

# An Empirical Analysis of the Impact of Digital Economy Development on Employment Quality: Panel Data Analysis Based on Stata

Ping Han<sup>a</sup>, Hanqi Song<sup>b\*</sup>

School of Economics, Harbin University of Commerce, Harbin, 150028, China

E-mail: <sup>a</sup>HP201077@163.com, <sup>b\*</sup>songhq@s.hrbcu.edu.cn

**Abstract.** In recent years, the rapid application of digital technology in the economy has continued to affect the quality of employment in China's labor market. The data are from 31 Chinese provinces between 2013 and 2020, systematically explores in the context of digital economy development and employment dynamics quality in China and its mechanism of action using an econometric model. We find that the digital economy has significantly improved employment quality. Therefore, we suggest that all aspects of the digital economy in the future could be strengthened, accomplish the enhancement of the quality of employment.

Keywords: Digital Economy, Employment Quality, Baseline Regression.

# 1 Introduction

Employment is the basis of people's livelihood and the most basic support for economic development, and the realization of fuller and higher-quality employment is an important foundation for practicing the people-centered development ideology and solidly advancing common prosperity. In recent years, thanks to the continuous promotion of development strategies such as "Smart City" and "Digital China", China's digital economy has been developing rapidly.

China's digital economy has reached 45.5 trillion yuan in 2022, accounting for 39.8% of GDP. The digital economy and its related industries have developed into an important area of demand for China's labor force, providing a strong impetus for sustained and healthy economic and social development. While contributing empirical evidence on the relationship between the digital economy and employment quality, the work in this paper also provides policy implications for China's current efforts to "stabilize employment" and promote common prosperity.

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#### 2 Theoretical Analysis

Fig. 1. Analysis flow chart

The digital economy first appeared in the newspaper The San Diego Union-Tribune, and then Don TaPscott introduced it into the industry literature and described it in detail, and since then the concept of digital economy has been formally formed[1]. Relevant studies have found that the development of the digital economy can effectively promote the improvement of the quality of employment, in which the quality of employment is a comprehensive concept, so the channels through which the development of the digital economy affects it are also multidimensional. It mainly affects the employability of the employed and then pulls up the wage level. Advances in digital technology will increase productivity levels, and at the same time increase the number of technology-intensive occupations with intuition, creativity and persuasion, and service-oriented and manual occupations with visual-verbal recognition and interpersonal interactions, which ultimately leads to the simultaneous growth of high-education, high-paying jobs and low-education, low-paying jobs in the labor market [2]. It has been found that the digital economy has a significant effect on the probability of participation in salaried non-farm employment, which is mainly realized by accelerating the accumulation of individual human capital and social capital [3], and it has also been found that the development of the digital economy not only raises the employment income of workers, but also has an even greater effect on low-income workers, and promotes the improvement of the quality of employment through the growth of income [4]. In addition to this, the digital economy also reduces the working hours of workers and raises their wages [5], and from the perspective of skill differentials, studies have found that the digital economy has weakened the relative earning power of the middle- and low-income labor force, but it has increased the level of their employment benefits [6]. In summary, digital economic development has had a profound impact on social employment, and there has been more literature

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on its impact on total employment. In terms of employment quality, it mainly focuses on a single aspect such as employment income, but the acquisition of workers' rights and benefits as an important criterion for judging employment quality is often neglected. The theoretical mechanism of digital economy development to drive the improvement of employment quality is shown in Figure 1.

# **3** Selection of Indicators

# 3.1 Core Explanatory Variables

Taking full account of objective requirements such as the start-up years[7]. See Table 1 for details.

Target Layer	Primary Indicators	Secondary Indicators
Evaluation of Digital Economy Development at Provincial Level in China System		R&D personnel
	Digital Environment Development	R&D internal expenditure
		Number of patent applications at the State Intellectual Property Office
		Number of students per 100,000 enrolled in higher education
	Digital Infrastructure Development	Cell phone penetration rate
		Percentage of Information Technology Practitioners
		Fiber optic cable line length
		Internet broadband access port
	Digital Trading Development	Number of corporate owned websites
		The proportion of e-commerce enterprises
		E-commerce sales
		Software business revenue

	Table 1.	Digital	economy	devel	lopment	level	system.
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#### 3.2 Explained Variables

At the level of the quality of employment, studies have been devoted to constructing indicators for evaluating the quality of employment. The indicators include the quality of employment and the quality of individual work. The quality of employment mainly involves traditional economic research objects such as remuneration and working hours, but also covers elements such as labor contracts and collective interest bargaining; the quality of individual work includes objective indicators such as job stability and working environment. The quality of employment is calculated as follows:

Employment quality (EMP) = (per capita wage income of farmers\*0.4 + average wage of urban workers\*0.6)\*0.6 + social security and employment expenditure in fiscal expenditure\*0.4

#### 3.3 Control Variables

(1) economic development (PGDP) is expressed using GDP per capita; (2) financial development (FIR) is expressed using institutional year-end deposit and loan balance/GDP; (3) urbanization rate (POP) is expressed using urban population/total population; the higher the urbanization rate, the more employment opportunities of all types; (4) government intervention (GOV) is expressed using government expenditure/GDP; and (5) education level (EDU) is expressed using education expenditure.

	Ν	MIN	MAX	MEAN	STD
DIG	248	0.018	3.730	2.200	0.753
EMP	248	12.698	15.901	14.706	0.643
PGDP	248	10.003	12.009	10.858	0.412
POP	248	0.240	0.896	0.594	0.125
FIR	248	1.912	7.578	3.554	1.128
GOV	248	6.827	9.766	8.437	0.589
EDU	248	16.298	20.130	18.446	0.735

Table 2. Descriptive Statistics.

#### 3.4 Data sources

The data in this paper come from the panel data of 31 provinces in China from 2013 to 2020, mainly from China Statistical Yearbook, China Urban Statistical Yearbook, China Population and Employment Statistical Yearbook, China Labor Statistical Yearbook and CEE and Guotaian database, etc. For the missing data of individual years and regions, this study has processed them according to the exponential smoothing method and logged some of the data In order to eliminate heteroskedasticity, compress the scale of variables, and accurately display the development speed. The descriptive statistics of the relevant variables are shown in Table 2.

# 4 Empirical Results and Analysis

The benchmark regression model is constructed as follows:

$$EMP_{it} = \alpha_0 + \alpha_1 DIG_{it} + \alpha_2 X_{it} + \lambda_i + \eta_t + \varepsilon_{it}$$
<sup>(1)</sup>

Where EMPit is quality of employment; DIGit is the degree of digital economy development; Xit is each relevant control variable;  $\alpha i$  is the constant term;  $\lambda i$  is the individual fixed effect;  $\eta t$  is the time fixed effect; and  $\epsilon it$  is the random disturbance term.

For the baseline regression analysis of the experimental data, stata software was used, and the empirical results can be seen in Table 3. The Table 3 explains that the coefficient is positive, the higher the digital economy development, the higher the quality of the employment. Column (2) shows that adding individual and year fixed effects still show a positive effect. The results in column (3) are the same as those obtained by adding control variables in the previous two stages, digital economy development has the potential to promote growth in employment quality.

		-	
	(1)	(2)	(3)
Variables	EMP	EMP	EMP
DIC	1.169***	0.808***	0.364***
DIG	(28.64)	(11.46)	(4.14)
			-0.242**
PGDP			(-2.52)
DOD			0.189
POP			(1.09)
FID			0.169***
FIK			(2.73)
COV			0.85***
GOV			(11.59)
			-0.973***
EDU			(5.96)
Constant term	0.4241	-0.2149***	-3.943***
	(0.00)	(-3.71)	(-4.24)
Fixed time	NO	YES	YES
Individual fixation	NO	YES	YES

Table 3. Baseline regression test results.

R <sup>2</sup>	0.8062	0.8567	0.9275
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### 5 Conclusions and Policy Recommendations

This paper concludes the following: the digital economy improves employment quality. This study has provided the following policy insights: The new institutional supply of the digital economy still needs to be strengthened, investing capital in digital technology, building digital infrastructures, training complex talents, conducting innovative research in this area, turning innovative results into the ground, and strengthening digital Research and development of the underlying technologies. In order to achieve improvements in digital economy and employment quality, we should consider not only the "resonance" of the two, but also take into account the "reciprocal symbiosis" of the two so that we should also create an open and inclusive employment environment, fair and competitive market trading environment, and to ensure the smooth entry of workers into employment. In order for workers to seamlessly enter the workplace.

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