

Measuring the Quality of Jobs in Turkey¹

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December, 2017

Summary

This paper introduces a new Job Quality Index that measures the quality of jobs in Turkey over the last decade. While the main focus is on wage employment – which in 2016 accounts for nearly 73 percent of all workers – the paper also discusses job quality of the self-employed and unpaid family workers. Based on a comprehensive definition of what constitutes a good job, the index consists of 6 dimensions covering aspects such as adherence to Labor Law regulations, working conditions, adequate linkage between wage and job, productive usage and adaptability of skills, career opportunities and employment resilience. The quality of wage employment improved at the aggregate level from 2009 until 2016; with sharper improvements in job quality between 2009 and 2012. Improvements are largely the result of compositional changes toward more formal sector wage jobs; yet the distribution of job quality remains widespread, across economic sectors, occupational categories and geographic locations. The paper delves deep into each dimension of a good job and highlights the main drivers of good (and bad) jobs in Turkey and identifies the types of reforms that are needed to enable workers to benefit from increasing growth while adapting to changing labor market conditions. Lastly, the findings from this paper show that by measuring job quality policymakers can identify what jobs should be incentivized to ensure that job growth is accompanied by job quality.

JEL: C18, E26, J08, J30, J46

Key words: Measurement, Labor Markets, Wages, Informal Labor

¹ This paper was developed by X. Del Carpio, C. Gruen, and V. Levin from the World Bank, in consultation with the Ministry of Development of Turkey. The paper is part of a broader effort to investigate “Creating Good Jobs in Turkey”. The team is thankful for the inputs received from the Ministry of Labor and Social Security in earlier versions of this work. The team is also thankful to World Bank colleagues, especially: A. Acar, M. Honorati, M. Makovec, A. Mason, C. Ridao-Cano, S. Demir Seker, M. Testaverde, A.L. Yener for key inputs throughout the development of the paper.

1. Introduction

Generating sufficient employment opportunities is one of the challenges Turkey is currently facing. Yet, the goal is not just “more jobs”, but also “better jobs”. Job quality clearly plays a significant role in individuals’ well-being (Scarpetta et. al. 2016). Creating a positive and safe work environment, providing competitive benefits and facilitating flexible work arrangements all matter for worker satisfaction. Workers that are content and work with a positive mind-set have higher levels of creativity, engagement, and productivity (Achor, 2012; Oswald, 2015; Lyubomirsky 2005). Thus, higher job quality promotes labor force participation, productivity, and overall economic performance.

While acknowledging the fact that employment quality matters, the underlying concept often remains elusive to policy makers. There is broad consensus that job quality is a multidimensional concept, but no universally accepted definition of what constitutes a good job. The topic has attracted increased interest in the academic community and by international organizations in recent years, and various frameworks how to define and measure job quality have been developed over the last decade (see, for example, the ILO Manual on concepts and definitions of decent work indicators, the UNECE Framework for measuring quality of employment or the OECD Project on job quality, labor market performance and well-being). Many of the existing measures aim at cross-country comparisons of job quality and although being informative, they may provide only limited guidance on how to improve job quality across different worker types or at the sub-national level.

This paper introduces the Job Quality Index (JQI) to measure the quality of jobs in Turkey. The proposed index consists of 6 dimensions which are operationalized with 13 measurable components, and offers a number of comparative advantages to existing measures. First, all necessary data are collected in the annual Labor Force Survey, which allows measuring job quality at a regular basis and tracking of job quality changes over time. Second, the underlying sample is large, which means that job quality can be estimated for different types of workers and at the sub-national level. Third, as the estimates are based on micro data, each worker gets a score and job quality estimates can be correlated with socio-demographic characteristics (age, gender, or education) and job-related factors (industry, occupation, and public or private sector employment). Finally, the index presents an interactive policy tool that can be easily adjusted, either through the definition of components or alternative weighting schemes, to incorporate emerging policy priorities.

The main focus of the analysis is on wage workers. Wage employment accounts for nearly 73 percent of all workers in 2016, but regionally the share of jobs included in the JQI calculations can be much lower. The income received from work is an important determinant of job quality, however, earnings-related information are only collected for wage workers in the LFS. The paper therefore also presents a *JQI for all workers* which excludes components that use information on earnings or revenues as these are not available in the LFS series for entrepreneurs and own-account workers. The analysis also discusses the impact of public sector jobs on job quality estimates and highlights the dimensions in which public sector jobs are of different quality.

There is the perception that many of the jobs created in Turkey after the global financial crisis of 2008-2009 are of lower quality. More workers have temporary contracts, are employed in low-productivity sectors, or do not earn the statutory minimum wage in per hour terms. Over the last decade informality declined significantly, reaching 32 percent in 2016 from 47 percent in 2006, but substantial regional variation persists. Similarly, formal employment continues to be concentrated in the more developed parts of Turkey, giving only few workers in the East the chance

of landing a good job. Against this background, an important question is whether the ‘more jobs’ came at the cost of ‘better jobs’?²

To allow a detailed analysis of the patterns of employment and associated job quality, three types of labor markets³ offering different types of wage employment are distinguished: (1) formal permanent wage jobs, (2) formal temporary wage jobs, which entitle the job holder to social security benefits but lack stability as they are only of limited duration, and (3) informal wage jobs without any benefits. Since 2008, the number of formal temporary wage jobs increased rapidly and in 2016, more than 1 million workers - or 5.5 percent of all wage workers - held fixed-term jobs. Formal permanent job opportunities expanded, too. Between 2014 and 2016, the number of permanent wage jobs in the formal sector increased by almost 8 percent and more than three out of four wage jobs belong to that category. Across the country, informal wage jobs declined substantially between 2011 and 2013. Recent estimates suggest that the total number of informal wage workers has been relatively stable around 3.3 million, but regional trends vary. In 2016, about 17 percent of all wage workers are in informal jobs, while for some regions in the south and southeast, the relevant share is between 30 and 47 percent.

The rest of the paper proceeds as follows. The next section discusses the definitions used to assess job quality in Turkey, and the methodology for calculating the aggregate Job Quality Index. The Results section opens with a discussion of the recent trends in aggregate JQI as well as the distribution of good jobs along different dimensions across a variety of worker and job-related characteristics. To gain a better understanding of the underlying drivers of the observed job quality changes, the analysis examines the performance for selected job quality components over time. Third, explorative data analysis using principal component analysis (PCA) provides insights as to factors that work together in creating quality jobs. These results are particularly informative for discussing effective policies to further promote the creation of good jobs in Turkey.

2. Measuring the quality of employment in Turkey: The Job Quality Index

2.1 Components of job quality

This paper introduces the Job Quality Index (JQI) which has been developed in collaboration with the Ministry of Development and the Ministry of Labor and Social Security of Turkey. The tool helps to monitor levels and trends of the quality of employment in the Turkish labor market. The index consists of 6 dimensions which are operationalized by 13 components. With the proposed method, both aggregate job quality and performance on

² A similar discussion is ongoing in a number of European countries, see Leschke, Watt (2008) or Eurofound (2015).

³ Usage of the term ‘type of labor market’ does not imply that there are separate labor markets for formal permanent, formal temporary and informal wage jobs. Rather, it is used interchangeably for type of wage employment or type of wage workers.

separate components can be assessed for different groups of workers within the pool of the wage-employed aged 15-64 years.⁴ For this paper, the index is calculated for the years 2009-2016.⁵

The central idea behind the index is that good jobs meet different criteria for different people. Acknowledging the fact that workers have different educational backgrounds or labor market histories, good jobs should cover a range of skill levels, different stages of productivity, and different sectors of the economy. Box 1 provides details on the definition of a good job and the components of the JQI.

Box 1: The Job Quality Index: definition of a good job and job quality components

What defines a good job? The proposed Job Quality Index consists of 6 dimensions which are operationalized with 13 components. All necessary data are collected in the Household Labor Force Survey. Based on the following definition, a good job is one that:

1. ***Is regulated and protected by the Labor Law and provides safe working conditions.*** These criteria are measured by the first four components of the index: (1) being registered with the social security system, and (2) having *wages that comply with the minimum wage*. The extent of prohibited (3) *child labor* and adequate (4) *work safety* is assessed at the sector level.
2. ***Provides adequate linkage between wages and the job.*** This is measured by two components: (5) *relative underpayment* and (6) *compensatory moonlighting* (employment in additional jobs where the primary job is full-time but low pay).
3. ***Offers career advancement and growth.*** This is measured with three components: (7) engagement in *work-related training*, (8) *underemployment* (workers prefer to work more hours); and (9) *employment engagement* (ranking of jobs by formality, full-time/part-time and contract tenure).
4. ***Uses the highest level of productivity,*** as measured by (10) *relative over-qualification*.
5. ***Is resilient to shocks.*** This is operationalized by (11) *resilience to aggregate shocks* (probability of job loss due to dismissal or end of temporary job during a crisis), and (12) *resilience to idiosyncratic shocks* (probability of job loss due to illness or disability).
6. ***Is adaptable to a changing economy,*** as measured by (13) *risk of skills obsolescence*.

For most components, the job of each wage-employed worker observed in LFS data is classified as “good quality” or “bad quality” in one of three ways: (1) comparison of individual job characteristic with a normative threshold (yes/no), (2) comparison of individual job characteristic with a cell-based threshold, derived from the average job characteristics of workers in the same peer group, or (3) classification based on the characteristics of workers who had similar jobs. Different approaches are adopted for components *child labor*, *work safety* and *employment engagement*. A detailed discussion of the methodological approach is provided in Annex A. For a brief summary, see Table 1.

⁴ Section 3.4 presents a version of the JQI for all workers, including formal entrepreneurs, informal self-employed and unpaid family workers.

⁵ Changes in the regulations concerning the collection of Household Labor Force Survey data that came into force in 2014 limit the comparability of results obtained in 2014 to earlier years. The paper mainly presents results obtained for 2016. For trends over time, either changes between 2009 and 2013 or between 2014 and 2016 are discussed.

Table 1: Job Quality Index: components, methodology and shares of good jobs in 2016

Component	Data used for scoring	Type of threshold	Criteria for good job	Share of good jobs in 2016 (percent)			
				all wage jobs	formal permanent	formal temporary	informal wage jobs
Social security benefits	Individual	Yes/No	The worker's job is registered with the social security institution/pays social security contributions.	83.0	100	100	0
Minimum wage compliance	Individual	Yes/No	The worker's hourly wage complies with the statutory minimum wage.	58.8	66.6	47.3	19.0
Low incidence of child labor	Sector	Normative	The sector's contribution to structural child labor is below 0.7. ^a	56.5	58.0	68.7	45.6
Better work safety	Sector	Normative	The sector's score of work safety is below the median value of work safety.	59.9	61.0	49.8	58.0
Low incidence of relative underpayment	Individual	Cell-based threshold	The worker's hourly wage is not in the bottom 30 percent of the cell-based wage distribution in the sector-occupation-education-potential LM experience cell.	68.3	75.8	55.9	30.8
Low incidence of compensatory moonlighting	Individual	Yes/No	A full-time worker earning below the low-pay threshold does not have a second job. ^b	95.9	98.2	85.2	86.6
High incidence of work-related training	Individual	Yes/No	The worker received work-related training in the past 4 weeks.	1.1	1.0	2.4	1.2
Low incidence of underemployment	Individual	Yes/No	The worker does not want to work more hours. ^c	96.6	97.8	93.7	92.4
Better employment engagement	Individual	6-item scale ^d	The worker has a formal permanent full-time job or if the worker works part-time in formal permanent job, it is by choice.	83.8	100	75.4	17.6
Low incidence of overqualification	Individual	Cell-based threshold	The worker's level of education is not above the education level of the median worker in the sector-occupation-birth cohort-graduation cohort cell.	83.7	82.4	86.8	88.8
High resilience to aggregate shocks	<u>2009-13</u> : Sector-occupation cell <u>2014-16</u> : Nuts1-occupation cell	Normative	The worker's cell has a share of jobs lost due to dismissal or end of temporary/seasonal work during a crisis that is less than 60 percent. ^e	25.4	28.3	13.1	16.0
High resilience to idiosyncratic shocks	Sector-occupation cell	Normative	The worker's cell has a share of jobs lost due to illness or disability that is below 2.5 percent. ^f	66.2	66.3	75.2	62.9
Low incidence of skills obsolescence	Sector-occupation cell	Normative	The worker's cell has a long-term unemployment rate that is below the annual economy-wide long-term unemployment rate. ^g	48.2	46.1	61.2	53.5

Notes:

^a The ratio of structural child labor is calculated as the sectoral share of child labor over the economy-wide share of child labor. The threshold of 0.7 points equals the average of structural child labor in 2011. Due to data limitations, this component cannot be calculated in earlier years; 2011 values are imputed in 2009 and 2010.

^b All other possible combinations of full-time, low pay and second job as well as part-time workers receive score zero. Low pay is defined as earnings less than two thirds of median earnings for all full-time workers (OECD definition).

^c Based on the ILO definition of underemployment, part-time and full-time workers are asked about their preference to work more hours.

^d See also Table A1.

^e The threshold of 60 percent tallies with the pre-crisis share of jobs lost due to dismissal or end of temporary/seasonal work in the nonagricultural economy.

^f The threshold of 2.5 percent corresponds to the economy-wide long-term share of jobs lost due to own illness or disability.

^g Annual national long-term unemployment rate (being unemployed for 12 months or more) varies between 2.9 percent in 2009 and 2.2 percent in 2016 (Eurostat).

2.2 Aggregating the job quality components

The aggregate Job Quality Index is calculated using principal component analysis (PCA). Since correlation among the job quality components can be high, estimating the composite index via PCA minimizes the bias that is caused by aggregating multicollinear data. Using PCA to obtain the composite index ensures that all components are included, with some components contributing more than others. Hence, the aggregate Job Quality Index effectively summarizes the complexities and multi-dimensional realities of employment quality. However, when discussing the criteria that make a good job, the individual components are used, as they are more amenable to interpretation and policy design. Box 1 and Annex B provide more details.

Box 1: Calculating the composite index of job quality using principal component analysis

Results from multivariate analysis show that some job quality components such as *employment engagement* and *formality* or *skills obsolescence* and *resilience to aggregate shocks* are interrelated. Including correlated variables in the composite index is likely to bias the aggregate JQI since dimensions that are captured by several variables are overrepresented at the expense of equally important but singularly measured dimensions.

Principal component analysis (PCA) is a data reduction technique which identifies a number of principal components that can adequately represent the primary data. PCA transforms a dataset by condensing groups of correlated variables into uncorrelated principal components. Each principal component depends on a set of coefficients, called factor or component loadings, and each coefficient measures the correlation between the individual variable and the latent factor.

Classical PCA relies on the Pearson correlation matrix which assumes that variables are continuous and normally distributed. In case of categorical variables, the Pearson correlation matrix is likely to underestimate the correlation between variables which can impact the calculations of the principal components. The polychoric correlation matrix is more suitable for categorical variables, however, this approach may face computational problems when variables are skewed or strongly correlated - as is the case for some components of job quality. Sensitivity tests show that results obtained from classical PCA are a close approximation of aggregate job quality estimates based on polychoric PCA. Thus, the first principal component obtained from classical PCA is used as the composite index of wage job quality – *JQI for wage employment*.¹

To obtain factor loadings that are consistent over time and acknowledge the structural break in the LFS series, PCA is performed separately on two samples covering years 2009-2013 and 2014-2016. The factor loadings for the each period are obtained from pooled samples. PCA-scores are rescaled to range between 0 and 1 for ease of interpretation.

¹ Following standard practice in microeconomics, the first component is used as the composite index. See also Kolenikov, Angeles (2009).

2.3 Measuring job quality in Turkey: Some caveats

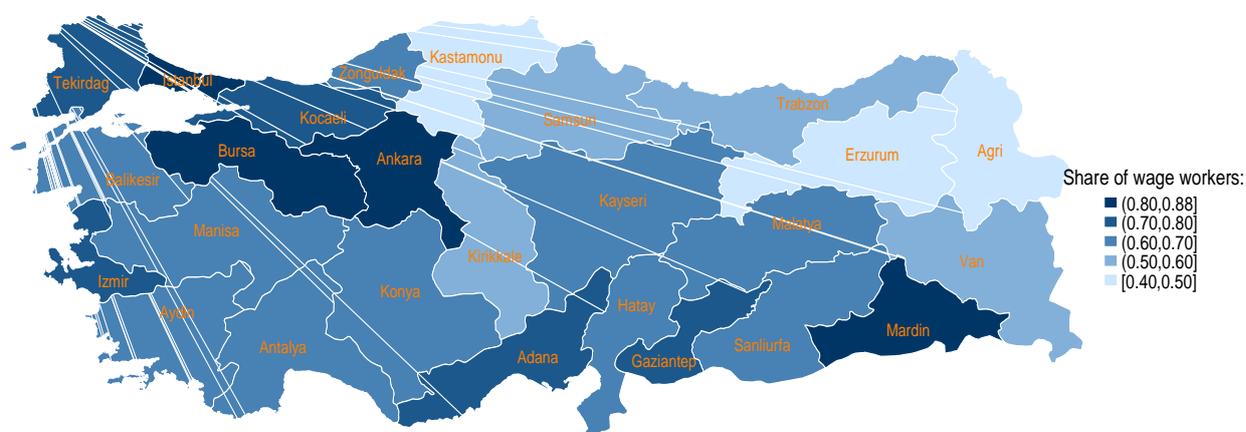
Coverage of workers

With the proposed definition of good jobs, not all types of jobs are considered in the calculations. Most importantly, only wage jobs are included, while self-employed and unpaid family workers are excluded. Wage employment is not equally distributed across regions, economic activity and the workers' socio-economic characteristics such as age or education. Above all, the shares of workers included in the analysis varies substantially by sub-region and main occupational groups.

In 2016, the share of jobs covered in the JQI varies between 40 percent in Agri-Kars-Ardahan-Igdir and close to 90 percent in Ankara and Istanbul (Figure 1). The coverage of workers was below 60 percent in North East Anatolia, East Black Sea (Trabzon), as well as in parts of West Black Sea, Central Anatolia, and Central East Anatolia. Between 2014 and 2016, the share of wage workers among all workers increased considerably in parts of Central East Anatolia and South East Anatolia, while it declined by more than 1 percentage point in Ankara, Kastamonu-Sinop-Cankiri, and Kayseri (Figure 1).

The coverage of workers also differs substantially across occupational groups. Coverage is above 90 percent for professionals, technicians/associate professionals and clerical support workers. About 70 percent of workers in elementary occupations are included. Coverage rates are relatively stable over time with the exception of managers. About 60 percent of workers in managerial occupations are included in 2009 but the share increased substantially in later years.⁶ Coverage is lowest for skilled agricultural workers, reaching 5 percent in 2016.

Figure 1: The proportion of workers covered by the JQI varies largely by sub-region (2016)

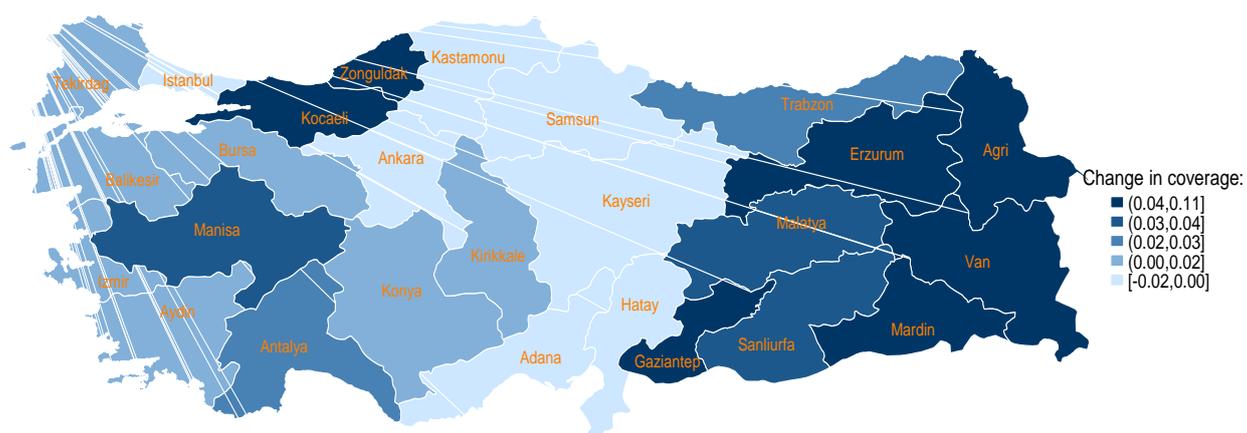


Notes: Proportion of wage workers among all workers aged 15-64, by sub-region, in 2016.

Source: Authors' calculations based on LFS data.

⁶ Since 2012, occupations are classified according to the International Standard Classification of Occupations 2008 (ISCO-08). Switching from ISCO-88 to ISCO-08 resulted in reclassifying many entrepreneurs who work in wholesale/retail trade from occupational class 1 (managers) to occupational class 5 (service and sales workers). Consequently, coverage of managers increased substantially in 2012 and later years. Since entrepreneurs do not report their monthly income, this change does not impact the calculations of job quality among wage workers.

Figure 1: Since 2014, coverage increased in southeastern sub-regions but declined in others



Notes: Changes in the proportion of wage workers (in percentage points) among all workers, between 2014 and 2016.
Source: Authors' calculations based on LFS data.

Table 1: The proportion of workers covered by the JQI varies across occupational groups

major occupational group: ISCO-88/08	2009	2010	2011	2012	2013		2014	2015	2016
1-Managers	62	62	64	78	85	break in series	81	82	83
2-Professionals	94	95	96	96	96		96	95	95
3-Technicians, assoc. professionals	92	93	92	93	94		92	92	91
4-Clerical support workers	95	96	97	98	98		98	98	98
5-Service & sales workers	80	83	83	78	78		79	80	80
6-Skilled agricultural, forestry, fishery workers	4	4	4	4	5		5	5	5
7-Craft & related trades workers	79	80	81	83	82		82	82	82
8-Plant & machine operators, assemblers	84	86	87	86	86		87	88	87
9-Elementary occupations	71	71	70	71	70		71	71	70

Notes: Proportion of wage workers among all workers in percent. Structural break in series in 2014.
Source: Authors' calculations based on LFS data.

Calculating the quality of wage employment in regions and occupations where only a small proportion of workers has salaried jobs can be misleading. Section 3.4 introduces the *JQI for all workers* that covers all types of jobs, including subsistence farmers and other informal self-employed, and is representative for all workers.

Pros and cons of calculating a composite index of job quality

To date, there is no universally accepted definition of what constitutes a good job and how to measure it. There is broad acceptance that the quality of employment is a multidimensional concept, but opinions differ what dimensions should be included. Similarly, there are different views on whether to describe job quality along the designated dimensions or to aggregate them into a single index. When aggregation is the preferred strategy, what weight should be given to each dimension? Oftentimes, a mixed approach is applied. For example, the OECD approach to job quality is based on three main dimensions with each of them being built from a number of subcomponents (OECD 2014, 2015). The European Job Quality Index is a single index, calculated as an unweighted average of six sub-indices (Leschke, Watt, Finn 2008, 2012). Box 3 briefly discusses two international projects on measuring job quality that include Turkey.

Composite indices allow us to summarize complex matters in a single number, making them a powerful means of communication. With too many dimensions chosen to describe a complex matter, there is a risk of generating a confusing picture of what is going on. Using a composite index instead, recent trends in multi-faceted job quality can easily be communicated to the parties involved and the general public, possibly starting

a broader discussion on the topic and stimulating public interest. An easy to interpret index number could also promote accountability of the government (OECD 2008).

On the other hand, composite indices are built on strong assumptions about how different dimensions can be traded off against each other in perfectly competitive markets (Green 2007). Deteriorating conditions in one dimension can be offset by improvements in other areas, concealing the need for policy action. Similarly, when the composite index decreases, it may be difficult to formulate the correct response since it is unclear what is causing the decline. Also, composite indices are susceptible to criticism related to weighting and aggregation procedures, as these decisions are arbitrary. A clear definition of the concept and purpose of the index as well as transparency when selecting dimensions or subcomponents and constructing the index will help to minimize misunderstandings and formulate appropriate policies (Saisana, Tarantola 2002).

Box 2: Putting Turkey’s job quality in an international perspective

Two recent projects aim at measuring and comparing the quality of jobs for a number of countries, including Turkey. The Eurofound project on job quality in Europe and the OECD job quality framework seek to bring job quality to the forefront of the policy debate on labor market performance. The quality of work is a key element of individual well-being but also determines participation, commitment and productivity. Both projects concentrate on outcomes that are measured at the worker’s level and focus on objective features of job quality. Job quality is defined along several dimensions, with some overlap between the approaches suggested. The resulting indices are evaluated for all workers, including entrepreneurs and self-employed without employees.

Eurofound: Trends in job quality in Europe

Based on the conceptual framework of job quality that was developed by the European Foundation for Living and Working Conditions in 2002 and using the Fifth European Working Conditions Survey (EWCS), Eurofound (2012) proposes four job quality indices that are presented separately. To reflect the multi-disciplinary nature of good jobs, the approach combines extrinsic and intrinsic aspects of job quality. The construction of the *Earnings*, *Prospects*, *Intrinsic Job Quality*, and *Working Time Quality* indices is shown in Table B1.1. The 2010 wave of the EWCS collected data in 34 countries that differ in terms of stage of development and economic structure. Across the four indices, job quality is oftentimes lowest for East European countries and highest for Nordic countries. Controlling for industry composition, Turkey ranks last for *Intrinsic Job Quality* and *Prospects*, third to last for *Working Time Quality* and sixth to last for *Earnings*.

Table B1: Eurofound project on measuring job quality: the structure of job quality indices

Job quality index	Operationalization
<i>Earnings</i>	hourly earnings
<i>Prospects</i>	job security, career progression, contract quality
<i>Intrinsic Job Quality</i>	(a) <i>skills and discretion</i> : skills and autonomy (b) <i>good social environment</i> : social support, absence of abuse (c) <i>good physical environment</i> : low level of physical and posture-related hazards (d) <i>work intensity</i> : pace of work, work pressures, emotional/value conflict demands
<i>Working Time Quality</i>	duration, scheduling, discretion, short-term flexibility over working time

Source: Eurofound 2012.

In part Turkey’s poor performance on job quality is a reflection of cross-country differences in the standard of living, as measured by GDP per capita. However, none of the indices have a strict relationship with GDP per capita and there is substantial variation between the indices in their country rankings. For example, jobs in Germany are in the upper half in terms of *Earnings* and *Prospects*, but in the lower half in terms of *Working Time Quality* and *Intrinsic Job Quality* (Eurofound 2012).

OECD: Job quality framework

The 2014 Employment Outlook introduces the OECD job quality framework which is applied to 32 OECD countries, including Turkey. The framework is based on three pillars: *Earnings Quality*, *Labor Market Security* and *Quality of the Working Environment*. In 2015, the approach was extended to emerging economies. To adapt the implementation of the framework to labor markets in emerging economies, two adjustments are made: (1) as open unemployment is often low, the *Labor Market Security* dimension is supplemented by the risk of falling below a subsistence level of earnings; (2) due to data limitations on working conditions in emerging economies, the *Quality of Working Environment* is proxied by the incidence of very long working hours. Using the modified framework, job quality is assessed for 12 emerging economies. Job quality in Mexico and Turkey is evaluated using both methodologies.

Table B2: The OECD job quality framework

Dimension	Main framework: OECD countries	Modified framework: emerging economies
<i>Earnings Quality</i>	average earnings, earnings inequality	same as main framework
<i>Labor Market Security</i>	unemployment risk, unemployment insurance	same as main framework PLUS risk of falling below a subsistence level of earnings
<i>Quality of the Working Environment</i>	work demands and conditions; resources and support available to cope with demands	main framework replaced by incidence of very long hours at work: more than 60 hours in an average week

Source: OECD 2014, 2015.

Within the sample of OECD countries, Turkey is among the bottom 10 performers in all three dimensions. In particular, Turkey's score for *Quality of the Working Environment* is lowest. Many workers report difficult and stressful working conditions and little resources to address these challenges. Turkey also scores low on *Good Quality Earnings* as average earnings are relatively low and inequality in earnings is high. In terms of *Labor Market Security* Turkey ranks 28 out of 32 countries, because of the relatively high risk of unemployment and strict eligibility rules to receive unemployment benefits.

When compared with other emerging economies, Turkey can position herself in the middle ranks for *Earnings Quality* and *Labor Market Security*. As the risk of very low pay in Turkey is moderated through the minimum wage regulation and relatively better social security, the main driver of insecurity remains unemployment. In terms of *Quality of the Working Environment*, Turkey ranks last with 21 percent of all workers reporting to work more than 60 hours in an average week.

With rising incomes, more jobs will be of better quality. Yet, both Eurofound and OECD job quality measures suggest there is also considerable scope for labor market policies and social policies to improve the quality of employment. Better working time regulations, improvements in work safety regulations and enforcement of existing labor legislation can help to significantly improve the quality of jobs in Turkey.

3. Results

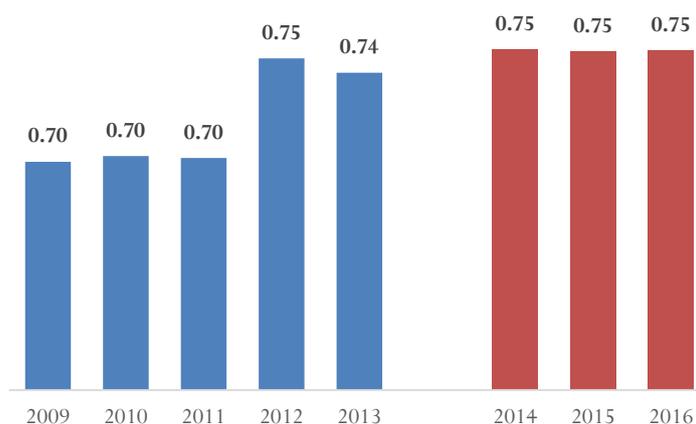
3.1 Trends in wage job quality

Aggregate quality of wage employment

Overall, aggregate wage job quality has improved. In 2009, the average JQI for wage-employed workers was 0.70, with the 95 percent confidence interval of 0.698-0.702. Aggregate job quality remained largely constant until 2011, peaked in 2012 with 0.745 and reached 0.739 in 2013. Since 2014, estimates of job quality have been constant at 0.75 (Figure 2). Note that starting in 2014, LFS data is collected using a new sampling framework and the calculation of the resilience to aggregate shocks indicator was modified, so results are not comparable to earlier years.

As to trends in inequality of quality wage employment, the earlier period saw a significant decline in inequality when measured by the Gini coefficient. Most importantly, JQI scores at the bottom end of the distribution improved above average as indicated by a declining p90/p10 ratio for 2011-13. This trend is partially reversed in later years. With the Gini coefficient being relatively constant since 2014, the mode (or most frequent value) of the job quality distribution is basically unchanged. The relative position of wage workers in low quality jobs improved somewhat in 2015 and the p90/p10 ratio fell. Declining job quality at the lower end of the distribution and improvements among higher quality employment make the p90/p10 ratio rise again in 2016 (Table 3).

Figure 2: Average job quality improved during the earlier period and remained constant since 2014



Notes: Results are comparable for years 2009-2013 and 2014-2016.

Source: Authors' calculations based on LFS data.

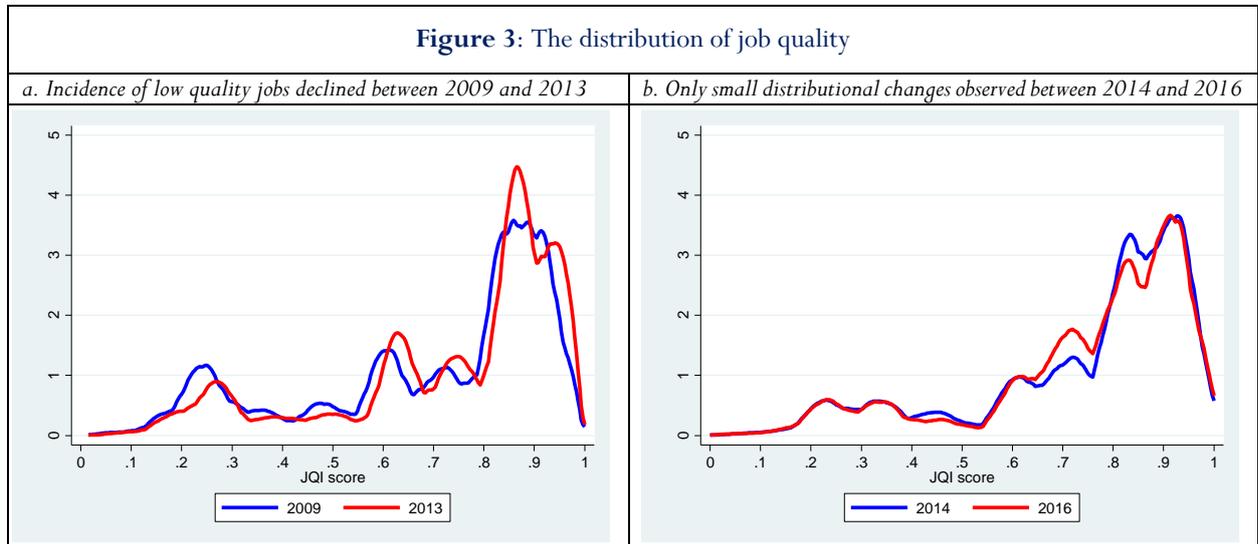
Table 2: Inequality in job quality declined during the earlier period and remained relatively constant since 2014

year	Gini coefficient	p90/p10
2009	0.128	2.10
2010	0.127	2.12
2011	0.126	2.12
2012	0.112	2.07
2013	0.108	2.08
<i>break in series</i>		
2014	0.149	2.73
2015	0.145	2.58
2016	0.146	2.67

Notes: The p90/p10 indicator measures the ratio of job quality of the 10 percent of wage workers with the highest JQI scores to the 10 percent with the lowest scores. Results are comparable for years 2009-2013 and 2014-2016.

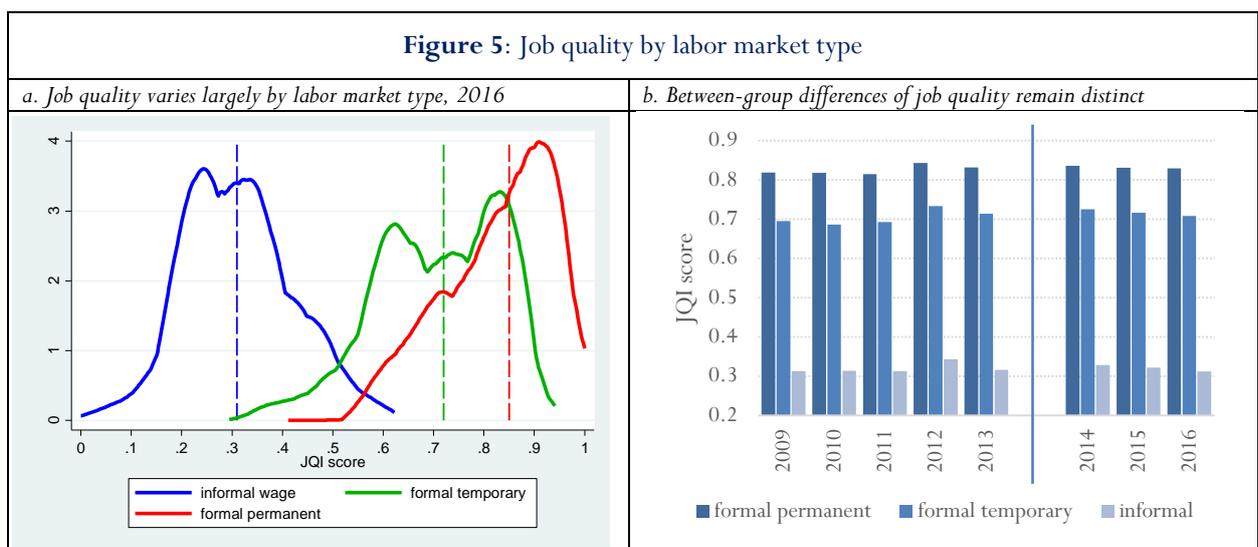
Source: Authors' calculations based on LFS data.

The distribution of job quality itself is widespread and multimodal (Figure 3). Between 2009 and 2013 a shift to the right of the entire job quality distribution is observed, resulting in higher job quality at the aggregate level. Changes between 2014 and 2016 are relatively small seem to cancel each other out, as average job quality remains at the score of 0.75.



Source: Authors' calculations based on LFS data.

The particular shape of the job quality distribution is mainly due to large differences in job quality by labor market type. In 2016, the median informal wage worker's job quality score is 0.31 and a substantial portion of informal wage jobs are of very low quality. Formal jobs are of far better quality and somewhat less dispersed. The median formal temporary worker reaches a score of 0.72 and the median value for formal permanent workers is 0.85 (Figure 3a). Within each group of workers, job quality changed only slightly over time (Figure 5b). Hence, the improvements in average job quality that happened between 2009 and 2013 are largely the result of compositional changes toward more formal wage jobs. During this period, the trend to more formalization also contributed to declining inequality in job quality.



Note: The vertical lines in panel (a) represent the median value of job quality for each labor market type.

Source: Authors' calculations based on LFS data.

Wage job quality by component

Table 3 shows trends over time for all 13 components. The share of good wage jobs remains relatively stable for some components, including *incidence of overqualification*, *underemployment* or *compensatory moonlighting*, while the performance of others varies considerably over time. For example, the share of registered wage jobs (measured through component *social security benefits*) increased substantially since 2009. The indicator continues to perform well in recent years; in 2016, 83 percent of wage workers are in formal jobs.

Table 3: Share of good wage jobs over time (percent)

Component	2009	2010	2011	2012	2013		2014	2015	2016
Social security benefits	75	76	77	80	81	break in series	82	83	83
Minimum wage compliance	64	62	62	62	64		66	65	59
Low incidence of child labor	43	43	43	54	37		62	57	58
Better work safety	59	58	58	59	59		59	60	61
Low incidence of relative underpayment	65	66	66	67	67		68	68	68
Low incidence of compensatory moonlighting	97	96	96	96	96		96	96	96
High incidence of work-related training	1	1	1	1	1		2	1	1
Low incidence of underemployment	93	93	94	95	95		95	97	97
Better employment engagement	79	79	79	81	83		83	84	84
Low incidence of overqualification	84	85	85	86	86		85	84	84
High resilience to aggregate shocks	18	31	35	85	83		39	26	25
High resilience to idiosyncratic shocks	91	64	50	61	49		53	64	66
Low incidence of skills obsolescence	72	50	65	32	46		51	62	48

Notes: Results are comparable for years 2009-2013 and 2014-2016.

Source: Authors' calculations based on LFS data.

Examining the performance on separate components shows that tenured formal wage workers often register the highest share of good jobs. For example, *minimum wage compliance* in per hour terms is highest, and the incidence of *relative underpayment*, *compensatory moonlighting* or *underemployment* is lowest for this group of workers. On the other hand, formal wage workers with tenure appear to be disproportionately affected by *overqualification* and *skills obsolescence*.⁷

The performance of *resilience to aggregate shocks* changed significantly for all wage workers. Only few jobs proved resilient to the economic crisis in 2008/2009. As a result, *resilience to aggregate shocks* was lowest in 2009 and recovered somewhat in subsequent years. Not surprisingly, workers in temporary jobs were particularly vulnerable to job losses during and after the crisis years. By 2012, about 90 percent of formal permanent wage jobs had regained resilience, but 40 percent of formal temporary wage jobs and 30 percent of informal wage jobs remained vulnerable.

Formal permanent wage jobs also appear relatively resilient to the sizable influx of refugees, especially Syrians under Temporary Protection (SuTP). In 2014, 43 percent of these jobs proved resilient, whereas formal temporary and informal wage jobs turned out to be more vulnerable. Only 21 percent of temporary and 27 percent of informal wage jobs met the good job criteria. Facing increasing numbers of SuTP in subsequent years, resilience declined for all wage workers in 2015 and remained relatively stable since then.

⁷ Annex C provides summary statistics on job quality components by labor market type.

Another component with varying performance is *resilience to idiosyncratic shocks*. Regardless of their type of employment, wage workers became more vulnerable to individual shocks between 2009-13. While in 2009 about 90 percent of all wage jobs were resilient to shocks such as own illness or disability, the share of good jobs declined to 49 percent in 2013. Recent years show a different trend. Since 2014, the share of all wage jobs being robust to individual shocks increased considerably from just above 50 percent in 2014 to 66 percent.

3.2 Distribution of wage job quality

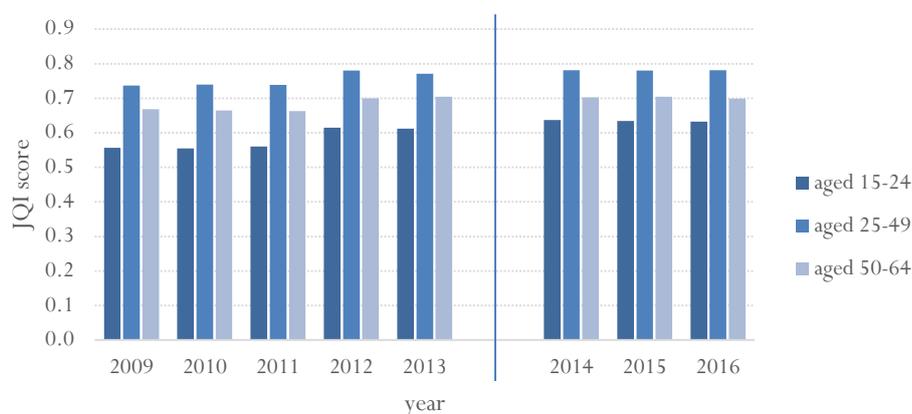
Job quality differs distinctly by worker-related and job-related characteristics as well as by region. The following section illustrates trends over time in wage job quality by selected population sub-groups and provides an in-depth discussion of the component-specific performance, separated by labor market type and for selected groups of workers (age, gender and education). Section 3.2.2 presents estimates of wage job quality at the sub-national level, while section 3.2.3 discusses differences in wage job quality that emerge between the private and public sector.

3.2.1 Patterns of wage job quality among different worker groups

Wage job quality by age

Estimated JQI scores are consistently highest for wage workers aged 25-49 years and lowest for wage workers aged 15-24 years. For all years, older age groups (50-64 years old) are somewhat better off than youth, while the gap to prime-age workers remains substantial (Figure 6).

Figure 6: Job quality among wage workers by age group



Notes: Results are comparable for years 2009-2013 and 2014-2016.

Source: Authors' calculations based on LFS data.

Looking at the performance for each component provides insights as to where the differences by age group are coming from.⁸ To this end, Table 4 shows the results of mean comparison tests for each component for the year 2016. Highlighted cells show the age group with the largest share of good jobs in the relevant component and type of labor market; when cells are shaded, the stated age group has the lowest share of good jobs.

⁸ Note that results obtained from the component-specific analysis on who has the better jobs may differ from results obtained from the Job Quality Index. The Index is a weighted average of all components, with weights for each component being obtained from performing PCA. See also Box 2 on methodology.

Notably, workers aged 15-24 years are often found at either end of the job quality spectrum. Irrespective of the type of job, young workers have better training opportunities. At the same time, they are disproportionately affected by non-compliance with minimum wage legislation and are more likely to be underpaid. Youth in formal employment are less vulnerable to aggregate shocks. When in temporary jobs, young workers enjoy better work safety, but are more likely to have additional jobs to supplement their income earned from the main (low-paid) job and face higher risks of skills obsolescence.

Older workers (50-64 years old) in tenured employment tend to work in sectors with better work safety and less child labor. Also, they are less affected by skills obsolescence but are more likely to engage in moonlighting when the main job is low-paid.

The majority of wage workers is between 25-49 years old and along many dimensions this age group enjoys intermediate levels of job quality. Prime age workers in permanent jobs are somewhat more likely to be underemployed. When in temporary employment, they are more likely to be overqualified for their jobs.

Table 4: Who has the better jobs? Results by age in 2016

Component	Type of wage employment:		
	formal permanent	formal temporary	informal
Minimum wage compliance	15-24 (-)	15-24 (-)	15-24 (-)
Low incidence of child labor	50-64		50-64
Better work safety	50-64	15-24	
Low incidence of relative underpayment	15-24 (-)	15-24 (-)	15-24 (-)
Low incidence of compensatory moonlighting	50-64 (-)	15-24 (-)	
High incidence of work-related training	15-24	15-24	15-24
Low incidence of underemployment	25-49 (-)		15-24
Low incidence of overqualification	15-24	25-49 (-)	15-24
High resilience to aggregate shocks	15-24	15-24	
High resilience to idiosyncratic shocks		15-24	
Low incidence of skills obsolescence	50-64	15-24 (-)	25-49

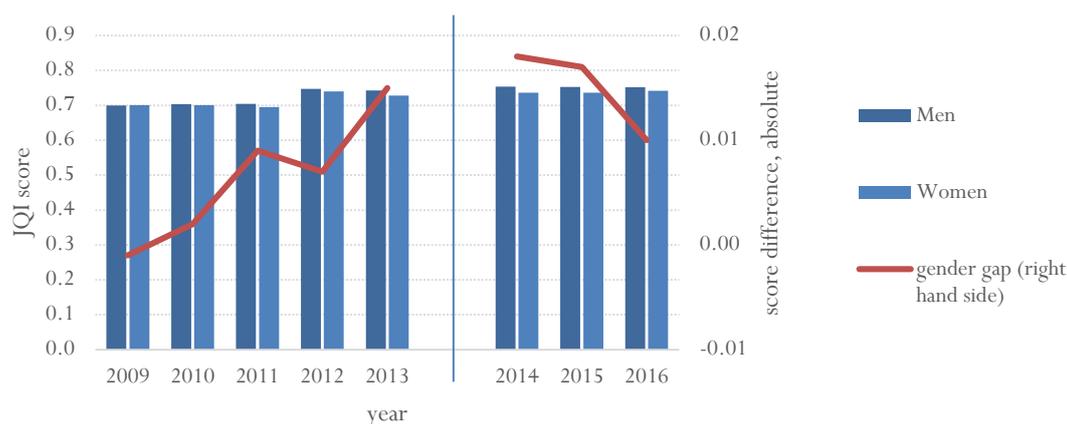
Notes: Results are obtained from mean comparison test by labor market type and age group. Highlighted cells indicate significant differences by age group in job quality components at the 95 percent significance level, with the stated age group having the highest share of good jobs. Age groups stated in shaded cells have the lowest share of good jobs. Blank cells indicate statistically insignificant differences between age groups. Component *social security benefits* is excluded as it does not vary within each labor market type and *employment engagement* is excluded because of the non-binary structure of the underlying data.

Source: Authors' calculations based on LFS data.

Wage job quality by gender

Despite an upward trend between 2009 and 2013, the job quality gender gap is minor among wage workers. Recent results suggest a somewhat larger absolute gender gap in 2014, but since then the gap has narrowed again (Figure 7).

Figure 7: Job quality among wage workers by gender



Notes: Results are comparable for years 2009-2013 and 2014-2016.

Source: Authors' calculations based on LFS data.

Turning to gender differences at the component level shows a number of interesting results (Table 5). Along many dimensions, the differences between male and female wage workers are highly significant and the direction of the gender-bias is rather consistent across labor market types. Men are better off in wage-related components such as relative underpayment and moonlighting. They are also less affected by skills obsolescence. Notably, there are no significant gender differences in minimum wage compliance for formal wage workers. Women are more likely to receive training and work in jobs that are relatively resilient to aggregate shocks. They are less often overqualified or underemployed and work in sectors with better work safety and less child labor. One significant change in gender-bias is observed for resilience to idiosyncratic shocks: women are less vulnerable than men in tenured jobs or informal wage jobs but when in formal temporary employment, they are more vulnerable to individual shocks.

Table 5: Who has the better jobs? Results by gender in 2016

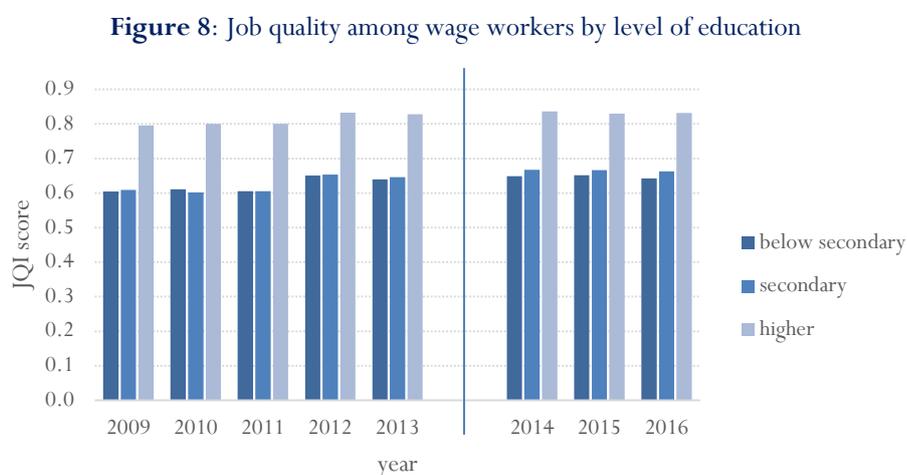
Component	Type of wage employment:		
	formal permanent	formal temporary	informal
Minimum wage compliance			m
Low incidence of child labor	f		f
Better work safety	f	f	f
Low incidence of relative underpayment	m	m	m
Low incidence of compensatory moonlighting	m	m	m
High incidence of work-related training	f	f	f
Low incidence of underemployment	f		f
Low incidence of overqualification	f	f	f
High resilience to aggregate shocks	f	f	f
High resilience to idiosyncratic shocks	f	m	f
Low incidence of skills obsolescence	m	m	m

Notes: Results are obtained from mean comparison test by labor market type and gender. Highlighted cells indicate significant gender differences in job quality components at the 95 percent significance level, with the stated gender m(ale) or f(emale) having the highest share of good jobs. Blank cells indicate statistically insignificant gender differences. Component *social security benefits* is excluded as it does not vary within each labor market type and *employment engagement* is excluded because of the non-binary structure of the underlying data.

Source: Authors' calculations based on LFS data.

Wage job quality by level of education

Exploring differences in job quality by worker education reveals important findings, too. JQI scores are by far the highest for wage workers who completed higher education which includes high school, vocational/technical high school and university graduates. Differences between workers with completed secondary and below secondary levels of education are minor (Figure 8).



Notes: Results are comparable for years 2009-2013 and 2014-2016. Higher education includes high school, vocational/technical high school and university.

Source: Authors' calculations based on LFS data.

By and large, this pattern also holds at the disaggregated level. With some notable exceptions, higher educational attainment ensures better quality of employment (Table 6). Wage workers with higher education have the highest share of good jobs in terms of minimum wage compliance, work safety, and resilience to individual as well as aggregate shocks. They also tend to work in sectors with low rates of child labor and to receive more work-related training. Workers that completed secondary school or vocational training at secondary school level are less likely to be underemployed or overqualified for their current jobs, while wage workers with basic skills are least affected by skills obsolescence.

Table 6: Who has the better jobs? Results by education in 2016

Component	Type of wage employment:		
	formal permanent	formal temporary	informal
Minimum wage compliance	higher	higher	higher
Low incidence of child labor	higher		secondary (-)
Better work safety	higher	higher	higher
Low incidence of relative underpayment	secondary	below second	
Low incidence of compensatory moonlighting	higher (-)	below second	higher (-)
High incidence of work-related training	higher	below second (-)	below second (-)
Low incidence of underemployment		secondary	secondary
Low incidence of overqualification	secondary	secondary	secondary
High resilience to aggregate shocks	higher	below second (-)	higher
High resilience to idiosyncratic shocks	higher	higher	higher
Low incidence of skills obsolescence	below second	below second	below second

Notes: Results are obtained from mean comparison test by labor market type and education. Highlighted cells indicate significant differences by level of education in job quality components at the 95 percent significance level, with the stated education level

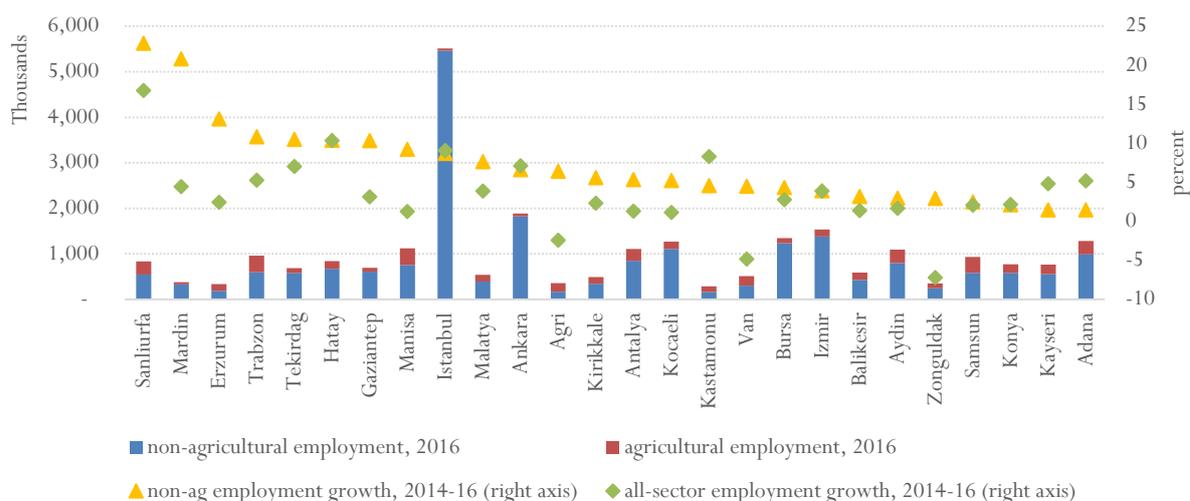
having the highest share of good jobs. Education levels stated in shaded cells have the lowest share of good jobs. Blank cells indicate statistically insignificant differences by education. Higher education includes high school, vocational/technical high school and university. Component *social security benefits* is excluded as it does not vary within each labor market type and *employment engagement* is excluded because of the non-binary structure of the underlying data.
 Source: Authors' calculations based on LFS data.

3.2.2 Job quality through a regional lens

There is substantial variation in Turkey's economy and economic development at the sub-national level. Economic specialization, ethnic and demographic composition and geographic location are some of the underlying reasons of existing regional disparities. Turkey's labor market is also characterized by unequal outcomes. Employment rates, labor force participation and unemployment differ widely, with only little signs of convergence.⁹

In recent years, Turkey's employment growth has been exceptional and many jobs were created in the formal non-agricultural economy. Notably, lagging regions in the eastern part of the country experienced above average employment growth rates. Between 2014 and 2016, non-agricultural job creation was highest in Mardin-Siirt-Batman-Sirnak and Sanliurfa-Diyarbakir (Figure). Some regions with appreciable employment shares in agriculture also registered significant shedding of these jobs, for example in the Aegean (Manisa-Usak-Afyon-Kutahya), East Marmara (Bursa-Eskisehir-Bilecik, Kocaeli-Sacarya-Duzce-Bolu), Mediterranean (Antaly-Burdur-Ispartaa), Southeast Anatolia (Gaziantep-Kilis-Adiyaman, Mardin-Siirt-Batman-Sirnak), West Marmara (Tekirdag), and West Black Sea (Zonguldak).

Figure 9: Non-agricultural employment is small but fast growing in lagging regions



Source: Authors' calculations based on LFS data.

Since 2014, overall employment growth slowed down and the unemployment rate increased to 10.9 percent in 2016¹⁰, indicating that despite impressive employment growth in the past, the number of jobs created is insufficient to absorb all job seekers.

Of particular concern is the quality of the jobs that are being created. Are these predominantly high quality jobs offering adequate wages, social security benefits and stability? Are the same types of jobs being created in different regions? Does the quality of employment converge at the sub-national level?

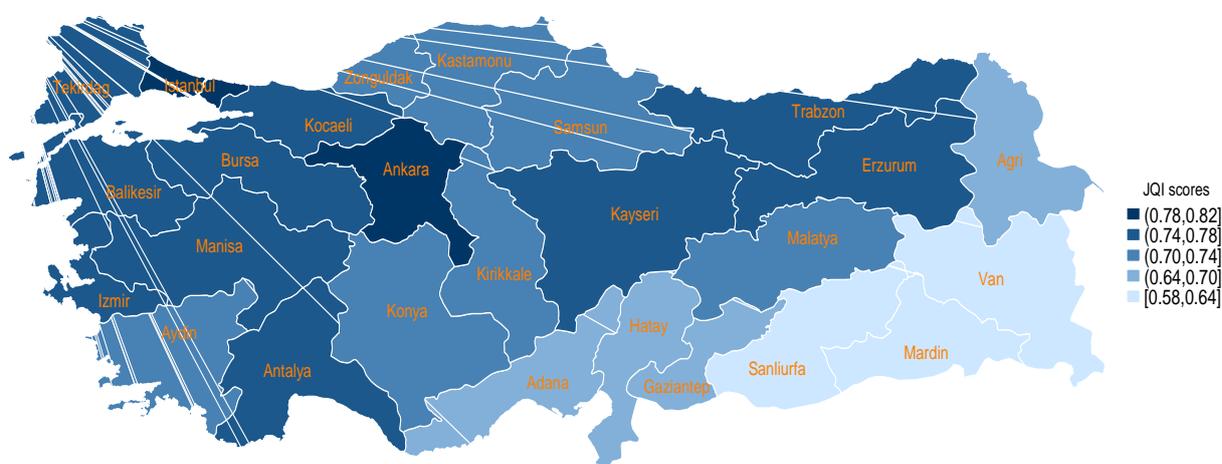
⁹ See also World Bank 2015, 2016 for an in-depth discussion of recent regional labor market trends.

¹⁰ IMF World Economic Outlook, October 2017

About two thirds of formal permanent wage jobs are concentrated in four regions: Istanbul, Aegean, West Anatolia, and East Marmara. Formal temporary wage employment is high in the Mediterranean, Istanbul, and Southeast Anatolia. In 2016, about 50 percent of informal wage jobs can be found in Istanbul, Mediterranean, and Southeast Anatolia. Fewer of these less attractive jobs are found in Northeast and Central East Anatolia, however, they still dominate local labor markets since the number of formal jobs available is among the lowest in the country.

The unequal distribution of wage jobs is also reflected in the JQI. Job quality among wage workers varies substantially across sub-regions. With a JQI score of 0.82, job quality is highest in Ankara followed by Istanbul and Kocaeli-Sacarya-Duzce-Bolu. Low quality jobs are concentrated in the south eastern part of Turkey. Sanliurfa-Diyarbakir ranks last with a JQI score below 0.6 (Figure). Note that the relatively high level of job quality in some eastern sub-regions, for example Erzurum-Erzican-Barbut, is somewhat misleading and does not represent the conditions that would apply to most workers as only a small fraction of locally available jobs are wage jobs and thus included in the calculation.

Figure 10: Job quality of wage employment in 2016



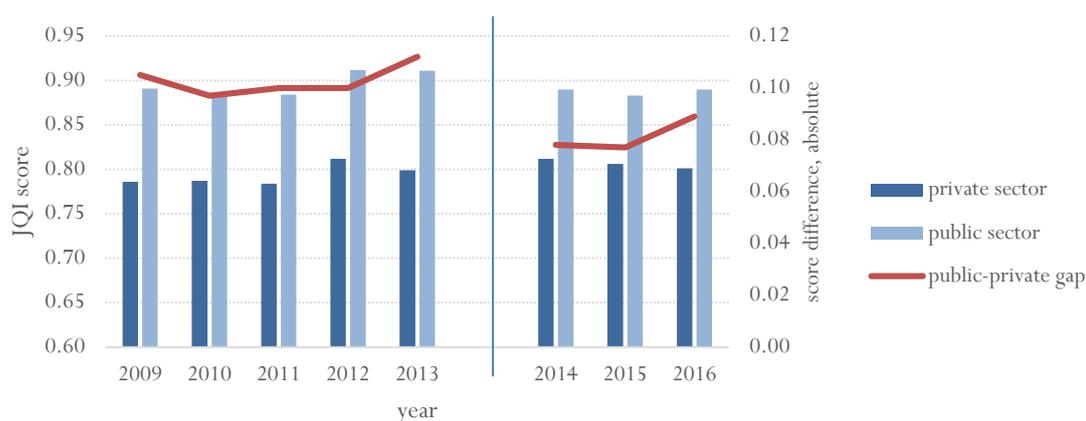
Source: Authors' calculations based on LFS data.

3.2.3 Patterns of wage job quality in the public and private sector

In 2016, about 18 percent of wage employment is in the public sector. Regionally, the share can be larger than 30 percent as is the case in sub-regions Erzurum-Erzican-Barbut and Mardin-Siirt-Batman-Sirnak (38 percent) or Kastamonu-Sinop-Cankiri and Malatya-Tunceli-Elazig-Bingol (around 35 percent). As long as informal wage jobs - which are almost exclusively found in the private sector - are included, job quality is considerably lower in the private sector than in the public sector. In 2016, aggregate job quality among private sector wage employees came to 0.72 whereas public sector jobs registered an average score of 0.88.

Once informal wage jobs are excluded from the analysis, the quality gap between private and public sector wage employment is reduced, but remains significant (Figure 11). Public sector workers enjoy higher minimum wage compliance rates, receive more training, have jobs that are resilient to idiosyncratic shocks, and work in sectors with less child labor and better work safety – all contributing to the higher job quality scores at the aggregate level.

Figure 11: Public sector jobs are of better quality



Notes: Results are comparable for years 2009-2013 and 2014-2016.
Source: Authors' calculations based on LFS data.

As to job permanency, (formal) temporary wage employment is more common in the private sector, but the number of temporary jobs in the public sector steadily increased in recent years. In 2016, about 285,000 public sector jobs are temporary jobs – accounting for 27 percent of all temporary jobs and 8 percent of all public sector jobs.

Looking at job quality by type of employer and permanency highlights a couple of findings (Table 8). First, permanent jobs in the public sector score the highest, followed by permanent jobs in the private sector. Second, temporary jobs in the public sector are of significantly lower quality than permanent public sector jobs. This is largely due to compositional effects, since the vast majority of temporary public sector jobs are in high value-added services. Within the group of temporary public sector jobs, jobs in high value-added services underperform in some of the dimensions that matter a lot for the calculation of the JQI, such as minimum wage compliance, relative underpayment, and employment relation.

Table 8: Job quality estimates for formal wage workers by type of employer and permanency of contract

		Type of employer	
		private sector	public sector
Permanency of contract	permanent	0.81	0.90
	temporary	0.70	0.73

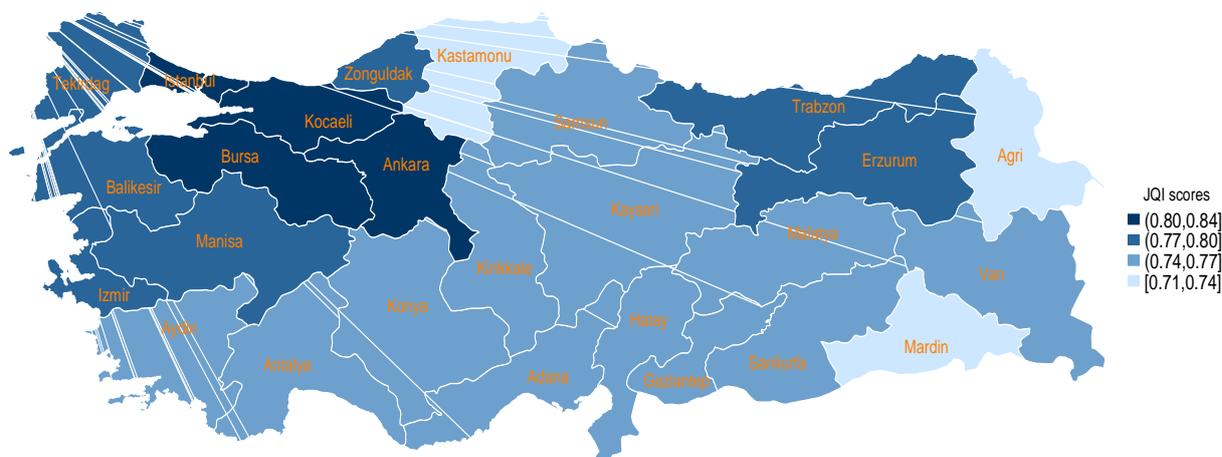
Notes: Results are shown for 2016. For earlier years, results are similar.
Source: Authors' calculations based on LFS data.

Formal jobs in the private sector represent only a fraction of the Turkish labor market. Still, given that the private sector will be the biggest job engine in the future, it is informative to know whether the quality of these jobs differs across sub-groups of workers.

Average job quality in the formal private sector declined somewhat, from 0.812 in 2014 to 0.801 in 2016. Differences by gender are very small and mostly insignificant, indicating that the benefits of formal private sector wage employment are shared equally between male and female workers. Differences by age or education are more distinct, with young and less educated workers having lower levels of job quality. Regionally differences are even more pronounced.

Sub-regions with the highest job quality scores include Ankara, Bursa, Istanbul, and Kocaeli-Sacarya-Duzce-Bolu, whereas job quality among formal wage workers employed in the private sector is lowest in Agri-Kars-Ardahan-Igdir, Kastamonu-Sinop-Cankiri, and Mardin-Siirt-Batman-Sirnak (Figure 12).

Figure 12: Job quality of formal wage employment in the private sector, 2016



Source: Authors' calculations based on LFS data.

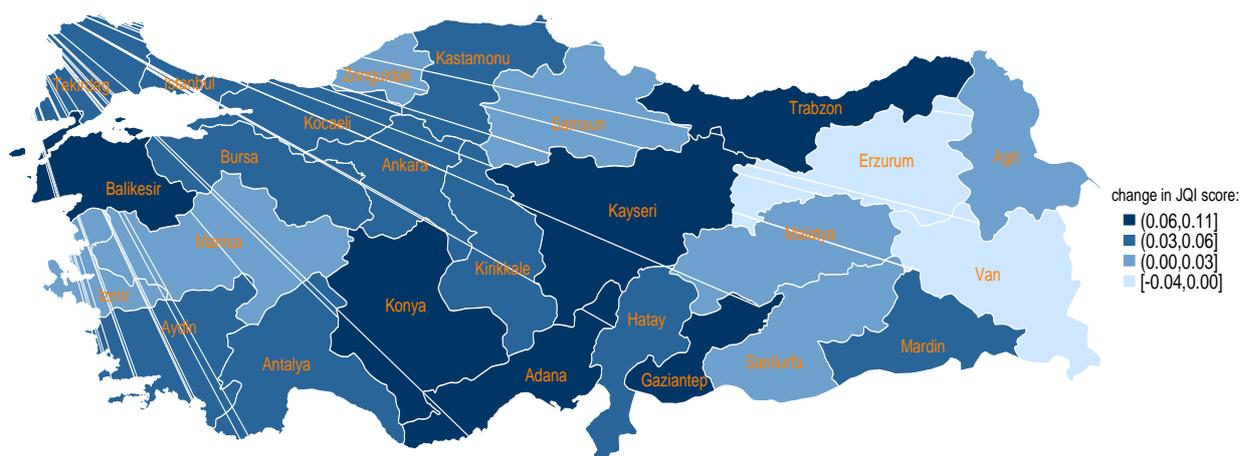
3.3 Distribution of changes in wage job quality

The following section provides a more detailed analysis of the changes in aggregate job quality. To illustrate the underlying dynamics, wage job quality changes are discussed at the subnational, sectoral and occupational level and the main drivers behind the changes are examined. The section concludes with a brief discussion of changes in wage job quality at the national level. The analysis is performed separately for years 2009-2013 and 2014-2016, with results of the former presented in Annex D.

Job quality changes at the sub-national level

Job quality varies substantially by sub-region and the quality of wage jobs developed differently over time. In particular, job quality developed differently in lagging regions between 2009 and 2013. While wage workers in Gaziantep-Kilis-Adiyaman realized the biggest improvements of 0.11, job quality remained stagnant or declined in North East Anatolia. Wage workers in Van-Mus-Bitlis-Hakkari realized a substantial decline of 0.04 points in aggregate job quality (Figure).

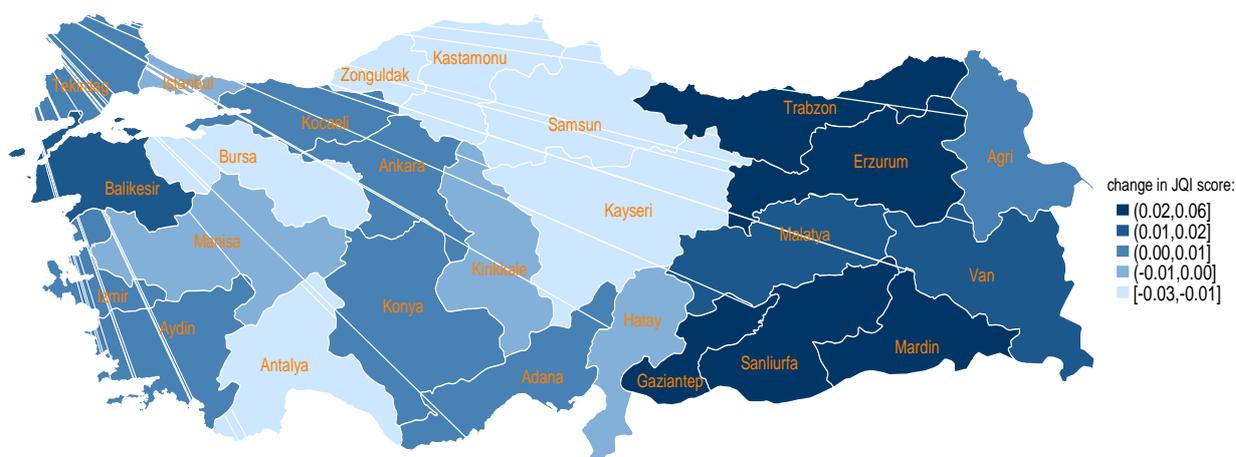
Figure 13: Changes in job quality, 2009-2013



Source: Authors' calculations based on LFS data.

Varying trends at the sub-national level are also observed between 2014 and 2016. Job quality declined in a number of sub-regions with relatively high scores including Antalya-Imparta-Burdur, Bursa-Eskisehir-Bilecik, and Istanbul, but improved throughout the eastern part (Figure). As a result, aggregate JQI scores remained relatively constant while regional scores of job quality somewhat converged.

Figure 14: Changes in job quality, 2014-2016



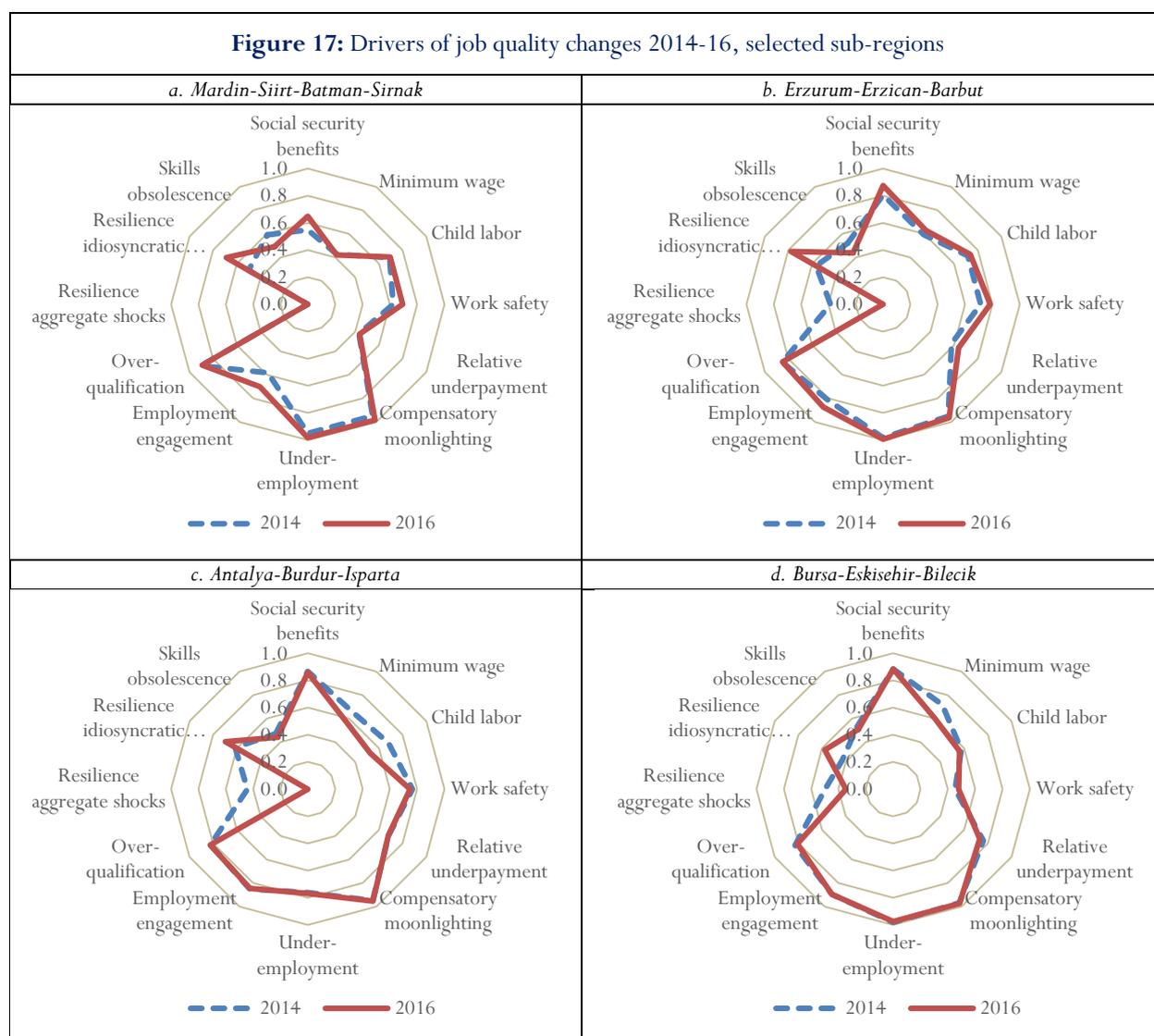
Source: Authors' calculations based on LFS data.

Over the full period¹¹, 2009 through 2016, quality of wage employment improved in all but one sub-region, Van-Mus-Bitlis-Hakkari, where JQI is marginally lower in 2016 than 2009. The biggest improvements are observed in Gaziantep-Adiyaman-Kilis (+0.14 points) and Balikesir-Canakkale (+0.12 points). In both sub-regions, the share of wage workers, among all workers, increased considerably over the period 2009 and 2016, from 65 to 77 percent in Gaziantep-Adiyaman-Kilis, and 51 to 63 percent in Balikesir-Canakkale, suggesting that a growing share of local workers benefited from the quality improvements (Figure 15).

¹¹ We note that comparability over time is limited due to the structural break in the LFS series in 2014 and the modified calculations of the resilience to aggregate shocks indicator for the years 2014-16.

Aggregate job quality among wage workers is highest in Ankara with limited change in score or rank since the start of 2014. Having the largest share of formal jobs and high standards regarding minimum wage compliance and employment engagement (or contracts) contribute to high and improving levels of job quality. But among those sub-regions that saw the largest increase in the latest period, 2014-2016, both Mardin-Siirt-Batman-Sirnak and Erzurum-Erzican-Barbut saw increases in JQI among wage workers. Improvements in Mardin-Siirt-Batman-Sirnak are driven by more formalization, better resilience by workers to idiosyncratic shocks and slightly better work safety. In the case of Erzurum-Erzican-Barbut, there have been slight improvements in formalization among wage workers and work safety. Interestingly, there has been improvements in resilience to idiosyncratic shocks such as being dismissed due to illness, but a clear deterioration in aggregate shocks or macro shocks that affect large segments of the workforce.

There have been declines in JQI in Antalya-Burdur-Isparta over the last few years; declines are driven by decreasing compliance with minimum wage and higher incidence of child labor in those provinces. There has also been a drastic reduction in resilience of workers to generalized shocks in the economy. In the case of Bursa-Eskisehir-Bilecik, the decline in JQI is largely a result of decreased compliance with minimum wage, with other factors playing a role but to a lesser extent.

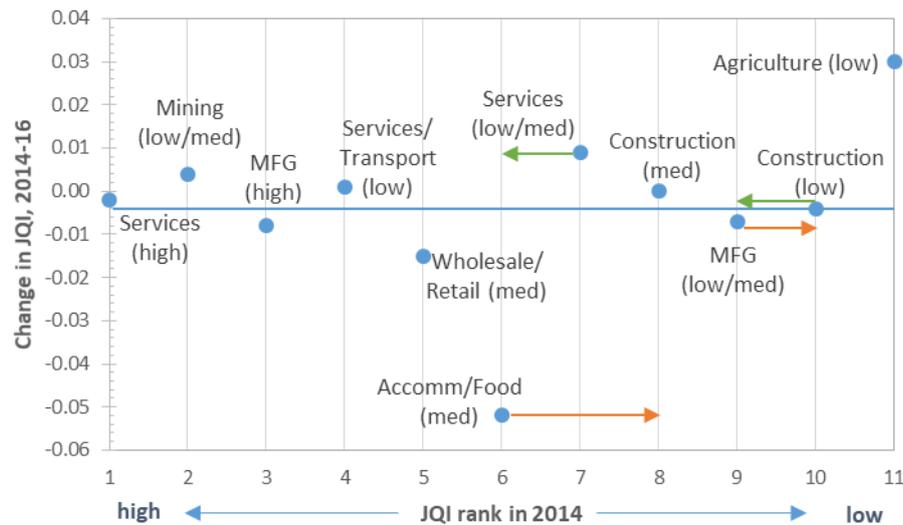


Notes: Performance on 12 job quality components in 2014 (dashed blue line) and 2016 (solid red line) are shown. Training was excluded from the graphs to keep the picture clear.
 Source: Authors' calculations based on LFS data.

Job quality changes by economic sector

In the period between 2014 and 2016, the quality of wage employment declined across the entire manufacturing sector (low/medium value added, and high value added sub-sectors), wholesale and retail sub-sectors, medium value-added accommodations and food, high value added services and low value-added construction. This pattern differs from the previous period (2009-2013) when most sectors realized above-average improvements. This indicates that jobs in critical segments of the Turkish labor market are declining in quality over time. But as in the previous period of analysis, differences across industries are still relatively large, resulting in only few rank order changes. (Figure).

Figure 18: Key sectors with medium levels of productivity decreased in job quality, 2014-16



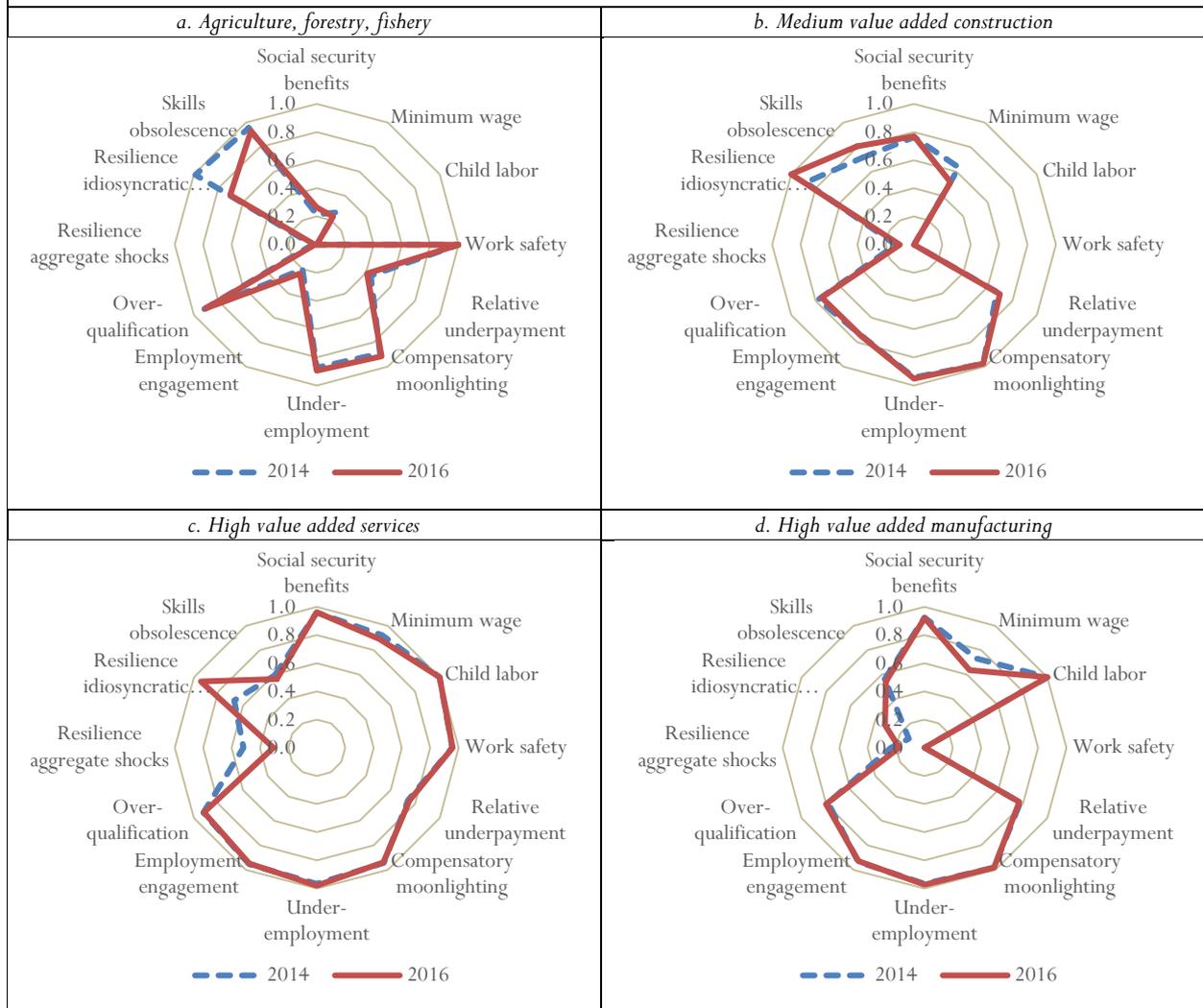
Notes: The blue horizontal line shows the average change in job quality by main economic sector between 2014 and 2016. The industry's productivity level is shown in brackets. In case of rank order changes, arrows indicate the sector's rank in 2016.

Source: Authors' calculations based on LFS data.

Turkey's high productivity industries created about 900,000 formal jobs between 2010 and 2013. Since 2014, high value-added sectors generated almost 650,000 formal jobs. In both periods, about 80 percent of job creation happened in high value-added services. Wage employment in this sector is of very high quality: in many of the job quality dimensions, most jobs fulfil the criteria that make a good job. There is room for improvement in terms of relative underpayment as about one in four jobs was underpaid relative to the jobholder's peer group in 2013 (Figure 19c). Results for the period 2014-16 confirm this trend. Incidence of skills obsolescence worsened in earlier years, while recent estimates suggest that the share of at-risk jobs in high value-added services has somewhat fallen.

High value-added manufacturing is the only sector where job quality declined slightly between 2009 and 2013. More formal jobs, better employment engagement and a much improved resilience to aggregate shocks raised job quality but the positive impact on the sector-specific JQI is offset by more jobs being vulnerable to individual shocks and higher risk of skills obsolescence. Job quality is dampened further since in 2013 the estimate of child labor is above the threshold (Figure 19d). Looking at estimates in 2016, high productivity manufacturing jobs continue to be of good quality, ranking third after high value-added services and mining, yet the sector's work environment is hazardous and many workers remain vulnerable to aggregate and individual shocks.

Figure 19: Drivers of job quality changes 2014-16, selected sectors



Notes: Performance on 12 job quality components in 2014 (dashed blue line) and 2016 (solid red line) are shown. Training was excluded from the graphs to keep the picture clear.
 Source: Authors' calculations based on LFS data.

Looking at the full period, from 2009 to 2016, it is clear that job quality improved in most sectors. There have been relatively large improvements in low and medium productivity sectors; some of the lower value added sectors saw a clear catch-up process. The main drivers of JQI increases are related to increased formalization and broadened utilization of temporary forms of work instead of informal work. For example, a low value added sector such as construction has seen significant improvements in formalization. The share of workers in this economic sub-sector contributing to social security increased from 38 to 63 percent over this period of time.

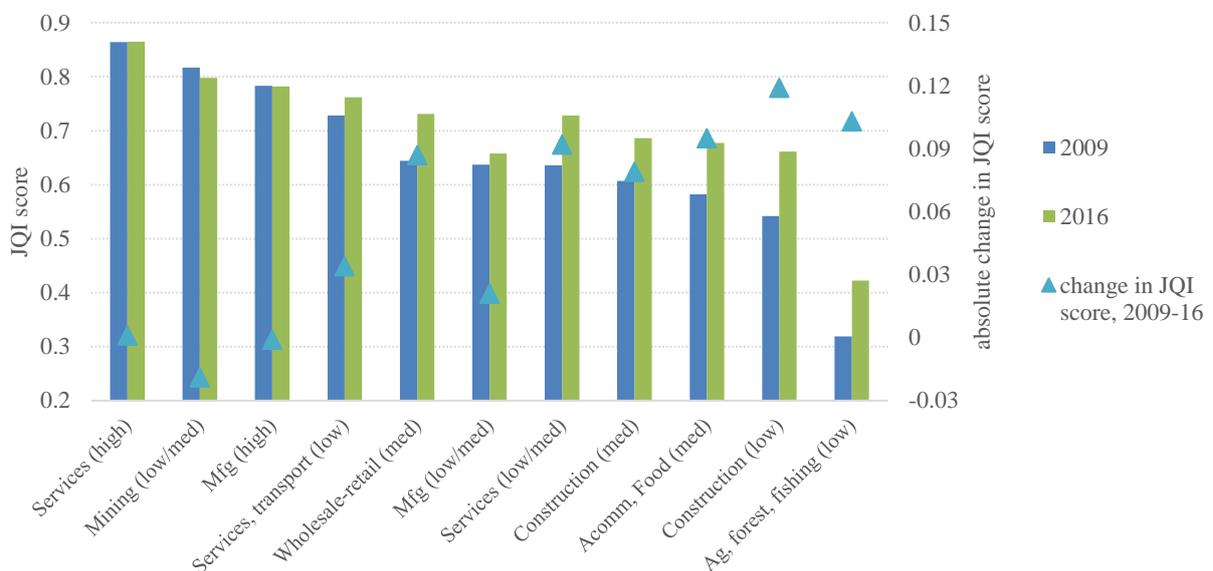
Job quality remains largely the same in 2009 and 2016 in high productivity sectors; namely in high value added services and high value added manufacturing. These sectors had relatively high scores in 2009 and saw slight increases over the full period, with some ups and downs year-on-year. Jobs in these sectors were mostly formal, well paid, resilient to most shocks and offered opportunities for growth. Given already relatively high levels of JQI in these sectors of the economy, the challenge for the government is not to necessarily to raise their score but rather to facilitate the ability of these sectors to keep offering high quality

jobs and to catalyze job creation in these sectors to increase the availability of high quality jobs for more workers over time.

The mining sector is the only sector that saw a decline in the JQI, by 0.02 points, over the full period. The sector had a relatively high JQI in 2009, however, it experienced a decline in terms of resilience to idiosyncratic shocks for workers which negatively affected the quality of jobs in the latter periods. With the exception of wage workers in agriculture (most are non-wage workers), all sectors realized a decline in minimum wage compliance between 2009 and 2016, but the main reason is the steep decline in minimum wage compliance between 2015 and 16, the year when the minimum wage was raised by 30 percent.

The largest decline in compliance with minimum wage observed over the full period is in the low/medium value added manufacturing sub-sector, where the share of good jobs declined from 53 to 43 percent from 2009 to 2016. But most of the non-compliance is observed in the latest period. Among wage workers in agriculture, there was a small increase in compliance of the minimum wage rate observed, from 20 to 23 percent between 2009 and 2016.

Figure 20: Trends in job quality by economic sector, wage workers



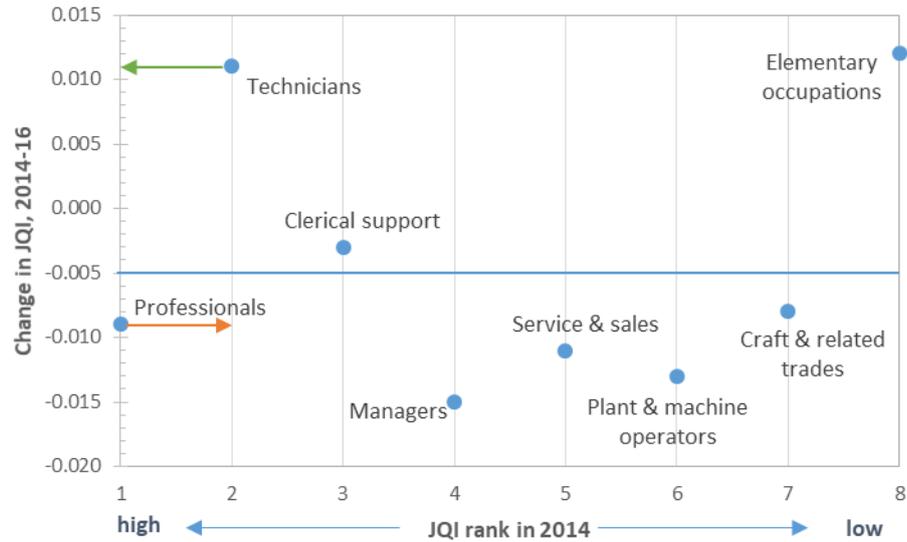
Source: Authors' calculations based on LFS data.

Job quality changes by major group of occupation¹²

Workers classified as professionals continue to have a high job quality score, though they have seen a slight decline in job quality in the last years, from 2014 to 2016. Both technicians and elementary occupation workers have seen increases in their quality of jobs score in the last years. However, in the case of elementary workers, their score remains at the bottom of the ranking scale of all occupations. All other occupations saw a decline in their scores; both managers and plant-machine operators saw the sharpest decline in their scores over the last few years indicating that deterioration in job quality cuts across occupations.

¹² Skilled agricultural, forestry and fishery (ISCO-08 major group 6) workers are excluded since only a very small portion of these workers are in wage employment.

Figure 20: Most occupations decreased in job quality, 2014-16



Notes: The blue horizontal line shows the average change in job quality by ISCO-08 major group between 2014 and 2016. In case of rank order changes, arrows indicate the sector's rank in 2016. Skilled agricultural, forestry and fishery wage workers are excluded due to very low coverage.
Source: Authors' calculations based on LFS data.

Resilience to individual and aggregate shocks declined significantly for managers, thus affecting their overall score. Managers have seen an increase in their relative wages, decrease in underemployment and reduction in skills obsolescence in this recent period, albeit the change has been slight. Among professional, there is a decline in minimum wage compliance, indicating that even for some professionals, paying the minimum wage in 2016 was harder than in the previous years. There has also been a decrease in resilience to shocks of all types, and less employers have offered work related training to professional staff. However, on the positive side, professionals have seen increases in formality, wage levels, adequacy in the use of their skills and less underemployment.

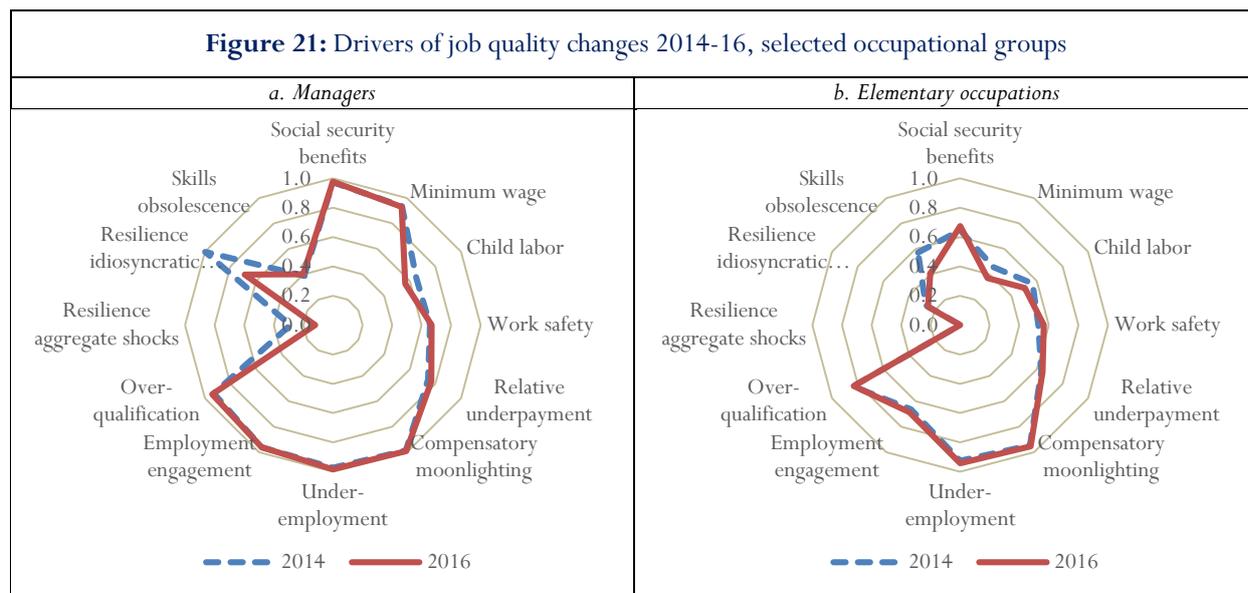
Technical and associate professional staff have seen various notable improvements in job quality in the last years. Such a positive change in technical occupations is worth highlighting to prospective students who need to decide between entering university or following a technical vocational education. This finding is also consistent with the trend observed in economically dynamic developing and developed countries. Technical occupations have experienced an increase in formalization and improvements in terms of resilience to idiosyncratic shocks, work safety and the utilization of their skills. They have also seen increases in relative wages among this category in the last years, indicating an increased value in the labor market for people in technical occupations. But there is still a non-negligible share of workers in this occupational category that earns below the minimum wage, indicating that not all technical occupations are valued in the economy.

Clerical workers have seen a decline in permanent formal contracts and an increase in the use of temporary formal contracts. Both clerical workers and service-sales workers have seen an increased vulnerability to aggregate shocks, and in the number of jobs they have at one time in order to earn sufficient income to sustain their livelihood. From what is observed in developed economies, it is clear that both of these categories of workers are more likely to become obsolete in rapidly evolving labor markets, and these workers will need to transition to jobs that are less likely to disappear in the near future.

Among elementary occupations, there is a slight increase in formalization, however there is a measurable decline in compliance with minimum wage among these workers indicating that despite More jobs with social security contributions, it is not possible for employers to pay the minimum wage to low skill level workers

engaged in elementary tasks. In the case of craft and related trades, there have been meaningful declines in two important dimensions: wage levels and compliance with minimum wages, and the incidence of child labor. Those are two important dimensions for a category that encompasses over 15 percent of the workforce and that is vulnerable to being classified as working poor.

In terms of formalization, plant, machinery operators and assemblers have seen a decline in formalization in the last years. Unlike other occupational categories, which have increased their incidence of formality, workers employed in factories (likely in the manufacturing sector) have seen a decline in formalization, minimum wage compliance, wage levels and incidence of child labor. Such negative trends are more common in some economic sub-sectors of the economy than others, but they negatively affect the scores observed in the manufacturing sector as a whole.



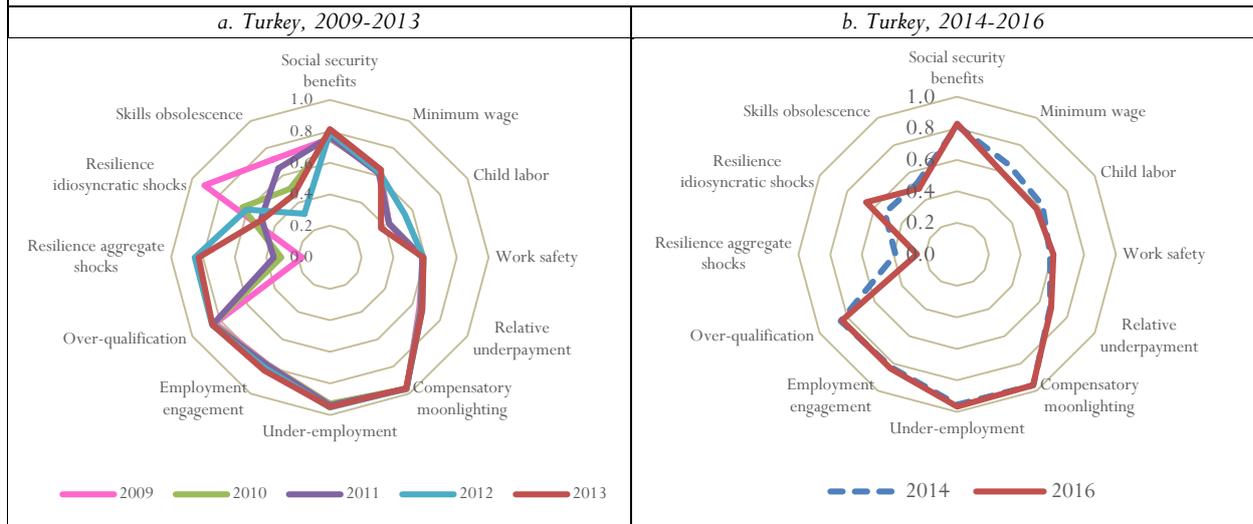
Notes: Performance on 12 job quality components in 2014 (dashed blue line) and 2016 (solid red line) are shown. Training was excluded from the graphs to keep the picture clear.
 Source: Authors' calculations based on LFS data.

Job quality changes at the national level

Underlying the improvements in aggregate job quality between 2009-13 was steady progress in many job quality components. The number of wage jobs with social security benefits grew substantially, employment engagement and relative underpayment improved. Also, employment resilience after the global financial crisis was regained, with 83 percent of all wage jobs meeting the relevant good job criterion in 2013. Per hour minimum wage compliance improved marginally, as did the measures of underemployment and overqualification. Then again, wage workers became more vulnerable to idiosyncratic shocks and skills obsolescence, and the sector-specific measure of child labor deteriorated considerably (Figure a).

Between 2014 and 2016, job quality has been relatively constant at the aggregate level – largely a result of offsetting trends at the individual component level. The positive effects of an increasing share of formal wage jobs, safer working conditions, and improved resilience to individual shocks are equalized by reduced minimum wage compliance, more child labor, and more jobs being vulnerable to aggregate shocks such as the increased influx of refugees, especially SuTP (Figure b).

Figure 22: Drivers of job quality changes, national level



Notes: Performance on 12 job quality components are shown. Training was excluded from the graphs to keep the picture clear. Reported values of work-related training are very low (less than 2 percent) in all years.

Source: Authors' calculations based on LFS data.

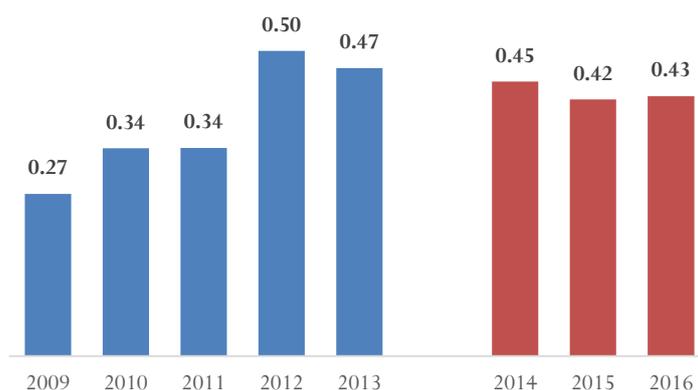
3.4 JQI for all workers

In 2016, about 20 percent of Turkey's workers were engaged in subsistence agriculture and informal small-scale self-employment. Regionally, the share of informal non-wage work can be as high as 55 percent. Since income from these activities is not reported in the LFS, a substantial proportion of workers is excluded from the job quality estimates that so far only included wage employment. Consequently, the picture of the quality of employment described so far is incomplete. This section presents the *JQI for all workers*, including self-employed, subsistence farmers, and unpaid family workers. The *JQI for all workers* is based on 9 components, excluding components that rely on wage information.¹³ This way, it is possible to estimate the quality of jobs in dimensions that are common to all workers.

The impact of including mainly informal work opportunities such as subsistence farming or low-productivity self-employment on job quality is clear: job quality for all workers is significantly below the estimates of job quality among wage workers. Between 2009 and 2013, the *JQI for all workers* improved substantially from 0.27 to 0.47. Results for 2014 and beyond, which are based on the new sampling framework for data collection and adjusted calculations for the resilience to aggregate shocks component, suggest that job quality for all workers was 0.45 in 2014 and declined slightly in the following years (Figure 23).

¹³ Excluded components are: minimum wage compliance, relative underpayment, compensatory moonlighting and employment engagement, which uses information on the employment contract. The remaining 9 components are aggregated using PCA. Annex E provides the corresponding summary statistics on job quality components by type of job.

Figure 23: Job quality for all workers improved between 2009 and 2013, remained relatively constant since 2014



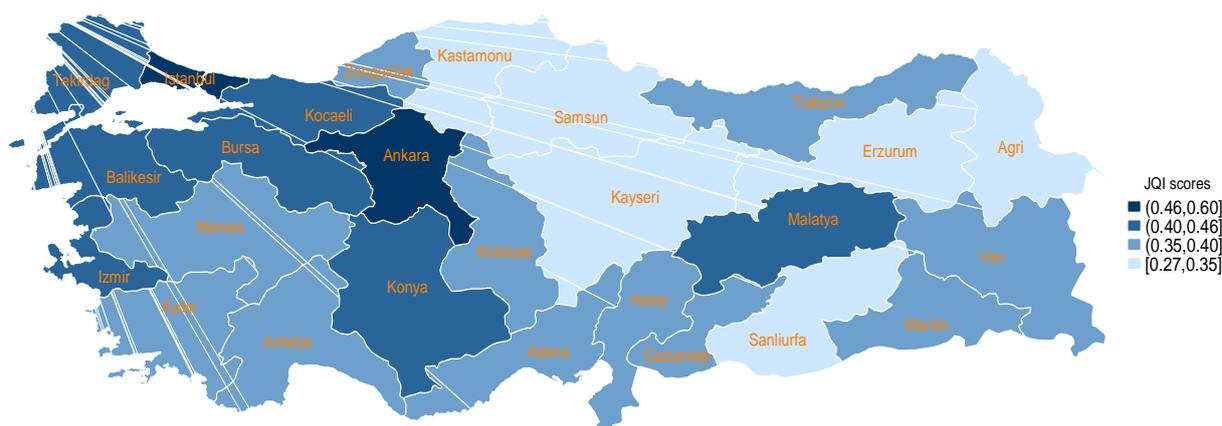
Notes: Results are comparable for years 2009-2013 and 2014-2016.

Source: Authors' calculations based on LFS data.

In 2016 average job quality for all workers reached 0.43, with important differences by type of job. Workers in formal wage jobs enjoyed the highest score of 0.51, followed by temporary wage workers with a score of 0.46. Jobs created by formal entrepreneurs (including self-employed) reach a score of 0.40, and informal wage workers obtain a score of 0.34. Job quality of other informal jobs, including subsistence farmers and unpaid family workers, reach a score of 0.24. As 2 out of 3 of these jobs are in agriculture – a sector where child labor is more common – average job quality is particularly low.

Sub-national estimates of job quality show important regional disparities (Figure 24). When all workers are included, the quality of employment continues to be substantially lower in the eastern part of the country. JQI estimates are lowest in sub-regions Agri-Kars-Ardahan-Igdir, Kastamonu-Sinop-Cankiri, Samsun-Amasya-Tokat-Corum, Erzurum-Erzican-Barbut, and Sanliurfa-Diyarbakir, with scores below 0.35. Workers in Ankara have on average the highest job quality by far (score of 0.60), followed by workers in Istanbul (0.52).

Figure 24: Sub-regional estimates of job quality for all workers, 2016



Source: Authors' calculations based on LFS data.

Looking at trends over time, between 2009 and 2013 job quality improved substantially everywhere, the main driver being increased formalization of Turkey's labor market. Lagging sub-regions in the eastern part could register above-average improvements and inequality in job quality declined when all workers are included.

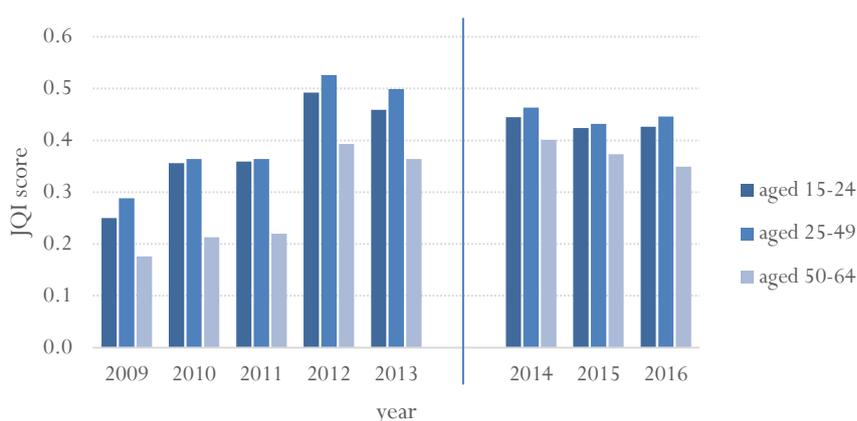
The aggregate trend of declining job quality since 2014 is largely mirrored at the sub-national level. Quality declines in 15 sub-regions, with the largest drop happening in Kastamonu-Sinop-Cankiri and Samsun-Amasya-Tokat-Corum where local jobs have become particularly vulnerable to aggregate and idiosyncratic shocks. Job quality improved in 7 sub-regions, with the strongest improvements observed in Malatya-Tunceli-Elazig-Bingol and Mardin-Siirt-Batman-Sirnak thanks to an above-average change in formalization (Annex E).

The calculation of job quality for all workers also allows to examine the quality of jobs created by entrepreneurs. The data distinguish between employers and self-employed who can be active in the formal or informal economy. Informal self-employment is most common, accounting for 46 percent of all entrepreneurs. The share of formally self-employed is 32 percent; 19 percent are formal employers and 3 percent are informal employers. In 2016, jobs created by *formal employers* reach a JQI score of 0.50. Almost one third of these jobs are in the wholesale/retail sector and 14 percent are in low/medium value added manufacturing. Less than 3 percent are in agriculture. Jobs created by *informal employers* are of lower quality, reaching an average score of 0.37 in 2016. Most of these jobs are also in wholesale/retail (26 percent), and one in ten are in agriculture.

Average job quality of *formal self-employment* is 0.40 in 2016. The majority of these jobs are of low productivity: more than one third are in agriculture, 25 percent in wholesale/retail and 10 percent are in low value added services. As to *informal self-employment*, average job quality is lowest with a score of 0.23. The share of low productivity agricultural jobs registers 51 percent and about 14 percent of these work opportunities are in wholesale/retail. Notably, the share of women is highest for this category of entrepreneurship, reaching 24 percent.

To provide more insights as to who among all workers fares relatively better, job quality estimates are presented for selected sub-groups of workers. Prime-age workers hold jobs that on average are of higher quality, matching the results obtained for wage workers. However, when all workers are considered, it is the older age groups (50-64 years old) that consistently achieve the lowest scores. Younger workers enjoy job quality levels that are closer to those of prime-age workers, especially in the years after the global financial crisis, but the gap started widening again in 2012 (Figure 25).

Figure 25: Job quality among all workers by age group



Notes: Results are comparable for years 2009-2013 and 2014-2016.

Source: Authors' calculations based on LFS data.

Looking at the gender quality gap, important differences emerge between JQI for wage employment and JQI for all workers. In the early years, job quality estimates for men are consistently higher than those for women

when including all workers, whereas the gender gap was negligible for wage workers. Since 2014 the gender gap among all workers is negative, suggesting that on average women enjoy slightly better job quality than men (Figure 26).

Figure 26: Job quality among all workers by gender

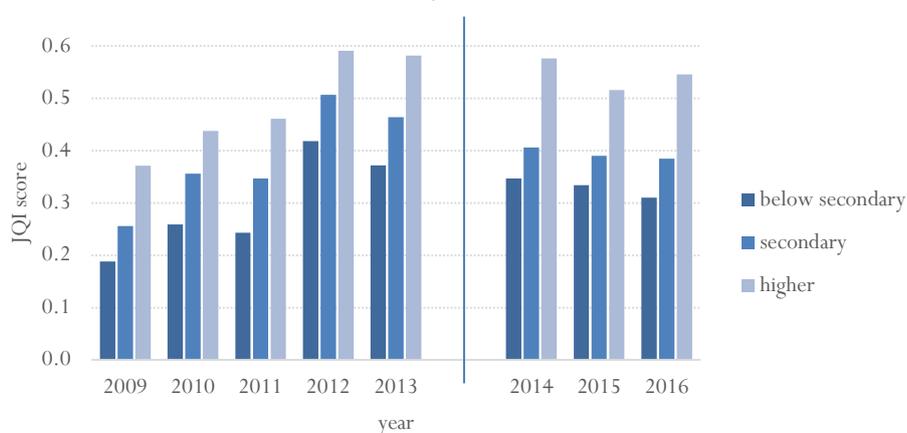


Notes: Results are comparable for years 2009-2013 and 2014-2016.

Source: Authors' calculations based on LFS data.

Similarly, job quality differences by workers' level of education are more pronounced when including a range of informal work opportunities. As expected, job quality scores are highest for workers who completed higher education and lowest for workers with less than secondary education. Still, job quality improved for all education groups until 2013. Distinct quality differences are also found in recent years, but job quality declined somewhat for each education level (Figure).

Figure 26: Job quality among all workers by level of education



Notes: Results are comparable for years 2009-2013 and 2014-2016.

Source: Authors' calculations based on LFS data.

4. Latent factors of good jobs creation

So far, PCA is used to weight and aggregate individual job quality components and build a composite index of job quality. PCA also allows to examine the structure of the underlying data in more detail. In particular, inspecting the principal components can be informative and allows to identify common – or latent – factors that are captured by several variables. In the case of the aggregate job quality index, PCA groups together job quality components that impact the creation of good jobs in a similar way. In other words, PCA helps in identifying the latent factors of good jobs creation. Having a better understanding which job quality components go together and could possibly reinforce each other will help in designing effective policies to promote the creation of good jobs.

The analysis identifies four relevant latent factors (Table 9).¹⁴ *Social security benefits* and *employment engagement* strongly correlate with latent factor **Formality**. The two components vary together and influence job quality in a similar way. If one component improves, the other will also improve. Rigid forms of employment limit the ability of employers to react to changing labor markets (namely peaks and troughs in demand). Non-wage costs affect the cost of employment directly. Evidence for Turkey shows that high non-wage costs (high labor tax) create a burden on employers and slow down employment creation in the formal sector, while encouraging informality (OECD, 2007; World Bank, 2006; Ayhan, 2013).

Table 9: Latent factors of good job creation

Formality	Adaptability of Skills and Resilience	Wage	Safety and Protection
social security benefits	skills obsolescence	minimum wage compliance	work safety
employment engagement	resilience to aggregate shocks	relative underpayment	child labor
			resilience to idiosyncratic shocks

Notes: Components in bold have correlation values of at least 0.6, for others it is between 0.3 and 0.5. See also Annex B.

The strong association between *skills obsolescence* and *resilience to aggregate shocks* suggest that aspects around **Adaptability of Skills and Employment Resilience** matter jointly for good job creation. Workers that do not adapt to changing demands for skills are at risk of losing their jobs and will face difficulties in finding productive employment. Adaptability to changing economic conditions, be it short-term impacts of a crisis or long-term challenges related to structural transformation, stems largely from acquiring malleable skills which can be applied to distinct tasks and occupations and which are useful across economic sectors.

Achieving employment resilience to external shocks such as the global financial crisis requires the implementation of macro-prudential regulations that ensure that Turkey's financial sector is not unduly exposed to irregular financial transactions. Financial contagion tends to indirectly impact the real economy: an increase in non-performing loans is likely to result in tighter credit conditions, particularly for small and medium-sized enterprises. Negative effects on the real economy can decelerate formal sector job creation and push workers into informal or short term temporary contract work. Similarly, the increased inflow of refugees in Turkey has direct effects on employment patterns. Economic theory predicts that large influxes of people can slow down or lower wages and displace locals from various employment. In Turkey most of the negative effects on locals is felt among informally employed workers. More specifically, the inflow of informally employed Syrian refugees led to large-scale displacement of Turkish workers out of informality, around 6 natives for every 10 refugees. The vast majority of the displacement occurred among informally

¹⁴ For more information on the analysis, see Annex B. The analysis was performed separately for years 2009-13 and 2014-16. For each period, PCA identified the same set of latent factors of good job creation with only marginal differences in the correlation between individual variables and rotated components.

employed Turkish workers. With a particularly negative effect on job losses among informally employed Turkish workers, mainly women, with less than secondary education levels, who exit the labor force (into education or idleness) or become unemployed. But there were some positive impacts observed among formally employed male workers with low or medium education levels. In fact, there is some occupational upgrading among Turkish male workers, from informal to formal employment as a result of the influx of refugees.

During the global financial crisis, active labor market policies (training/upskilling), agreements to retain workers at reduced work hours, and supporting small and medium-sized firms in accessing credit have proven to be successful measures to mitigate the adverse impacts of aggregate shocks on employment.

The government of Turkey recognized the importance of providing refugees the opportunity to work formally in Turkey; part of the impetus was to help refugees integrate better into the economy but also to prevent further informality in the Turkish labor market. As such, it passed the necessary legislation to allow employers to apply for formal work permits for refugees in January 2016. But to prevent displacement of Turkish workers from formal employment, the work permit system imposes some restrictions—for example, sectoral limitations, and quotas to ensure that no more than 10 percent of the workforce in a firm is foreign—on the issuance of permits. There are also various active labor market programs that subsidize wages of Turkish workers and incentivize employers to recruit and retain Turkish workers in formal employment.

Wage-related aspects of job quality form another latent factor of good job creation called **Wage**. Improving compliance with the minimum wage in per hour terms also helps reducing the share of wage workers that – compared to their peer group – is underpaid. Wages affect the cost of formal employment directly. However, minimum wages cannot be deemed too high or too low on their own, instead, they should be measured relative to worker productivity in order for the level to be appropriately assessed.

Aspects of **Safety and Protection** describe a fourth area of good job creation. Improving work safety, enforcing child labor laws and strengthening workers' resilience to individual shocks are critical measures to generating safe jobs that can also protect workers. Weak enhancement of labor regulation, high employment costs and persistent informality in the labor market are all contributing factors to relatively high levels of work related accidents and injuries (especially in metal, mining and construction), and the persistent utilization of children in work for hire (especially in agriculture). The working conditions in many occupations in Turkey involve distinct and severe hazards to worker health which reduces wellbeing, working capacity and even the lifespan of individuals. Some of these trends probably intensified with the recent influx of asylum seekers in the country, many of them children that are active in the informal economy.

5. Summary and suggested next steps

The past years Turkey did well in creating more and better jobs, but in 2016, economic growth was a moderate 3.2 percent, resulting in a meaningful decline in net job creation than previous years. Between 2014 and 2016, around 650,000 formal jobs were created in high value-added services such as education, health services, or public administration, and high value-added manufacturing. Yet, almost 50 percent of net job creation in the formal economy occurred in sectors with low or medium levels of productivity. And the rate of wage employment creation was too slow to absorb all job seekers, resulting in significant increases in unemployment. Interestingly, job quality among wage workers improved on average; but large quality differences persist between the formal and informal sector, between different groups of workers and across regions.

Since there is a positive correlation between economic growth and job quality, there is no reason to expect a decline in the average national JQI for wage workers in 2017¹⁵. However, since part of the growth stems from fiscal stimulus programs, there is a risk that these programs may not be sustained and growth may be negatively affected. Therefore, to ensure sustainable improvements to job quality in Turkey, it will be important to continue to emphasize structural reforms that promote increased formalization of the economy since ‘formality’ is the most critical component in the job quality index. In other words, to promote the creation of good jobs, especially in medium and high value added sectors, it will be important to begin addressing key structural constraints that weaken the efficient functioning of the formal labor market. Reducing the costs of employment and doing business, complying with tax and labor regulation, improving access to finance, promoting entrepreneurship and introducing or enhancing incentive schemes for job creation and retention in strategic sectors should be at the core of the structural reform process. Limited emphasis in the formal education system to promote entrepreneurship also hinder people from innovating and pursuing entrepreneurial endeavors and ultimately creating quality employment opportunities.

It is also important to note that there are substantial differences in job quality between wage and non-wage workers. Non-wage workers are largely engaged in subsistence farming, informal small-scale self-employment and low-productivity self-employment. These workers exhibit the lowest levels of job quality, significantly below the estimates of job quality among wage workers. In fact, there have even been reversals in average job quality in the last years, partly because many of these people are engaged in labor activities in sectors where labor regulation has very limited reach, and the incidence of child labor is on the rise and resilience to various shocks is low.

Apart from these structural changes in the economy, labor market, education and social sectors more broadly, it will be important to continue monitoring the quality of jobs across the Turkish economy in order to identify policy areas that need reform and targeted activities to improve overall working conditions. By continuing to use the JQI, the government will be able to know how distinct occupations evolve in terms of quality, across economic sectors and regions, and how labor market conditions evolve for all (wage and non-wage) workers. For instance, it is clear from the analysis that there is regional divergence not only in terms of employment patterns (number of jobs) but also in the types of jobs (quality) available. Such dissimilar patterns highlight that there are clear local challenges that require local solutions. Thus, continuous monitoring of the quality of jobs can help to understand the impact of local policies, and help to identify policies that may hinder the creation of good jobs in some regions.

¹⁵ Economic growth has been higher (5.1 percent year-on-year) in the first half of 2017, growth has been supported by substantial fiscal stimulus, private consumption and net exports. The third quarter figures also suggest a strong economic activity due to the base effect and strong domestic demand.

Lastly, previous experience in Turkey, suggests that if the country implements prudent economic and labor market policies that help to activate, retain and retrain Turkey's workers, ease formal employment creation, and put forth worker (not job) protections, more quality jobs can be created. International evidence supports the need for a comprehensive and planned approach. It shows that when job creation measures are taken while being accompanied by measures that aim to eliminate structural bottlenecks, the synergies obtained catalyze formal job creation.¹⁶ A next step to this analysis is to outline a set of concrete policy measures to help Turkey to continue along the path of creating more and better jobs.

¹⁶ Scarpetta, S. et al. (2016): Measuring the quality of jobs in OECD countries. <http://voxeu.org/article/measuring-quality-jobs-oecd-countries>

References

- Achor, S. (2012): Positive Intelligence, Harvard Business Review
- EU (2008): Employment in Europe 2008. European Commission, DG Employment, Social Affairs and Equal Opportunities, Publications Office of the European Union, Luxembourg.
- Eurofound (2015): Convergence and divergence of job quality in Europe 1995–2010, Publications Office of the European Union, Luxembourg.
- Eurofound (2012): Trends in job quality in Europe, Publications Office of the European Union, Luxembourg.
- Green, F. (2007): Demanding Work: The Paradox of Job Quality in the Affluent Economy. IMF (2015): World Economic Outlook, October 2015.
- Kolenikov, Angeles (2009): Socioeconomic status measurement with discrete proxy variables: Is principal component analysis a reliable answer?, Review of Income and Wealth, Vol 55(1).
- Leschke, Watt (2008): Job quality in Europe. European Trade Union Institute for Research, Education and Health and Safety, WP 2008.07.
- Leschke, Watt, Finn (2012): Job quality in the crisis – an update of the JQI. European Trade Union Institute for Research, Education and Health and Safety, WP 2012.07.
- Leschke, Watt, Finn (2008): Putting a number on job quality? Constructing a European Job Quality Index. European Trade Union Institute for Research, Education and Health and Safety, WP 2008.03.
- Lyubomirsky, King, Diener (2005): The benefits of frequent positive affect: Does happiness lead to success?, Psychological Bulletin, Vol 131(6)
- OECD (2015a): McGowan, A. M., and D. Andrews. Labour Market Mismatch and Labour Productivity: Evidence from PIAAC Data. OECD Economics Department Working Paper No. 1209, 2015.
- OECD (2015): OECD Employment Outlook 2015. OECD Publishing.
http://dx.doi.org/10.1787/empl_outlook-2015-en
- OECD (2014): OECD Employment Outlook 2014, OECD Publishing.
http://dx.doi.org/10.1787/empl_outlook-2014-en
- OECD (2008): Handbook on constructing composite indicators. Methodology and user guide.
- Oswald et al. (2015): Happiness and productivity, Journal of Labor Economics, Vol 33(4)
- Saisana, Tarantola (2002): State-of-the-art report on current methodologies and practices for composite indicator development, EUR 20408 EN, European Commission-JRC: Italy.
- Scarpetta, S. et al. (2016): Measuring the quality of jobs in OECD countries.
<http://voxeu.org/article/measuring-quality-jobs-oecd-countries>

Turkstat (2016): Labour Force Statistics, November 2015, Press Release No. 21576, 15 February 2016.

Turkstat (2013): Accidents at work and work-related health problems research results.

World Bank (2016): Labor market patterns in Turkey: overview of supply and demand side issues. Draft for comments.

World Bank (2015): Regional labor market dynamics in Turkey. Draft for comments.

World Bank (2014): Turkey's Transitions: Integration, Inclusion, Institutions

Annex A: Methodology behind the JQI

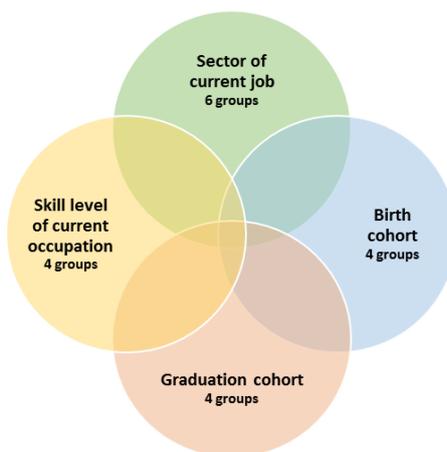
Comparison of individual job characteristic with a normative threshold

Some of the JQI components probe basic job features against a normative threshold. For example, is the worker's job registered with the social security institution? Does the hourly wage comply with the statutory minimum wage? Did the worker participate in work-related training in the past 4 weeks? If the component-specific good job criterion was met, the worker receives score one for good job or else score zero is assigned, indicating that - regarding the relevant component - the current job is of low quality.

Comparison of individual job characteristic with a cell-based threshold

Comparing the worker's individual characteristics to a threshold that is derived from the average job characteristics of workers in the same peer group facilitates a relative approach to measuring job quality. Cells of comparable workers, i.e. the worker's peer group, are created. Two relative measures of job quality are included in the index: *relative underpayment* and *overqualification*. In the case of *overqualification* the worker's peer group comprises all workers that belong to the same sector-occupation-birth cohort-graduation cohort cell.¹⁷ To determine whether the worker is overqualified, his education level is compared to the education level of the median worker in the relevant cell. In case the worker's education is higher than the education of the median worker, he is considered being overqualified for his current job and receives score zero. A similar approach is followed for *relative underpayment*, with each worker's peer group being created using the following 4 dimensions: sector of current job (6 groups), occupational skill level (4 groups), education (3 groups) and potential labor market experience (in years, 4 groups).

Figure A1: Constructing cells of comparable workers to measure overqualification



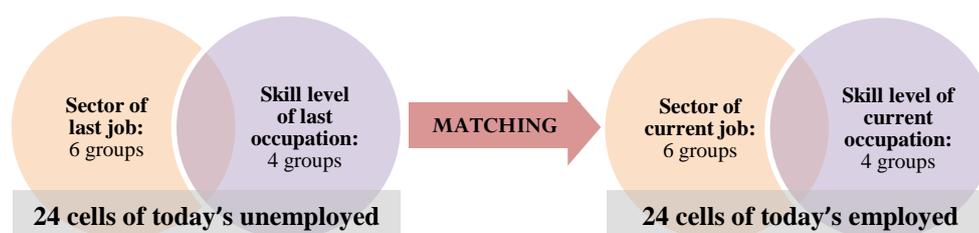
Source: Authors' illustration.

¹⁷ Sectors are grouped into 6 categories (Table A2), main occupational groups are aggregated into 4 skill levels (Table A3). To better control for changes in the educational system, workers are grouped into 4 distinct groups of birth cohorts and 4 graduation cohorts, creating in 384 cells in total.

Classification based on cells of workers who had similar jobs

For three components, the assessment is based on a more aggregate level and workers are grouped into distinct cells. Components such as *resilience to idiosyncratic shocks*, *skills obsolescence*, and *resilience to aggregate shocks* exploit information of today's unemployed to assess the quality of employment of today's workers. For example, examining the main reason why people whose last job was in a specific sector-occupation cell became unemployed provides important information on the resilience of current jobs with similar characteristics (i.e. the same sector-occupation cell, see also Figure A2).¹⁸ Depending on the component, the cell-based information that is mapped from the unemployed to the employed differs.

Figure A2: Cell-based assignment: matching cells of today's workers with cells of today's unemployed



Source: Authors' illustration.

Child labor

Since job quality is estimated for workers aged between 15-64 years, the extent of inappropriate child labor cannot be directly measured at the individual level. However, using available recall information on whether today's workers aged 15 years did work in the same job one year ago, it is possible to identify sectors that have a particularly high incidence of child labor.¹⁹ In particular, for each sector the ratio of 'structural child labor' is calculated which equals the sectoral share of child labor over the economy-wide share of child labor.²⁰ The jobs of workers currently employed in sectors that have above average incidence of structural child labor are classified as low quality jobs.²¹ Most sectors are consistently above or below the threshold, but changes from high to low incidence of child labor and vice versa exist, with significant implications for aggregate job quality (Figure).

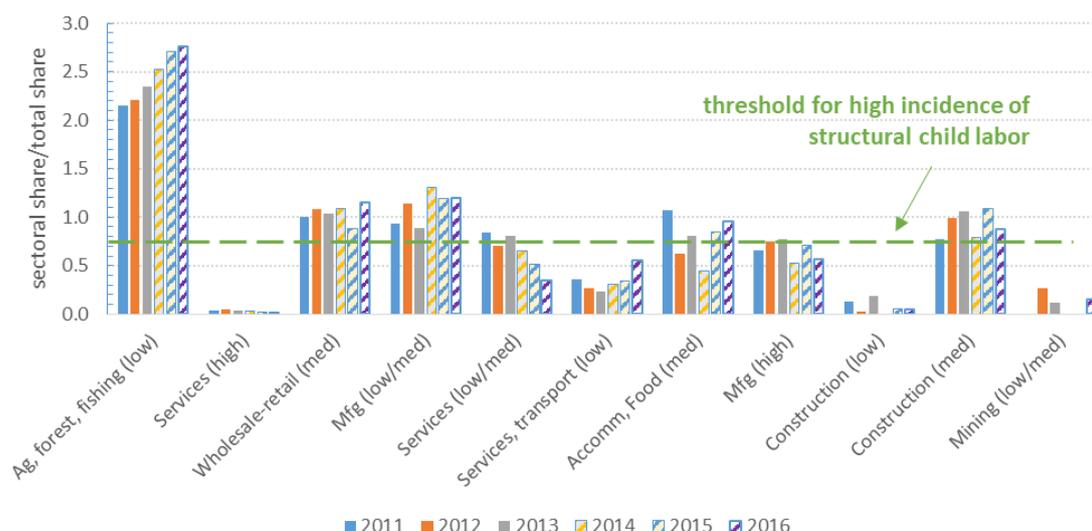
¹⁸ During 2009-2013, the underlying aggregate shock is the global financial crisis and cells are constructed as shown in Figure A2. For years 2014-16, *resilience to aggregate shocks* is measured against the increased inflow of refugees. To map the refugee numbers regionally, estimates of the indicator are based on 48 region-occupation cells, combining 12 NUTS1 regions and 4 occupation skill levels.

¹⁹ The estimates reflect a lower bound estimate of child labor since underage workers who worked in a different job are not accounted for.

²⁰ This approach allows a more differentiated view of child labor in the Turkish economy as the contribution of each sector to the overall economy is also accounted for. Sectors are classified according to their level of productivity.

²¹ Due to data limitations, the structural share of child labor could not be estimated in earlier years. Instead, sector-specific 2011 values are imputed in 2009 and 2010.

Figure A3: Incidence of structural child labor



Notes: Sectors are ranked by employment shares in 2013. The threshold of 0.7 points equals the average value of structural child labor in 2011. Results from 2014 onwards are not comparable to earlier years.
Source: Authors' calculations based on LFS data.

Work safety

Work safety utilizes the LFS 2013 ad-hoc module on accidents at work and work-related health problems. In particular, the sector-specific incidence during the past 12 months of (i) accidents at work and (ii) work-related health problems as published by Turkstat (2013) are included. To obtain estimates of work safety, the average rank across the two measures is calculated for each sector.²² Sectors that rank below the median receive score 1, as they exhibit a below-average risk of work-related accidents and health problems. The 2013 sector-specific scores of work safety are extrapolated to other years to allow work safety estimates for the years 2009-2013 and 2014-2016.

Employment engagement

Employment engagement is the only component where jobs are not rated on a binary scale. Instead, a 6-item scale is applied in order to rank jobs according to their type of contract and other job features. A good job, receiving score one, is defined as being (i) formal, (ii) permanent, and (iii) full-time or part-time by choice. At the other end of the job quality spectrum are temporary jobs without social security benefits. These jobs represent low quality employment and receive score zero. To address quality differences among formal sector jobs, scores that are between one and zero are possible, highlighting the fact that also formal jobs may lack security or may not meet the preferred number of hours spent at work (Table A1).

Table A1: Employment engagement: 6-item scale to rank quality of job

Score	Job characteristics	Share in 2016 (percent)			
		all wage jobs	formal permanent	formal temporary	informal wage

²² Results are available for 9 sector aggregates: A-Agriculture, forestry, fishing; B-Mining and quarrying; C-Manufacturing; D,E-Electricity, gas, steam and water supply, sewerage; F-Construction; G,I-Wholesale and retail trade, hotels and restaurants; H,J-Transportation, storage and communication; K-N-Finance, insurance, real estate and business services; O-U-Community, social and personal services (Turkstat, 2013).

1	social security benefits, permanent, full-time OR social security benefits, permanent, part-time by choice	76.2	99.9	-	-
0.8	social security benefits, temporary, full-time	5.0	-	85.8	-
0.6	social security benefits, permanent, part-time but prefers full-time	0.08	0.1	-	-
0.5	social security benefits, temporary, part-time by choice	0.74	-	12.7	-
0.3	social security benefits, temporary, part-time, but prefers full-time OR no social security benefits, permanent	10.6	-	1.5	58.7
0	no social security benefits, temporary	7.4	-	-	41.3

Source: Authors' calculations based on LFS 2016.

Table A2: Economic sector classification of current and last job (NACE rev. 2)

NACE rev. 2	Sector of current or last job:
A: Agriculture, forestry, fishing	A
B: Mining, quarrying	B + C + D + E
C: Manufacturing	
D: Electricity, gas, steam, AC supply	
E: Water supply; sewerage, waste management, remediation	F
F: Construction	
G: Wholesale, retail trade; repair of motor vehicles	G + H + I
H: Transportation, storage	
I: Accommodation, food service	
J: Information, communication	J + K + L + M + N
K: Financial, insurance activities	
L: Real estate activities	
M: Professional, scientific, technical activities	
N: Administrative, support service	O + P + Q + R + S + T + U
O: Public administration, defense	
P: Education	
Q: Human health, social work	
R: Arts, entertainment, recreation	
S: Other services	
T: Households as employers	
U: Extraterritorial organizations	

Table A3: Skill level of current and last occupation (Major groups of ISCO classification)

ISCO88/08	Skill level of occupation:
1: Managers	High
2: Professionals	
3: Technicians and associate professionals	Medium
4: Clerical support workers	
5: Service and sales workers	
6: Skilled agricultural, forestry and fishery workers	Low
7: Craft and related trades workers	
8: Plant and machine operators and assemblers	
9: Elementary occupations	
	Basic

Annex B: Principal component analysis – exploring and aggregating primary data

The structure of primary data that is used to build a composite index is often multicollinear, indicating that two or more of the observed variables are strongly related and may capture the same latent factor. PCA is a statistical tool to address issues of multicollinearity and to ensure that variables are suitably aggregated to form a composite index.

PCA groups individual variables into principal components according to their degree of correlation. Each component depends on a set of coefficients and each coefficient measures the correlation between the individual indicator and the principal component. Factor loadings are used to construct the weights when calculating the composite index.²³ Typically, the composite index is based on the first principal component as it contains the most information extracted from the original variables and has maximal overall variance.

To acknowledge the structural break in the LFS series, PCA analysis is performed separately for the years 2009-13 and 2014-16. For each period, PCA identifies a similar set of principal components (13 in total) with only marginal differences for the factor loadings. For further explorative analysis, only components that meet certain criteria are retained. In line with standard practice, the first five principal components are retained for the analysis of job quality as they have eigenvalues larger than one.²⁴ Together the first five principal components account for about 60 percent of total variance. Results for the period 2014-2016 are shown in Table B1.

Table B1: Principal components with eigenvalues > 1

	Component 1	Component 2	Component 3	Component 4	Component 5
Social security benefits	0.53	-0.15	-0.13	0.18	0.24
Minimum wage compliance	0.42	-0.01	0.33	-0.31	-0.23
Child labor	0.16	0.18	0.46	0.18	-0.02
Work safety	0.09	0.49	0.18	0.23	0.04
Relative underpayment	0.37	-0.10	0.16	-0.45	-0.28
Compensatory moonlighting	0.16	-0.15	-0.30	0.36	-0.11
Work-related training	0.01	0.07	0.10	-0.16	0.77
Underemployment	0.05	-0.02	-0.14	0.38	-0.39
Employment engagement	0.54	-0.16	-0.17	0.20	0.21
Overqualification	-0.06	0.05	0.28	0.39	0.04
Resilience to aggregate shocks	0.15	0.49	-0.31	-0.13	-0.05
Resilience to idiosyncratic shocks	0.13	0.50	0.16	0.14	-0.04
Skills obsolescence	-0.06	-0.38	0.51	0.22	0.02

²³ Weights are constructed by normalizing the squared factor loadings.

²⁴ Eigenvalues are the variances of the principal components. Since the analysis is conducted on standardized variables with zero mean and unit variance, components with an eigenvalue < 1 account for less variance than any of the original variables, and are excluded.

Individual variables can have high loadings on more than one principal component, as is the case for *minimum wage compliance* which has a correlation of larger than 0.3 (absolute value) in three principal components. This pattern makes it difficult to identify factors that are important to measuring job quality but are proxied by more than one variable. To improve the interpretability of the results, the retained principal components can be rotated to achieve a simpler structure of the factor loadings.²⁵

Table B2 shows the correlations between the retained principal components and the original variables after rotation for the years 2014-2016. Correlations with an absolute value larger than 0.5 are taken into consideration when determining the latent factors. Note that although component 5 is strongly correlated with work-related training and underemployment, it is not included in the main discussion of latent factors since the variance of each variable is very low. Note, that estimates obtained for period 2009-2013 are very similar and result in the same set of latent factors of good job creation.

Table B2: Correlation coefficients between rotated components and variables

	Component 1	Component 2	Component 3	Component 4	Component 5
Social security benefits	0.64	0.02	0.05	0.02	0.08
Minimum wage compliance	0.06	0.03	0.65	0.09	-0.03
Child labor	0.02	0.12	0.11	0.50	0.01
Work safety	0.00	-0.12	-0.07	0.60	0.02
Relative underpayment	0.00	-0.02	0.69	-0.09	-0.07
Compensatory moonlighting	0.36	-0.05	-0.20	-0.11	-0.26
Work-related training	0.08	0.01	-0.09	0.02	0.79
Underemployment	0.11	-0.03	-0.10	0.04	-0.49
Employment engagement	0.66	0.00	0.03	0.01	0.04
Overqualification	0.00	0.25	-0.14	0.37	-0.21
Resilience to aggregate shocks	0.02	-0.64	0.02	0.15	0.01
Resilience to idiosyncratic shocks	-0.01	-0.10	0.04	0.45	0.07
Skills obsolescence	0.02	0.70	0.02	0.07	0.04
Latent factor	Formality	Resilience and adaptability of skills	Wage	Safety and protection	—

²⁵ We transform an orthogonal rotation, using the varimax option in Stata.

Annex C: JQI for wage workers

Figure C1: Share of good jobs among wage workers by labor market type, 2009-2013 and 2014-2016

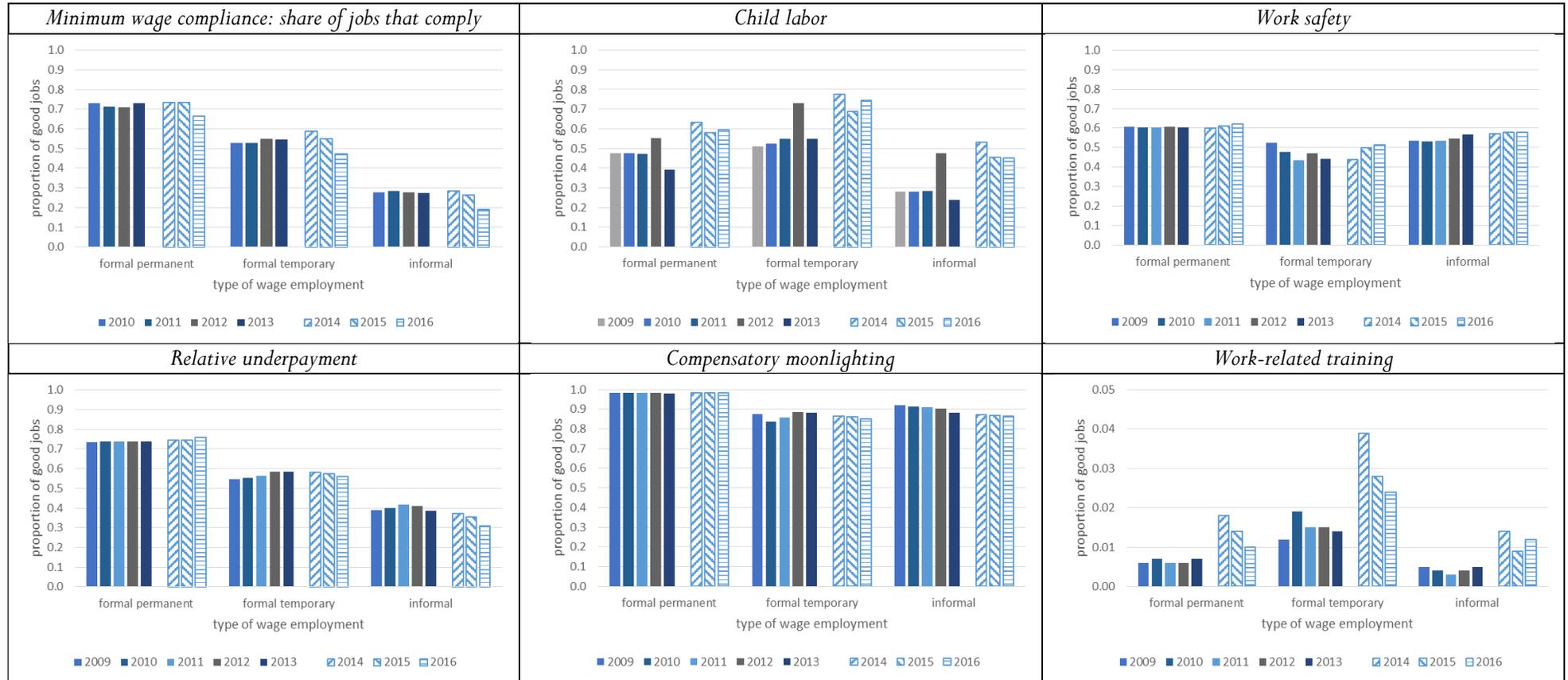
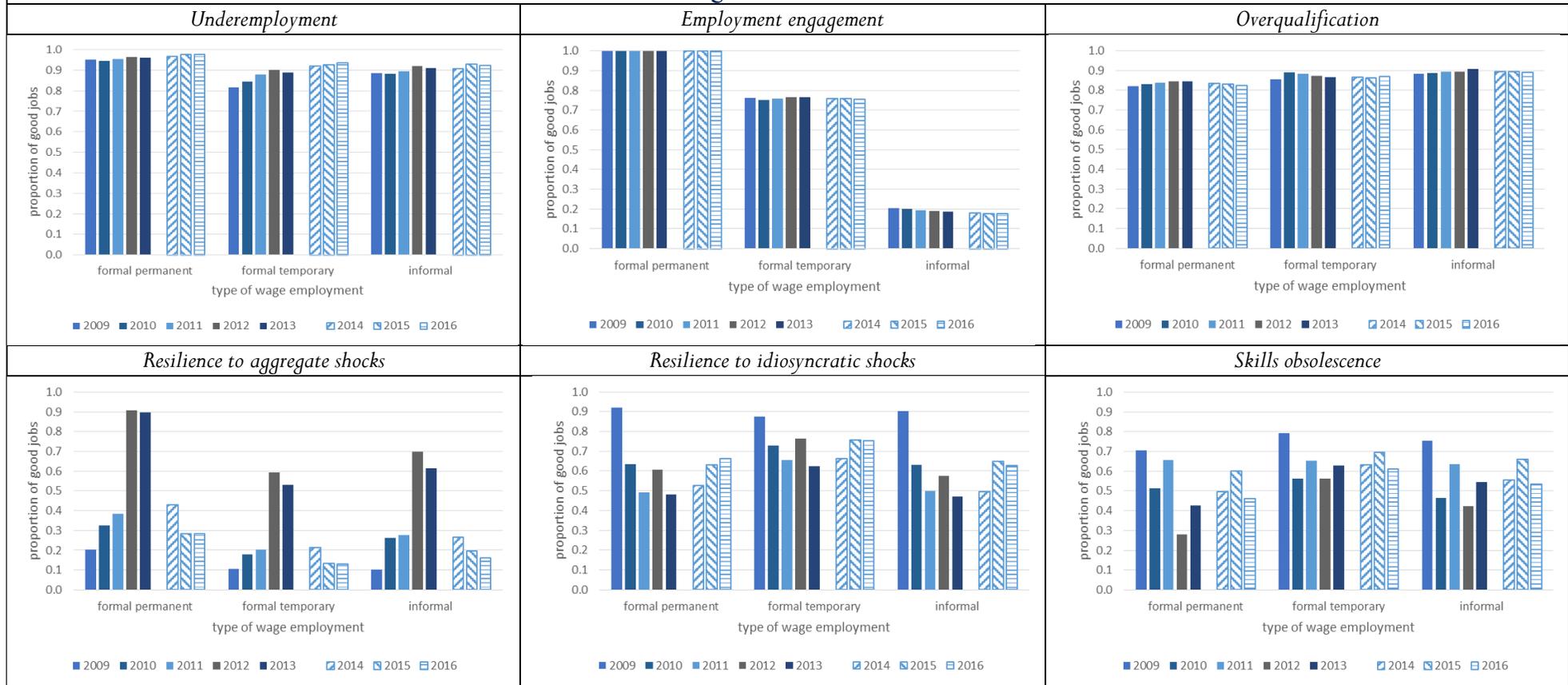


Figure C1: continued



Notes: Results obtained after 2013 are not comparable to earlier years.
 Source: Authors' calculations based on LFS data.

Annex D: Drivers of job quality changes, 2014-16

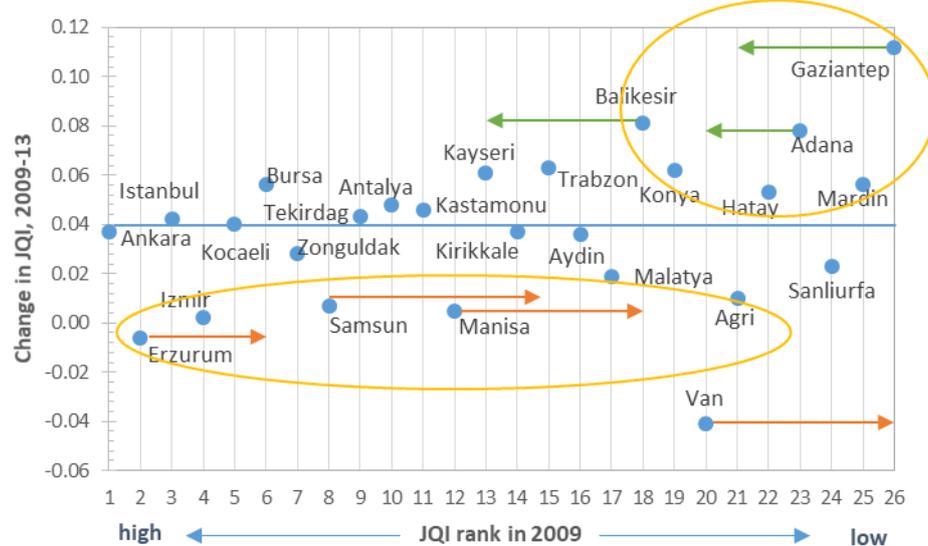
Figure D0: Percentage of Jobs that do not face issues related to each dimension, 2014-16

Indicator	2014	2015	2016	Change*	Trend
Social security benefits	0.8171	0.8290	0.8301	0.0130	+
Minimum wage compliance	0.6552	0.6530	0.5878	-0.0674	-
Child labor	0.6205	0.5647	0.5774	-0.0431	-
Work safety	0.5853	0.5987	0.6073	0.0221	+
Relative underpayment	0.6771	0.6765	0.6834	0.0063	+
Compensatory moonlighting	0.9596	0.9586	0.9589	-0.0007	-
Work-related training	0.0184	0.0136	0.0114	-0.0069	-
Underemployment	0.9533	0.9671	0.9664	0.0132	+
Employment engagement	0.8287	0.8372	0.8376	0.0089	+
Over qualification	0.8467	0.8423	0.8375	-0.0092	-
Resilience to aggregate shocks	0.3887	0.2594	0.2539	-0.1347	-
Resilience to idiosyncratic shocks	0.5266	0.6409	0.6623	0.1357	+
Skills obsolescence	0.5125	0.6167	0.4818	-0.0307	-

*Note: An increase means there a large percentage of jobs experience the positive side of each dimension. A decrease means that a larger percentage of jobs experience the negative aspect of the dimension.

Figure D1 contrasts absolute job quality changes between 2009 and 2013 with changes in the (relative) job quality ranking for each sub-region. On average, regional job quality improved by 0.04 points between 2009 and 2013, shown by the blue horizontal line. The graph highlights a couple of findings. First, job quality improved or remained largely constant in all but one sub-region: wage workers in Van realized a significant decline in employment quality and the sub-region ranks last in 2013. Second, a cluster of sub-regions with low scores in 2009 realized the largest improvements in wage job quality. Adana-Mersin, Balikesir-Canakkale, and Gaziantep-Kilis-Adiyaman improved their scores by 0.08 points or more – that is more than double the average change in job quality. A higher JQI score is also reflected in a better relative position: Balikesir-Canakkale and Gaziantep-Kilis-Adiyaman improve their ranks by 5 places, Adana-Mersin moves up 3 positions. Third, there is another cluster of sub-regions with only marginal changes. Job quality remained largely stagnant in Agri-Kars-Ardahan-Igdir, Erzurum-Erzican-Barbut, Izmir, Manisa-Afyon-Usak-Kutahya, and Samsun-Amasya-Tokat-Corum. In relative terms, these sub-regions have fallen behind in 2013, slipping between 2 and 7 ranks.

Figure D1: Levels of and trends in aggregate job quality by sub-region, 2009-2013



Notes: For selected sub-regions, arrows indicate the rank in 2013. The blue horizontal line shows the average change in sub-regional job quality between 2009 and 2013.
Source: Authors' calculations based on LFS data.

As in other sub-regions, resilience to aggregate shocks was very low in 2009, but recovered quickly in later years. By 2013, employment resilience among wage jobs reached nearly 90 percent.

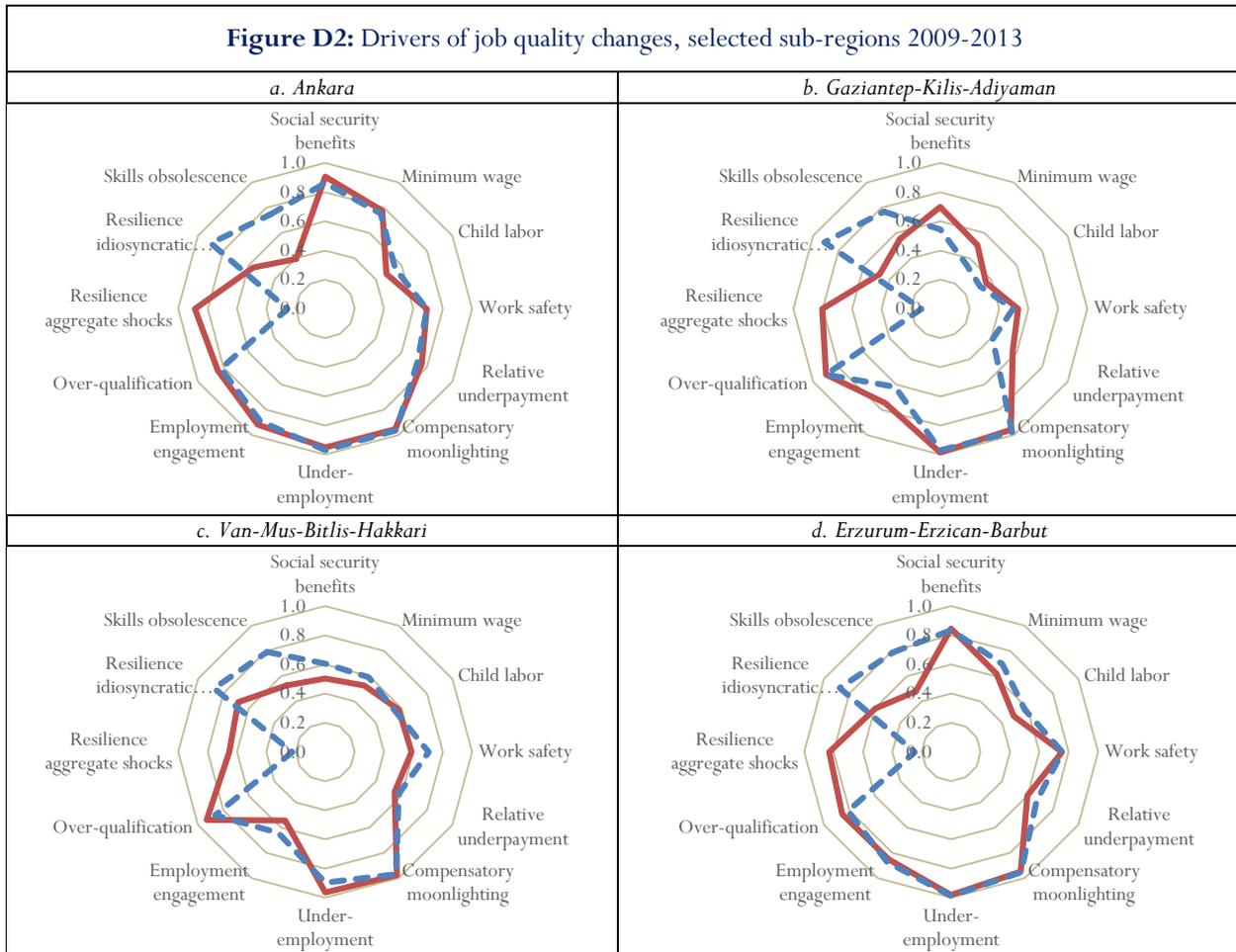
In Gaziantep-Kilis-Adiyaman, job quality improved along many dimensions. More jobs that pay social security contributions, improved minimum wage compliance, lower incidences of child labor and relative under-payment as well as better employment engagement resulted in Gaziantep's JQI score to improve from 0.55 to 0.66. Worth noting that despite increases, JQI remains low relative to the national average of 0.75.

With a JQI score of 0.62, wage workers in Van-Mus-Bitlis-Hakkari were better off in 2009. Since then, job quality dropped significantly and the sub-region ranks last in 2013. Fewer jobs with social security contributions, reduced minimum wage compliance, worse employment engagement and lower work safety contributed to the decline in job quality in Van.

Comparing the experience of Trabzon and Erzurum-Erzican-Barbut showcases that the type of jobs being created matters. In each sub-region, the share of wage employment was below 40 percent in 2009 but increased significantly in subsequent years. The majority of wage jobs are in high productivity services such as education, health or public administration.²⁶ In Erzurum-Erzican-Barbut, many of the newly created employment opportunities are temporary jobs in the low/medium value-added service sector, with lower standards of minimum wage abidance, and higher incidences of child labor and relative underpayment. Positive effects of creating formal jobs are outweighed by lower quality wage employment. As a result, aggregate job quality declined. Trabzon also created temporary employment opportunities but expanded its high productivity service sector at the same time, generating many tenured wage jobs. Consequently, job quality of wage employment increased and the sub-region improved its relative position by 5 ranks.

²⁶ In Erzurum-Erzican-Barbut, almost every second job was in high productivity services, explaining the high JQI rank in 2009. By 2013, the sector still employs the majority of workers, but its relative size declined to 38 percent.

Figure D2: Drivers of job quality changes, selected sub-regions 2009-2013



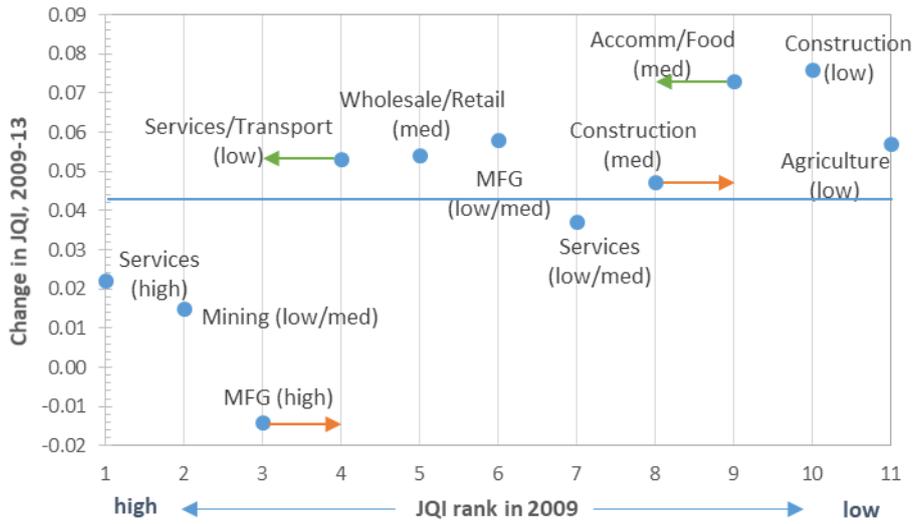
Notes: Performance on 12 job quality components in 2009 (dashed blue line) and 2013 (solid red line) are shown. Training was excluded from the graphs to keep the picture clear. Reported values of work-related training are very low in both years, registering less than 1 percent in most sub-regions.

Source: Authors' calculations based on LFS data.

There are a few trends in job quality that are common to all sub-regions. First, all parts of Turkey were severely affected by the global financial crisis and resilience to aggregate shocks was very low in 2009. In 2010, employment resilience started to improve, but the rate of recovery differed across regions. In 2013, the share of good jobs based on this component was above 85 percent in 7 sub-regions, including Ankara, Istanbul and Zonguldak, and was lowest with around 65 percent in Agri-Kars-Ardahan-Igdir, Sanliurfa-Diyarbakir and Van.

Second, resilience to idiosyncratic shocks declined over time in all parts of Turkey. That is, more jobs are lost due to own illness or disability. Nationwide, the share of good jobs based on this component was 90 percent in 2009 and declined to less than 50 percent in 2013. Third, skills obsolescence has become more frequent since 2009. Taking long-term unemployment as one possible indicator of skills obsolescence, current jobs in sector-occupation cells with long-term unemployment rates above the national rate are likely to become obsolete. The proportion of at-risk jobs increased in all sub-regions, with the highest shares in 2013 being observed in Ankara, Antalya, and Istanbul.

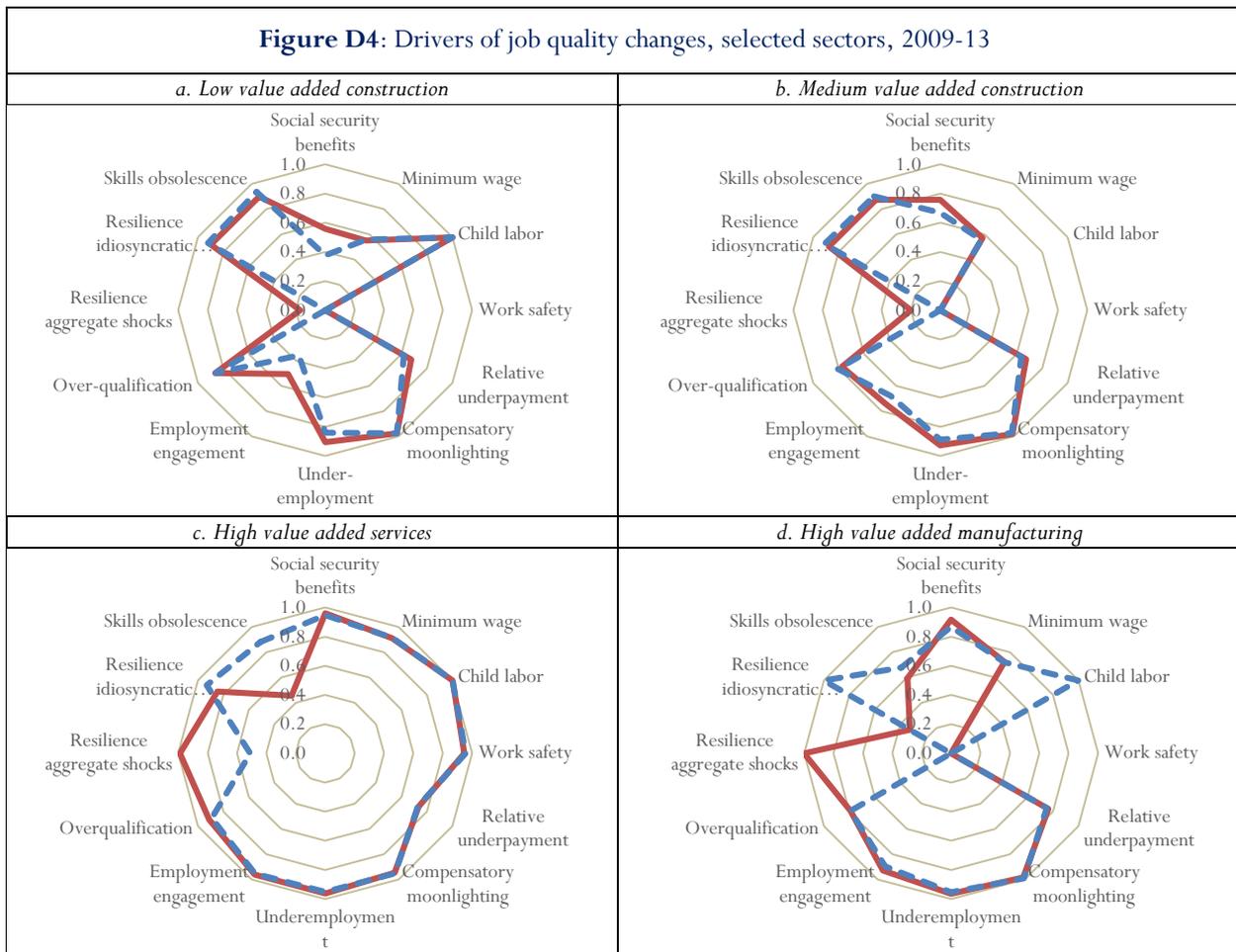
Figure D3: Sectors with medium or low levels of productivity realized above-average improvements in job quality



Notes: The blue horizontal line shows the average change in job quality by main economic sector between 2009 and 2013. The industry's productivity level is shown in brackets. Arrows indicate the sector's rank in 2013.

Source: Authors' calculations based on LFS data.

Figure D4: Drivers of job quality changes, selected sectors, 2009-13

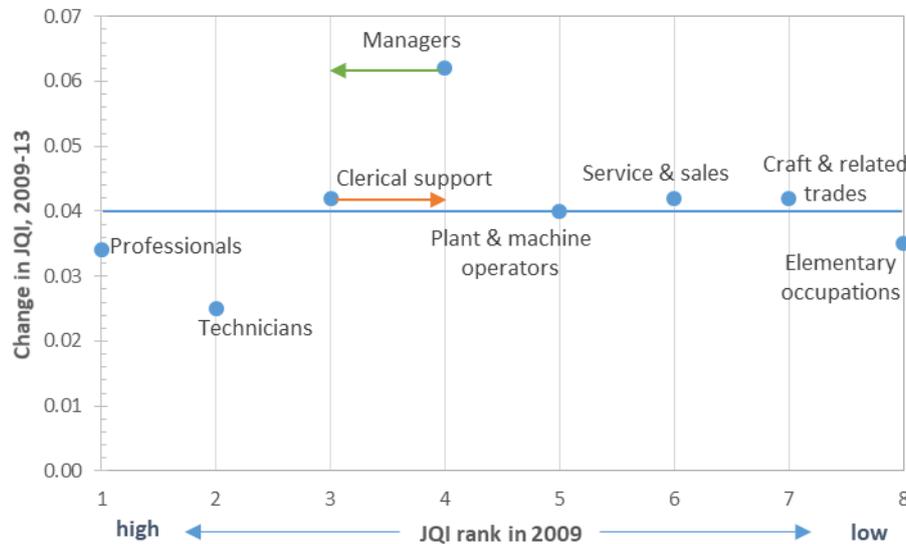


Notes: Performance on 12 job quality components in 2009 (dashed blue line) and 2013 (solid red line) are shown. Training was excluded from the graphs to keep the picture clear. Reported values of work-related training are very low in both years, registering less than 1 percent in most sub-regions.

Source: Authors' calculations based on LFS data.

Wage workers in low productivity construction achieved the largest improvements.²⁷ The construction sector created many temporary jobs, lifting the share of jobs with social security benefits from 50 percent in 2009 to 64 percent in 2013. Work safety, which is assessed at the sectoral level, remains very low and many jobs in construction are highly vulnerable to aggregate shocks. Similarly, job quality is affected by the extent of child labor.

Figure D5: Job quality improved across all occupation groups



Notes: The blue horizontal line shows the average change in job quality by ISCO-08 major group between 2009 and 2013. Arrows indicate the sector's rank in 2013. Skilled agricultural, forestry and fishery wage workers are excluded due to very low coverage.

Source: Authors' calculations based on LFS data.

At the level of ISCO-08 major groups of occupations, job quality scores for professionals, technicians/associate professionals and clerical support workers are above 0.8 in 2009. By 2013, managers caught up with the top quality occupations and move up 1 position, trading places with clerical support workers (Figure D5).²⁸

Looking at the profile of professionals, the share of good jobs is close to 90 percent or higher in many dimensions. Resilience to individual shocks declined somewhat and an increasing share of professional jobs is affected by skills obsolescence (Figure D6a). More jobs with social security contributions, high standards in terms of minimum wage compliance and employment engagement, and less overqualification are the main factors behind the improved JQI score for managers. However, managers seem particularly affected by skills obsolescence with the share of at-risks jobs reaching 70 percent in 2013. Compared to professionals, managers are more likely to work in sectors where child labor is more common and work safety standards are lower (Figure D6b).

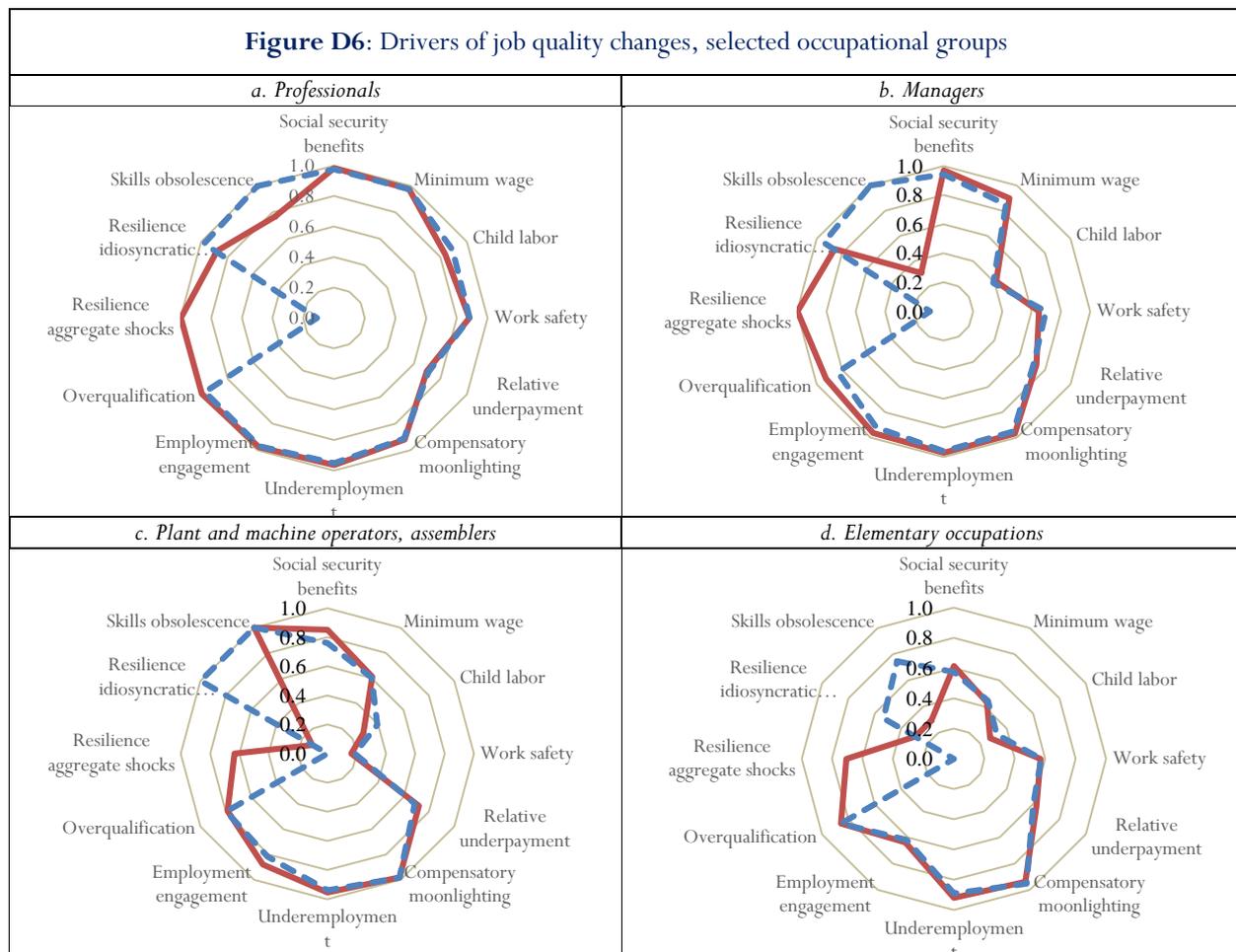
Workers in low-skills occupations²⁹ benefited disproportionately from formalization, contributing to improved JQI scores in 2013. However, these jobs are highly vulnerable to shocks, specifically individual distress such as illness or disability. Job quality could be further improved by enforcing minimum wages, better relative pay as well as less child labor and better working conditions at the sectoral level (Figure D6c).

²⁷ The share of construction jobs included in the calculations increased from 85 percent in 2009 to 88 percent in 2013. Nearly 60 percent of construction jobs are low productivity jobs.

²⁸ Reclassification of some wage workers from occupational class 1 (managers) to occupational class 5 (service and sales workers) probably contributed to higher scores for managers.

²⁹ Craft and related trade workers; plant and machine operators, assemblers.

Employment quality is lowest in elementary occupations, that is mostly jobs held by laborers in manufacturing or construction. Despite some progress, the portion of jobs with social security benefits is low, reaching 60 percent in 2013. Minimum wage compliance is clearly below 50 percent. Contrary to low-skills jobs, elementary occupations are particularly at risk to become obsolete (Figure D6d).



Notes: Performance on 12 job quality components in 2009 (dashed blue line) and 2013 (solid red line) are shown. Training was excluded from the graphs to keep the picture clear. Reported values of work-related training are very low in both years.

Source: Authors' calculations based on LFS data.

Annex E: JQI for all workers

Figure E1: Share of good jobs among all workers by labor market type, 2009-2013 and 2014-2016

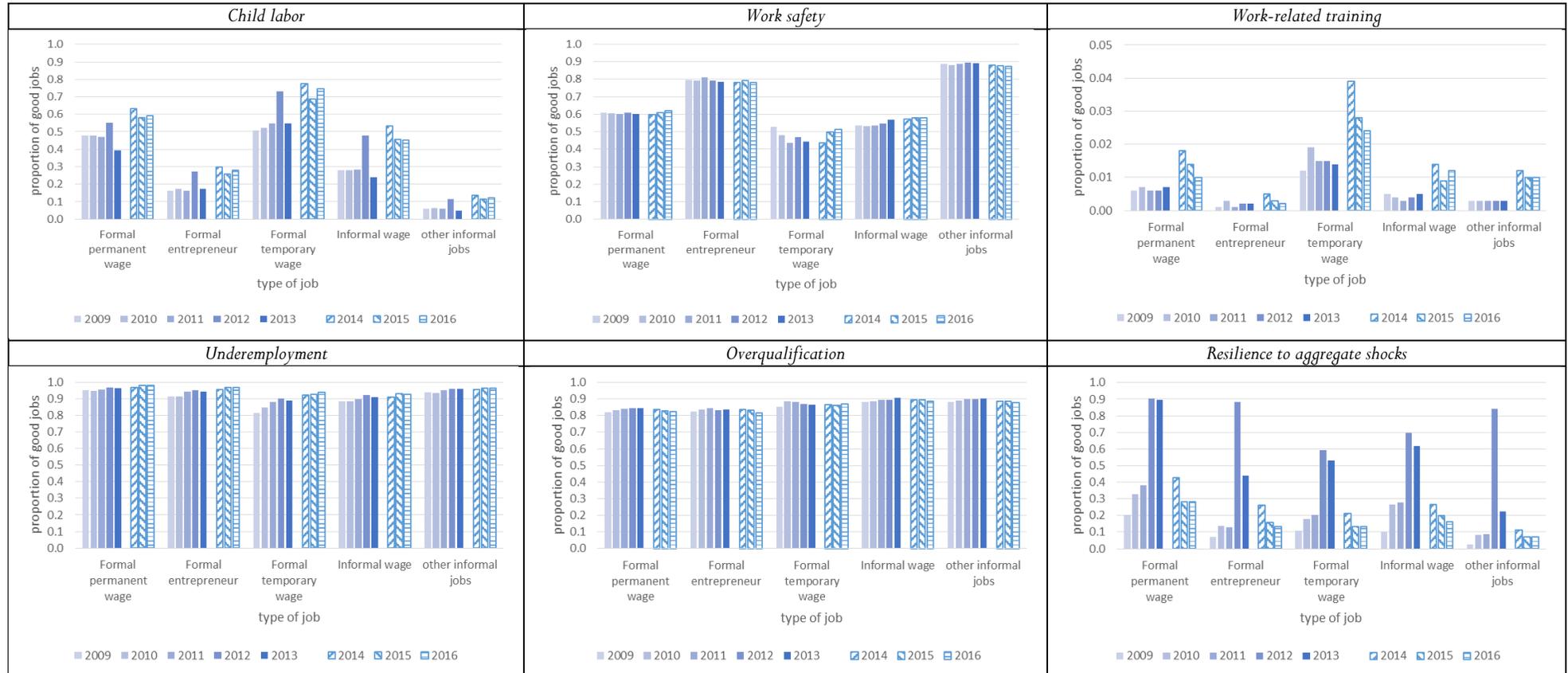
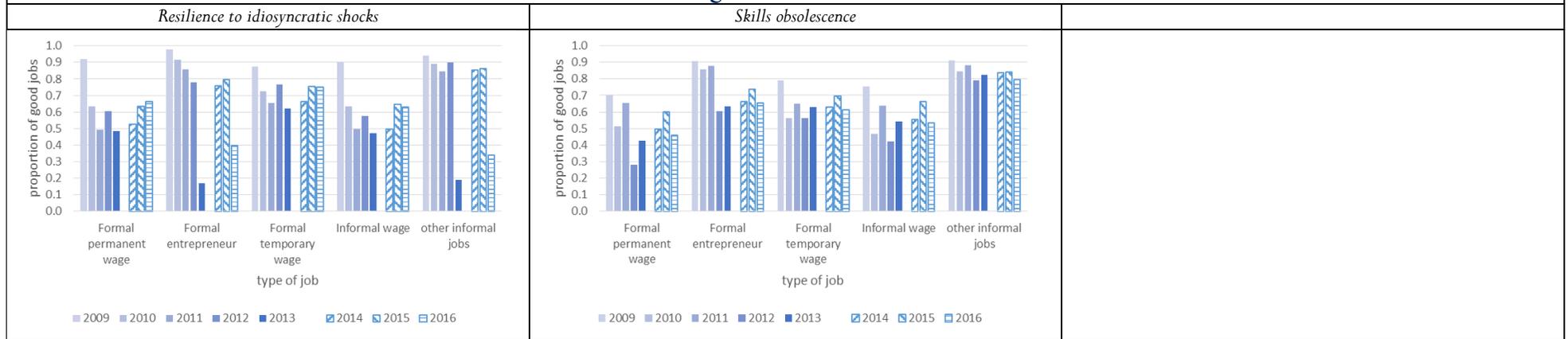


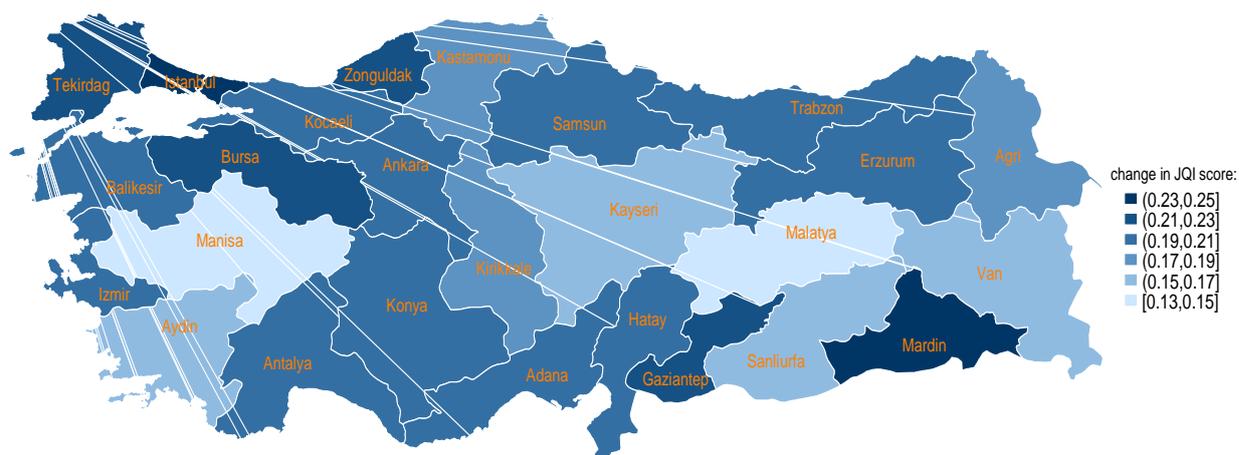
Figure E1: continued



Notes: Results obtained after 2013 are not comparable to earlier years due to changes in the LFS sampling design.

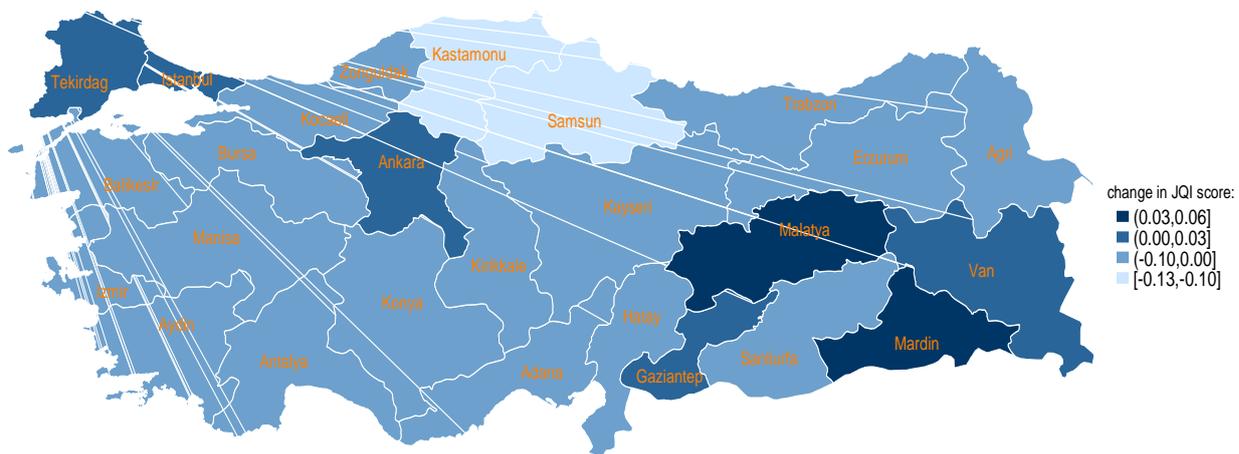
Source: Authors' calculations based on LFS data.

Figure E2: Changes in job quality among all workers, 2009-2013



Source: Authors' calculations based on LFS data.

Figure E3: Changes in job quality among all workers, 2014-2016



Source: Authors' calculations based on LFS data.

Table E1: Inequality in job quality for all workers

year	Gini coefficient	p90/p10	p75/p25
2009	0.352	11.5	3.1
2010	0.358	14.9	3.1
2011	0.372	16.3	2.6
2012	0.246	3.5	2.0
2013	0.258	4.6	2.1
<i>break in series</i>			
2014	0.302	4.9	2.6
2015	0.278	4.4	2.1
2016	0.320	5.8	2.6

Notes: The p90/p10 indicator measures the ratio of job quality of the 10 percent of wage workers with the highest JQI scores to the 10 percent with the lowest scores. Results are comparable for years 2009-2013 and 2014-2016.

Source: Authors' calculations based on LFS data