The Job Quality Index – A New Measure of Job Quality in the U.S. Labor Market

By Steven Byers PhD, and Jeff Ferry

The Coalition for a Prosperous America and partners have developed the Private Sector Job Quality Index (JQI), a monthly measure of the quality of US jobs as determined by the ratio of high-quality jobs compared with low-quality jobs. The index was developed in partnership with the Cornell University Research Academy of Development, Law, and Economics (CRADLE), the University of Missouri at Kansas City Economics Department, and investment banker and Cornell professor Dan Alpert. The index provides insight into the US labor market that helps us understand the dynamics of job creation, income distribution, and wage inflation. In this paper we look at the methodology behind the creation of the JQI and compare it to other measures of the US labor market. We look at past studies of labor market dynamics and offer thoughts on how the JQI can add to these efforts. This paper is organized as follows: Section I – Introduction, Section II - Literature Review, Section III – The Job Quality Index, Section IV – Construction of the Job Quality Index (JQI), Section IV – Evolution of the Job Quality Index and the US Job Market, Section V – Concluding Remarks.

I - Introduction

In the years since the 2008 recession, the US has seen a boom in job creation but very modest growth in wages. Between the low point in 2009 and 2019, the US added 21 million jobs to reach a total of 129 million private sector jobs. The unemployment rate fell to 3.5% in February 2020. Yet in those ten years of economic recovery, the real median household wage grew just 4.5%. The weak growth in real wages breaks with many expectations and previous assumptions about the behavior of the US labor market. Labor market tightness should have led to faster wage growth. Historically, the US generated much faster growth in real wages. Historically, there was also a closer relationship between labor market tightness and wage growth, as described by the Phillips Curve.

There are also questions about the relationship between the labor force participation rate (LFPR) and the level of wages or incomes. The LFPR for prime-age workers (defined as workers between the ages of 25 and 54) peaked in 1999 at 84.6. It then began a slow but steady decline to reach 80.6 in late 2015 before rising slowly to reach 82.9 in December 2019. Declining labor force participation was seen among both male and female workers, reversing a long period prior to 1999 when female labor participation rose as part of a worldwide cultural trend where more women left the home for the workplace. In most other advanced countries, female labor force participation has continued to rise in the years after 2000. Yet in the US, female prime-age labor force participation fell. There is much debate about the fundamental causes of the
decline in male and female participation. However, it seems likely that it is related in some way to the attractiveness of the jobs available to the 259 million Americans over the age of 16.

The Private Sector Job Quality Index offers new insight into these puzzles. It is a measure of the quality of jobs in the US, expressed as the ratio between high-quality jobs and low-quality jobs. Quality is measured by the average weekly wage of production and nonsupervisory employees in the private sector labor force. Production and nonsupervisory (P&NS) workers make up some 81% of the total private sector labor force. We focus on P&NS workers because by excluding the well-documented large income increases for the top 10% of the US working population in recent years we get better insight into the job market as experienced by the majority of Americans.

The trend in the JQI since 1990 is largely downwards, reflecting much faster growth in low-quality jobs than high-quality. The JQI is based entirely on data from the Bureau of Labor Statistics, organized via 180 employment categories. The JQI has trended downwards as low-paid service sector jobs have dominated job growth since 1990. The JQI thus puts a spotlight on the shifting composition of the jobs market. We believe that it is not enough simply to look at national average wages or national median wages. The composition of the market, in terms of type of jobs and industrial sector of jobs, is important for understanding the forces at work in the US labor market. We explore these trends further below.

II – Literature Review

What is Job Quality?

Job quality is an elusive term. The factors that individuals use to describe what a quality job is are as diverse as the people who work at them. In the JQI, we use a purely quantitative measure of job quality, the average weekly wage of the approximately 105 million P&NS workers in the US. Much of the recent economic literature has focused on non-wage measures of job quality or combinations of wage, nonwage benefits, and qualitative job characteristics to measure job quality. We review some of the alternative approaches here.

In general terms, job quality refers a set of attributes about a job adds to or subtracts from a workers’ well-being. Based on research by the Warwick Institute for Employment Research there are ten concepts/terms that are commonly used in the literature when describing the attributes of a job.¹

1 - Decent Work - The International Labor Organization (ILO) defines decent work as having four dimensions: employment, security, rights at work, and representation. The objective of employment is for workers to realize an equitable return from labor. Security in the workplace pertains to physical working conditions. Rights at work addresses social conditions at work and leveling of discrimination in order that all workers have access to achievement at work. Representation at work is necessary so that workers are not passive elements to overall work and is necessary to achieve the other three dimensions of decent work.2

2 - Good Work – There are four domains to good work. Good work: 1) engages workers; 2) engages with the community culture that reflects local, regional and operational contexts in which the work is performed; 3) respects procedural justice and relational fairness, thus eliminating discrimination, bullying, incivility and intolerance; and 4) appropriately balances job demands, job control and job security (change is managed effectively, involves realistic job performance indicators, utilizes hard productivity metrics, and matches the job to the worker.)3

3 - Fair Work – According to the Fair Work Convention (FWC), a Scottish organization, fair work is work that offers all individuals and effective voice, opportunity, security, fulfillment and respect. It balances the rights and responsibilities of employers and workers. It generates benefits for individual, organizations and society.4

4 - Fulfilling Work – According to the UK recruiter, Randstad, fulfilling work included pay as the primary driver of fulfillment, but also includes achievement, recognition, responsibility, advancement and the nature of the work as contributions to fulfilling work.5

5 - Meaningful Work – The notion of meaningful work has stems from psychology where it is defined by three components: 1) work must make sense in that the worker knows what is being asked of them and the resources for its accomplishment are identified, 2) it has significance and purpose, the work must contribute to the organization goals, 3) the work contributes to the greater good of society.6

6 - Well-being and Work – the OECD, in its report titled, “How’s Life? 2013-:Measuring Well-Being, well-being in work focuses on two main dimensions; jobs and earnings and work-life balance. The first dimension includes refers to work-related aspects of material

4 Fair Work Convention (FWC), https://www.fairworkconvention.scot/about-the-convention/
5 2014 Randstad Fulfillment @ Work Report
living conditions. It also includes broad indicators of labor market performance such as unemployment and unemployment rates. The work-life balance dimensions relate to a number of work-related aspects of quality of life such as life-long learning. Additionally, they offer up two more indicators to the well-being framework: income volatility and organizational and social aspects of the work environment. Broad measures of well-being at work focus on the enthusiasm for and contentment with the job.

7 - Quality of Working Life – refers the favorableness or un-favorableness of the job environment of an organization for its employees. Quality of working life (QWL) emerged after World War Two and was aimed at improving the QWL as it related to industrial relations and worker motivation. Initially, the concept focused on job design to increase employee engagement but has not evolved to include adequate and fair compensation, safe and healthy working conditions, development of human capacity,, opportunities for professional growth, job security, worker rights and protections, social integration in the work force and work-life balance.7

8 - Quality of Employment – According to work performed by the United Nations Economic Commission for Europe (UNECE) Task Force on the Measurement of the Quality of Employment there are seven proposed dimensions of quality of employment: 1) Safety and ethics of employment, 2) income and benefits from employment, 3) working hours and balancing work and non-working life, 4) security of employment and social protection, 5) social dialogue, 6) skills development and life-long learning, and 7) workplace relationships and intrinsic nature of work.

9 - Quality of Work – Different academic fields have described quality of work many ways that can be encapsulated by six dimensions: 1) job security, 2) pay and fringe benefits, 3) intrinsic job rewards, 4) work intensity, 5) autonomy, and 6) control.9

10 - Job Quality – Munoz de Bustillo et al. (2009, 2011) encourage limiting indicators of job quality to those aspects of the job that have a clear and direct impact on the well-being of the worker. Their concept of job quality combines characteristics of the work performed and the environment in which the job is performed. The environment is broken into two dimensions, the work dimension and the employment dimension. The work dimension includes the level of autonomy at work, and the social and physical environment of the work. The employment dimension involves the contractual dimensions under which the work is performed. This includes pay, contractual stability, and development opportunities. The authors arrive at a measure of job quality that includes five dimensions to measure job quality: 1) pay, 2) intrinsic characteristics of

work, 3) quality of employment, 4) work-life balance, and 5) health and safety. This job quality measure has been adopted by the European Commission and its associated agencies.\(^\text{10}\)

**International Measures of Job Quality**

There is an ongoing debate among researchers as to whether job quality dimensions should be restricted to the characteristics of the job or are dependent on the preferences and opinions of the worker. Measures of job quality generally are qualitative or quantitative in nature. Quantitative measures are generally objective in nature, are easily measured, and typically rely on characteristics such as pay and benefits. Qualitative measures are more reliant on subjective characteristics such as work/life balance, opportunity, workers’ rights, self-satisfaction, and other social aspects of a job, and typically are captured through surveys. Munoz de Bustillo et al (2009) suggest that a multi-variate measure of job quality that is “operationalized a set of indicators or in a composite index.” Below, we provide a summary of some of the better-known international measures of job quality.

**European Trade Union Institute (ETIU) Job Quality Index**

The ETIUJQI consists of six sub-indices, namely wages, non-standard forms of employment, work-life balance and working time, working conditions and job security, access to training and career advancement, and collective interest representation and voice/participation. The data the index utilizes allows only for national index averages for the EU 27 countries. It constructed so that it allows for cross country comparisons over time as well as gender comparisons. However, the index provides no information about the distribution of job quality around these national averages, for example by skill or income level, by age, sector or region.

**The Organization for Economic Co-operation and Development (OECD) Job Quality Index**

The OECD framework for measuring and assessing job quality considers three objective and measurable dimensions of job quality that are both important for worker well-being and relevant for policy: earnings quality, labor market security, and quality of the working environment. Together, they provide a comprehensive assessment of job quality and is based on a database of survey questions beginning in the 1990’s.

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Earnings quality refers to the extent to which the earnings received by workers in their jobs contribute to their well-being. While the level of earnings provides a key benchmark for assessing their contribution to material living standards, the way earnings are distributed across the workforce also matters for well-being. Therefore, the OECD measures earnings quality by an index that accounts for both the level of earnings and their distribution across the workforce.

Labor market security captures those aspects of economic security that are related to the probability of job loss and its economic cost for workers. This is measured by the risk of unemployment which encompasses both the risk of becoming unemployed and the expected duration of unemployment. It is measured by the degree of public unemployment insurance, which considers both the coverage of the benefits and their generosity.

Quality of the working environment captures non-economic aspects of job quality and includes factors that relate to the nature and content of work performed, working-time arrangements and workplace relationships. Jobs that are characterized by a high level of job demands such as time pressure or physical health risk factors, combined with insufficient job resources to accomplish the required job duties, such as work autonomy and social support at work, constitute a major health risk factor for workers. Therefore, the quality of the working environment is measured by the incidence of job strain, which is a combination of high job demands and limited job resources.

Munoz de Bastillo et al., Job Quality Index

Munoz et al have produced an index based on five dimensions of job quality that are split into two categories: pay and amenities. Pay involves objective measures including wage level, type of payment (fixed or performance-based pay) and non-wage fringe benefits (pensions and health coverage). It also includes subjective aspects such as satisfaction with pay. Amenities include: 1) intrinsic characteristics of work such as skills, autonomy, control, variety, work effort that are objective measures. It also includes subjective measures such as meaningfulness, fulfillment, social support and powerfulness, 2) terms of employment including objective measures such contractual stability and opportunities for training. Subjective measures include perception of job security, 3) health and safety includes physical and psycho-social risks, 4) work-life balance includes working time arrangements such as duration, scheduling and flexibility and work intensity, 5) representation and voice includes employee consultation, trade union representation, and employee involvement in decision making.

Aggregation of the information within each dimension is done by arithmetically averaging the scores of the individual variables. The aggregation at the highest level is done by geometrically averaging the five dimensions into the overall index score. The weights for each of the five dimension is as follows: Pay and benefits 20%, Intrinsic characteristics 20%, terms of employment 20%, health and safety 20% and work-life balance 20%. The index does not capture measures related to well-being, gender and
socio-economic variables such as level of education, age, occupation, industry, sector, ownership type, employer size and type of employment.

IV – Construction of the Job Quality Index (JQI)

The JQI analyzes the full complement of US production and non-supervisory (P&NS) jobs in 180 industry sectors spanning all 20 super-sectors into which the BLS groups establishments. The principal data utilized is contained in the Current Employment Survey or CES (often referred to as the establishment survey). In developing the JQI, the goal was to ensure it could be produced on a monthly basis contemporaneously with the release of each month’s new CES data from the Bureau of Labor Statistics. The BLS consistently maintains the CES on a monthly basis and has done so in its current form since 1990. Previously, from 1938 to 1989, the establishment survey was considerably less granular.

The process for constructing the JQI begins with establishing a Quality Job Benchmark for each given month. The benchmark value is calculated as the average weighted weekly wage for all P&NS workers in the universe. We then calculate average weekly wages for each of the 180 industry sectors. The average weekly wage is the average hourly wage (AHW) multiplied by the average weekly hours (AWH). AHW and AWH data is published monthly by the BLS for all 180 sectors.

Next, we divide the 180 sectors into high-quality or low-quality based on whether the average weekly wage is higher or lower than the Benchmark. We sum the employment figures to obtain a monthly total of high-quality jobs and low-quality jobs. The total number of high-quality jobs is divided by the total number of low-quality jobs for each month. This ratio represents the preliminary JQI value. An index reading of 100 would indicate the same number of high-quality jobs as low-quality. Readings below 100 indicate a greater number of low-quality jobs while a reading above 100 indicates greater number of high-quality jobs.

Some industry sectors have stayed consistently well above the benchmark since the inception of the index in 1990. Transportation Equipment Manufacturing or Oil and Gas Extraction are two examples of such high-paying sectors. Other sectors have stayed consistently below the Benchmark. Clothing Stores and Residential Care Facilities are examples of the latter. Other sectors have progressed from below the Benchmark to above. Several of the health care sectors have moved upwards relative to the Benchmark and the entire P&NS universe as the amount spent on health care in the US has trended upwards since 1990.
A small number of sectors show volatility in the average weekly wage sufficiently to flip from high-quality to low-quality and back again for brief periods of time. To smooth out the volatility such “flips” would cause in the final Job Quality Index, we use a smoothing technique on what we call “flip categories.” To meet our definition of a flip category, a sector must show one or more flips in the raw monthly data and have employment of over a million. In the aggregate, these four categories comprise just over 7.5% of all private sector P&NS jobs in the U.S. The four flip categories are listed below.

We use data from the annual Occupational Employment Statistics (OES) to break each flip category into individual occupations. Each occupation has pay levels. We then break the flip category into two parts, the number of employees with pay levels above the Benchmark and the number of employees below the Benchmark. Flip categories tend to flip because they are bimodal, in other words a large number of employees well above the Benchmark matched by a large number below. When either group rises more in a month, it can shift the entire sector average. Breaking the flip categories into two sub-categories reduces the sudden flips from high-quality to low-quality or vice versa.

Table 1: Flip Categories, Employee Totals

<table>
<thead>
<tr>
<th>Flip Category</th>
<th>P&amp;NS Employees (December 2018)</th>
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<tbody>
<tr>
<td>Education</td>
<td>3,197,100</td>
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<tr>
<td>Offices of Physicians</td>
<td>2,202,000</td>
</tr>
<tr>
<td>Depository Credit Intermediation</td>
<td>1,277,600</td>
</tr>
<tr>
<td>Food Manufacturing</td>
<td>1,276,300</td>
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</tbody>
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Finally, we report the JQI as an index where 100 means the number of high-quality P&NS jobs is equal to the number of low-quality P&NS jobs. A reading above 100 indicates a bias towards high-quality jobs and a reading below 100 indicates a bias towards low-quality jobs.

V – Evolution of the Job Quality Index and the US Job Market

The JQI covers the period from January 1990 to the present. Figure 1 shows the evolution of the JQI since its inception. It launched at 94.21, and moved steadily down to bottom at 84.36 in December 1999. It then rose to a peak of 90.74 in September 2006. It then began a decline, which took it to its all-time low of 78.56 in March 2012.
From there it rose steadily to reach 85.30 in April 2017. It then dropped back down to its recent level of 81.31 in April 2020.

The secular decline of the JQI between 1990 and 2019 indicates that the US was much more successful at creating low-wage jobs rather than high-wage jobs. The move from 94 to 81 indicates that low-wage jobs went from 48.5% of the P&NS job base in 1990 to 44.8% of the base in 2019. The most important long-term trend driving the shift to low-quality jobs is the loss of manufacturing jobs. The Manufacturing super-sector consists of several sectors. In aggregate, the US lost over four million Manufacturing jobs in these years, nearly all of which were high-quality jobs by our standard. At the same time, the fastest-growing super-sectors included Leisure and Hospitality, which added over four million jobs, most of them low-quality. Other fast-growing sectors included Education and Social Assistance, most of those jobs being low-quality. Health Care was another fast-growing super-sector, with a broad distribution between high and low quality.

Looking at shorter-term trends, the decline in the JQI in the 1990s is due in large part to the erosion in manufacturing employment, which accelerated in these years. This was
the result of increased import penetration, notably from so-called Asian Tiger economies, which added to the competitive pressure from Japan and China\textsuperscript{11}

The Internet bubble of 1997-2000 led to growth in high-quality technology-related jobs, pushing the JQI up in those years. It was broadly flat until 2005 when it accelerates sharply. The rise in 2005-2006 was due to growth in jobs in construction and finance as the housing and financial boom (bubble) gathered steam. In 2007, the JQI fell sharply as construction began to contract while Retail Trade, Leisure and Hospitality, and Wholesale Trade added hundreds of thousands of workers. The recession of 2008-9 led to a large decline in high-wage jobs in manufacturing and construction, while pushing down wages in some of the sectors close to the Benchmark, converting some high-quality jobs into low-quality jobs.

The sharp rise in the JQI between 2012 and 2017 reflected the construction boom of these years as well as growth in high-quality health care jobs. Ironically, the decline after April 2017 came in spite of solid growth in manufacturing and construction, the traditional sources of high-quality jobs. The economic boom was sufficiently concentrated in services to drive stronger growth in Leisure and Hospitality, Education, Social Assistance, and various other low-quality sectors.

We are often asked if the JQI method of comparing employee numbers above and below a Benchmark merely reflects the difference between the mean and median wage in the US. There is some truth in this observation. In any sample, the rise of a measure of mean income over and above a measure of median income for the same sample indicates growing inequality. In other words, more earners at the top of the income distribution are taking a larger share of the total income pie. Mathematically, the average income per worker rises. More workers below the average must share the income left over, the number of workers below the average rises and the median falls below the average.

The Office of the Chief Actuary of the Social Security Administration made exactly this analysis in a 2019 report\textsuperscript{12} on US average and median net compensation of American workers. The results can be seen in Figure 2 below. Average net compensation was $50,000.44 in 2018. Median net compensation was $32,838.05. The report found that as a percentage of average, the median declined from 71.875\% in 1990 to 65.676\% in 2018.

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However, the SSA report covers all US employees. By focusing on P&NS employees, the JQI excludes management staff and business owners who tend to be high earners. Many reports have documented this group’s increased share of US income in recent years. The JQI shows that even within “ordinary” workers, there has been a growing tendency for income to move to the upper strata of such workers, increasing the number of low-quality earners who are receiving income below the average. Looking at the trend from an industry sector point of view, the decline of high-paying sectors like Manufacturing and the rise of low-paying sectors like Leisure and Hospitality has exacerbated inequality in the US labor market.

Figure 2: The US average wage has risen faster and widened the gap with the US median wage.

![Average and median wages](source: Social Security Administration)

The JQI provides insight into the conundrum referred to above of consistent growth in employment, very low unemployment rates, yet very low growth in national average hourly wages. The shift in jobs towards low-quality jobs drives a downward trend in the average wage earned by the total of P&NS workers, even if individual earners or
complete sectors are enjoying wage growth. This is reinforced by the wide disparities in weekly average income. Imagine 100 workers in an economy, each earning $1. If all enjoy wage increases of 10%, then the next year, the average wage will be $1.10. However, if of the 100 workers, 90 enjoy the 10% increase but 10 move from an industry where they earned $1 to a new job where they earn 50 cents, then the average wage rises to only $1.04, a 4% increase instead of 10%. When inflation is taken into account, it is easy to see how national average wage increases can disappear with a steady secular trend towards low-quality jobs.

Consider a real-world example. Between December 2009 and December 2019, the Computer and Electronics Manufacturing sector saw average hourly wage growth of 14% and employment growth of 4%. The Full-Service Restaurants sector also saw wage growth, of 42%, and employment growth of 25%. However, the Full-Service Restaurants employee earned 40.3% less than the Computer employee in 2019. Both sectors saw wage growth, but because the Restaurants sector grew employee numbers far faster, it took a larger share of the P&NS employee base by 2019 and had a larger impact on the national average wage (or Benchmark). In that period, the Benchmark rose by 28.0%, compared with consumer inflation of about 16% in those ten years. Thus, real (inflation-adjusted) P&NS average wages rose at a rate of about 1.2% a year in the years 2009-2019. In the table below we show the total employment figures for high-quality and low-quality employees. The total of low-quality employees grew 3 percentage points faster than high-quality, putting downward pressure on the national average.

There is a secondary effect of the shifts observed in the US labor force in recent years. Growth industries tend to raise wages faster than mature or shrinking industries (see Rycx and Tojerow for an overview on this topic). The extended decline in many of our high-paying industries, particularly sectors in manufacturing, has led to slower wage growth in those traditionally high-paying sectors. As Table 2 illustrates, Computer and Electronics Manufacturing was subjected to reduced growth in the last ten years and as a result, the average hourly wage rose only 14%, amounting to a 2% cut in real wages. On the other hand, the Full-Service Restaurants sector was a growth sector and delivered a large 42% growth in wages to employees. The slower wage growth on top of the slower employee growth of the high-quality sectors has and likely will continue to contribute to a decline in the JQI over time.

Table 2: Wage & Employment Comparisons, 2009 vs. 2019

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<tbody>
<tr>
<td>Computer &amp; Elec. Mfg</td>
<td>631.8</td>
<td>656.9</td>
<td>4.0%</td>
<td>$22.40</td>
<td>$25.54</td>
<td>14.0%</td>
</tr>
<tr>
<td>Full-Service</td>
<td>4012.9</td>
<td>5027.3</td>
<td>25.3%</td>
<td>$10.72</td>
<td>$15.25</td>
<td>42.3%</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Restaurants</th>
<th>Total High-Quality</th>
<th>Total Low-Quality</th>
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<tr>
<td></td>
<td>39,142</td>
<td>48,323</td>
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<tr>
<td></td>
<td>46,269</td>
<td>58,706</td>
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<tr>
<td></td>
<td>18.2%</td>
<td>21.5%</td>
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Source: JQI Database

VI – Concluding Remarks

The Private Sector Job Quality Index was developed to monitor job quality trends in real time, and to provide new insight into trends in the US labor market. The JQI is based on a ratio of the total number of high-quality production and non-supervisory (P&NS) jobs divided by the number of low-quality P&NS jobs. Quality is defined with reference to the national weekly average wage of all P&NS employees.

There are many different measures of job quality in the literature. Some, like ours, focus on “hard,” financial measures, while others focus on non-wage benefits or emotional and psychological job satisfaction. Many indicators and metrics can play a role in assessing the success of a national economy in meeting the needs of its workforce.

The JQI addresses the challenge of recent US labor market performance, wherein job creation (prior to the COVID crisis) has continued strongly for ten years and the unemployment rate has trended down to 50-year lows. However in the midst of excellent job growth numbers, wage growth has been weak and labor force participation has been disappointing. The JQI enables us to monitor how the changing composition of jobs, in particular the absolute and relative growth of low-quality jobs, can explain slow wage growth and broad worker dissatisfaction with their jobs and job opportunities. Further research is needed to explore these relationships in greater detail.