9	8.7	10	
2.5	Infrastructure		5.3	11	
2.5.1	Broadband penetration rate (% of households)	39.0	5.0	15	
2.5.2	Road density (km/1 000 km2)	78.3	1.9	20	○
2.5.3	Number of private cars (per 10 000 people)	16.0	6.9	3	●
2.5.4	Electrical power failures (per million people)		9.1	4	
2.5.5	Multimode Accessibility Index	57.0	3.4	18	○
2.6	Health and environment		8.0	6	
2.6.1	Life expectancy (years)	75.0	8.3	5	
2.6.2	Infant mortality (per 1 000 live births)	8.5	8.5	8	
2.6.3	Air pollution (Pm2.5 µg/m³)	16.1	7.3	9	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR33 Manisa, Afyon, Kütahya, Uşak

Table A.11 **Key Facts, 2015 or latest available year**

Total population (million people)	3.00	2015
Population density (per km²)	67.00	2015
Area (km²)	44 728.00	2015
Urbanization (%)	72.29	2014
Inflation (%)	8.53	2014
Gross Value Added (million constant 2010 TYR)	38 042.00	2011
Share in Turkey's GVA (%)	3.59	2011
Share in Turkey's exports (%)	1.77	2014

Figure A.11 **GVA per capita, constant 2010 TRY, 2005-2015**

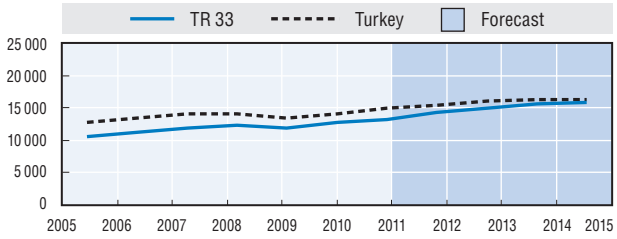


Figure A.12 **Scores by dimension**

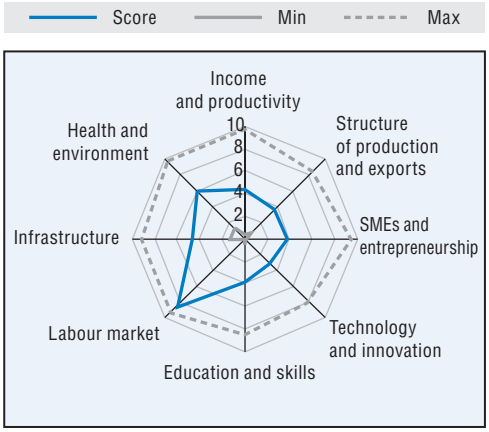


Table A.12 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		4.6	9	
1.	Economic performance		4.0	9	
2.	Determinants		5.2	10	
1.1	Income and productivity		4.3	9	
1.1.1	Household income (2005 TRY)	11 744.0	4.5	12	
1.1.2	GVA per capita (2010 TRY)	15 172.3	5.4	9	
1.1.3	Labour productivity (2010 PPP USD)	38 248.0	3.2	10	
1.2	Productive structure		3.7	11	
1.2.1	Trade openness (%)	0.3	2.2	9	
1.2.2	Number of products exported (SITC, 4-digit level)	122.0	3.6	16	
1.2.3	Export sophistication (EXPY)	8 379.6	3.9	7	
1.2.4	Agriculture (% of GVA)	19.0	2.4	19	
1.2.5	Manufacturing (% of employment)	33.7	6.7	5	●
1.2.6	Enterprises in manufacturing (%)	11.3	5.2	8	
1.2.7	Number of MNEs (per 10 000 enterprises)	1.1	2.1	15	
2.1	SMEs and entrepreneurship		3.8	14	
2.1.1	Number of SMEs (per 1 000 people 15-64)	63.5	4.8	11	
2.1.2	New business registered (per 10 000 people 15-64)	13.0	1.2	16	
2.1.3	Informal economy (% of employment)	21.0	8.3	7	
2.1.4	Total credit (% of GVA)		0.9	20	○
2.2	Technology and innovation		3.1	8	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.8	3.8	6	●
2.2.2	High and medium high-tech sectors (% of employment)	3.9	3.6	8	
2.2.3	Number of patent applications (per million people)	35.1	2.0	9	
2.3	Education and skills		3.9	17	
2.3.1	Secondary education (% of labour force)	15.3	2.0	23	○
2.3.2	Tertiary education (% of labour force)	10.6	0.7	24	○
2.3.3	Tertiary enrolment (% of population)	4.0	3.6	9	
2.3.4	Female literacy rate (%)	93.9	9.0	6	●
2.4	Labour market		8.6	5	●
2.4.1	Labour force participation rate (% of population 15+)	50.4	7.7	10	
2.4.2	Female labour force participation rate (% of population 15+)	38.2	7.3	11	
2.4.3	Labour utilization rate (%)	38.3	9.1	6	●
2.4.4	Dependency ratio (%)	45.2	8.4	11	
2.4.5	Unemployment (%)	5.4	9.6	2	●
2.5	Infrastructure		4.7	16	
2.5.1	Broadband penetration rate (% of households)	32.0	3.5	21	○
2.5.2	Road density (km/1 000 km2)	79.4	2.0	19	
2.5.3	Number of private cars (per 10 000 people)	13.2	5.5	10	
2.5.4	Electrical power failures (per million people)		8.0	11	
2.5.5	Multimode Accessibility Index	62.7	4.3	7	
2.6	Health and environment		5.9	16	
2.6.1	Life expectancy (years)	73.7	5.5	22	○
2.6.2	Infant mortality (per 1 000 live births)	10.9	6.0	16	
2.6.3	Air pollution (Pm2.5 µg/m³)	17.8	6.1	12	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR41 Bursa, Eskişehir, Bilecik

Table A.13 **Key Facts, 2015 or latest available year**

Total population (million people)	3.81	2015
Population density (per km²)	133.00	2015
Area (km²)	28 566.00	2015
Urbanization (%)	94.45	2014
Inflation (%)	8.53	2014
Gross Value Added (million constant 2010 TYR)	67 719.00	2011
Share in Turkey's GVA (%)	6.39	2011
Share in Turkey's exports (%)	6.53	2014

Figure A.13 **GVA per capita, constant 2010 TRY, 2005-2015**

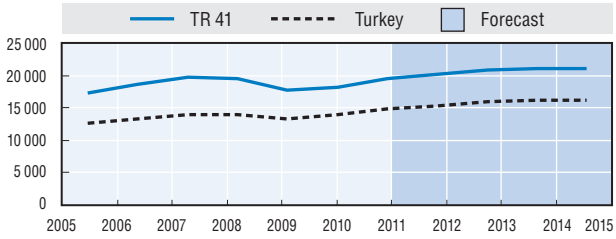


Figure A.14 **Scores by dimension**

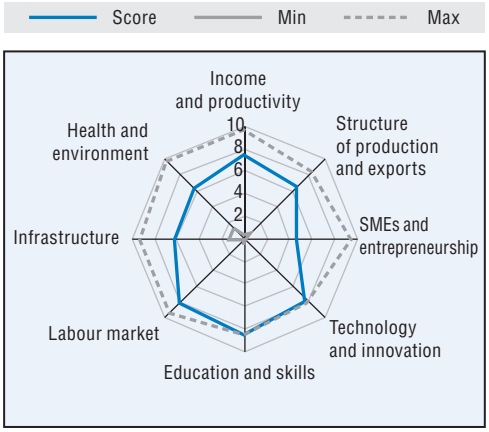


Table A.14 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		7.1	3	
1.	Economic performance		7.0	4	
2.	Determinants		7.1	3	
1.1	Income and productivity		7.5	4	
1.1.1	Household income (2005 TRY)	13 905.0	6.6	3	
1.1.2	GVA per capita (2010 TRY)	20 363.8	8.6	5	
1.1.3	Labour productivity (2010 PPP USD)	58 642.0	7.2	4	
1.2	Productive structure		6.6	4	
1.2.1	Trade openness (%)	0.4	3.9	4	
1.2.2	Number of products exported (SITC, 4-digit level)	166.0	4.7	7	
1.2.3	Export sophistication (EXPY)	10 472.4	8.2	2	●
1.2.4	Agriculture (% of GVA)	5.6	7.8	4	
1.2.5	Manufacturing (% of employment)	43.8	9.4	2	●
1.2.6	Enterprises in manufacturing (%)	15.5	9.7	2	●
1.2.7	Number of MNEs (per 10 000 enterprises)	1.2	2.2	14	○
2.1	SMEs and entrepreneurship		4.8	7	
2.1.1	Number of SMEs (per 1 000 people 15-64)	64.7	5.1	10	
2.1.2	New business registered (per 10 000 people 15-64)	20.7	3.0	6	
2.1.3	Informal economy (% of employment)	17.1	9.4	2	●
2.1.4	Total credit (% of GVA)		1.6	15	○
2.2	Technology and innovation		7.7	2	●
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.8	3.8	6	
2.2.2	High and medium high-tech sectors (% of employment)	10.4	10.0	1	●
2.2.3	Number of patent applications (per million people)	155.1	9.3	2	●
2.3	Education and skills		8.3	1	●
2.3.1	Secondary education (% of labour force)	26.8	10.0	1	●
2.3.2	Tertiary education (% of labour force)	20.3	4.6	5	
2.3.3	Tertiary enrolment (% of population)	56.5	10.0	1	●
2.3.4	Female literacy rate (%)	93.4	8.7	9	
2.4	Labour market		8.0	8	
2.4.1	Labour force participation rate (% of population 15+)	47.6	6.1	16	○
2.4.2	Female labour force participation rate (% of population 15+)	34.9	6.4	14	○
2.4.3	Labour utilization rate (%)	35.2	7.8	13	
2.4.4	Dependency ratio (%)	42.0	9.3	5	
2.4.5	Unemployment (%)	7.0	8.6	11	
2.5	Infrastructure		6.1	7	
2.5.1	Broadband penetration rate (% of households)	55.0	8.3	4	
2.5.2	Road density (km/1 000 km²)	86.3	2.9	14	○
2.5.3	Number of private cars (per 10 000 people)	13.8	5.8	6	
2.5.4	Electrical power failures (per million people)		9.7	2	●
2.5.5	Multimode Accessibility Index	59.1	3.7	13	
2.6	Health and environment		6.3	15	○
2.6.1	Life expectancy (years)	73.9	6.0	20	○
2.6.2	Infant mortality (per 1 000 live births)	8.3	8.8	6	
2.6.3	Air pollution (Pm2.5 µg/m³)	20.5	4.2	17	○

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova

Table A.5 **Key Facts, 2015 or latest available year**

Total population (million people)	3.52	2015
Population density (per km²)	175.00	2015
Area (km²)	20 184.00	2015
Urbanization (%)	87.93	2014
Inflation (%)	8.35	2014
Gross Value Added (million constant 2010 TYR)	66 562.00	2011
Share in Turkey's GVA (%)	6.28	2011
Share in Turkey's exports (%)	7.63	2014

Figure A.15 **GVA per capita, constant 2010 TRY, 2005-2015**

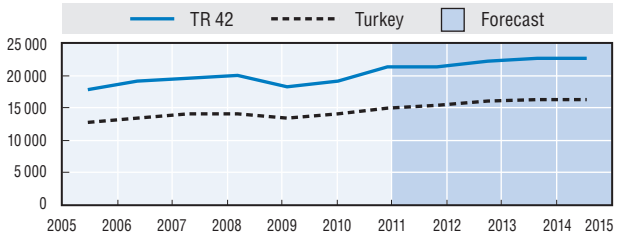


Figure A.16 **Scores by dimension**

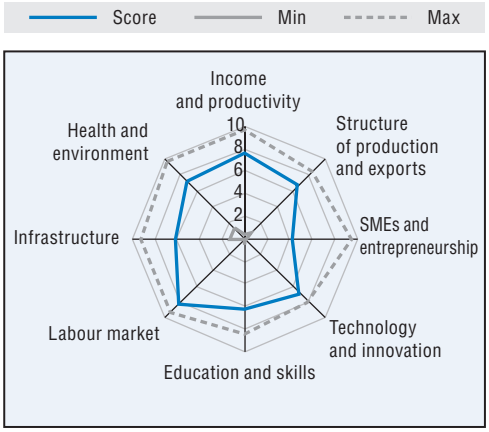


Table A.16 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		6.9	4	
1.	Economic performance		7.1	3	●
2.	Determinants		6.7	4	
1.1	Income and productivity		7.6	3	●
1.1.1	Household income (2005 TRY)	13 232.0	5.9	5	
1.1.2	GVA per capita (2010 TRY)	21 889.3	9.5	2	●
1.1.3	Labour productivity (2010 PPP USD)	58 949.0	7.2	3	●
1.2	Productive structure		6.7	2	●
1.2.1	Trade openness (%)	0.5	4.3	3	●
1.2.2	Number of products exported (SITC, 4-digit level)	161.0	4.6	8	
1.2.3	Export sophistication (EXPY)	11 318.7	10.0	1	●
1.2.4	Agriculture (% of GVA)	6.9	7.3	6	
1.2.5	Manufacturing (% of employment)	41.3	8.7	3	●
1.2.6	Enterprises in manufacturing (%)	12.0	5.9	7	
1.2.7	Number of MNEs (per 10 000 enterprises)	6.8	5.8	7	
2.1	SMEs and entrepreneurship		4.3	11	○
2.1.1	Number of SMEs (per 1 000 people 15-64)	65.1	5.1	9	
2.1.2	New business registered (per 10 000 people 15-64)	18.7	2.6	9	
2.1.3	Informal economy (% of employment)	20.0	8.6	4	
2.1.4	Total credit (% of GVA)		1.0	19	○
2.2	Technology and innovation		6.8	4	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	1.2	5.5	3	●
2.2.2	High and medium high-tech sectors (% of employment)	9.0	8.6	2	●
2.2.3	Number of patent applications (per million people)	107.3	6.4	4	
2.3	Education and skills		6.2	6	
2.3.1	Secondary education (% of labour force)	22.6	7.1	5	
2.3.2	Tertiary education (% of labour force)	21.6	5.1	4	
2.3.3	Tertiary enrolment (% of population)	4.9	4.1	4	
2.3.4	Female literacy rate (%)	92.6	8.3	11	○
2.4	Labour market		8.2	7	
2.4.1	Labour force participation rate (% of population 15+)	53.6	9.4	3	●
2.4.2	Female labour force participation rate (% of population 15+)	40.1	7.9	10	
2.4.3	Labour utilization rate (%)	37.4	8.7	8	
2.4.4	Dependency ratio (%)	43.8	8.8	9	
2.4.5	Unemployment (%)	9.8	6.9	18	○
2.5	Infrastructure		6.2	6	
2.5.1	Broadband penetration rate (% of households)	54.0	8.1	6	
2.5.2	Road density (km/1 000 km2)	107.7	5.6	5	
2.5.3	Number of private cars (per 10 000 people)	11.5	4.7	16	○
2.5.4	Electrical power failures (per million people)		8.4	7	
2.5.5	Multimode Accessibility Index	60.7	4.0	11	○
2.6	Health and environment		7.2	12	○
2.6.1	Life expectancy (years)	74.4	7.0	10	
2.6.2	Infant mortality (per 1 000 live births)	8.5	8.5	8	
2.6.3	Air pollution (Pm2.5 µg/m³)	17.8	6.1	12	○

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR51 Ankara

Table A.17 **Key Facts, 2015 or latest available year**

Total population (million people)	5.15	2015
Population density (per km²)	210.00	2015
Area (km²)	24 521.00	2015
Urbanization (%)	99.13	2014
Inflation (%)	9.33	2014
Gross Value Added (million constant 2010 TYR)	91 460.00	2011
Share in Turkey's GVA (%)	8.63	2011
Share in Turkey's exports (%)	5.14	2014

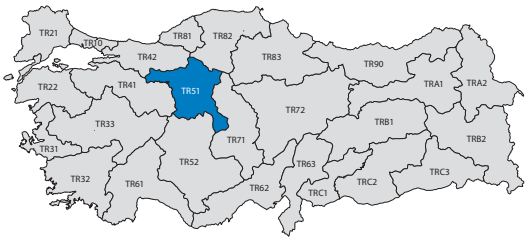


Figure A.17 **GVA per capita, constant 2010 TRY, 2005-2015**

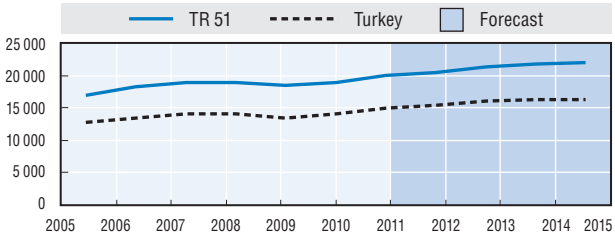


Figure A.18 **Scores by dimension**

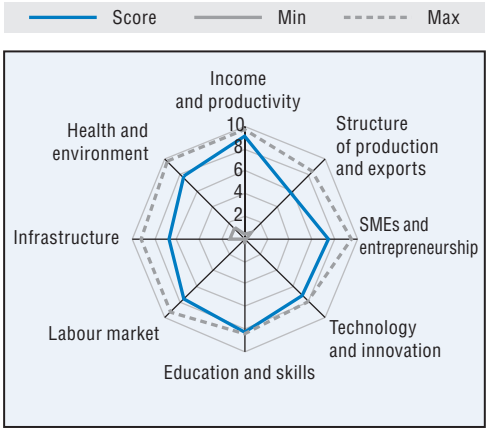


Table A.18 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		7.4	2	
1.	Economic performance		7.4	2	
2.	Determinants		7.5	2	
1.1	Income and productivity		9.0	2	
1.1.1	Household income (2005 TRY)	17 295.0	10.0	1	●
1.1.2	GVA per capita (2010 TRY)	21 063.4	9.0	3	
1.1.3	Labour productivity (2010 PPP USD)	63 449.0	8.1	2	
1.2	Productive structure		5.7	6	
1.2.1	Trade openness (%)	0.3	2.5	7	
1.2.2	Number of products exported (SITC, 4-digit level)	729.0	10.0	1	●
1.2.3	Export sophistication (EXPY)	9 502.1	6.2	3	
1.2.4	Agriculture (% of GVA)	2.8	8.9	2	
1.2.5	Manufacturing (% of employment)	17.1	2.3	20	○
1.2.6	Enterprises in manufacturing (%)	10.5	4.2	12	
1.2.7	Number of MNEs (per 10 000 enterprises)	6.9	5.8	6	
2.1	SMEs and entrepreneurship		7.5	2	
2.1.1	Number of SMEs (per 1 000 people 15-64)	70.0	6.2	7	
2.1.2	New business registered (per 10 000 people 15-64)	29.8	5.2	3	
2.1.3	Informal economy (% of employment)	14.7	10.0	1	●
2.1.4	Total credit (% of GVA)		8.6	3	
2.2	Technology and innovation		7.2	3	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	2.7	10.0	1	●
2.2.2	High and medium high-tech sectors (% of employment)	4.6	4.3	4	
2.2.3	Number of patent applications (per million people)	123.5	7.4	3	
2.3	Education and skills		8.2	2	
2.3.1	Secondary education (% of labour force)	26.5	9.8	2	
2.3.2	Tertiary education (% of labour force)	33.8	10.0	1	●
2.3.3	Tertiary enrolment (% of population)	4.9	4.1	4	
2.3.4	Female literacy rate (%)	93.8	8.9	7	
2.4	Labour market		7.6	13	
2.4.1	Labour force participation rate (% of population 15+)	50.3	7.6	11	
2.4.2	Female labour force participation rate (% of population 15+)	30.2	5.1	20	○
2.4.3	Labour utilization rate (%)	34.9	7.6	14	
2.4.4	Dependency ratio (%)	40.6	9.7	4	
2.4.5	Unemployment (%)	10.2	6.6	19	
2.5	Infrastructure		6.7	3	
2.5.1	Broadband penetration rate (% of households)	55.0	8.3	4	
2.5.2	Road density (km/1 000 km²)	75.8	1.6	21	○
2.5.3	Number of private cars (per 10 000 people)	22.3	10.0	1	●
2.5.4	Electrical power failures (per million people)		7.7	17	
2.5.5	Multimode Accessibility Index	74.3	6.0	4	
2.6	Health and environment		7.7	9	
2.6.1	Life expectancy (years)	75.7	9.8	2	
2.6.2	Infant mortality (per 1 000 live births)	7.9	9.2	3	
2.6.3	Air pollution (Pm2.5 µg/m³)	20.6	4.1	18	○

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR52 Konya, Karaman

Table A.19 **Key Facts, 2015 or latest available year**

Total population (million people)	2.35	2015
Population density (per km²)	49.00	2015
Area (km²)	47 717.00	2015
Urbanization (%)	90.41	2014
Inflation (%)	8.06	2014
Gross Value Added (million constant 2010 TYR)	24 837.00	2011
Share in Turkey's GVA (%)	2.34	2011
Share in Turkey's exports (%)	1.17	2014

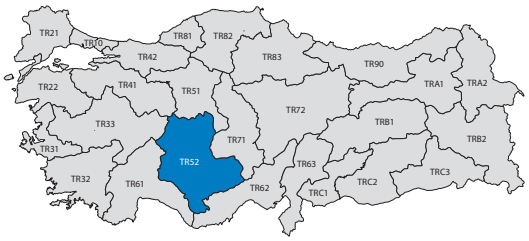


Figure A.19 **GVA per capita, constant 2010 TRY, 2005-2015**

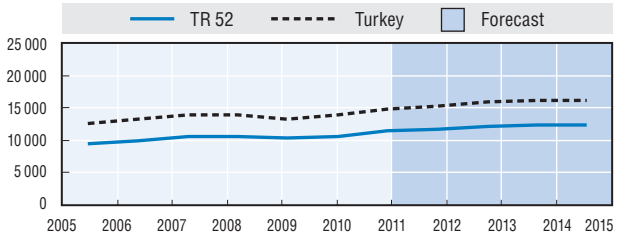


Figure A.20 **Scores by dimension**

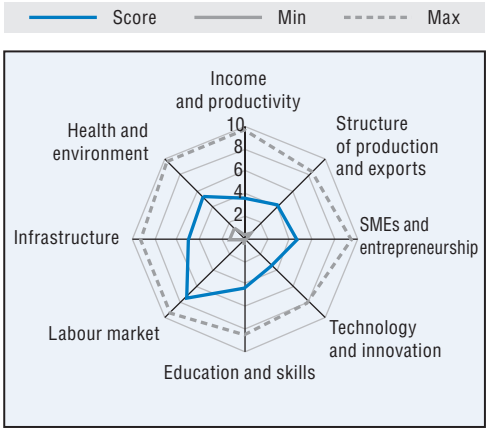


Table A.20 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		4.5	10	
1.	Economic performance		3.9	10	
2.	Determinants		5.1	12	
1.1	Income and productivity		3.6	13	
1.1.1	Household income (2005 TRY)	11 834.0	4.5	11	
1.1.2	GVA per capita (2010 TRY)	12 060.6	3.4	14	
1.1.3	Labour productivity (2010 PPP USD)	35 889.0	2.7	15	
1.2	Productive structure		4.2	10	
1.2.1	Trade openness (%)	0.2	1.6	13	
1.2.2	Number of products exported (SITC, 4-digit level)	179.0	5.0	6	●
1.2.3	Export sophistication (EXPY)	7 636.9	2.3	14	
1.2.4	Agriculture (% of GVA)	22.5	0.9	21	○
1.2.5	Manufacturing (% of employment)	31.0	6.0	7	
1.2.6	Enterprises in manufacturing (%)	15.3	9.4	4	●
1.2.7	Number of MNEs (per 10,000 enterprises)	3.5	4.2	10	
2.1	SMEs and entrepreneurship		4.7	8	
2.1.1	Number of SMEs (per 1,000 people 15-64)	66.8	5.5	8	
2.1.2	New business registered (per 10'000 people 15-64)	20.5	3.0	7	
2.1.3	Informal economy (% of employment)	27.8	6.5	17	
2.1.4	Total credit (% of GVA)		3.8	6	●
2.2	Technology and innovation		3.4	7	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.4	1.5	14	
2.2.2	High and medium high-tech sectors (% of employment)	4.7	4.4	3	●
2.2.3	Number of patent applications (per million people)	72.4	4.2	6	●
2.3	Education and skills		4.3	12	
2.3.1	Secondary education (% of labour force)	15.3	2.1	22	○
2.3.2	Tertiary education (% of labour force)	15.6	2.7	13	
2.3.3	Tertiary enrolment (% of population)	4.0	3.6	9	
2.3.4	Female literacy rate (%)	93.7	8.9	8	
2.4	Labour market		7.3	16	
2.4.1	Labour force participation rate (% of population 15+)	46.8	5.7	18	○
2.4.2	Female labour force participation rate (% of population 15+)	28.9	4.7	21	○
2.4.3	Labour utilization rate (%)	33.1	6.9	16	
2.4.4	Dependency ratio (%)	50.5	6.8	17	
2.4.5	Unemployment (%)	4.7	10.0	1	●
2.5	Infrastructure		5.0	13	
2.5.1	Broadband penetration rate (% of households)	40.0	5.2	13	
2.5.2	Road density (km/1,000 km²)	83.4	2.5	16	
2.5.3	Number of private cars (per 10,000 people)	13.6	5.7	8	
2.5.4	Electrical power failures (per million people)		7.7	18	○
2.5.5	Multimode Accessibility Index	59.3	3.8	12	
2.6	Health and environment		5.2	17	
2.6.1	Life expectancy (years)	74.1	6.4	17	
2.6.2	Infant mortality (per 1,000 live births)	11.6	5.3	17	
2.6.3	Air pollution (Pm2.5 µg/m³)	20.8	4.0	19	○

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR61 Antalya, Isparta, Burdur

Table A.21 **Key Facts, 2015 or latest available year**

Total population (million people)	2.90	2015
Population density (per km²)	81.00	2015
Area (km²)	35 840.00	2015
Urbanization (%)	87.85	2014
Inflation (%)	8.85	2014
Gross Value Added (million constant 2010 TYR)	42 132.00	2011
Share in Turkey's GVA (%)	3.98	2011
Share in Turkey's exports (%)	0.87	2014

Figure A.21 **GVA per capita, constant 2010 TRY, 2005-2015**

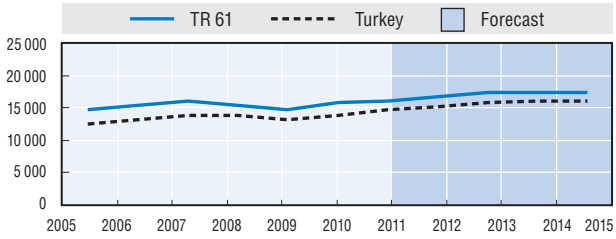


Figure A.22 **Scores by dimension**

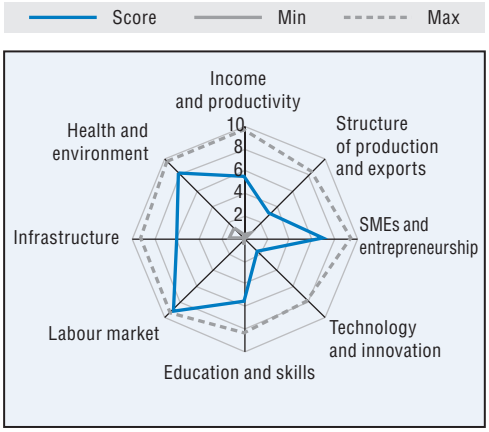


Table A.22 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		5.2	7	
1.	Economic performance		4.3	7	
2.	Determinants		6.0	7	
1.1	Income and productivity		5.5	7	
1.1.1	Household income (2005 TRY)	13 110.0	5.8	6	
1.1.2	GVA per capita (2010 TRY)	16 912.8	6.4	7	
1.1.3	Labour productivity (2010 PPP USD)	43 731.0	4.2	7	
1.2	Productive structure		3.2	15	
1.2.1	Trade openness (%)	0.1	0.7	18	○
1.2.2	Number of products exported (SITC, 4-digit level)	129.0	3.8	14	
1.2.3	Export sophistication (EXPY)	8 136.6	3.4	10	
1.2.4	Agriculture (% of GVA)	16.6	3.3	14	
1.2.5	Manufacturing (% of employment)	11.0	0.6	22	○
1.2.6	Enterprises in manufacturing (%)	8.3	1.9	23	○
1.2.7	Number of MNEs (per 10 000 enterprises)	20.7	8.6	3	
2.1	SMEs and entrepreneurship		7.0	3	○
2.1.1	Number of SMEs (per 1 000 people 15-64)	87.6	10.0	1	●
2.1.2	New business registered (per 10 000 people 15-64)	32.9	6.0	2	●
2.1.3	Informal economy (% of employment)	23.5	7.6	10	
2.1.4	Total credit (% of GVA)		4.5	4	
2.2	Technology and innovation		1.6	12	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.6	2.7	10	
2.2.2	High and medium high-tech sectors (% of employment)	0.6	0.4	19	○
2.2.3	Number of patent applications (per million people)	30.0	1.7	11	
2.3	Education and skills		5.5	7	
2.3.1	Secondary education (% of labour force)	19.6	5.0	10	
2.3.2	Tertiary education (% of labour force)	18.5	3.9	7	
2.3.3	Tertiary enrolment (% of population)	3.8	3.5	12	
2.3.4	Female literacy rate (%)	94.7	9.4	5	
2.4	Labour market		8.9	2	●
2.4.1	Labour force participation rate (% of population 15+)	54.7	10.0	1	●
2.4.2	Female labour force participation rate (% of population 15+)	43.8	9.0	4	
2.4.3	Labour utilization rate (%)	39.2	9.5	2	●
2.4.4	Dependency ratio (%)	43.3	8.9	8	
2.4.5	Unemployment (%)	7.9	8.0	16	
2.5	Infrastructure		5.9	8	
2.5.1	Broadband penetration rate (% of households)	50.0	7.3	7	
2.5.2	Road density (km/1 000 km²)	86.2	2.9	15	
2.5.3	Number of private cars (per 10 000 people)	17.5	7.6	2	●
2.5.4	Electrical power failures (per million people)		7.6	19	○
2.5.5	Multimode Accessibility Index	62.6	4.3	8	
2.6	Health and environment		8.2	5	
2.6.1	Life expectancy (years)	75.6	9.6	3	
2.6.2	Infant mortality (per 1 000 live births)	8.3	8.8	6	
2.6.3	Air pollution (Pm2.5 µg/m³)	17.4	6.4	10	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR62 Adana, Mersin

Table A.23 **Key Facts, 2015 or latest available year**

Total population (million people)	3.89	2015
Population density (per km²)	132.00	2015
Area (km²)	29 400.00	2015
Urbanization (%)	97.21	2014
Inflation (%)	7.85	2014
Gross Value Added (million constant 2010 TYR)	41 933.00	2011
Share in Turkey's GVA (%)	3.96	2011
Share in Turkey's exports (%)	2.31	2014

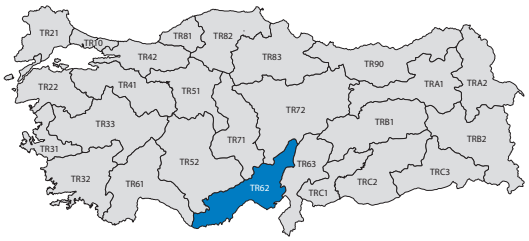


Figure A.23 **GVA per capita, constant 2010 TRY, 2005-2015**

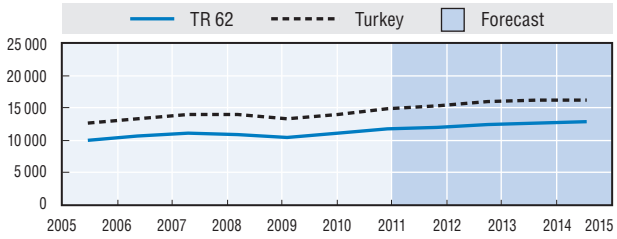


Figure A.24 **Scores by dimension**

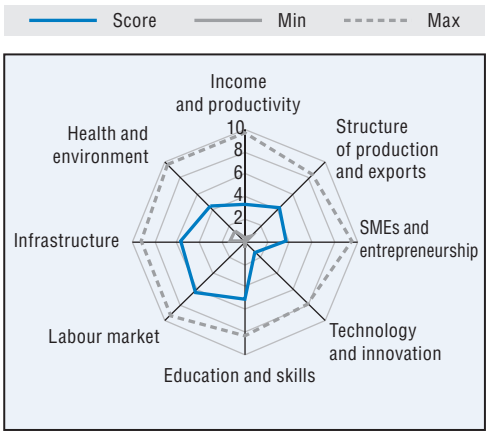


Table A.24 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		4.0	14	
1.	Economic performance		3.8	11	
2.	Determinants		4.2	18	
1.1	Income and productivity		3.3	15	
1.1.1	Household income (2005 TRY)	10 737.0	3.4	18	
1.1.2	GVA per capita (2010 TRY)	12 335.0	3.6	13	
1.1.3	Labour productivity (2010 PPP USD)	36 215.0	2.8	14	
1.2	Productive structure		4.3	9	
1.2.1	Trade openness (%)	0.2	2.1	11	
1.2.2	Number of products exported (SITC, 4-digit level)	218.0	5.7	5	●
1.2.3	Export sophistication (EXPY)	7 692.9	2.5	13	
1.2.4	Agriculture (% of GVA)	14.7	4.1	12	
1.2.5	Manufacturing (% of employment)	21.0	3.3	17	
1.2.6	Enterprises in manufacturing (%)	10.2	4.0	14	
1.2.7	Number of MNEs (per 10,000 enterprises)	20.4	8.6	4	●
2.1	SMEs and entrepreneurship		3.7	15	
2.1.1	Number of SMEs (per 1,000 people 15-64)	62.0	4.5	13	
2.1.2	New business registered (per 10'000 people 15-64)	17.1	2.2	12	
2.1.3	Informal economy (% of employment)	35.4	4.5	21	○
2.1.4	Total credit (% of GVA)		3.7	7	
2.2	Technology and innovation		1.3	14	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.5	2.1	13	
2.2.2	High and medium high-tech sectors (% of employment)	1.3	1.1	13	
2.2.3	Number of patent applications (per million people)	16.7	0.9	18	
2.3	Education and skills		5.1	9	
2.3.1	Secondary education (% of labour force)	22.6	7.1	6	●
2.3.2	Tertiary education (% of labour force)	16.9	3.3	11	
2.3.3	Tertiary enrolment (% of population)	2.0	2.1	20	○
2.3.4	Female literacy rate (%)	91.9	7.9	13	
2.4	Labour market		6.2	21	○
2.4.1	Labour force participation rate (% of population 15+)	48.4	6.6	13	
2.4.2	Female labour force participation rate (% of population 15+)	31.3	5.4	17	
2.4.3	Labour utilization rate (%)	32.2	6.5	19	○
2.4.4	Dependency ratio (%)	47.9	7.6	13	
2.4.5	Unemployment (%)	12.8	5.1	23	○
2.5	Infrastructure		5.7	9	
2.5.1	Broadband penetration rate (% of households)	36.0	4.4	18	
2.5.2	Road density (km/1,000 km²)	87.2	3.0	13	
2.5.3	Number of private cars (per 10,000 people)	12.3	5.0	15	
2.5.4	Electrical power failures (per million people)		9.0	5	●
2.5.5	Multimode Accessibility Index	79.0	6.8	3	●
2.6	Health and environment		4.4	21	○
2.6.1	Life expectancy (years)	74.3	6.8	11	
2.6.2	Infant mortality (per 1,000 live births)	12.9	4.0	19	○
2.6.3	Air pollution (Pm2.5 µg/m³)	23.0	2.4	24	○

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR63 Hatay, Kahramanmaraş, Osmaniye

Table A.25 **Key Facts, 2015 or latest available year**

Total population (million people)	3.12	2015
Population density (per km²)	134.00	2015
Area (km²)	23 298.00	2015
Urbanization (%)	93.75	2014
Inflation (%)	8.50	2014
Gross Value Added (million constant 2010 TYR)	27 437.00	2011
Share in Turkey's GVA (%)	2.59	2011
Share in Turkey's exports (%)	1.98	2014

Figure A.25 **GVA per capita, constant 2010 TRY, 2005-2015**

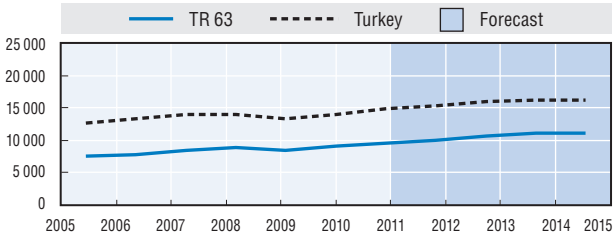


Figure A.26 **Scores by dimension**

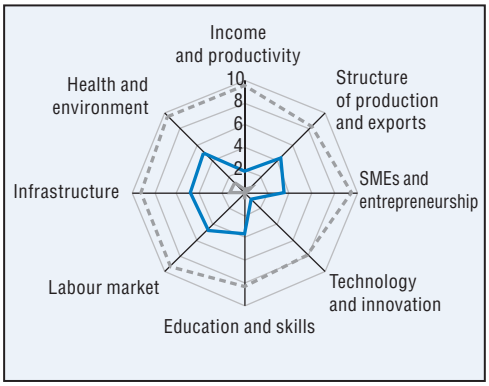


Table A.26 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		3.3	20	
1.	Economic performance		3.2	16	
2.	Determinants		3.5	22	○
1.1	Income and productivity		1.9	22	○
1.1.1	Household income (2005 TRY)	8 200.0	0.9	22	○
1.1.2	GVA per capita (2010 TRY)	10 781.4	2.6	18	
1.1.3	Labour productivity (2010 PPP USD)	33 059.0	2.1	19	
1.2	Productive structure		4.5	8	●
1.2.1	Trade openness (%)	0.4	3.8	5	●
1.2.2	Number of products exported (SITC, 4-digit level)	135.0	4.0	13	
1.2.3	Export sophistication (EXPY)	7 517.8	2.1	17	
1.2.4	Agriculture (% of GVA)	14.4	4.2	11	
1.2.5	Manufacturing (% of employment)	30.3	5.8	9	
1.2.6	Enterprises in manufacturing (%)	11.3	5.1	9	
1.2.7	Number of MNEs (per 10 000 enterprises)	8.3	6.3	5	●
2.1	SMEs and entrepreneurship		3.5	19	
2.1.1	Number of SMEs (per 1 000 people 15-64)	58.9	3.8	18	
2.1.2	New business registered (per 10 000 people 15-64)	15.7	1.8	13	
2.1.3	Informal economy (% of employment)	35.1	4.5	20	
2.1.4	Total credit (% of GVA)		3.7	8	●
2.2	Technology and innovation		0.8	20	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.4	1.5	14	
2.2.2	High and medium high-tech sectors (% of employment)	0.7	0.5	18	
2.2.3	Number of patent applications (per million people)	9.6	0.4	22	○
2.3	Education and skills		3.6	21	
2.3.1	Secondary education (% of labour force)	17.6	3.6	18	
2.3.2	Tertiary education (% of labour force)	13.8	2.0	17	
2.3.3	Tertiary enrolment (% of population)	1.8	1.8	23	○
2.3.4	Female literacy rate (%)	89.7	6.8	15	
2.4	Labour market		4.6	23	○
2.4.1	Labour force participation rate (% of population 15+)	41.9	3.0	24	○
2.4.2	Female labour force participation rate (% of population 15+)	28.2	4.5	22	○
2.4.3	Labour utilization rate (%)	25.2	3.5	24	○
2.4.4	Dependency ratio (%)	55.9	5.2	21	
2.4.5	Unemployment (%)	12.2	5.4	22	○
2.5	Infrastructure		4.8	15	
2.5.1	Broadband penetration rate (% of households)	38.0	4.8	16	
2.5.2	Road density (km/1 000 km²)	88.1	3.1	12	
2.5.3	Number of private cars (per 10 000 people)	10.5	4.2	18	
2.5.4	Electrical power failures (per million people)		7.1	20	
2.5.5	Multimode Accessibility Index	67.5	5.0	5	●
2.6	Health and environment		5.1	18	
2.6.1	Life expectancy (years)	74.8	7.9	7	●
2.6.2	Infant mortality (per 1 000 live births)	12.3	4.6	18	
2.6.3	Air pollution (Pm2.5 µg/m³)	22.3	2.9	21	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR71 Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir

Table A.27 **Key Facts, 2015 or latest available year**

Total population (million people)	1.51	2015
Population density (per km²)	48.00	2015
Area (km²)	31 187.00	2015
Urbanization (%)	53.88	2014
Inflation (%)	8.70	2014
Gross Value Added (million constant 2010 TYR)	16 371.00	2011
Share in Turkey's GVA (%)	1.55	2011
Share in Turkey's exports (%)	0.27	2014

Figure A.27 **GVA per capita, constant 2010 TRY, 2005-2015**

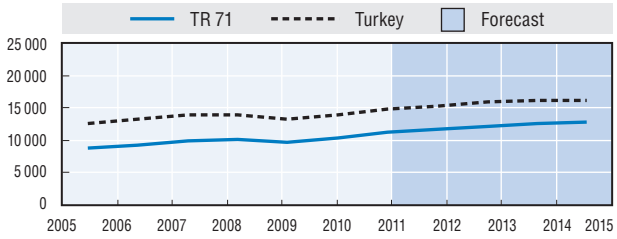


Figure A.28 **Scores by dimension**

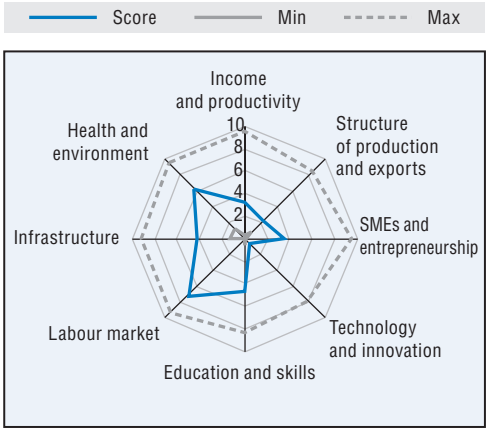


Table A.28 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		3.5	18	
1.	Economic performance		2.8	18	
2.	Determinants		4.3	17	
1.1	Income and productivity		3.3	14	
1.1.1	Household income (2005 TRY)	10 629.0	3.3	19	
1.1.2	GVA per capita (2010 TRY)	12 424.5	3.6	12	
1.1.3	Labour productivity (2010 PPP USD)	37 028.0	2.9	12	
1.2	Productive structure		2.3	19	
1.2.1	Trade openness (%)	0.1	0.5	22	○
1.2.2	Number of products exported (SITC, 4-digit level)	94.0	2.7	22	○
1.2.3	Export sophistication (EXPY)	7 624.1	2.3	15	
1.2.4	Agriculture (% of GVA)	22.7	0.9	22	○
1.2.5	Manufacturing (% of employment)	24.7	4.3	13	
1.2.6	Enterprises in manufacturing (%)	9.5	3.2	16	
1.2.7	Number of MNEs (per 10,000 enterprises)	1.0	1.9	16	
2.1	SMEs and entrepreneurship		3.5	17	
2.1.1	Number of SMEs (per 1,000 people 15-64)	60.9	4.2	15	
2.1.2	New business registered (per 10'000 people 15-64)	13.2	1.2	14	
2.1.3	Informal economy (% of employment)	23.6	7.6	11	●
2.1.4	Total credit (% of GVA)		1.0	18	
2.2	Technology and innovation		0.6	22	○
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.2		24	○
2.2.2	High and medium high-tech sectors (% of employment)	0.8	0.6	16	
2.2.3	Number of patent applications (per million people)	20.6	1.1	16	
2.3	Education and skills		4.7	10	●
2.3.1	Secondary education (% of labour force)	18.5	4.3	15	
2.3.2	Tertiary education (% of labour force)	17.1	3.3	10	●
2.3.3	Tertiary enrolment (% of population)	5.0	4.1	3	●
2.3.4	Female literacy rate (%)	90.4	7.1	14	
2.4	Labour market		7.1	17	
2.4.1	Labour force participation rate (% of population 15+)	46.6	5.6	19	
2.4.2	Female labour force participation rate (% of population 15+)	32.0	5.6	15	
2.4.3	Labour utilization rate (%)	32.8	6.8	17	
2.4.4	Dependency ratio (%)	49.5	7.1	16	
2.4.5	Unemployment (%)	6.5	8.9	5	●
2.5	Infrastructure		4.2	21	
2.5.1	Broadband penetration rate (% of households)	44.0	6.0	9	●
2.5.2	Road density (km/1,000 km²)	81.1	2.2	18	
2.5.3	Number of private cars (per 10,000 people)	12.9	5.3	11	●
2.5.4	Electrical power failures (per million people)		5.3	23	○
2.5.5	Multimode Accessibility Index	50.2	2.3	21	
2.6	Health and environment		6.3	14	
2.6.1	Life expectancy (years)	73.8	5.7	21	
2.6.2	Infant mortality (per 1,000 live births)	9.1	7.9	12	
2.6.3	Air pollution (Pm2.5 µg/m³)	18.9	5.3	15	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR72 Kayseri, Sivas, Yozgat

Table A.29 **Key Facts, 2015 or latest available year**

Total population (million people)	2.38	2015
Population density (per km²)	40.00	2015
Area (km²)	59 664.00	2015
Urbanization (%)	74.73	2014
Inflation (%)	8.99	2014
Gross Value Added (million constant 2010 TYR)	24 229.00	2011
Share in Turkey's GVA (%)	2.29	2011
Share in Turkey's exports (%)	1.27	2014

Figure A.29 **GVA per capita, constant 2010 TRY, 2005-2015**

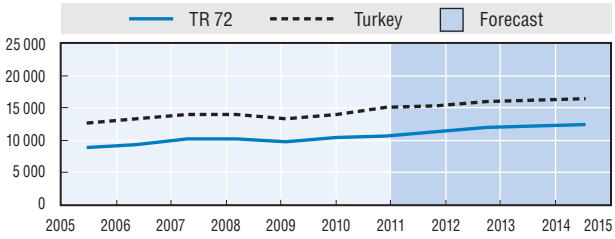


Figure A.30 **Scores by dimension**

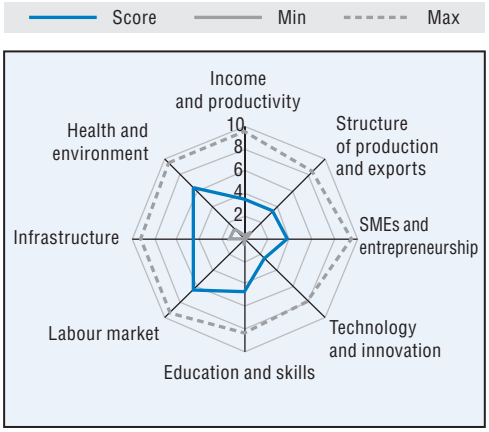


Table A.30 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		4.1	13	
1.	Economic performance		3.6	14	
2.	Determinants		4.6	16	
1.1	Income and productivity		3.6	12	
1.1.1	Household income (2005 TRY)	12 127.0	4.8	9	●
1.1.2	GVA per capita (2010 TRY)	11 925.0	3.3	16	
1.1.3	Labour productivity (2010 PPP USD)	34 938.0	2.5	16	
1.2	Productive structure		3.6	13	
1.2.1	Trade openness (%)	0.2	1.8	12	
1.2.2	Number of products exported (SITC, 4-digit level)	107.0	3.2	19	○
1.2.3	Export sophistication (EXPY)	7 608.8	2.3	16	
1.2.4	Agriculture (% of GVA)	15.3	3.9	13	
1.2.5	Manufacturing (% of employment)	31.6	6.2	6	●
1.2.6	Enterprises in manufacturing (%)	12.6	6.6	6	●
1.2.7	Number of MNEs (per 10 000 enterprises)	0.6	1.3	20	○
2.1	SMEs and entrepreneurship		3.8	13	
2.1.1	Number of SMEs (per 1 000 people 15-64)	56.5	3.3	20	○
2.1.2	New business registered (per 10 000 people 15-64)	18.6	2.5	10	
2.1.3	Informal economy (% of employment)	26.5	6.8	16	
2.1.4	Total credit (% of GVA)		2.7	11	
2.2	Technology and innovation		2.4	9	●
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.7	3.2	8	●
2.2.2	High and medium high-tech sectors (% of employment)	2.3	2.1	9	●
2.2.3	Number of patent applications (per million people)	33.6	1.9	10	
2.3	Education and skills		4.7	11	
2.3.1	Secondary education (% of labour force)	19.1	4.6	13	
2.3.2	Tertiary education (% of labour force)	18.7	4.0	6	●
2.3.3	Tertiary enrolment (% of population)	3.7	3.4	14	
2.3.4	Female literacy rate (%)	89.3	6.6	16	
2.4	Labour market		6.4	20	○
2.4.1	Labour force participation rate (% of population 15+)	46.5	5.5	20	○
2.4.2	Female labour force participation rate (% of population 15+)	31.6	5.5	16	
2.4.3	Labour utilization rate (%)	31.7	6.3	21	○
2.4.4	Dependency ratio (%)	50.6	6.8	18	
2.4.5	Unemployment (%)	9.6	7.0	17	
2.5	Infrastructure		4.6	19	
2.5.1	Broadband penetration rate (% of households)	40.0	5.2	13	
2.5.2	Road density (km/1 000 km²)	72.4	1.1	22	○
2.5.3	Number of private cars (per 10 000 people)	12.7	5.2	14	
2.5.4	Electrical power failures (per million people)		7.9	15	
2.5.5	Multimode Accessibility Index	57.8	3.5	16	
2.6	Health and environment		6.5	13	
2.6.1	Life expectancy (years)	74.2	6.6	13	
2.6.2	Infant mortality (per 1 000 live births)	9.8	7.2	15	
2.6.3	Air pollution (Pm2.5 µg/m³)	18.5	5.6	14	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR81 Zonguldak, Karabük, Bartın

Table A.31 **Key Facts, 2015 or latest available year**

Total population (million people)	1.02	2015
Population density (per km²)	107.00	2015
Area (km²)	9 493.00	2015
Urbanization (%)	54.26	2014
Inflation (%)	8.90	2014
Gross Value Added (million constant 2010 TYR)	13 541.00	2011
Share in Turkey's GVA (%)	1.28	2011
Share in Turkey's exports (%)	0.46	2014

Figure A.31 **GVA per capita, constant 2010 TRY, 2005-2015**

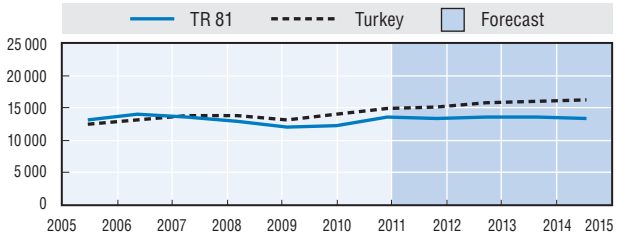


Figure A.32 **Scores by dimension**

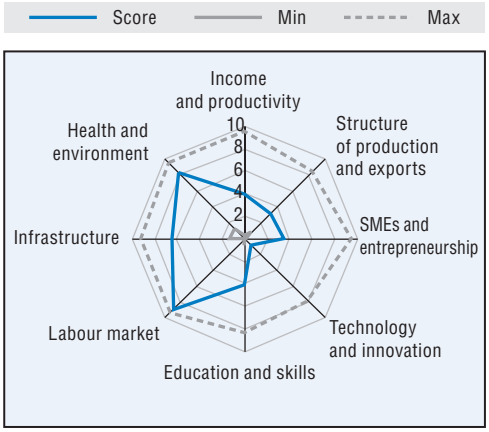


Table A.32 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		4.4	11	
1.	Economic performance		3.6	13	
2.	Determinants		5.2	11	
1.1	Income and productivity		3.9	10	
1.1.1	Household income (2005 TRY)	12 697.0	5.4	8	
1.1.2	GVA per capita (2010 TRY)	12 901.0	3.9	11	
1.1.3	Labour productivity (2010 PPP USD)	34 781.0	2.5	17	
1.2	Productive structure		3.2	14	
1.2.1	Trade openness (%)	0.3	2.4	8	
1.2.2	Number of products exported (SITC, 4-digit level)	44.0	-	26	○
1.2.3	Export sophistication (EXPY)	7 798.5	2.7	11	
1.2.4	Agriculture (% of GVA)	6.0	7.6	5	
1.2.5	Manufacturing (% of employment)	29.1	5.5	11	
1.2.6	Enterprises in manufacturing (%)	8.9	2.5	20	○
1.2.7	Number of MNEs (per 10,000 enterprises)	1.0	1.9	17	
2.1	SMEs and entrepreneurship		3.5	18	○
2.1.1	Number of SMEs (per 1,000 people 15-64)	57.5	3.5	19	○
2.1.2	New business registered (per 10'000 people 15-64)	12.0	0.9	18	○
2.1.3	Informal economy (% of employment)	22.6	7.9	8	
2.1.4	Total credit (% of GVA)		1.7	14	
2.2	Technology and innovation		0.8	21	○
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.3	0.8	21	○
2.2.2	High and medium high-tech sectors (% of employment)	0.8	0.6	16	
2.2.3	Number of patent applications (per million people)	17.7	0.9	17	
2.3	Education and skills		4.0	16	
2.3.1	Secondary education (% of labour force)	19.2	4.7	12	
2.3.2	Tertiary education (% of labour force)	13.8	2.0	16	
2.3.3	Tertiary enrolment (% of population)	3.9	3.6	11	
2.3.4	Female literacy rate (%)	87.9	5.8	17	
2.4	Labour market		8.9	4	●
2.4.1	Labour force participation rate (% of population 15+)	50.7	7.8	9	
2.4.2	Female labour force participation rate (% of population 15+)	47.4	10.0	1	●
2.4.3	Labour utilization rate (%)	38.6	9.2	4	●
2.4.4	Dependency ratio (%)	42.1	9.3	6	
2.4.5	Unemployment (%)	7.4	8.4	13	
2.5	Infrastructure		6.4	4	●
2.5.1	Broadband penetration rate (% of households)	49.0	7.1	8	
2.5.2	Road density (km/1,000 km²)	117.3	6.9	4	●
2.5.3	Number of private cars (per 10,000 people)	13.5	5.6	9	
2.5.4	Electrical power failures (per million people)		8.3	8	
2.5.5	Multimode Accessibility Index	62.1	4.2	9	
2.6	Health and environment		8.2	4	●
2.6.1	Life expectancy (years)	74.3	6.8	11	
2.6.2	Infant mortality (per 1,000 live births)	7.6	9.5	2	●
2.6.3	Air pollution (Pm2.5 µg/m³)	14.5	8.4	4	●

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR82 Kastamonu, Çankırı, Sinop

Table A.33 **Key Facts, 2015 or latest available year**

Total population (million people)	0.76	2015
Population density (per km²)	29.00	2015
Area (km²)	26 435.00	2015
Urbanization (%)	36.27	2014
Inflation (%)	8.92	2014
Gross Value Added (million constant 2010 TYR)	7 551.00	2011
Share in Turkey's GVA (%)	0.71	2011
Share in Turkey's exports (%)	0.09	2014

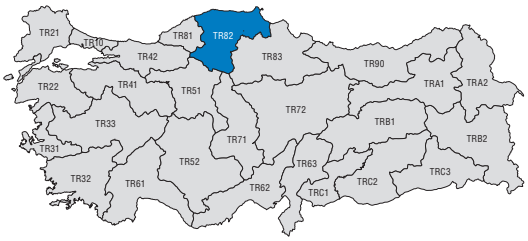


Figure A.33 **GVA per capita, constant 2010 TRY, 2005-2015**

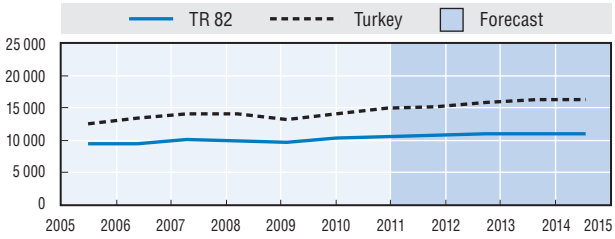


Figure A.34 **Scores by dimension**

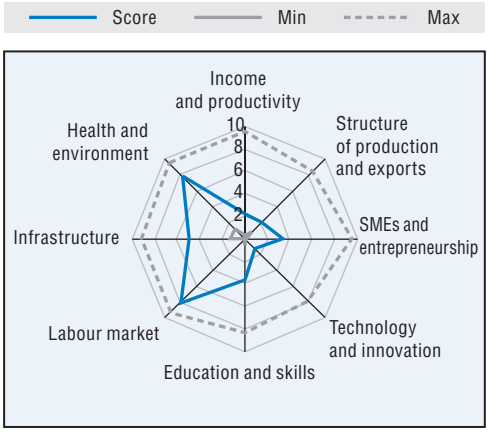


Table A.34 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		3.5	19	
1.	Economic performance		2.2	20	
2.	Determinants		4.8	15	
1.1	Income and productivity		2.3	19	
1.1.1	Household income (2005 TRY)	11 050.0	3.8	15	
1.1.2	GVA per capita (2010 TRY)	10 588.3	2.5	20	
1.1.3	Labour productivity (2010 PPP USD)	24 942.0	0.6	24	○
1.2	Productive structure		2.1	21	
1.2.1	Trade openness (%)	0.1	0.7	19	
1.2.2	Number of products exported (SITC, 4-digit level)	69.0	1.6	24	○
1.2.3	Export sophistication (EXPY)	6 979.6	1.0	20	
1.2.4	Agriculture (% of GVA)	23.1	0.7	24	○
1.2.5	Manufacturing (% of employment)	30.5	5.9	8	●
1.2.6	Enterprises in manufacturing (%)	10.8	4.6	10	
1.2.7	Number of MNEs (per 10 000 enterprises)			23	○
2.1	SMEs and entrepreneurship		3.3	20	
2.1.1	Number of SMEs (per 1 000 people 15-64)	60.5	4.2	16	
2.1.2	New business registered (per 10 000 people 15-64)	9.3	0.3	23	○
2.1.3	Informal economy (% of employment)	25.6	7.1	15	
2.1.4	Total credit (% of GVA)		1.8	13	
2.2	Technology and innovation		1.1	16	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.4	1.5	14	
2.2.2	High and medium high-tech sectors (% of employment)	1.6	1.4	11	
2.2.3	Number of patent applications (per million people)	11.9	0.6	21	
2.3	Education and skills		3.6	20	
2.3.1	Secondary education (% of labour force)	18.1	4.0	17	
2.3.2	Tertiary education (% of labour force)	13.2	1.8	20	
2.3.3	Tertiary enrolment (% of population)	3.0	3.0	17	
2.3.4	Female literacy rate (%)	87.8	5.8	18	
2.4	Labour market		8.0	10	
2.4.1	Labour force participation rate (% of population 15+)	50.2	7.5	12	
2.4.2	Female labour force participation rate (% of population 15+)	41.0	8.2	9	
2.4.3	Labour utilization rate (%)	38.4	9.1	5	●
2.4.4	Dependency ratio (%)	51.4	6.5	19	
2.4.5	Unemployment (%)	6.4	9.0	4	●
2.5	Infrastructure		5.0	12	
2.5.1	Broadband penetration rate (% of households)	37.0	4.6	17	
2.5.2	Road density (km/1 000 km²)	93.7	3.9	8	●
2.5.3	Number of private cars (per 10 000 people)	12.8	5.3	12	
2.5.4	Electrical power failures (per million people)		8.1	10	
2.5.5	Multimode Accessibility Index	56.6	3.3	19	
2.6	Health and environment		7.9	7	●
2.6.1	Life expectancy (years)	74.2	6.6	13	
2.6.2	Infant mortality (per 1 000 live births)	9.4	7.6	14	
2.6.3	Air pollution (Pm2.5 µg/m³)	13.1	9.4	2	●

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR83 Samsun, Tokat, Çorum, Amasya

Table A.35 **Key Facts, 2015 or latest available year**

Total population (million people)	2.72	2015
Population density (per km²)	72.00	2015
Area (km²)	37 524.00	2015
Urbanization (%)	75.62	2014
Inflation (%)	9.10	2014
Gross Value Added (million constant 2010 TYR)	28 499.00	2011
Share in Turkey's GVA (%)	2.69	2011
Share in Turkey's exports (%)	0.54	2014

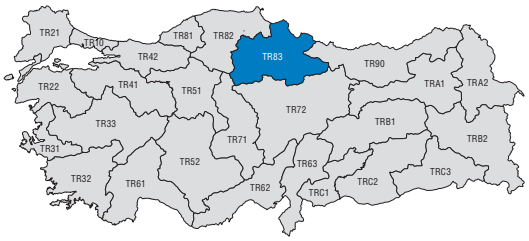


Figure A.35 **GVA per capita, constant 2010 TRY, 2005-2015**

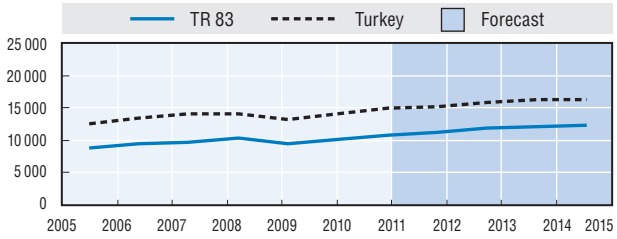


Figure A.36 **Scores by dimension**

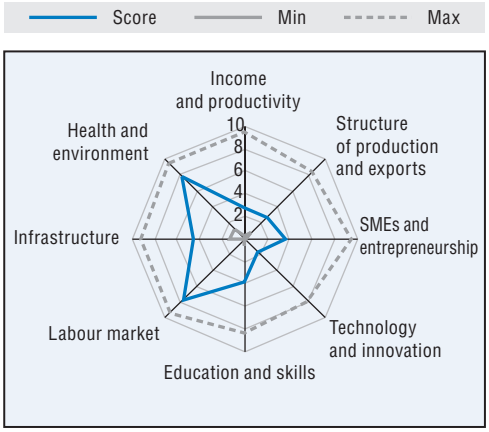


Table A.36 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		3.8	17	
1.	Economic performance		2.8	17	
2.	Determinants		4.8	14	
1.1	Income and productivity		2.8	17	
1.1.1	Household income (2005 TRY)	10 738.0	3.4	17	
1.1.2	GVA per capita (2010 TRY)	11 803.5	3.2	17	
1.1.3	Labour productivity (2010 PPP USD)	30 675.0	1.7	21	○
1.2	Productive structure		2.8	16	
1.2.1	Trade openness (%)	0.1	0.9	17	
1.2.2	Number of products exported (SITC, 4-digit level)	145.0	4.2	11	
1.2.3	Export sophistication (EXPY)	7 722.2	2.5	12	
1.2.4	Agriculture (% of GVA)	18.5	2.6	18	
1.2.5	Manufacturing (% of employment)	21.8	3.5	16	
1.2.6	Enterprises in manufacturing (%)	10.7	4.5	11	
1.2.7	Number of MNEs (per 10,000 enterprises)	0.6	1.4	18	
2.1	SMEs and entrepreneurship		3.6	16	
2.1.1	Number of SMEs (per 1,000 people 15-64)	59.3	3.9	17	
2.1.2	New business registered (per 10'000 people 15-64)	11.9	0.9	20	○
2.1.3	Informal economy (% of employment)	23.5	7.7	9	●
2.1.4	Total credit (% of GVA)		1.9	12	
2.2	Technology and innovation		1.6	13	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.6	2.7	10	●
2.2.2	High and medium high-tech sectors (% of employment)	1.0	0.8	14	
2.2.3	Number of patent applications (per million people)	23.2	1.3	14	
2.3	Education and skills		3.7	18	
2.3.1	Secondary education (% of labour force)	16.2	2.6	19	○
2.3.2	Tertiary education (% of labour force)	12.7	1.6	22	○
2.3.3	Tertiary enrolment (% of population)	2.7	2.7	19	○
2.3.4	Female literacy rate (%)	92.0	8.0	12	
2.4	Labour market		7.7	12	
2.4.1	Labour force participation rate (% of population 15+)	48.0	6.3	14	
2.4.2	Female labour force participation rate (% of population 15+)	36.5	6.9	12	
2.4.3	Labour utilization rate (%)	35.3	7.8	12	
2.4.4	Dependency ratio (%)	48.6	7.4	14	
2.4.5	Unemployment (%)	6.5	8.9	5	●
2.5	Infrastructure		4.6	18	
2.5.1	Broadband penetration rate (% of households)	35.0	4.2	19	○
2.5.2	Road density (km/1,000 km²)	81.3	2.3	17	
2.5.3	Number of private cars (per 10,000 people)	11.4	4.6	17	
2.5.4	Electrical power failures (per million people)		8.0	13	
2.5.5	Multimode Accessibility Index	60.7	4.0	10	●
2.6	Health and environment		7.9	8	●
2.6.1	Life expectancy (years)	74.2	6.6	13	
2.6.2	Infant mortality (per 1,000 live births)	8.7	8.3	10	●
2.6.3	Air pollution (Pm2.5 µg/m³)	14.2	8.7	3	●

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TR90 Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane

Table A.37 **Key Facts, 2015 or latest available year**

Total population (million people)	2.72	2015
Population density (per km²)	72.00	2015
Area (km²)	37 524.00	2015
Urbanization (%)	75.62	2014
Inflation (%)	9.10	2014
Gross Value Added (million constant 2010 TYR)	28 499.00	2011
Share in Turkey's GVA (%)	2.69	2011
Share in Turkey's exports (%)	0.54	2014

Figure A.37 **GVA per capita, constant 2010 TRY, 2005-2015**

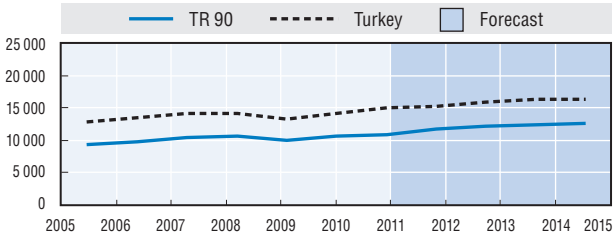


Figure A.38 **Scores by dimension**

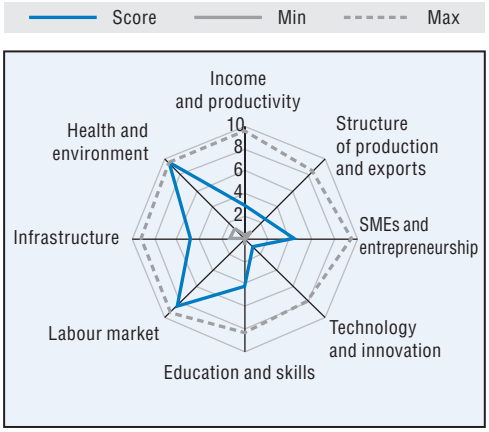


Table A.38 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		3.8	17	
1.	Economic performance		2.8	17	
2.	Determinants		4.8	14	
1.1	Income and productivity		2.8	17	
1.1.1	Household income (2005 TRY)	10 738.0	3.4	17	
1.1.2	GVA per capita (2010 TRY)	11 803.5	3.2	17	
1.1.3	Labour productivity (2010 PPP USD)	30 675.0	1.7	21	○
1.2	Productive structure		2.8	16	
1.2.1	Trade openness (%)	0.1	0.9	17	
1.2.2	Number of products exported (SITC, 4-digit level)	145.0	4.2	11	
1.2.3	Export sophistication (EXPY)	7 722.2	2.5	12	
1.2.4	Agriculture (% of GVA)	18.5	2.6	18	
1.2.5	Manufacturing (% of employment)	21.8	3.5	16	
1.2.6	Enterprises in manufacturing (%)	10.7	4.5	11	
1.2.7	Number of MNEs (per 10 000 enterprises)	0.6	1.4	18	
2.1	SMEs and entrepreneurship		3.6	16	
2.1.1	Number of SMEs (per 1 000 people 15-64)	59.3	3.9	17	
2.1.2	New business registered (per 10 000 people 15-64)	11.9	0.9	20	○
2.1.3	Informal economy (% of employment)	23.5	7.7	9	●
2.1.4	Total credit (% of GVA)		1.9	12	
2.2	Technology and innovation		1.6	13	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.6	2.7	10	●
2.2.2	High and medium high-tech sectors (% of employment)	1.0	0.8	14	
2.2.3	Number of patent applications (per million people)	23.2	1.3	14	
2.3	Education and skills		3.7	18	
2.3.1	Secondary education (% of labour force)	16.2	2.6	19	○
2.3.2	Tertiary education (% of labour force)	12.7	1.6	22	○
2.3.3	Tertiary enrolment (% of population)	2.7	2.7	19	○
2.3.4	Female literacy rate (%)	92.0	8.0	12	
2.4	Labour market		7.7	12	
2.4.1	Labour force participation rate (% of population 15+)	48.0	6.3	14	
2.4.2	Female labour force participation rate (% of population 15+)	36.5	6.9	12	
2.4.3	Labour utilization rate (%)	35.3	7.8	12	
2.4.4	Dependency ratio (%)	48.6	7.4	14	
2.4.5	Unemployment (%)	6.5	8.9	5	●
2.5	Infrastructure		4.6	18	
2.5.1	Broadband penetration rate (% of households)	35.0	4.2	19	
2.5.2	Road density (km/1 000 km²)	81.3	2.3	17	
2.5.3	Number of private cars (per 10 000 people)	11.4	4.6	17	
2.5.4	Electrical power failures (per million people)	-	8.0	13	
2.5.5	Multimode Accessibility Index	60.7	4.0	10	●
2.6	Health and environment		7.9	8	●
2.6.1	Life expectancy (years)	74.2	6.6	13	
2.6.2	Infant mortality (per 1 000 live births)	8.7	8.3	10	●
2.6.3	Air pollution (Pm2.5 µg/m³)	14.2	8.7	3	●

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TRA1 Erzurum, Erzincan, Bayburt

Table A.39 **Key Facts, 2015 or latest available year**

Total population (million people)	1.07	2015
Population density (per km²)	26.00	2015
Area (km²)	40 681.00	2015
Urbanization (%)	72.59	2014
Inflation (%)	8.91	2014
Gross Value Added (million constant 2010 TYR)	9 756.00	2011
Share in Turkey's GVA (%)	0.92	2011
Share in Turkey's exports (%)	0.03	2014

Figure A.39 **GVA per capita, constant 2010 TRY, 2005-2015**

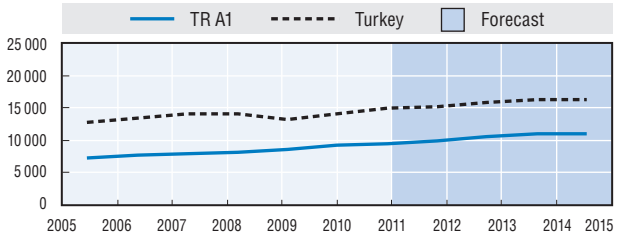


Figure A.40 **Scores by dimension**

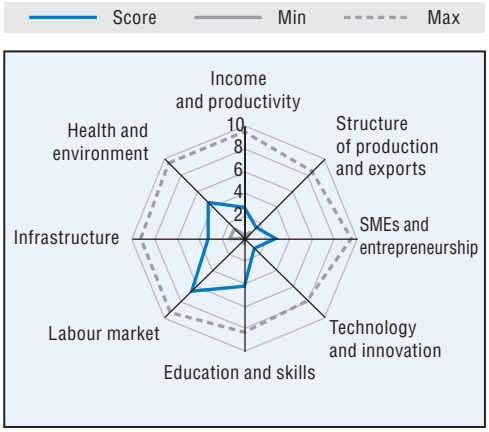


Table A.40 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		2.9	22	
1.	Economic performance		2.1	22	
2.	Determinants		3.8	20	
1.1	Income and productivity		2.8	18	
1.1.1	Household income (2005 TRY)	11 084.0	3.8	14	
1.1.2	GVA per capita (2010 TRY)	10 660.9	2.5	19	
1.1.3	Labour productivity (2010 PPP USD)	32 101.0	2.0	20	
1.2	Productive structure		1.4	24	○
1.2.1	Trade openness (%)	0.0	-	26	○
1.2.2	Number of products exported (SITC, 4-digit level)	110.0	3.3	18	
1.2.3	Export sophistication (EXPY)	6 707.3	0.4	24	○
1.2.4	Agriculture (% of GVA)	17.4	3.0	17	
1.2.5	Manufacturing (% of employment)	11.8	0.9	21	
1.2.6	Enterprises in manufacturing (%)	8.7	2.3	21	
1.2.7	Number of MNEs (per 10,000 enterprises)	-	-	23	○
2.1	SMEs and entrepreneurship		2.7	21	
2.1.1	Number of SMEs (per 1,000 people 15-64)	49.0	1.7	22	
2.1.2	New business registered (per 10'000 people 15-64)	8.1	-	26	○
2.1.3	Informal economy (% of employment)	20.7	8.4	6	●
2.1.4	Total credit (% of GVA)		0.7	22	
2.2	Technology and innovation		1.2	15	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.6	2.7	10	●
2.2.2	High and medium high-tech sectors (% of employment)	0.3	0.1	22	
2.2.3	Number of patent applications (per million people)	15.0	0.8	20	
2.3	Education and skills		4.3	13	
2.3.1	Secondary education (% of labour force)	19.7	5.1	9	●
2.3.2	Tertiary education (% of labour force)	16.7	3.2	12	
2.3.3	Tertiary enrolment (% of population)	6.7	4.8	2	●
2.3.4	Female literacy rate (%)	84.4	4.0	22	
2.4	Labour market		6.7	18	
2.4.1	Labour force participation rate (% of population 15+)	47.5	6.1	17	
2.4.2	Female labour force participation rate (% of population 15+)	30.3	5.1	19	
2.4.3	Labour utilization rate (%)	32.4	6.6	18	
2.4.4	Dependency ratio (%)	54.1	5.8	20	
2.4.5	Unemployment (%)	6.6	8.8	7	●
2.5	Infrastructure		3.2	22	
2.5.1	Broadband penetration rate (% of households)	28.0	2.7	23	○
2.5.2	Road density (km/1,000 km²)	69.8	0.8	25	○
2.5.3	Number of private cars (per 10,000 people)	7.4	2.6	22	
2.5.4	Electrical power failures (per million people)		6.4	21	
2.5.5	Multimode Accessibility Index	57.6	3.5	17	
2.6	Health and environment		4.5	20	
2.6.1	Life expectancy (years)	73.3	4.7	23	○
2.6.2	Infant mortality (per 1,000 live births)	14.3	2.5	20	
2.6.3	Air pollution (Pm2.5 µg/m³)	17.4	6.4	10	●

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TRA2 Ağrı, Kars, Iğdır, Ardahan

Table A.41 **Key Facts, 2015 or latest available year**

Total population (million people)	1.14	2015
Population density (per km²)	38.00	2015
Area (km²)	30 026.00	2015
Urbanization (%)	38.52	2014
Inflation (%)	8.66	2014
Gross Value Added (million constant 2010 TYR)	7 078.00	2011
Share in Turkey's GVA (%)	0.67	2011
Share in Turkey's exports (%)	0.13	2014

Figure A.41 **GVA per capita, constant 2010 TRY, 2005-2015**

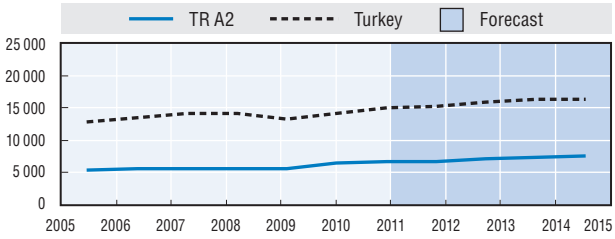


Figure A.42 **Scores by dimension**

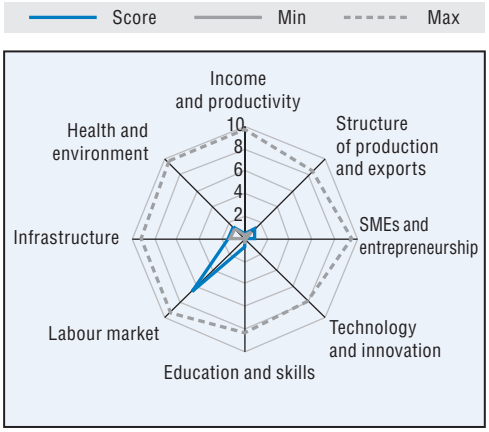


Table A.42 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		1.5	23	
1.	Economic performance		0.8	25	
2.	Determinants		2.2	23	
1.1	Income and productivity		0.4	25	
1.1.1	Household income (2005 TRY)	8 153.0	0.9	23	
1.1.2	GVA per capita (2010 TRY)	7 085.5	0.3	25	
1.1.3	Labour productivity (2010 PPP USD)	22 065.0	-	26	○
1.2	Productive structure		1.2	25	
1.2.1	Trade openness (%)	0.1	0.6	20	
1.2.2	Number of products exported (SITC, 4-digit level)	277.0	6.6	4	●
1.2.3	Export sophistication (EXPY)	7 208.6	1.5	18	
1.2.4	Agriculture (% of GVA)	24.8	-	26	
1.2.5	Manufacturing (% of employment)	9.0	0.1	25	
1.2.6	Enterprises in manufacturing (%)	6.6	-	26	○
1.2.7	Number of MNEs (per 10 000 enterprises)	-	-	23	
2.1	SMEs and entrepreneurship		0.9	24	
2.1.1	Number of SMEs (per 1 000 people 15-64)	41.2	-	26	○
2.1.2	New business registered (per 10 000 people 15-64)	8.9	0.2	24	
2.1.3	Informal economy (% of employment)	41.3	2.9	23	
2.1.4	Total credit (% of GVA)		0.5	23	
2.2	Technology and innovation		-	26	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.2	-	24	
2.2.2	High and medium high-tech sectors (% of employment)	0.2	-	25	
2.2.3	Number of patent applications (per million people)	2.6	-	26	○
2.3	Education and skills		0,7	25	
2.3.1	Secondary education (% of labour force)	12,6	0,1	24	
2.3.2	Tertiary education (% of labour force)	8,7	-	26	○
2.3.3	Tertiary enrolment (% of population)	2,0	2,1	20	
2.3.4	Female literacy rate (%)	78,2	0,7	24	
2.4	Labour market		6,7	19	
2.4.1	Labour force participation rate (% of population 15+)	53,4	9,3	4	●
2.4.2	Female labour force participation rate (% of population 15+)	41,3	8,2	8	●
2.4.3	Labour utilization rate (%)	34,2	7,4	15	
2.4.4	Dependency ratio (%)	66,6	2,1	23	
2.4.5	Unemployment (%)	6,7	8,8	8	●
2.5	Infrastructure		1,4	24	
2.5.1	Broadband penetration rate (% of households)	41,0	5,4	10	●
2.5.2	Road density (km/1 000 km²)	63,5	-	26	○
2.5.3	Number of private cars (per 10 000 people)	2,6	0,2	24	
2.5.4	Electrical power failures (per million people)		-	26	○
2.5.5	Multimode Accessibility Index	45,0	1,5	23	
2.6	Health and environment		1,5	25	
2.6.1	Life expectancy (years)	71,1	-	26	○
2.6.2	Infant mortality (per 1 000 live births)	15,3	1,5	23	
2.6.3	Air pollution (Pm2.5 µg/m³)	22,3	2,9	21	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TRB1 Malatya, Elazığ, Bingöl, Tunceli

Table A.43 **Key Facts, 2015 or latest available year**

Total population (million people)	1.69	2015
Population density (per km²)	47.00	2015
Area (km²)	35 917.00	2015
Urbanization (%)	70.55	2014
Inflation (%)	8.99	2014
Gross Value Added (million constant 2010 TYR)	14 780.00	2011
Share in Turkey's GVA (%)	1.39	2011
Share in Turkey's exports (%)	0.35	2014

Figure A.43 **GVA per capita, constant 2010 TRY, 2005-2015**

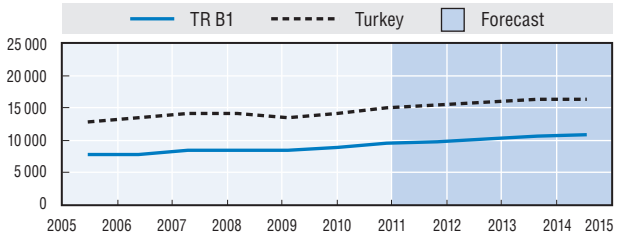


Figure A.44 **Scores by dimension**

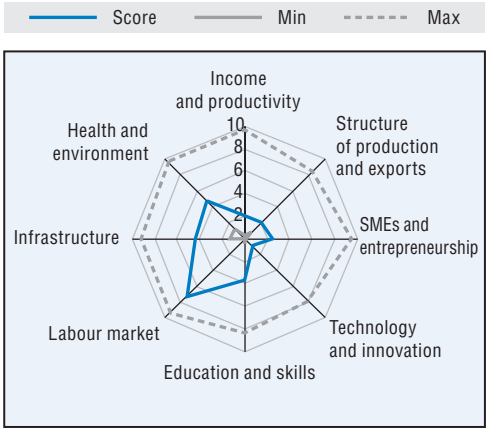


Table A.44 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		3.0	21	
1.	Economic performance		2.1	21	
2.	Determinants		4.0	19	
1.1	Income and productivity		2.1	20	
1.1.1	Household income (2005 TRY)	9 652.0	2.4	20	
1.1.2	GVA per capita (2010 TRY)	10 244.4	2.3	21	
1.1.3	Labour productivity (2010 PPP USD)	30 496.0	1.6	22	○
1.2	Productive structure		2.1	20	
1.2.1	Trade openness (%)	0.1	0.4	23	○
1.2.2	Number of products exported (SITC, 4-digit level)	64.0	1.3	25	○
1.2.3	Export sophistication (EXPY)	6 850.9	0.7	22	○
1.2.4	Agriculture (% of GVA)	14.0	4.4	10	●
1.2.5	Manufacturing (% of employment)	20.4	3.2	18	
1.2.6	Enterprises in manufacturing (%)	9.9	3.6	15	
1.2.7	Number of MNEs (per 10,000 enterprises)	0.5	1.2	21	
2.1	SMEs and entrepreneurship		2.5	22	○
2.1.1	Number of SMEs (per 1,000 people 15-64)	51.8	2.3	21	
2.1.2	New business registered (per 10'000 people 15-64)	13.1	1.2	15	
2.1.3	Informal economy (% of employment)	32.2	5.3	19	
2.1.4	Total credit (% of GVA)		1.3	17	
2.2	Technology and innovation		0.9	19	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.4	1.5	14	
2.2.2	High and medium high-tech sectors (% of employment)	3	0.1	22	○
2.2.3	Number of patent applications (per million people)	21.3	1.1	15	
2.3	Education and skills		3.6	19	
2.3.1	Secondary education (% of labour force)	18.8	4.5	14	
2.3.2	Tertiary education (% of labour force)	13.0	1.7	21	
2.3.3	Tertiary enrolment (% of population)	3.8	3.5	12	
2.3.4	Female literacy rate (%)	86.1	4.9	21	
2.4	Labour market		7.3	15	
2.4.1	Labour force participation rate (% of population 15+)	46.0	5.2	21	
2.4.2	Female labour force participation rate (% of population 15+)	43.7	8.9	5	●
2.4.3	Labour utilization rate (%)	32.1	6.5	20	
2.4.4	Dependency ratio (%)	49.2	7.2	15	
2.4.5	Unemployment (%)	7.7	8.2	15	
2.5	Infrastructure		4.4	20	
2.5.1	Broadband penetration rate (% of households)	41.0	5.4	10	●
2.5.2	Road density (km/1,000 km²)	88.3	3.2	11	
2.5.3	Number of private cars (per 10,000 people)	7.8	2.8	21	
2.5.4	Electrical power failures (per million people)		8.5	6	●
2.5.5	Multimode Accessibility Index	49.0	2.2	22	○
2.6	Health and environment		4.8	19	
2.6.1	Life expectancy (years)	74.8	7.9	7	●
2.6.2	Infant mortality (per 1,000 live births)	14.5	2.3	21	
2.6.3	Air pollution (Pm2.5 µg/m³)	20.3	4.3	16	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TRB2 Van, Muş, Bitlis, Hakkari

Table A.45 **Key Facts, 2015 or latest available year**

Total population (million people)	2.11	2015
Population density (per km²)	51.00	2015
Area (km²)	41 558.00	2015
Urbanization (%)	70.63	2014
Inflation (%)	8.60	2014
Gross Value Added (million constant 2010 TYR)	11 043.00	2011
Share in Turkey's GVA (%)	1.04	2011
Share in Turkey's exports (%)	0.27	2014

Figure A.45 **GVA per capita, constant 2010 TRY, 2005-2015**

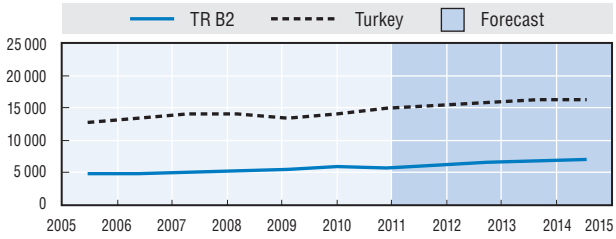


Figure A.46 **Scores by dimension**

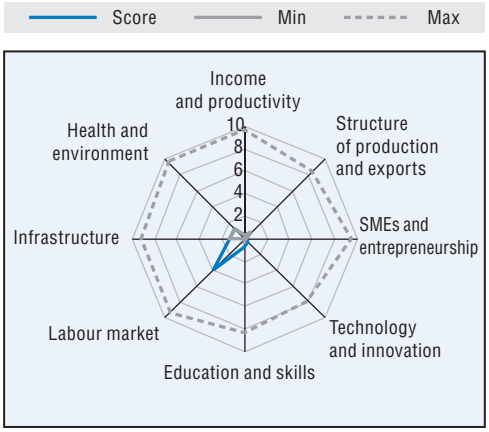


Table A.46 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		1.0	26	○
1.	Economic performance		0.6	26	○
2.	Determinants		1.5	24	
1.1	Income and productivity		0.3	26	○
1.1.1	Household income (2005 TRY)	7 956.0	0.7	24	
1.1.2	GVA per capita (2010 TRY)	6 613.3	-	26	○
1.1.3	Labour productivity (2010 PPP USD)	23 807.0	0.3	25	
1.2	Productive structure		0.8	26	○
1.2.1	Trade openness (%)	0.0	0.2	25	
1.2.2	Number of products exported (SITC, 4-digit level)	127.0	3.8	15	●
1.2.3	Export sophistication (EXPY)	6 580.9	0.1	25	
1.2.4	Agriculture (% of GVA)	23.0	0.7	23	
1.2.5	Manufacturing (% of employment)	8.6	-	26	○
1.2.6	Enterprises in manufacturing (%)	7.1	0.6	25	
1.2.7	Number of MNEs (per 10 000 enterprises)	-	-	23	
2.1	SMEs and entrepreneurship		0.1	26	○
2.1.1	Number of SMEs (per 1 000 people 15-64)	41.6	0.1	25	
2.1.2	New business registered (per 10 000 people 15-64)	8.5	0.1	25	
2.1.3	Informal economy (% of employment)	52.1	-	26	○
2.1.4	Total credit (% of GVA)		0.2	25	
2.2	Technology and innovation		0.4	24	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.3	0.8	21	●
2.2.2	High and medium high-tech sectors (% of employment)	0.4	0.2	20	●
2.2.3	Number of patent applications (per million people)	5.7	0.2	23	
2.3	Education and skills		0.7	24	
2.3.1	Secondary education (% of labour force)	12.4	-	26	○
2.3.2	Tertiary education (% of labour force)	9.5	0.3	25	
2.3.3	Tertiary enrolment (% of population)	1.5	1.5	24	
2.3.4	Female literacy rate (%)	79.2	1.2	23	
2.4	Labour market		4.0	24	
2.4.1	Labour force participation rate (% of population 15+)	48.0	6.3	14	●
2.4.2	Female labour force participation rate (% of population 15+)	21.9	2.7	24	
2.4.3	Labour utilization rate (%)	26.2	3.9	23	
2.4.4	Dependency ratio (%)	69.5	1.2	24	
2.4.5	Unemployment (%)	10.6	6.4	20	●
2.5	Infrastructure		1.3	25	
2.5.1	Broadband penetration rate (% of households)	15.0	-	26	○
2.5.2	Road density (km/1 000 km²)	72.1	1.1	24	
2.5.3	Number of private cars (per 10 000 people)	2.1	-	25	
2.5.4	Electrical power failures (per million people)		5.6	22	
2.5.5	Multimode Accessibility Index	34.9	-	26	○
2.6	Health and environment		1.3	26	○
2.6.1	Life expectancy (years)	71.3	0.4	25	
2.6.2	Infant mortality (per 1 000 live births)	15.8	0.9	25	
2.6.3	Air pollution (Pm2.5 µg/m³)	22.9	2.5	23	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TRC1 Gaziantep, Adıyaman, Kilis

Table A.47 **Key Facts, 2015 or latest available year**

Total population (million people)	2.62	2015
Population density (per km²)	171.00	2015
Area (km²)	15 280.00	2015
Urbanization (%)	89.02	2014
Inflation (%)	9.12	2014
Gross Value Added (million constant 2010 TYR)	18 686.00	2011
Share in Turkey's GVA (%)	1.76	2011
Share in Turkey's exports (%)	4.47	2014

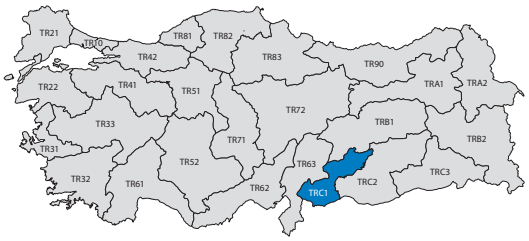


Figure A.47 **GVA per capita, constant 2010 TRY, 2005-2015**

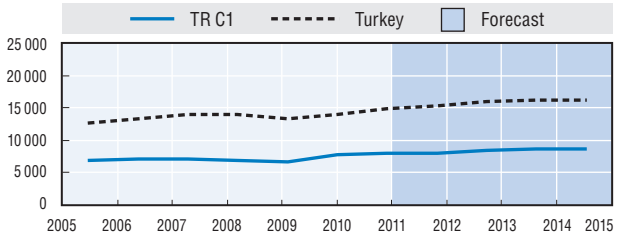


Figure A.48 **Scores by dimension**

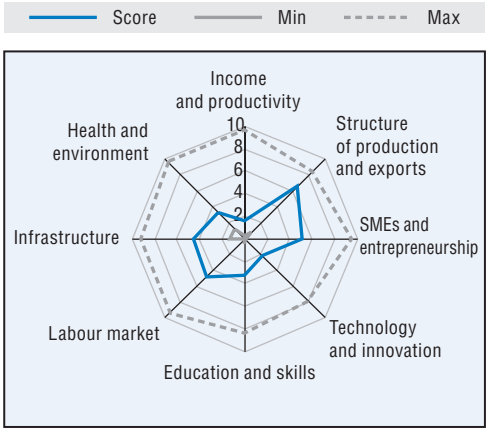


Table A.48 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		3.9	16	
1.	Economic performance		4.0	8	
2.	Determinants		3.8	21	
1.1	Income and productivity		1.5	23	○
1.1.1	Household income (2005 TRY)	8 332.0	1.0	21	
1.1.2	GVA per capita (2010 TRY)	8 369.1	1.1	23	○
1.1.3	Labour productivity (2010 PPP USD)	34 462.0	2.4	18	
1.2	Productive structure		6.6	3	●
1.2.1	Trade openness (%)	1.0	9.1	2	●
1.2.2	Number of products exported (SITC, 4-digit level)	149.0	4.3	10	
1.2.3	Export sophistication (EXPY)	6 510.0	-	26	○
1.2.4	Agriculture (% of GVA)	10.5	5.8	8	
1.2.5	Manufacturing (% of employment)	37.7	7.8	4	●
1.2.6	Enterprises in manufacturing (%)	15.3	9.5	3	●
1.2.7	Number of MNEs (per 10,000 enterprises)	28.1	9.4	2	●
2.1	SMEs and entrepreneurship		5.1	6	
2.1.1	Number of SMEs (per 1,000 people 15-64)	61.8	4.4	14	
2.1.2	New business registered (per 10'000 people 15-64)	17.7	2.3	11	
2.1.3	Informal economy (% of employment)	38.0	3.8	22	
2.1.4	Total credit (% of GVA)		10.0	1	●
2.2	Technology and innovation		2.2	10	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.4	1.5	14	
2.2.2	High and medium high-tech sectors (% of employment)	1.0	0.8	14	
2.2.3	Number of patent applications (per million people)	72.6	4.3	5	
2.3	Education and skills		3.2	22	
2.3.1	Secondary education (% of labour force)	15.9	2.4	20	
2.3.2	Tertiary education (% of labour force)	15.5	2.7	14	
2.3.3	Tertiary enrolment (% of population)	1.9	2.0	22	
2.3.4	Female literacy rate (%)	87.5	5.6	20	
2.4	Labour market		4.8	22	
2.4.1	Labour force participation rate (% of population 15+)	42.7	3.4	23	○
2.4.2	Female labour force participation rate (% of population 15+)	22.1	2.8	23	○
2.4.3	Labour utilization rate (%)	26.4	4.0	22	
2.4.4	Dependency ratio (%)	62.0	3.4	22	
2.4.5	Unemployment (%)	7.3	8.4	12	
2.5	Infrastructure		4.6	17	
2.5.1	Broadband penetration rate (% of households)	31.0	3.3	22	
2.5.2	Road density (km/1,000 km²)	102.9	5.0	7	
2.5.3	Number of private cars (per 10,000 people)	8.9	3.4	19	
2.5.4	Electrical power failures (per million people)		7.9	16	
2.5.5	Multimode Accessibility Index	58.2	3.6	14	
2.6	Health and environment		3.3	22	
2.6.1	Life expectancy (years)	74.1	6.4	17	
2.6.2	Infant mortality (per 1,000 live births)	16.7	-	26	○
2.6.3	Air pollution (Pm2.5 µg/m³)	21.5	3.5	20	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TRC2 Şanlıurfa, Diyarbakır

Table A.49 **Key Facts, 2015 or latest available year**

Total population (million people)	3.48	2015
Population density (per km²)	103.00	2015
Area (km²)	33 823.00	2015
Urbanization (%)	98.67	2014
Inflation (%)	8.80	2014
Gross Value Added (million constant 2010 TYR)	21 421.00	2011
Share in Turkey's GVA (%)	2.02	2011
Share in Turkey's exports (%)	0.32	2014

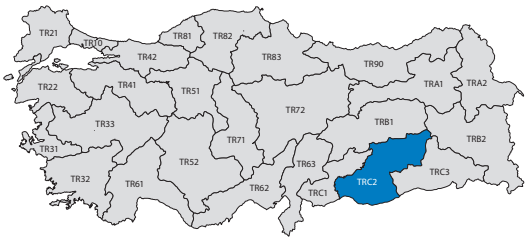


Figure A.49 **GVA per capita, constant 2010 TRY, 2005-2015**

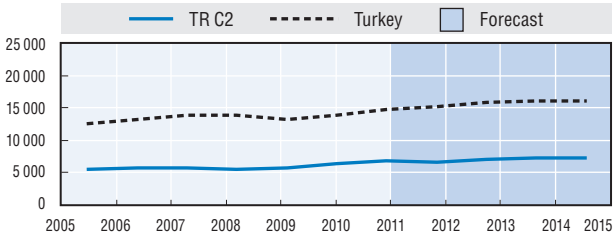


Figure A.50 **Scores by dimension**

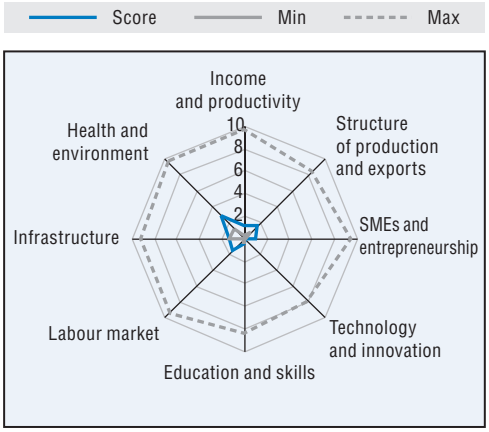


Table A.50 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		1.2	25	○
1.	Economic performance		1.3	24	
2.	Determinants		1.1	25	○
1.1	Income and productivity		1.1	24	
1.1.1	Household income (2005 TRY)	7 317.0	0.0	25	○
1.1.2	GVA per capita (2010 TRY)	7 109.1	0.3	24	
1.1.3	Labour productivity (2010 PPP USD)	37 753.0	3.1	11	●
1.2	Productive structure		1.6	23	
1.2.1	Trade openness (%)	0.1	0.4	24	
1.2.2	Number of products exported (SITC, 4-digit level)	114.0	3.4	17	●
1.2.3	Export sophistication (EXPY)	6 969.1	1.0	21	
1.2.4	Agriculture (% of GVA)	24.0	0.3	25	○
1.2.5	Manufacturing (% of employment)	9.4	0.2	24	
1.2.6	Enterprises in manufacturing (%)	8.4	2.0	22	
1.2.7	Number of MNEs (per 10 000 enterprises)	2.6	3.6	11	●
2.1	SMEs and entrepreneurship		1.0	23	
2.1.1	Number of SMEs (per 1 000 people 15-64)	49.0	1.7	23	
2.1.2	New business registered (per 10 000 people 15-64)	11.9	0.9	19	●
2.1.3	Informal economy (% of employment)	51.5	0.2	25	○
2.1.4	Total credit (% of GVA)		1.3	16	●
2.2	Technology and innovation		0.1	25	○
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.2	-	24	
2.2.2	High and medium high-tech sectors (% of employment)	0.4	0.2	20	
2.2.3	Number of patent applications (per million people)	3.2	0.0	25	○
2.3	Education and skills		0.5	26	○
2.3.1	Secondary education (% of labour force)	12.5	0.1	25	○
2.3.2	Tertiary education (% of labour force)	10.7	0.8	23	
2.3.3	Tertiary enrolment (% of population)	1.2	1.0	25	○
2.3.4	Female literacy rate (%)	77.2	0.2	25	○
2.4	Labour market		1.4	25	○
2.4.1	Labour force participation rate (% of population 15+)	41.5	2.8	25	○
2.4.2	Female labour force participation rate (% of population 15+)	15.1	0.8	25	○
2.4.3	Labour utilization rate (%)	21.2	1.8	25	○
2.4.4	Dependency ratio (%)	73.3	0.1	25	○
2.4.5	Unemployment (%)	17.5	2.2	25	○
2.5	Infrastructure		1.3	26	○
2.5.1	Broadband penetration rate (% of households)	20.0	1.0	25	○
2.5.2	Road density (km/1 000 km²)	72.3	1.1	23	
2.5.3	Number of private cars (per 10 000 people)	4.0	0.9	23	
2.5.4	Electrical power failures (per million people)		0.3	25	○
2.5.5	Multimode Accessibility Index	54.6	3.0	20	
2.6	Health and environment		2.9	24	
2.6.1	Life expectancy (years)	73.2	4.5	24	
2.6.2	Infant mortality (per 1 000 live births)	15.0	1.8	22	
2.6.3	Air pollution (Pm2.5 µg/m³)	23.0	2.4	24	

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

TRC3 Mardin, Batman, Şırnak, Siirt

Table A.51 **Key Facts, 2015 or latest available year**

Total population (million people)	2.15	2015
Population density (per km²)	83.00	2015
Area (km²)	26 090.00	2015
Urbanization (%)	75.43	2014
Inflation (%)	7.65	2014
Gross Value Added (million constant 2010 TYR)	14 636.00	2011
Share in Turkey's GVA (%)	1.38	2011
Share in Turkey's exports (%)	1.07	2014

Figure A.51 **GVA per capita, constant 2010 TRY, 2005-2015**

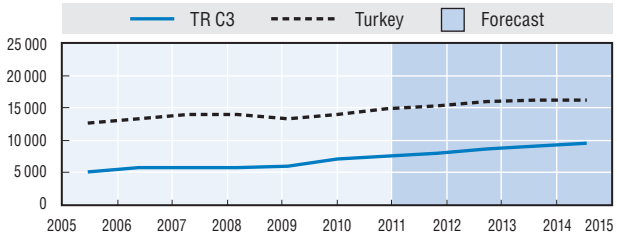


Figure A.52 **Scores by dimension**

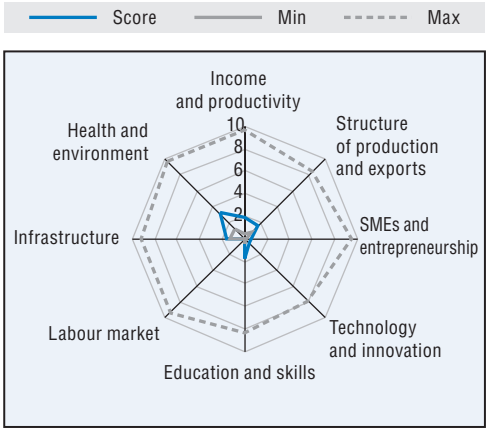


Table A.52 **Regional values, scores and ranks**

		Value	Score 0-10	Rank 1-26	
Index	Regional competitiveness		1.4	24	
1.	Economic performance		1.8	23	
2.	Determinants		1.0	26	○
1.1	Income and productivity		1.9	21	
1.1.1	Household income (2005 TRY)	7 288.0	-	26	○
1.1.2	GVA per capita (2010 TRY)	9 164.1	1.6	22	
1.1.3	Labour productivity (2010 PPP USD)	42 911.0	4.1	8	●
1.2	Productive structure		1.7	22	
1.2.1	Trade openness (%)	0.1	1.2	15	
1.2.2	Number of products exported (SITC, 4-digit level)	154.0	4.5	9	●
1.2.3	Export sophistication (EXPY)	6 765.2	0.5	23	
1.2.4	Agriculture (% of GVA)	17.3	3.0	16	
1.2.5	Manufacturing (% of employment)	9.5	0.2	23	
1.2.6	Enterprises in manufacturing (%)	7.6	1.1	24	
1.2.7	Number of MNEs (per 10,000 enterprises)	0.6	1.3	19	
2.1	SMEs and entrepreneurship		0.6	25	
2.1.1	Number of SMEs (per 1,000 people 15-64)	41.8	0.1	24	
2.1.2	New business registered (per 10'000 people 15-64)	11.5	0.8	22	
2.1.3	Informal economy (% of employment)	46.0	1.6	24	
2.1.4	Total credit (% of GVA)		-	26	○
2.2	Technology and innovation		0.5	23	
2.2.1	High-tech manuf. and knowledge-intensive ss (% of employment)	0.4	1.5	14	
2.2.2	High and medium high-tech sectors (% of employment)	0.2	-	25	
2.2.3	Number of patent applications (per million people)	5.1	0.2	24	
2.3	Education and skills		1.7	23	
2.3.1	Secondary education (% of labour force)	19.5	4.9	11	●
2.3.2	Tertiary education (% of labour force)	13.7	2.0	18	
2.3.3	Tertiary enrolment (% of population)	0.7	-	26	○
2.3.4	Female literacy rate (%)	76.9	-	26	○
2.4	Labour market		-	26	○
2.4.1	Labour force participation rate (% of population 15+)	36.4	-	26	○
2.4.2	Female labour force participation rate (% of population 15+)	12.5	-	26	○
2.4.3	Labour utilization rate (%)	17.0	-	26	○
2.4.4	Dependency ratio (%)	73.7	-	26	○
2.4.5	Unemployment (%)	21.1	-	26	○
2.5	Infrastructure		1.6	23	
2.5.1	Broadband penetration rate (% of households)	28.0	2.7	23	
2.5.2	Road density (km/1,000 km²)	91.5	3.6	10	●
2.5.3	Number of private cars (per 10,000 people)	2.1	-	25	
2.5.4	Electrical power failures (per million people)		0.4	24	
2.5.5	Multimode Accessibility Index	43.5	1.3	25	
2.6	Health and environment		3.2	23	
2.6.1	Life expectancy (years)	74.9	8.1	6	●
2.6.2	Infant mortality (per 1,000 live births)	15.3	1.5	23	
2.6.3	Air pollution (Pm2.5 µg/m³)	26.4	-	26	○

Note: Strengths ● and weaknesses ○ (top 5 and bottom 5 indicator ranks respectively)

All data sources are included in Annex C.

Annex B.
Computing the composite indicators to assess regional competitiveness in Turkey (Technical annex)

This technical annex is divided into two main parts. Part B1 describes in detail how Turkey's regional competitiveness index was built. Part B2 summarises the salient elements of the multivariate analysis carried out to assess the conceptual and statistical coherence of the regional competitiveness index.

B1. Constructing the regional competitiveness index of Turkey

B1.1. Scope of the regional competitiveness index

The scope of the index needs to be defined in three ways: the regions covered, the indicators included and the time span concerned.

Regional coverage

The regional competitiveness index covers 26 regions as defined by Level 2 of the Nomenclature of Territorial Units for Statistics (NUTS II). These 26 regions cover a total of 81 NUTS III provinces, and are grouped into 12 NUTS I regions.

Table B1. **NUTS classification in Turkey**[19]

NUTS I (12 regions)	NUTS II (26 regions)	NUTS III (81 provinces)	OECD extended regional typology
Istanbul Region (TR1)	İstanbul (TR10)	Istanbul Province (TR100)	Predominantly urban
West Marmara Region (TR2)	Tekirdağ, Edirne, Kırklareli (TR21)	Tekirdağ Province (TR211)	Predominantly rural close to a city
		Edirne Province (TR212)	Predominantly rural close to a city
		Kırklareli Province (TR213)	Predominantly rural close to a city
	Balıkesir, Çanakkale (TR22)	Balıkesir Province (TR221)	Intermediate
		Çanakkale Province (TR222)	Predominantly rural remote
Aegean Region (TR3)	İzmir (TR31)	İzmir Province (TR310)	Predominantly urban
	Aydın, Denizli, Muğla (TR32)	Aydın Province (TR321)	Intermediate
		Denizli Province (TR322)	Intermediate
		Muğla Province (TR323)	Predominantly rural remote
	Manisa, Afyon, Kütahya, Uşak (TR33)	Manisa Province (TR331)	Intermediate
		Afyonkarahisar Province (TR332),	Predominantly rural close to a city
		Kütahya Province (TR333),	Predominantly rural close to a city
		Uşak Province (TR334)	Predominantly rural close to a city
East Marmara Region (TR4)	Bursa, Eskişehir, Bilecik (TR41)	Bursa Province (TR411),	Intermediate
		Eskişehir Province (TR412),	Intermediate
		Bilecik Province (TR413)	Predominantly rural remote
	Kocaeli, Sakarya, Düzce, Bolu, Yalova (TR42)	Kocaeli Province (TR421),	Predominantly urban
		Sakarya Province (TR422),	Intermediate
		Düzce Province (TR423),	Intermediate
		Bolu Province (TR424),	Predominantly rural close to a city
		Yalova Province (TR425)	Intermediate
West Anatolia Region (TR5)	Ankara (TR51)	Ankara Province (TR511)	Predominantly urban
	Konya, Karaman (TR52)	Konya Province (TR521),	Predominantly rural close to a city
		Karaman Province (TR522)	Predominantly rural close to a city
Mediterranean Region (TR6)	Antalya, Isparta, Burdur (TR61)	Antalya Province (TR611),	Intermediate
		Isparta Province (TR612),	Predominantly rural close to a city
		Burdur Province (TR613)	Predominantly rural remote
	Adana, Mersin (TR62)	Adana Province (TR621),	Intermediate
		Mersin Province (TR622)	Intermediate
	Hatay, Kahramanmaraş, Osmaniye (TR63)	Hatay Province (TR631),	Intermediate
		Kahramanmaraş Province (TR632),	Predominantly rural close to a city
		Osmaniye Province (TR633)	Intermediate
Central Anatolia Region (TR7)	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir (TR71)	Kırıkkale Province (TR711),	Intermediate
		Aksaray Province (TR712),	Predominantly rural close to a city
		Niğde Province (TR713),	Predominantly rural close to a city
		Nevşehir Province (TR714),	Predominantly rural close to a city
		Kırşehir Province (TR715)	Predominantly rural close to a city
	Kayseri, Sivas, Yozgat (TR72)	Kayseri Province (TR721),	Intermediate
		Sivas Province (TR722),	Predominantly rural remote
		Yozgat Province (TR723)	Predominantly rural close to a city

Table B1. **NUTS classification in Turkey**[19] (cont.)

NUTS I (12 regions)	NUTS II (26 regions)	NUTS III (81 provinces)	OECD extended regional typology
West Black Sea Region (TR8)	Zonguldak, Karabük, Bartın (TR81)	Zonguldak Province (TR811)	Predominantly urban
		Karabük Province (TR812)	Intermediate
		Bartın Province (TR813)	Predominantly rural remote
	Kastamonu, Çankırı, Sinop (TR82)	Kastamonu Province (TR821)	Predominantly rural close to a city
		Çankırı Province (TR822)	Predominantly rural close to a city
		Sinop Province (TR823)	Predominantly rural remote
	Samsun, Tokat, Çorum, Amasya (TR83)	Samsun Province (TR831),	Intermediate
		Tokat Province (TR832)	Predominantly rural close to a city
		Çorum Province (TR833)	Predominantly rural close to a city
		Amasya Province (TR834)	Predominantly rural close to a city
East Black Sea Region (TR9)	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane (TR90)	Trabzon Province (TR901)	Intermediate
		Ordu Province (TR902)	Intermediate
		Giresun Province (TR903)	Predominantly rural remote
		Rize Province (TR904)	Intermediate
		Artvin Province (TR905)	Predominantly rural remote
		Gümüşhane Province (TR906)	Predominantly rural remote
Northeast Anatolia Region (TRA)	Erzurum, Erzincan, Bayburt (TRA1)	Erzurum Province (TRA11)	Predominantly rural close to a city
		Erzincan Province (TRA12)	Predominantly rural close to a city
		Bayburt Province (TRA13)	Predominantly rural remote
	Ağrı, Kars, Iğdır, Ardahan (TRA2)	Ağrı Province (TRA21),	Predominantly rural close to a city
		Kars Province (TRA22)	Predominantly rural close to a city
		Iğdır Province (TRA23)	Predominantly rural close to a city
		Ardahan Province (TRA24)	Predominantly rural remote
Central East Anatolia Region (TRB)	Malatya, Elazığ, Bingöl, Tunceli (TRB1)	Malatya Province (TRB11)	Intermediate
		Elazığ Province (TRB12)	Intermediate
		Bingöl Province (TRB13)	Predominantly rural close to a city
		Tunceli Province (TRB14)	Predominantly rural close to a city
	Van, Muş, Bitlis, Hakkari (TRB2)	Van Province (TRB21)	Predominantly rural close to a city
		Muş Province (TRB22)	Predominantly rural close to a city
		Bitlis Province (TRB23)	Predominantly rural close to a city
		Hakkâri Province (TRB24)	Predominantly rural close to a city
Southeast Anatolia Region (TRC)	Gaziantep, Adıyaman, Kilis (TRC1)	Gaziantep Province (TRC11)	Intermediate
		Adıyaman Province (TRC12)	Predominantly rural close to a city
		Kilis Province (TRC13)	Intermediate
	Şanlıurfa, Diyarbakır (TRC2)	Şanlıurfa Province (TRC21)	Predominantly rural close to a city
		Diyarbakır Province (TRC22)	Intermediate
	Mardin, Batman, Şırnak, Sirt (TRC3)	Mardin Province (TRC31)	Predominantly rural close to a city
		Batman Province (TRC32)	Intermediate
		Şırnak Province (TRC33)	Predominantly rural close to a city
		Siirt Province (TRC34)	Predominantly rural close to a city

Indicator coverage and sources

Regional profiles are structured around two pillars:

- Pillar 1, Economic performance (2 dimensions, 10 indicators);
- Pillar 2, Determinants of competitiveness (6 dimensions, 24 indicators).

Indicators in each pillar were collected from a variety of sources:

- Turkstat
- Eurostat
- Small and Medium Sized Industry Development Organisation (KOSGEB)
- Ministry of Development
- Ministry of Economy
- Ministry of Finance

- OECD Regional Statistics
- The Union of Chambers and Commodity Exchanges of Turkey (TOBB)
- Turkish Banking Regulation and Supervision Agency (BDDK)
- Turkish Electricity Distribution Corporation (TEDAŞ)
- Turkish Patent Institute (TPE)

Annex B2 contains a complete list of indicators, including descriptions and sources.

Time series

The regional competitiveness index is computed for a single year, 2015, on the basis of the last available data points for all series in the period 200515. Some indicators have better overall coverage than others. For example, eight series relate to only one year of data, while three cover the entire 11 years.

Table B2. **Years of data (index only)**

Years of dataavailable	Number of series	As % of total	Time Ranges (number of series)
1	8	23.5%	2012 (1), 2013 (3), 2014 (3), 2015 (1)
2	2	5.9%	2013-14
3	2	5.9%	2009-11
4	1	2.9%	2009-12
5	5	14.7%	2009-13 (1), 2010-14 (4)
6	1	2.9%	2009-14
7	4	11.8%	2005-11 (1), 2008-14 (3)
8	2	5.9%	2005-12 (1), 2007-14 (1)
9	5	14.7%	2005-13 (4), 2006-14 (1)
10	1	2.9%	2005-14
11	3	8.8%	2005-15 (1 based on estimates)
Total	**34**	**100%**	

B1.2. Treatment of indicators

Indicators are usually treated in the following order:

- Estimates
- Scaling and other computations
- Missing data imputed
- Outliers treated and indicators transformed for statistical purposes
- Bounds for normalisation determined
- Normalisation.

Estimates

Two important indicators missed data for the period 2012-2015: regional gross value added (GVA) in constant 2010 Turkish lira, and regional GVA in current Turkish lira.

To obtain estimates for 2012-15, a growth function was applied to regional GVA in current Turkish Lira (period 2004-11). The choice of a growth function rather than a linear trend function was based on the ratio of the IMF estimate of Turkey's GDP over GVA for the period 2012-2015. The average ratio of GDP over GVA for Turkey over the period 2004-2011 was 1.12. A trend function yielded ratios ranging from 1.20 to 1.38 for 2012-15 (average of 1.27), whereas a growth function produced ratios of between 1.09 and 1.12 (1.10 on average). Based on this analysis the estimates obtained from applying the growth function were used to compute regional shares in Turkey's national GVA, regional GVA growth rates, and as scaling indicators for a series of indicators.

To obtain regional GVA in constant 2010 Turkish lira, the IMF's national GDP deflator was used on the estimates, as no regional GVA deflators were available for Turkey.

Scaling

Most indicators come already scaled at source by some relevant size indicator, which allows regional comparisons. The following indicators, however, required scaling or additional computation on the part of the OECD.

Indicators scaled by population:

- 1.1.2 Regional GVA per capita (in 2010 TRY), based on regional GVA estimates in constant 2010 Turkish lira
- 1.2.3 Number of patent applications (per million people)
- 2.5.4 Electrical power failures (per million people)

Indicators scaled by (estimated) GVA in current Turkish lira:

- 1.2.1 Trade openness (%)
- 2.1.4 Total credit (% of regional GVA)

Others:

- 1.2.5 Manufacturing (% of employment)
- 1.2.6 Enterprises in manufacturing (%)
- 1.2.7 Number of MNEs (per 10 000 enterprises)
- 2.1.1 Number of SMEs (per 1 000 people 15-64)
- 2.1.2 New business registered (per 10 000 people 15-64)
- 2.5.5 Multimode Accessibility Index

Indicator 1.2.2, number of products exported (SITC 4-digit level), is right-skewed and was not scaled. From a theoretical perspective the number of products exported is determined less by size than by trade openness, export sophistication, economic diversification, industrial fabric, etc., which are captured by the rest of the indicators in the same dimension (which were proxied by the share of agriculture in GVA and the share of manufacturing in employment). Statistically, correlations and principal components analysis support this choice.

Indicator 2.2.3, number of patent applications (per million people), is computed as the sum of the number of patent applications by province (NUTS III) for each region, providing regional aggregates that are then scaled by total population.

Indicator 2.5.5, Multimode Accessibility Index (MAI), measures the accessibility of provinces (NUTS III) on the basis of four sub-indicators measuring road, air, rail and sea transport provisions. The MAI at province level is computed by the Ministry of Development; while at the regional level (NUTS II) it is computed as the weighted average of province-levels scores, with weighting determined by the shares of the surface areas of each province in a region.

Imputation of missing data

For each indicator, the last available data point in each series is used. Since the dataset includes at least one data point per region and per indicator, the final dataset is complete, i.e. there are no missing data (Table B3). For all series, the last year of data for each region is the same with one exception: although 2014 is the last year of data in 2.2.1, high-tech manufacturing and knowledge-intensive services (% of employment), the data point for TR82 Kastamonu, Çankırı, Sinop is for 2013.

Table B3. **Year of last available datapoints**

Last year of data	Indicators	Percentage
2011	3	8.8%
2012	3	8.8%
2013	8	23.5%
2014	16	47.1%
2015	3	8.8%
2015 (est.)	1	2.9%
Total	**34**	**100.0%**

A complete dataset was required to perform a series of statistical analysis to the data. For each series, data points for earlier/later years were completed with the first/last available data point (e.g. for a series with data for 2010-2013, the 2010 data is used for 2005-2009, and the 2013 data is used for years 2014 and 2015). Data gaps between two years were imputed by linear interpolation (this concerns indicator 2.2.2 high and medium high-tech sectors, year 2012 for TRA1, TRA2 and TRB2 and year 2013 for TRB2. When missing data points concern scaled, ratio or growth indicators, the imputation is performed at the level of the final indicator, not of the original series.

Treatment of series with outliers

Outliers can polarise scores and bias rankings. Series with outliers were detected with a standard practice using two criteria: absolute value of skewness greater than 2 and kurtosis greater than 3.5. The whole dataset was used to detect outliers (286 observations with imputed data).

Four indicators were concerned:

- 1.2.2 Number of products exported (SITC 4-digit level)
- 1.2.7 Number of MNEs (per 10 000 enterprises)
- 2.2.1 High-tech manufacturing and knowledge-intensive services (% of employment)
- 2.3.3 Tertiary enrolment (% of population)

Since the four indicators presented right-skewness, the same transformation was used for all of them:

$$f(value) = IF(MIN(series) > 1, \mathrm{LN}(value), \text{otherwise L}$$

Other alternatives were also considered. In the case of global composite indicators (100-plus yearly observations), series with less than 4 or 5 outliers are usually winsorised, not transformed. With a sample of only 26 regions, however, the shape moments – which describe symmetry of tails and combined weight of tails in the distribution of each indicator – are somewhat less telling. So winsorisation, which involves adjudicating the next value in the series until skewness and kurtosis come within the specified ranges, meant losing too much information on distance. In a first series of computations, outliers were winsorised and the confidence intervals of the regions at the top of the ranking showed extreme robustness. The decision was therefore taken to transform those indicators, so that scores would reflect regional gaps – not just middle- range scores, but those at the top, too.

Another alternative was to relax or strengthen the specified criteria as there was no justification to depart from standard practice. Skewness and kurtosis criteria are not, in fact, necessarily aimed at ensuring normality, but rather at treating outliers (problematic data points to the tails). In that regard, the Stata SKTEST – a test of normality that combines skewness and kurtosis tests – was performed on all indicators in all years (286 indicators and imputed datasets). Only six indicators passed the test – income per household, female labour participation, broadband penetration and cars at the 5% level of confidence, and secondary enrolment, and infant mortality at the 1% level of confidence.

Another alternative was to use different transformations for each problematic indicator. It was discarded for the sake of parsimony. In fact, Stata's LADDER command, which assesses the normality of different transformations, was not conclusive.

The last alternative would have been to transform all indicators. Such an option was in fact selected for the computation of confidence intervals for ranks. It combined yearly minmax normalisation with a log-transformation that brings all median scores to 5 (refer to section on Aggregation).

Normalisation

To make indicator values comparable, they are normalised so that they fall within the [0-10] range, where 10 denotes high and 0 low competitiveness.

Normalisation is performed on the basis of yearly minimum and maximum values for each indicator, applied to the imputed and transformed indicators (outlier free dataset). Yearly minmax normalisation involves maximum variability in scores and, therefore, greater robustness in rankings. The main drawback is that comparisons over time or computations of trends on the basis of scores are no longer valid.

Other bounds were also considered, such as period minmax (distance to frontier), goalpost, and theoretical min max. They all have their own strong and weak points. Most global composite indicators use yearly minmax normalisation. However, the balance was tipped in favour of yearly minmax by some additional considerations:

- The dissimilar year-coverage of series detracted from the concept of distance to frontier;
- Goalposts can be justified in global rankings, but less so in a regional ranking of an emerging economy. And questions emerge such as whether the reference value should be some policy goal, for instance in five to ten years from now on, or whether it should be values prevailing in developed economies?
- Robustness in ranks, based on statistically significant differences in scores, is crucial to focus in regional gaps and draw policy conclusions.

Taking into account the direction of effects , the normalisation formula is the same for all indicators:

$$score\ x = \left[\frac{f(value)\text{-}f(MIN)}{f(MAX)\text{-}f(MIN)}\,d + 0.5 * (1 - d)\right] * 10$$

For a non-transformed indicator, which reduces the formula to the familiar:

'Goods': $(d = 1)\text{:}\ score\ x = \frac{value\text{-}MIN}{MAX\text{-}MIN} * 10$

'Bads': $(d = -1)\text{:}\ score\ x = \frac{\text{MAX} - \text{value}}{\text{MAX} - \text{MIN}} * 10$

Standardization was also considered, but discarded on two grounds:

1. Scores are not necessarily bounded (even after transformation of skewed indicators), which complicates the interpretation of scores;
2. With a sample of 26 regions, statistical moments are less telling, and standardisation requires the first two, average and standard deviation.

Standardization, however, was retained for computing confidence intervals in rankings (refer to section on Confidence intervals for ranks).

B1.3. Aggregation

Aggregation method

The index is computed as the arithmetic average of two pillars:

- Pillar 1, Economic performance
- Pillar 2, Determinants of competitiveness.

Pillar 1 is divided into dimensions (1.1 and 1.2) Pillar 2 into 6 dimensions (2.1 to 2.6) that comprise a total of 34 indicators. Pillar and dimension scores are computed as the weighted arithmetic averages of their components.

Arithmetic averages are fully compensatory in that an important comparative advantage in a few indicators can compensate comparative disadvantages in many. Geometric averages, in contrast, reward countries with balanced profiles and give them incentive to improve specifically in the dimensions in which they perform poorly. Since they require strictly positive values, however, geometrical averages are not usually applied at the first level of aggregation. Geometric averages are one of the methods used in the statistical audit to obtain ranking confidence intervals (refer to section on Confidence intervals for ranks).

Weights as scaling coefficients

Different weighting methods can be chosen and scores and rankings are usually quite sensitive to changes in weights. In this index, weights are conceptualised as scaling coefficients for the purpose of obtaining higher correlation between each component (indicator/dimension/pillar) and its upper dimension (dimension/pillar/index) so that dimension scores are balanced in their underlying components. This, in practice, usually involves lower relative weights for highly correlated components or, in other words, higher relative weights for components that relate to the topic under measurement and have not yet been captured by other components.

Weights are restricted to values of 0.5 and 1 which are easy to communicate. They also offer the advantage of staying fixed so that they are the same if the exercise is repeated in subsequent years, unless there are major changes in the correlation structure.

In the final assessment, weights of 0.5 were applied to the following:

- 2.4.1 Labour force participation rate (% of population 15+);
- 2.4.2 Female labour force participation rate (% of population 15+);
- 2.4.3 Labour utilisation rate (%);
- Dimension 2.1 SMEs and entrepreneurship;
- Dimension 2.3 Education and skills;
- Dimension 2.5 Infrastructure; and
- Dimension 2.6 Health and environment.

Higher relative weight were applied to dimension 2.2, technology and innovation, and 2.4, labour market, which are less closely correlated with the four other dimensions in Pillar 2, determinants of competitiveness.

The statistical audit included other weighting schemes for ranking confidence intervals (refer to section on Confidence intervals for ranks):

- Equal weights (i.e. simple averages);
- PCA-based weights, in accordance with the *Handbook on Constructing Composite* Indicators (OECD and JRC, 2008), pp. 89-90;
- Random weights (Monte Carlo simulation).

Confidence intervals for ranks

Due to the various subjective choices made in the process of constructing composite indicators (i.e. the treatment of missing values, the choice of aggregation method, the weight of indicators, etc.), an evaluation of the confidence in the model is required.

To give a sense of how robust the regional ranking is, results include confidence intervals for index and pillar rankings. They were obtained from an uncertainty and sensitivity statistical audit to assess the impact of different modelling choices on scores and ranks. Confidence intervals are computed for ranks because the scores obtained using different modelling parameters/techniques are not necessarily comparable.

The statistical audit includes the following scenarios, for a total of 18 rankings for each score. This is applied to index and pillar scores, which produces a total of 54 rankings:

A) Normalisation and transformation, with the following options:

- Four indicators log-transformed, yearly min-max normalized scores [0 to10] on the basis of the outlier free dataset (chosen);
- Four indicators log-transformed, yearly standardized scores plus five on the basis of the outlier free dataset.

$$z = \frac{value\text{-}AVERAGE(series)}{STDEV(series)} + 5$$

- Yearly min-max normalization [0 to 10] followed by a non-linear transformation aimed at bringing the sample median to a score of 5, i.e. ; in one step the transformation-cum-normalization is equivalent to applying the following to the imputed dataset:

$$z = 5\left[\frac{LN\left(1 + \frac{(v\text{-}MIN)(MAX + MIN\text{-}2MEDIAN)}{(MEDIAN\text{-}MIN)^2}\right)}{LN\left(\frac{MAX\text{-}MEDIAN}{MEDIAN\text{-}MIN}\right)} d + (1 - d)\right]$$

B) Weights, three options for each of the above:

- Weights as scaling coefficients of 0.5 and 1 (chosen);
- Equal weights; and
- JRC/OECD PCA-based weights.

C) Aggregation method, two options for each of the above:

- Weighted arithmetic averages (chosen); and
- Weighted geometric averages (pillar level only).

The confidence intervals are constructed as the interval between the lowest rank as the lower bound and the highest rank as the upper bound among all eighteen scenaria for the index and both pillars.

Other rank-based methods were also assessed: median rank ranks (*sic*), average rank ranks (sic), Borda points and the Copeland rule. Their results were not used for the confidence intervals, however, because the methods consider only ordinal information – the absolute value of information is lost.

B1.4. Results

Table B4 shows the results in each of the two pillars, while Table B5 drills down still further and looks at scores in the eight dimensions.

Table B4. **Performance of Turkish regions in the regional competitiveness index and its two pillars, economic performance and determinants of competitiveness**

Code	Region	Regional Competitiveness			Economic Performance			Determinants of Competitiveness		
		Index			Pillar 1			Pillar 2		
		Rank	Range	Score	Rank	Range	Score	Rank	Range	Score
TR10	İstanbul	1	[1, 1]	8.57	1	[1, 1]	9.00	1	[1, 1]	8.13
TR51	Ankara	2	[2, 2]	7.42	2	[2, 2]	7.37	2	[2, 3]	7.47
TR41	Bursa, Eskişehir, Bilecik	3	[3, 6]	7.06	4	[3, 4]	7.01	3	[3, 7]	7.11
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	4	[3, 5]	6.93	3	[3, 4]	7.12	4	[4, 7]	6.74
TR31	İzmir	5	[3, 5]	6.42	5	[5, 5]	6.29	5	[2, 5]	6.56
TR21	Tekirdağ, Edirne, Kırklareli	6	[4, 6]	6.09	6	[6, 6]	5.65	6	[4, 6]	6.54
TR61	Antalya, Isparta, Burdur	7	[7, 7]	5.15	7	[7, 8]	4.35	7	[5, 7]	5.96
TR32	Aydın, Denizli, Muğla	8	[8, 10]	4.72	12	[10, 12]	3.74	8	[8, 8]	5.70
TR33	Manisa, Afyon, Kütahya, Uşak	9	[8, 10]	4.61	9	[7, 11]	4.03	10	[9, 13]	5.20
TR52	Konya, Karaman	10	[9, 11]	4.48	10	[9, 10]	3.89	12	[9, 14]	5.06
TR81	Zonguldak, Karabük, Bartın	11	[10, 16]	4.39	13	[13, 18]	3.58	11	[9, 16]	5.19
TR22	Balıkesir, Çanakkale	12	[12, 14]	4.25	15	[13, 15]	3.45	13	[11, 13]	5.06
TR72	Kayseri, Sivas, Yozgat	13	[11, 16]	4.11	14	[12, 15]	3.57	16	[11, 16]	4.64
TR62	Adana, Mersin	14	[11, 14]	4.02	11	[8, 11]	3.79	18	[17, 18]	4.25
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	15	[12, 17]	3.98	19	[19, 19]	2.72	9	[9, 14]	5.23
TRC1	Gaziantep, Adıyaman, Kilis	16	[15, 19]	3.91	8	[8, 17]	4.04	21	[18, 21]	3.78
TR83	Samsun, Tokat, Çorum, Amasya	17	[14, 17]	3.79	17	[16, 17]	2.80	14	[12, 15]	4.78
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	18	[17, 19]	3.53	18	[17, 18]	2.78	17	[17, 21]	4.27
TR82	Kastamonu, Çankırı, Sinop	19	[17, 20]	3.46	20	[20, 24]	2.17	15	[13, 16]	4.76
TR63	Hatay, Kahramanmaraş, Osmaniye	20	[19, 22]	3.33	16	[12, 16]	3.18	22	[21, 22]	3.47
TRB1	Malatya, Elazığ, Bingöl, Tunceli	21	[21, 22]	3.04	21	[20, 25]	2.10	19	[19, 21]	3.98
TRA1	Erzurum, Erzincan, Bayburt	22	[20, 22]	2.95	22	[21, 24]	2.08	20	[19, 22]	3.81
TRA2	Ağrı, Kars, Iğdır, Ardahan	23	[23, 26]	1.52	25	[22, 25]	0.81	23	[23, 26]	2.23
TRC3	Mardin, Batman, Şırnak, Siirt	24	[23, 26]	1.41	23	[20, 23]	1.79	26	[24, 26]	1.03
TRC2	Şanlıurfa, Diyarbakır	25	[23, 25]	1.22	24	[21, 24]	1.34	25	[23, 26]	1.09
TRB2	Van, Muş, Bitlis, Hakkari	26	[24, 26]	1.05	26	[26, 26]	0.56	24	[23, 26]	1.54

Source: All data sources are included in Annex C.

Table B5. Performance of Turkish regions in the eight dimensions of the regional competitiveness index

Code	Region	Income and productivity		Productive Structure		SMEs and entrepreneur-ship		Technology and innovation		Education and skills		Labour market		Infrastructure		Health and environment	
		Pillar 1.1		Pillar 1.2		Pillar 2.1		Pillar 2.2		Pillar 2.3		Pillar 2.4		Pillar 2.5		Pillar 2.6	
		Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
TR10	İstanbul	1	9.58	1	8.43	1	9.47	1	7.85	3	6.57	11	7.67	1	9.21	2	8.77
TR51	Ankara	2	9.04	6	5.70	2	7.51	3	7.22	2	8.20	13	7.57	3	6.74	9	7.69
TR41	Bursa, Eskişehir, Bilecik	4	7.45	4	6.56	7	4.76	2	7.68	1	8.34	8	8.01	7	6.10	15	6.30
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	3	7.57	2	6.66	11	4.31	4	6.84	6	6.16	7	8.19	6	6.16	12	7.22
TR31	İzmir	5	6.70	5	5.87	5	5.39	6	4.49	5	6.21	14	7.57	2	8.22	3	8.56
TR21	Tekirdağ, Edirne, Kırklareli	6	6.57	7	4.73	9	4.39	5	4.52	4	6.41	1	9.28	5	6.41	11	7.48
TR61	Antalya, Isparta, Burdur	7	5.50	15	3.20	3	7.04	12	1.58	7	5.45	2	8.91	8	5.92	5	8.24
TR32	Aydın, Denizli, Muğla	11	3.86	12	3.62	4	6.34	11	1.98	15	4.21	3	8.90	11	5.26	6	8.05
TR33	Manisa, Afyon, Kütahya, Uşak	9	4.32	11	3.73	14	3.79	8	3.12	17	3.85	5	8.57	16	4.67	16	5.89
TR52	Konya, Karaman	13	3.55	10	4.22	8	4.70	7	3.37	12	4.33	16	7.27	13	4.98	17	5.22
TR81	Zonguldak, Karabük, Bartın	10	3.94	14	3.23	18	3.50	21	0.75	16	4.03	4	8.90	4	6.42	4	8.24
TR22	Balıkesir, Çanakkale	8	4.58	18	2.32	12	4.04	17	1.06	8	5.21	9	8.00	10	5.61	10	7.49
TR72	Kayseri, Sivas, Yozgat	12	3.56	13	3.59	13	3.83	9	2.39	11	4.66	20	6.41	19	4.60	13	6.46
TR62	Adana, Mersin	15	3.26	9	4.32	15	3.69	14	1.34	9	5.09	21	6.24	9	5.65	21	4.39
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	16	2.97	17	2.48	10	4.37	18	0.95	14	4.22	6	8.43	14	4.88	1	9.62
TRC1	Gaziantep, Adıyaman, Kilis	23	1.52	3	6.56	6	5.13	10	2.17	22	3.17	22	4.84	17	4.63	22	3.29
TR83	Samsun, Tokat, Çorum, Amasya	17	2.79	16	2.81	16	3.59	13	1.57	18	3.74	12	7.65	18	4.61	8	7.86
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	14	3.30	19	2.26	17	3.52	22	0.56	10	4.72	17	7.13	21	4.25	14	6.33
TR82	Kastamonu, Çankırı, Sinop	19	2.27	21	2.06	20	3.33	16	1.13	20	3.63	10	7.98	12	5.03	7	7.88
TR63	Hatay, Kahramanmaraş, Osmaniye	22	1.89	8	4.47	19	3.46	20	0.79	21	3.56	23	4.62	15	4.84	18	5.12
TRB1	Malatya, Elazığ, Bingöl, Tunceli	20	2.09	20	2.11	22	2.53	19	0.90	19	3.63	15	7.33	20	4.41	19	4.83
TRA1	Erzurum, Erzincan, Bayburt	18	2.76	24	1.40	21	2.71	15	1.18	13	4.26	18	6.71	22	3.21	20	4.52
TRA2	Ağrı, Kars, Iğdır, Ardahan	25	0.39	25	1.24	24	0.90	26	0.00	25	0.72	19	6.66	24	1.44	25	1.46
TRC3	Mardin, Batman, Şırnak, Siirt	21	1.89	22	1.70	25	0.64	23	0.54	23	1.73	26	0.00	23	1.61	23	3.18
TRC2	Şanlıurfa, Diyarbakır	24	1.14	23	1.55	23	1.01	25	0.08	26	0.51	25	1.43	26	1.29	24	2.88
TRB2	Van, Muş, Bitlis, Hakkari	26	0.34	26	0.78	26	0.10	24	0.38	24	0.74	24	4.04	25	1.34	26	1.28

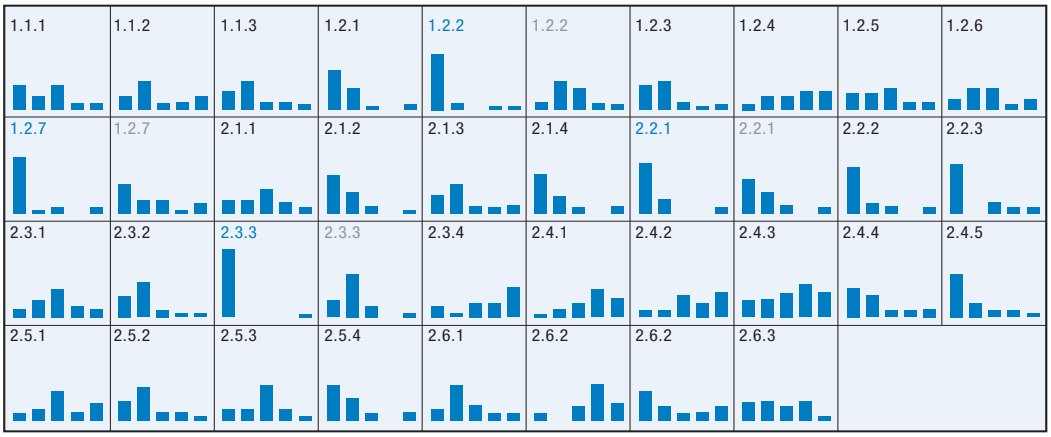
Source: All data sources are included in Annex C.

B2. Multivariate analysis: main elements

A multivariate analysis (MVA) was performed to assess the statistical coherence of the framework and the soundness of combining components in a single index. The section on multivariate analysis includes a brief summary of the different tests which were performed and led to several changes to the original conceptual framework.

Figure B6 presents the histograms of the original series and, where applicable, for transformed indicators on the basis of the last available year of data (26 observations for each series).

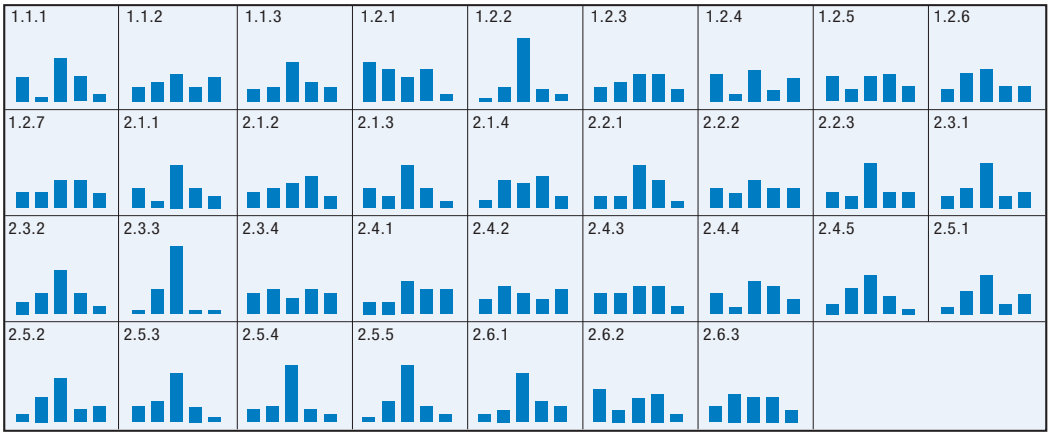
Figure B6. **Histograms of original series and, where applicable, transformed series (4 indicators)**



Note: the red colouring highlights the series including outliers; the green colouring shows the transformed series.

Figure B7 shows the histograms of normalisation-cum-transformation with a median score of 5. Normalisation-cum-transformation was performed for 6 of the scenarios considered for the confidence intervals.

Figure B7. **Histograms based on the non-linear log-transformation with median score of 5**



B2.1. Descriptive statistics

The descriptive statistics are based on 286 observations for 2005-2015 (11 years of data), using the complete dataset including imputations. Four indicators had to be treated for absolute skewness greater than 2 and kurtosis greater than 3.5. They were 1.2.2, 1.2.7, 2.2.1, and 2.3.3. Not a single series passed the Shapiro-Wilk test of normality (Excel). However, indicators 1.1.1, 2.4.2, 2.5.1 and 2.5.3 passed the d'Agostino Ksquared test for normality (i.e. the SKTEST under Stata).

Table B6. **Descriptive statistics for 2005-2015 series**

Descriptive Statistics	Min.	Max.	Median	Mean	Standard deviation	Kurtosis	Skewness
1.1.1 Household income (2005 TRY)	7 288.00	17 295.00	11 307.00	11 319.58	2 484.47	-0.12	0.27
1.1.2 GVA per capita (2010 TRY)	4 487.94	22 638.27	10 930.37	12 020.37	4 654.37	-0.72	0.50
1.1.3 Labour productivity (2010 PPP USD)	20 807.00	73 218.00	36 236.50	38 996.85	12 359.24	0.33	0.99
1.2.1 Trade openness (%)	0.01	1.12	0.14	0.23	0.24	3.52	1.89
1.2.2 Number of products exported (SITC 4-digit level)	44.00	729.00	132.00	173.31	142.65	7.23	2.69
1.2.3 Export sophistication (EXPY)	5 410.71	11 318.71	7 104.68	7 342.58	1 248.89	0.81	0.91
1.2.4 Agriculture (% of GVA)	0.20	31.10	16.10	15.07	7.08	-0.75	-0.39
1.2.5 Manufacturing (% of employment)	7.42	46.47	24.68	24.45	10.48	-0.63	0.25
1.2.6 Enterprises in manufacturing (%)	6.31	15.96	10.34	10.57	2.53	-0.36	0.61
1.2.7 Number of MNEs (per 10 000 enterprises)	0.00	42.15	1.75	5.54	8.72	5.49	2.44
2.1.1 Number of SMEs (per 1 000 people aged 15-64)	40.41	89.91	59.31	60.19	11.88	-0.20	0.49
2.1.2 New business registered (per 10 000 people aged 15-64)	7.88	49.57	13.18	16.01	8.17	3.27	1.80
2.1.3 Informal economy (% of employment)	14.71	52.07	24.90	28.43	9.98	0.18	1.05
2.1.4 Total credit (% of GVA)	19.23	118.23	43.53	46.44	19.04	2.82	1.52
2.2.1 High-tech manufacturing and knowledge-intensive services (% of employment)	0.20	3.00	0.60	0.78	0.59	4.46	2.22
2.2.2 High and medium high-tech sectors (% of employment)	0.10	11.10	1.10	2.21	2.53	2.69	1.80
2.2.3 Number of patent applications (per million people)	0.00	166.86	14.28	27.80	33.86	3.26	1.89
2.3.1 Secondary education (% of labour force)	10.18	30.72	19.15	19.70	4.08	-0.49	0.27
2.3.2 Tertiary education (% of labour force)	4.79	34.24	12.78	13.81	5.32	3.00	1.49
2.3.3 Tertiary enrolment (% of population)	0.30	56.50	2.80	4.30	8.21	28.39	5.28
2.3.4 Female literacy rate (%)	51.64	95.80	84.30	81.86	10.41	1.28	-1.22
2.4.1 Labour force participation rate (% of population over 15)	27.60	58.80	46.95	46.54	6.35	0.76	-0.77
2.4.2 Female labour force participation rate (% of population over 15)	3.32	56.11	31.12	30.63	11.13	-0.26	-0.20
2.4.3 Labour utilization rate (%)	14.90	43.80	32.60	31.63	6.60	0.03	-0.65
2.4.4 Dependency ratio (%)	39.43	86.19	49.56	52.47	11.75	0.59	1.21
2.4.5 Unemployment (%)	3.30	22.00	9.55	10.05	3.82	0.16	0.82
2.5.1 Broadband penetration rate (% of households)	15.00	63.00	40.00	41.04	11.95	-0.37	0.01
2.5.2 Road density (km/1 000 km^2)	61.58	143.38	85.68	89.54	18.28	-0.10	0.80
2.5.3 Number of private cars (per 10 000 people)	1.50	22.30	9.05	9.20	4.45	-0.07	0.24
2.5.4 Electrical power failures (per million people)	3.69	46.28	12.28	16.02	11.46	2.11	1.78
2.5.5 Multimode Accessibility Index	34.93	100.00	58.66	60.33	13.47	1.55	0.95
2.6.1 Life expectancy (years)	71.10	75.80	74.20	74.19	1.08	2.13	-1.29
2.6.2 Infant mortality (per 1 000 live births)	7.10	20.50	12.40	12.59	3.07	-0.48	0.34
2.6.3 Air pollution (PM 2.5 µg/m^3)	12.30	26.40	18.15	18.54	3.59	-0.87	0.15

Table B9 shows descriptive statistics for the data used for the 2015 index. The values included in this table were the values used for the normalization, standardization and transformation functions discussed above. The values used for the transformed indicators appear at the bottom of the table.

While indicator 1.2.1 does not pass the skewness and kurtosis criteria for the last available year of data (2015), the series has complete data for the 200515 period and skewness and kurtosis are within the specified ranges for the period. The series was therefore not transformed. Once transformed, indicator 2.3.3 does not pass the skewness and kurtosis criteria for the last available year of data (2012), but skewness and kurtosis are within the specified ranges for the entire dataset (the series' original data covers the period 200512).

Table B7. Descriptive statistics for the 2015 index

Descriptive Statistics	Min.	Max.	Median	Mean	Standard deviation	Kurtosis	Skewness	Year of data
1.1.1 Household income (2005 TRY)	7 288.00	17 295.00	11 307.00	11 319.58	2 529.24	0.10	0.29	2014
1.1.2 GVA per capita (2010 TRY)	6 613.35	22 610.48	12 197.84	13 603.00	4 819.12	-0.82	0.51	2015 (est.)
1.1.3 Labour productivity (2010 PPP USD)	22 065.00	73 218.00	36 291.00	39 789.08	12 734.08	0.72	1.04	2011
1.2.1 Trade openness (%)	0.01	1.11	0.17	0.26	0.27	4.64	2.13	2015
1.2.2 Number of products exported (SITC 4-digit level)	44.00	729.00	132.00	173.31	145.22	8.93	2.85	2014
1.2.3 Export sophistication (EXPY)	6 510.04	11 318.71	7 664.87	7 946.42	1 203.05	1.39	1.22	2011
1.2.4 Agriculture (% of GVA)	0.20	24.80	15.95	14.85	7.13	-0.83	-0.43	2011
1.2.5 Manufacturing (% of employment)	8.59	46.01	24.49	24.69	11.00	-0.74	0.15	2012
1.2.6 Enterprises in manufacturing (%)	6.56	15.77	10.32	10.65	2.59	-0.24	0.68	2014
1.2.7 Number of MNEs (per 10 000 enterprises)	0.00	34.57	1.27	5.92	9.33	3.43	2.05	2014
2.1.1 Number of SMEs (per 1 000 people aged 15-64)	41.24	87.57	61.92	62.44	12.64	-0.14	0.22	2014
2.1.2 New business registered (per 10 000 people aged 15-64)	8.12	49.57	14.46	17.61	9.26	4.65	1.91	2014
2.1.3 Informal economy (% of employment)	14.71	52.07	24.90	28.43	10.16	0.46	1.11	2012
2.1.4 Total credit (% of GVA)	36.87	118.23	50.86	59.76	22.88	1.95	1.60	2014
2.2.1 High-tech manufacturing and knowledge-intensive services (% of employment)	0.20	2.70	0.45	0.71	0.63	5.16	2.28	2014
2.2.2 High and medium high-tech sectors (% of employment)	0.20	10.40	1.15	2.33	2.67	3.04	1.78	2014
2.2.3 Number of patent applications (per million people)	2.63	166.86	23.67	44.47	46.90	1.31	1.48	2015
2.3.1 Secondary education (% of labour force)	12.39	26.78	18.94	18.97	3.98	-0.34	0.24	2013
2.3.2 Tertiary education (% of labour force)	8.72	33.78	15.53	16.35	5.39	3.31	1.45	2013
2.3.3 Tertiary enrolment (% of population)	0.70	56.50	3.75	5.38	10.51	25.03	4.96	2012
2.3.4 Female literacy rate (%)	76.88	95.80	91.13	89.30	5.86	0.05	-1.05	2014
2.4.1 Labour force participation rate (% of population over15)	36.40	54.70	48.20	48.43	4.41	0.78	-0.84	2014
2.4.2 Female labour force participation rate (% of population over 15)	12.45	47.44	35.14	34.45	9.38	0.00	-0.71	2013
2.4.3 Labour utilization rate (%)	17.00	40.40	35.05	33.36	5.84	1.44	-1.32	2014
2.4.4 Dependency ratio (%)	39.59	73.74	48.26	50.56	10.33	0.34	1.16	2014
2.4.5 Unemployment (%)	4.70	21.10	7.45	9.14	3.94	2.55	1.64	2013
2.5.1 Broadband penetration rate (% of households)	15.00	63.00	40.00	41.04	12.17	-0.20	0.01	2013
2.5.2 Road density (km/1 000 km^2)	63.51	141.84	86.79	91.08	19.34	0.70	1.06	2014
2.5.3 Number of private cars (per 10 000 people)	2.10	22.30	12.75	11.32	4.87	0.30	-0.34	2014
2.5.4 Electrical power failures (per million people)	3.69	46.28	12.28	16.02	11.66	2.78	1.88	2014
2.5.5 Multimode Accessibility Index	34.93	100.00	58.66	60.33	13.72	2.11	1.01	2015
2.6.1 Life expectancy (years)	71.10	75.80	74.20	74.19	1.10	2.80	-1.37	2013
2.6.2 Infant mortality (per 1 000 live births)	7.10	16.70	9.25	10.84	3.09	-1.21	0.63	2013
2.6.3 Air pollution (PM 2.5 µg/m^3)	12.30	26.40	18.15	18.54	3.66	-0.80	0.16	2013
Transformed indicators								
1.2.2 Number of products exported (SITC 4-digit level)	3.78	6.59	4.88	4.95	0.60	1.77	0.88	2014
1.2.7 Number of MNEs (per 10 000 enterprises)	0.00	3.57	0.82	1.28	1.10	-0.55	0.75	2014
2.2.1 High-tech manufacturing and knowledge-intensive services (% of employment)	0.00	1.25	0.22	0.35	0.33	2.23	1.54	2014
2.3.3 Tertiary enrolment (% of population)	0.00	4.04	1.40	1.32	0.71	8.55	2.02	2012

B2.2. Analysis of correlations

The analysis of correlations led to some changes to the framework as well as weight adjustments.

Highly colinear indicators

Highly colinear indicators within a dimension (roughly speaking, $r > 0.90$) need to be treated – either by eliminating one of the two (e.g. setting the weight to zero due to redundancy), or by counting them as a single indicator (and adjusting their relative weights to that end). Otherwise, they influence the results of principal component analysis (PCA) and dominate the regional scores in the dimension concerned.

There were no instances of highly colinear indicators for 2015. When the whole dataset (period 200515) is considered, however, indicator 2.4.2, female labour force participation rate (% of population over 15), is closely correlated with indicator 2.4.1, labour force participation rate (% of population over 15), and indicator 2.4.3, labour utilisation rate (%) – respectively, the correlations are 0.93 and 0.91. The three indicators were assigned weights of 0.5 in their dimensions.

Negative correlations

Negative correlations indicate that either the direction of effects is wrong or that there are implicit trade-offs between indicators that are intrinsic to the topic being measured. It is generally desirable that there should be no negative correlations – at least within the dimensions concerned. Weights for indicators which correlate negatively should probably be set to zero (and thus eliminated).

The original framework included public education and health expenditure scaled by total public expenditure. Correlations between the remaining indicators were negative or low in both cases. Scaling by regional GVA or population did not solve the problem, however, and PCA analysis confirmed that these indicators load on their own Principal Components. There might be several reasons for the results:

- the indicators do not behave as expected because they do not include private expenditure in education and health;
- they measure indirect inputs to competitiveness, not throughputs or outputs, contrary to the other indicators in their particular dimensions.

The decision was made to eliminate negatively public education and health expenditure from the regional competitiveness index.

Random associations

Indicators that are randomly associated with any of the remaining indicators in a dimension (with correlations close to zero) should be examined and generally eliminated.

Although random associations might be real, they might also be due to the non-coverage of certain years, year-coverage mismatches, the small sample size (26 regions), or combinations thereof. For instance, in dimension 1.2, indicator 1.2.2, number of products exported (SITC 4-digit level), and indicator 1.2.5, manufacturing (% of employment), have correlations of -0.03 in 2015 and -0.08 in 200515. The first series is available only for 2014, whereas the latter covers the period 200912. The correlation for the data used in the regional competitiveness index therefore relates to two different years (2014 and 2012). By contrast, the correlation for the whole period considers no trend for 1.2.2 (the 2014 data is repeated every year) and one trend (at least for four years) for 1.2.5. Both indicators were kept in the final regional competitiveness index.

Regional inflation was originally included in 1.1, but two issues with this indicator were detected. First, there is potential non-linearity at play, as deflation can be as detrimental as high or hyper-inflation. In the case of Turkey, however, the problem was

that inflation rates showed little variance across regions and over time – ranging from 4.2% in 2009 to 12.8% in 2008 (the economic crisis of 2009 had a strong deflationary effect) – which might explain the random association that would probably not be expected in the case of a global ranking with countries as units. The decision was taken to eliminate this indicator from the index.

Regional GVA growth and labour productivity growth were originally included in pillar 1. While they present a positive correlation with indicators in dimension 1.1 in 2015, they have erratic behaviour over longer periods, particularly during the years of the economic crisis. Growth indicators were not chosen because, being more cyclical than structural, they merely added noise to the regional competitiveness index.

Dimension 2.4 originally included a series of indicators – the unemployment of tertiary graduates as a percentage of unemployed, youth unemployment as a percentage of youth population, and the net migration rate – that were not used in the final regional competitiveness index for statistical and conceptual reasons. These indicators were randomly associated with the remaining indicators in dimension 2.4 and principal component analysis (PCA) confirmed that the original pillar 1.4 included two principal components. These indicators present cyclical behaviour in contrast to the indicators chosen, which are more structural and therefore better suited to aggregation in a composite indicator.

Size-related indicators were not kept for the regional competiveness index as they biased results in favour of bigger regions, and not necessarily in favour of more competitive regions.

B2.3. Principal components analysis

The final adjustments to the framework were based on principal components analysis (PCA) (most of the adjustments have already been mentioned in previous sections and will not be repeated here).

With only 26 yearly observations, the analysis could not be restricted to a single year. The whole dataset, spanning the period 200515, was used instead. PCA requires complete series which were provided by imputing missing data (see section on Imputation of missing data). Normalized scores (yearly minmax) were used. In the end each region/year combination is taken as a separate case, so time trends or region-level auto-correlations are not accounted for.

Through successive PCA reports in each dimension, loadings with eigenvalue greater than 1 were considered for the factor matrix, which was then rotated using varimax rotation, (which maximizes the sum of the variances of the squared loadings.

After rotation, each indicator is ideally loaded – mostly on a single latent that captures more than 60% of the total variance of the corresponding component – and all loadings in the same component have the same sign.

The final PCA analysis shows the presence of a single factor for each dimension (based on indicators) and for each pillar (based on dimension scores), with the exception of dimension 1.2, productive structure. However, all loadings on PC1 (unrotated) are greater than 0.57, and PC1 explains 55.7% of the total variance, thus justifying the final structure.

The limitations of the dataset called for PCA results to be interpreted with caution. Indicators that did not behave as expected were not necessarily dismissed, though, if the economic literature provided solid grounds for keeping them. Moreover, Turkey's regions are not as dissimilar as some countries might be (as illustrated by the example on inflation mentioned earlier). The key questions used for the final decision regarding indicators and framework structure were the following:

- Does the economic empirical and theoretical literature support this choice of the indicator and framework structure?
- Would this indicator behave as expected with high probability if a global index with very dissimilar countries were constructed? If not, is there a scaling problem that needs to be addressed?
- Do Turkey's regions present sufficient variability for the indicator not to add noise to the composite indicator?
- Does the statistical multivariate analysis support this choice?

A PCA analysis of all indicators was used to determine the PCA-based set of weights used for the statistical audit (Confidence intervals for ranks). The methodology follows the explanation set out in the OECD/JRC's *Handbook on Constructing Composite Indicators (2008), pp. 8990.*

Table B10 shows the percentage of variance explained by the first principal component of each dimension, which ranges between 55.7% and 88.4%.

Table B7. **Variance explained by the first principal component**

	Variance explained by the first principal component
Value added and income	88.4%
Structure of production and exports	55.7%
SMEs and entrepreneurship	68.3%
Technology and innovation	72.6%
Education and skills	66.7%
Labour market	74.4%
Infrastructure	63.5%
Health and environment	63.5%

B2.4. Treelet analysis

Treelet analysis introduces sparsity among component loadings by combining hierarchical clustering with PCA features. Like PCA components, treelet sparse components account for much of the variation in the original data and are used for dimension reduction purposes. Treelet analysis was performed on the entire dataset (286 observations), using final scores and correlations (for the purpose of consistency with PCA analysis and because, even if scores are normalized, indicators are not in the same unit, which rules out the use of covariances).

A different range of choices of final components and corresponding cut-level suggestions were investigated. However, there was a clear sparsity-stability trade-off which stemmed from the correlation structure of the data (the higher the number of components retained, the lower the suggested cut-off). The cluster dendogram provides a visual representation of loading sparsity and the general dependency structure of the data. It is based on the pairing of the two indicators with the largest correlation coefficient, which are merged by local PCA which leads to a new set of indicators which are subsequently paired and merged until the whole dataset is clustered in this fashion.

Annex C.
Sources and definitions

Key facts on the region

Total population (million people)

- Total population, in millions.
- Source: OECD Regional Statistics (regional geography), 2015

Population density (per km²)

- Population per square kilometre.
- Source: OECD *Regional Statistics (regional geography), 2015*

Area (km²)

- Surface in square kilometres.
- Source: OECD *Regional Statistics (regional geography), 2015*

Urbanisation (%)

- Percentage of population living in urban areas, i.e. areas with a population of more than 20 000. (NB: the computation methodology changed in 2012.)
- Source: Turkstat, *2014*

Inflation (%)

- Percentage change in the 12-month average of the consumer price index over the previous year, base year 2003.
- Source: Turkstat, *2014*

Regional Gross value added (GVA, million constant 2010 TRY)

- Regional GVA in million Turkish lira in constant prices, base year 2010. Calculated and deflated by OECD with 2010 as the base year and GVA in nominal prices. Estimates for 201215 based on a growth function applied to GVA in current Turkish lira and drew on data for the period 200411. Inflation was factored in using the IMF GDP deflator for the period 200515.
- Source: Turkstat *and OECD computations, 2015*

Share in Turkey's GVA (%)

- Regional GVA as a percentage of total Turkish GVA in current Turkish lira (estimates for 201215).
- Source: Turkstat; OECD computations, 2015

Share in Turkey's exports (%)

- Region's exports as a percentage of total Turkish exports.
- Source: Turkstat, OECD computations, 2014

Pillar 1. Economic performance

1.1. Income and productivity

1.1.1. Household income (2010 TRY)

- Disposable income per equalised household in Turkish lira, constant prices, base year 2010.
- Source: OECD Regional Statistics, 2014

1.1.2. *Regional GVA per capita (2010 TRY)*

- Regional GVA per capita in Turkish lira, constant prices, base year 2010 (for 201215 estimates).
- Source: Turkstat, OECD computations, 2015

1.1.3. *Labour productivity (2010 PPP USD)*

- Regional GVA per worker (used as a proxy for labour productivity) in USD PPP, constant prices, base year 2010.
- Source: OECD Regional Statistics, 2011

1.2 Productive structure

1.2.1 *Trade openness (%)*

- Total trade in (exports and imports) as a percentage of GVA in current TRY (estimates for GVA in 201215).
- Source: Turkstat, OECD computations, 2015

1.2.2 *Number of products exported – SITC 4-digit level*

- Number of products exported (SITC 4-digit level).
- Source: Turkstat, Ministry of Development computations, 2014

1.2.3 *Export sophistication (EXPY), SITC 4-digit level*

- Overall level of income associated with a region's export basket gives the export sophistication of region "j" during year "t" (EXPYjt).
- EXPY is calculated with the product space methodology (see Hausmann, R. and C. Hidalgo (2011), "The network structure of economic output", Journal of Economic Growth , Vol. 16, Issue 4, pp. 309342):
- Step1:CalculatePRODY,theincomelevel(per-capitaGVA)associatedwitheachproduct. PRODYk=Σj [(xjk/Xj) / ∑n(xnk/Xn)] * Yj
  where Y: GVA per capita
- Step 2: Calculate the EXPY, the income level (per-capita GVA) associated with each region's entire export basket.
  EXPYj= ∑k(xjk / Xj) * PRODYk,
- Where x: export value, X: sum of export values in all industries, j: region index, k: commodity index, n: reference group index (e.g. all countries in the world or all regions j in Turkey).
- Source: Turkstat computations, 2011

1.2.4 *Agriculture (% of GVA)*

- Agriculture as a percentage of gross value added (both in current Turkish lira)
- Source: Turkst*at, 2011*

1.2.5 *Manufacturing (% of employment)*

- Manufacturing as a percentage of total employment, i.e. number of people in work (NACE Rev.2)
- Source: Turkstat, OECD computations, 2012

1.2.6 *Enterprises in manufacturing (%)*

- Registered enterprises in manufacturing as a percentage of total number of registered enterprises in the region.
- Source: Turkstat data from business registers, OECD computations, 2014

1.2.7 Number of MNEs (per 10 000 enterprises)

- Number of multinational enterprises (MNEs) per 10 000 companies.
- *Source:* Ministry of Economy, Turkstat for number of companies, OECD computations, 2012

Pillar 2. Determinants of Competitiveness

2.1 SMEs and entrepreneurship

2.1.1 Number of SMEs (per 1 000 people aged 1564)

- Number of SMEs per 1 000 people of working age, aged 1564.
- *Source:* KOSGEB, OECD computations, 2014

2.1.2 New businesses registered (per 10 000 people aged 1564)

- Number of newly established companies (companies, cooperatives and individual proprietorship) per 10 000 people of working age, aged 1564.
- *Source:* The Union of Chambers and Commodity Exchanges of Turkey (TOBB) (Turkey Trade Registry Gazette (Türkiye Ticaret Sicili Gazetesi), OECD computations, 2014

2.1.3 Informal economy employment (%)

- Informal employment (excluding agriculture) as a percentage of total employment.
- *Source:* Turkstat, 2012

2.1.4 Total credit (% of GVA)

- Value of total credit as a percentage of regional GVA (both in current Turkish lira), with estimates for GVA in 201214. The data series is proprietary – only scores are published.
- *Source:* Turkish Banking Regulation and Supervision Agency (BDDK), Turkstat for regional GVA OECD computations, 2014

2.2 Technology and innovation

2.2.1 High-tech manufacturing and knowledge-intensive services (% of total employment)

- Employment in high-technology sectors (high-technology manufacturing and knowledge-intensive high-technology services) as a percentage of total employment.
- *Source:* Eurostat, 2014

2.2.2 High and medium high-tech sectors (% of total employment)

- Employment in high and medium high-technology manufacturing as a percentage of total employment.
- *Source:* Eurostat, 2014

2.2.3 Number of patent applications (per million people)

- PCT patent applications per million people (fractional count), by inventor and priority year.
- *Source:* Turkish Patent Institute, OECD computations, 2015

2.3 Education and skills

2.3.1 Secondary education (% of labour force)

- Educational attainment in secondary education (high school and vocational high school) as a percentage of total labour force (aged 15 and over).
- *Source:* OECD Regional Statistics (regional innovation), 2013

2.3.2 *Tertiary education (% of labour force)*

- Educational attainment in tertiary education (higher education) as a percentage of the total regional labour force (aged 15 and over).
- *Source:* OECD Regional Statistics (regional innovation), 2013

2.3.3 *Tertiary enrolment (% of population)*

- Students enrolled in tertiary education (ISCED 5 short cycle tertiary courses, ISCED 6 advanced research qualifications) as a percentage of population.
- Source: OECD Regional Statistics (regional innovation), 2012

2.3.4 *Female literacy rate (%)*

- Number of females aged 15 and over who can both read, write and understand a short statement on their everyday life – as a percentage of female population in that age group.
- *Source:* Turkstat, 2014

2.4 Labour market

2.4.1 *Labour force participation rate (% of population 15+)*

- Labour force aged 15+ as a percentage of population aged 15+.
- *Source:* OECD Regional Statistics (regional labour), 2014

2.4.2 *Female labour force participation rate (% of population 15+)*

- Female labour force aged 15 and over as a percentage of female population aged 15 and over.
- *Source:* OECD Regional Statistics (regional labour), 2013

2.4.3 *Labour utilisation rate (%)*

- Employment as a percentage of population.[20]
- *Source:* OECD Regional Statistics (regional economy), 2014

2.4.4 *Dependency ratio (%)*

- Population aged under 15 or over 65 as a percentage of the population aged 15 64.
- *Source:* OECD Regional Statistics (regional demography), 2014

2.4.5 *Unemployment (%)*

- Unemployed labour force aged 15+ as a percentage of total labour force aged 15 and over.
- *Source:* Turkstat, 2013

2.5 Infrastructure

2.5.1 *Broadband penetration rate (% of households)*

- Households with internet broadband access as a percentage of households.
- *Source:* OECD Regional Statistics (regional well-being), 2013

2.5.2 *Road density (km/1 000 km^2)*

- Ratio of the length of the country's total road network to the country's land area (km per 1 000 km^2). The road network includes motorways, provincial and state roads.
- *Source:* Turkstat for road lengths, OECD Regional Statistics for regional surface areas, Ministry of Development computations, 2014

2.5.3 Number of private cars (per 10 000 people)

- Number of private cars per 10 000 people.
- *Source:* Turkstat, 2014

2.5.4 Electrical power failures (per million people)

- Number of electrical power failures (e.g. power cuts, blackouts) per million people. The data series is proprietary – only scores are published.
- *Source:* Turkish Electricity Distribution Corporation (TEDAŞ), 2014

2.5.5 Multimode Accessibility Index

- The multimode accessibility index measures how accessible the provinces (NUTS III) are by motorway, air, rail and sea – the arithmetic mean of the four sub-indicators):
- The motorway index is defined as the accessibility to the national market given the total population and distances between provinces. The railway index measures rail transport provision. It includes indicators on minimum distance to railway stations, passenger capacity and load capacity. The airline index measures air transport provision. It includes indicators on the minimum distance to airports, airport traffic and the number of airports with connections. The seaway index measures seaport capacity and connectivity. It includes indicators of the minimum distance to seaports and total handling capacity of seaports. The index at the regional level is computed as the weighted average of province-level scores, with weighting determined by the shares of the surface areas of each province in a region.
- *Source:* Constructed by the Ministry of Development, OECD computations, 2015

2.6 Health and environment

2.6.1 Life expectancy (years)

- Life expectancy at birth, in years.
- *Source:* OECD Regional Statistics (regional well-being), 2013

2.6.2 Infant mortality (per 1 000 live births)

- Number of deaths within the first year of life per 1 000 live births.
- *Source:* OECD Regional Statistics (regional geography), 2013

2.6.3 Air pollution (PM2.5 $\mu g/m^{3)}$

- Air pollution, level of PM2.5, micrograms per cubic metre.
- *Source:* OECD Regional Statistics (regional well-being), 2013

Annex D.
Data tables

Dataset

Region Code		TR10	TR21	TR22	TR31	TR32	TR33	TR41	TR42	TR51	TR52	TR61	TR62	TR63
Indicator	Pillar	İstanbul	Tekirdağ, Edirne, Kırklareli	Balıkesir, Çanakkale	İzmir	Aydın, Denizli, Muğla	Manisa, Afyon, Kütahya, Uşak	Bursa, Eskişehir, Bilecik	Kocaeli, Sakarya, Düzce, Bolu, Yalova	Ankara	Konya, Karaman	Antalya, Isparta, Burdur	Adana, Mersin	Hatay, Kahramanmaraş, Osmaniye
Household income (2005 TL)	1.1.1	16 029.00	13 005.00	11 012.00	13 733.00	11 530.00	11 744.00	13 905.00	13 232.00	17 295.00	11 834.00	13 110.00	10 737.00	8 200.00
GVA per capita (2010 TL)	1.1.2	22 610.48	20 681.52	16 312.48	18 740.10	13 875.13	15 172.34	20 363.77	21 889.26	21 063.39	12 060.64	16 912.77	12 335.05	10 781.42
Labour productivity (2010 PPP USD)	1.1.3	73 218.00	48 668.00	42 289.00	53 127.00	36 367.00	38 248.00	58 642.00	58 949.00	63 449.00	35 889.00	43 731.00	36 215.00	33 059.00
Trade openness (%)	1.2.1	1.11	0.14	0.08	0.41	0.25	0.25	0.44	0.49	0.29	0.19	0.09	0.24	0.43
Number of products exported (SITC, 4-digit level)	1.2.2	6.21	4.95	4.66	5.64	4.65	4.80	5.11	5.08	6.59	5.19	4.86	5.38	4.91
Export sophistication (EXPY)	1.2.3	8 973.45	9 264.73	8 260.65	8 899.50	8 177.72	8 379.62	10 472.37	11 318.71	9 502.14	7 636.86	8 136.63	7 692.89	7 517.79
Agriculture (% of GVA)	1.2.4	0.20	9.70	22.30	5.40	16.70	19.00	5.60	6.90	2.80	22.50	16.60	14.70	14.40
Manufacturing (% of employment)	1.2.5	28.10	46.01	22.41	29.72	24.29	33.74	43.76	41.33	17.06	30.96	10.97	20.95	30.31
Enterprises in manufacturing (%)	1.2.6	15.77	8.95	9.43	12.75	10.39	11.35	15.45	12.01	10.45	15.25	8.33	10.24	11.25
Number of MNEs (per 10,000 enterprises)	1.2.7	3.57	1.22	0.38	2.01	1.77	0.76	0.77	2.06	2.06	1.50	3.08	3.06	2.23
Number of SMEs (per 1,000 people 15-64)	2.1.1	83.75	72.77	73.82	74.14	86.34	63.45	64.68	65.06	69.96	66.78	87.57	62.03	58.86
New business registered (per 10'000 people 15-64)	2.1.2	49.57	19.49	12.71	24.17	27.47	13.02	20.70	18.75	29.75	20.46	32.86	17.07	15.74
Informal economy (% of employment)	2.1.3	19.07	23.96	25.20	24.59	28.07	21.03	17.08	20.00	14.71	27.81	23.51	35.39	35.09
Total credit (% of GVA)	2.1.4	117.22	40.91	43.53	63.12	73.78	43.98	49.74	44.61	107.11	67.93	73.87	66.72	66.63
High-tech manufacturing and knowledge-intensive services (% of employment)	2.2.1	1.19	0.69	0.10	0.69	0.41	0.47	0.47	0.69	1.25	0.18	0.34	0.26	0.18
High and medium high-tech sectors (% of employment)	2.2.2	4.30	4.20	1.80	4.10	1.50	3.90	10.40	9.00	4.60	4.70	0.60	1.30	0.70
Number of patent applications (per million people)	2.2.3	166.86	70.27	16.46	70.26	26.07	35.06	155.13	107.31	123.49	72.37	30.02	16.70	9.63
Secondary education (% of labour force)	2.3.1	23.72	25.13	18.40	21.40	15.67	15.32	26.78	22.61	26.45	15.35	19.57	22.59	17.58
Tertiary education (% of labour force)	2.3.2	25.82	17.78	17.28	22.29	13.58	10.60	20.27	21.60	33.78	15.60	18.50	16.94	13.75
Tertiary enrolment (% of population)	2.3.3	1.19	1.48	1.53	1.28	1.25	1.46	4.04	1.65	1.65	1.46	1.41	0.83	0.74
Female literacy rate (%)	2.3.4	93.20	94.86	94.80	95.80	94.92	93.94	93.43	92.63	93.80	93.71	94.72	91.86	89.70
Labour force participation rate (% of population 15+)	2.4.1	52.60	53.90	45.70	52.80	52.20	50.40	47.60	53.60	50.30	46.80	54.70	48.40	41.90
Female labour force participation rate (% of population 15+)	2.4.2	31.17	43.31	35.35	43.57	46.21	38.15	34.92	40.09	30.21	28.89	43.78	31.32	28.20
Labour utilization rate (%)	2.4.3	35.70	40.40	35.70	36.80	38.70	38.30	35.20	37.40	34.90	33.10	39.20	32.20	25.20
Dependency ratio (%)	2.4.4	40.53	39.59	43.07	40.04	43.96	45.19	42.02	43.84	40.61	50.45	43.26	47.93	55.88
Unemployment (%)	2.4.5	11.20	7.50	6.00	15.40	6.90	5.40	7.00	9.80	10.20	4.70	7.90	12.80	12.20
Broadband penetration rate (% of households)	2.5.1	63.00	63.00	41.00	57.00	39.00	32.00	55.00	54.00	55.00	40.00	50.00	36.00	38.00
Road density (km/1,000 km^2)	2.5.2	141.84	104.53	92.69	125.79	78.29	79.44	86.33	107.66	75.81	83.39	86.16	87.25	88.08
Number of private cars (per 10,000 people)	2.5.3	15.80	12.80	13.80	14.90	16.00	13.20	13.80	11.50	22.30	13.60	17.50	12.30	10.50
Electrical power failures (per million people)	2.5.4	6.78	12.39	11.41	3.69	7.37	12.06	4.80	10.44	13.28	13.38	14.12	7.78	15.92
Multimode Accessibility Index	2.5.5	100.00	58.16	66.84	87.35	56.96	62.66	59.09	60.72	74.26	59.34	62.59	78.97	67.45
Life expectancy (years)	2.6.1	75.30	74.10	74.20	74.70	75.00	73.70	73.90	74.40	75.70	74.10	75.60	74.30	74.80
Infant mortality (per 1,000 live births)	2.6.2	8.00	8.70	9.10	7.10	8.50	10.90	8.30	8.50	7.90	11.60	8.30	12.90	12.30
Air pollution (Pm2.5 µg/m^3)	2.6.3	14.70	15.50	15.20	15.10	16.10	17.80	20.50	17.80	20.60	20.80	17.40	23.00	22.30

Dataset

Region Code		TR71	TR72	TR81	TR82	TR83	TR90	TRA1	TRA2	TRB1	TRB2	TRC1	TRC2	TRC3
Indicator	Pillar	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	Kayseri, Sivas, Yozgat	Zonguldak, Karabük, Bartın	Kastamonu, Çankırı, Sinop	Samsun, Tokat, Çorum, Amasya	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	Erzurum, Erzincan, Bayburt	Ağrı, Kars, Iğdır, Ardahan	Malatya, Elazığ, Bingöl, Tunceli	Van, Muş, Bitlis, Hakkari	Gaziantep, Adıyaman, Kilis	Şanlıurfa, Diyarbakır	Mardin, Batman, Şırnak, Siirt
Household income (2005 TL)	1.1.1	10 629.00	12 127.00	12 697.00	11 050.00	10 738.00	11 920.00	11 084.00	8 153.00	9 652.00	7 956.00	8 332.00	7 317.00	7 288.00
GVA per capita (2010 TL)	1.1.2	12 424.52	11 925.00	12 901.04	10 588.29	11 803.48	11 990.82	10 660.94	7 085.46	10 244.43	6 613.35	8 369.08	7 109.10	9 164.08
Labour productivity (2010 PPP USD)	1.1.3	37 028.00	34 938.00	34 781.00	24 942.00	30 675.00	26 706.00	32 101.00	22 065.00	30 496.00	23 807.00	34 462.00	37 753.00	42 911.00
Trade openness (%)	1.2.1	0.07	0.21	0.28	0.09	0.11	0.15	0.01	0.08	0.06	0.03	1.01	0.05	0.15
Number of products exported (SITC, 4-digit level)	1.2.2	4.54	4.67	3.78	4.23	4.98	4.37	4.70	5.62	4.16	4.84	5.00	4.74	5.04
Export sophistication (EXPY)	1.2.3	7 624.15	7 608.81	7 798.54	6 979.57	7 722.18	7 048.68	6 707.30	7 208.60	6 850.88	6 580.93	6 510.04	6 969.09	6 765.16
Agriculture (% of GVA)	1.2.4	22.70	15.30	6.00	23.10	18.50	12.70	17.40	24.80	14.00	23.00	10.50	24.00	17.30
Manufacturing (% of employment)	1.2.5	24.68	31.61	29.06	30.51	21.81	18.48	11.79	8.97	20.44	8.59	37.65	9.37	9.48
Enterprises in manufacturing (%)	1.2.6	9.51	12.63	8.86	10.83	10.69	9.29	8.66	6.56	9.87	7.14	15.30	8.44	7.55
Number of MNEs (per 10,000 enterprises)	1.2.7	0.68	0.45	0.68	-	0.50	0.86	-	-	0.41	-	3.37	1.28	0.46
Number of SMEs (per 1,000 people 15-64)	2.1.1	60.86	56.52	57.47	60.53	59.35	63.33	48.98	41.24	51.84	41.62	61.81	48.97	41.80
New business registered (per 10'000 people 15-64)	2.1.2	13.18	18.55	12.04	9.26	11.87	11.58	8.12	8.88	13.14	8.46	17.73	11.90	11.47
Informal economy (% of employment)	2.1.3	23.62	26.48	22.57	25.63	23.45	20.39	20.67	41.28	32.15	52.07	38.02	51.51	45.97
Total credit (% of GVA)	2.1.4	45.22	58.52	50.34	51.38	52.10	64.36	42.95	41.10	47.25	38.63	118.23	47.53	36.87
High-tech manufacturing and knowledge-intensive services (% of employment)	2.2.1	-	0.41	0.10	0.18	0.34	0.18	0.34	-	0.18	0.10	0.18	-	0.18
High and medium high-tech sectors (% of employment)	2.2.2	0.80	2.30	0.80	1.60	1.00	0.30	0.30	0.20	0.30	0.40	1.00	0.40	0.20
Number of patent applications (per million people)	2.2.3	20.55	33.64	17.66	11.89	23.19	24.15	14.99	2.63	21.29	5.68	72.63	3.16	5.11
Secondary education (% of labour force)	2.3.1	18.53	19.08	19.15	18.15	16.20	20.16	19.70	12.59	18.81	12.39	15.86	12.55	19.45
Tertiary education (% of labour force)	2.3.2	17.06	18.72	13.81	13.17	12.72	14.02	16.72	8.72	12.99	9.47	15.47	10.68	13.74
Tertiary enrolment (% of population)	2.3.3	1.67	1.39	1.44	1.19	1.10	1.48	1.95	0.83	1.41	0.59	0.79	0.41	-
Female literacy rate (%)	2.3.4	90.39	89.33	87.90	87.79	92.01	87.67	84.37	78.15	86.07	79.17	87.53	77.18	76.88
Labour force participation rate (% of population 15+)	2.4.1	46.60	46.50	50.70	50.20	48.00	50.80	47.50	53.40	46.00	48.00	42.70	41.50	36.40
Female labour force participation rate (% of population 15+)	2.4.2	31.96	31.63	47.44	41.00	36.53	45.05	30.29	41.25	43.72	21.92	22.10	15.14	12.45
Labour utilization rate (%)	2.4.3	32.80	31.70	38.60	38.40	35.30	38.30	32.40	34.20	32.10	26.20	26.40	21.20	17.00
Dependency ratio (%)	2.4.4	49.50	50.63	42.07	51.41	48.59	47.59	54.07	66.64	49.24	69.50	62.02	73.28	73.74
Unemployment (%)	2.4.5	6.50	9.60	7.40	6.40	6.50	6.80	6.60	6.70	7.70	10.60	7.30	17.50	21.10
Broadband penetration rate (% of households)	2.5.1	44.00	40.00	49.00	37.00	35.00	35.00	28.00	41.00	41.00	15.00	31.00	20.00	28.00
Road density (km/1,000 km^2)	2.5.2	81.12	72.37	117.35	93.70	81.34	124.69	69.76	63.51	88.26	72.12	102.88	72.26	91.53
Number of private cars (per 10,000 people)	2.5.3	12.90	12.70	13.50	12.80	11.40	8.20	7.40	2.60	7.80	2.10	8.90	4.00	2.10
Electrical power failures (per million people)	2.5.4	23.84	12.69	10.77	11.79	12.16	12.14	18.83	46.28	10.11	22.46	12.84	44.88	44.41
Multimode Accessibility Index	2.5.5	50.18	57.78	62.08	56.60	60.75	43.79	57.63	44.99	49.05	34.93	58.23	54.59	43.52
Life expectancy (years)	2.6.1	73.80	74.20	74.30	74.20	74.20	75.80	73.30	71.10	74.80	71.30	74.10	73.20	74.90
Infant mortality (per 1,000 live births)	2.6.2	9.10	9.80	7.60	9.40	8.70	8.20	14.30	15.30	14.50	15.80	16.70	15.00	15.30
Air pollution (Pm2.5 µg/m^3)	2.6.3	18.90	18.50	14.50	13.10	14.20	12.30	17.40	22.30	20.30	22.90	21.50	23.00	26.40

ASSESSING REGIONAL COMPETITIVENESS IN TURKEY

Regions play an increasingly important role in OECD economies. They are responsible for delivering policies that directly affect citizens' lives and the business environment. With wide disparities in the economic development of its regions Turkey is among the OECD countries now taking an active interest in regional development policies and regional competitiveness.

The OECD conducted its project, Boosting Regional Competitiveness in Turkey, to help improve regional and sectoral competitiveness policies in Turkey and to make co-ordination between newly created development agencies, the Ministry of Development and other relevant Turkish institutions more effective. The 22-month project was implemented by the OECD in close collaboration with the Ministry of Development of Turkey and co-financed by the European Union and Turkey.

Project findings are examined in four thematic reports. This report focuses on measuring, benchmarking and monitoring competitiveness in the regions through a tailored set of indicators.

This project is co-financed by the
European Union and the Republic of Turkey