

The Influence of Policy Perception on the Employment of College Graduates under the New Development Paradigm

----- Based on Machine Learning

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Abstract: employment policy is an important factor affecting the employment level of college graduates. Based on the policy documents of the Ministry of education and the text data of the annual report on the employment quality of college graduates from 2015 to 2019, this paper uses the text data analysis method to calculate the policy perception of colleges and universities, and uses the panel regression model to evaluate the policy effect. The study found that the policy perception of colleges and universities often increases gradually with time, and the midland is higher than the eastern and western parts of China. In addition, no matter whether control education investment, policy perception can significantly promote the employment of college graduates. Heterogeneity analysis shows that policy perception has a significant impact on the employment level of graduates from double-world-class universities, eastern colleges and universities and colleges and universities with low employment. Further analysis found that the increase in policy perception of colleges and universities affects the employment level of graduates by promoting direct employment, which is more obvious for double-world-class universities and universities in the eastern region. In addition, the core conclusions remain robust after replacing employment level index, changing policy perception measurement methods, and eliminating the impact of outliers. The conclusion of the study shows that the increase in policy perception can promote the employment level of college graduates. Under the new development paradigm, colleges and universities should closely integrate with national policies, strive to optimize graduate employment and entrepreneurship guidance services, and promote more full employment of graduates.

Keywords: policy perception; colleges and universities; graduate employment; text data analysis

1. Introduction

Since the government implemented the enrollment expansion policy in 1999, the number of students enrolled and the size of students in China's colleges and universities have continued to increase. The gross enrolment ratio of higher education in 2019 has reached 51.6%, marking a historic transition in higher education from the mass education period to the universal phase. The expansion of the "entrance" to higher education has led to an increase in the "export". According to the statistics of the Ministry of Education, the total number of college graduates in China has increased from 6.51 million in 2011 to 8.74 million in 2020, the number of graduates has expanded by 2.23 million in 10 years and will continue to expand. At the same time, China's economy are entering a new development stage, Xi Jinping (2021) pointed out that accelerating the construction of a new development paradigm with the domestic cycle as the main body and the domestic and international dual cycles promoting each

other is a major strategic task related to the overall development of our country proposed in the "Suggestions" of the "14th Five-Year Plan", which needs to be accurately grasped and actively promoted from the overall situation. The continuous increase in the scale of college graduates confronts a new development pattern, which is bound to lead to a more complex employment situation.

At the 19th National Congress of the Communist Party of China, General Secretary Xi Jinping stressed that employment is the biggest livelihood, and it is necessary to adhere to the employment priority strategy and active employment policy to achieve higher quality and fuller employment. The 2021 Central Economic Work Conference pointed out that we must continue to do a good job in the "six stability" and "six guarantees" work, and put the employment work at the top of it, in order to achieve "stable employment" and "guarantee employment", it is necessary to do a good job in the employment of key groups such as college graduates. At present, the ratio of financial education funds to tuition fees of ordinary colleges and universities in China is 4:1, indicating that the government intervenes in the cultivation of human capital of college students through active financial means, in addition, employment policies also play an active role in the allocation process of college graduates, helping college graduates to find employment in an orderly manner and improving the quality of college students' employment. So, what is the guiding effect of the employment policy for college graduates? What kind of employment methods can employment policies play a role in promoting the employment of college graduates in China? It is of great significance to solve these problems in the economic environment in which China has entered a new pattern of development.

2. Literature review

The existing literature is mostly qualitative research on the employment policy of college graduates. Scholars disagree on the evolution of employment policies for college graduates, with Meng Bin and Zhong Xinwen proposing the "syllogism" against the backdrop of the 70th anniversary of the founding of the People's Republic of China[1], and Li Wenwen corroborating the "syllogism" based on the perspective of the "discontinuity-balance" theory [2]. Wei Ying put forward the "two-stage theory" according to the change of the dominant force in policy change [3]. In view of the study of the types of employment policies, Wu Qing divided employment policies into nine types according to the different roles [4]. Chen Congwen et al. classified employment policies from the perspective of supply and demand of human capital, including promoting demand and supply, and achieving matching supply and demand [5]. For the realistic positioning of the policy, Meng Bin believes that relying solely on market-oriented allocation of college graduate resources can easily lead to unemployment, and employment policy intervention is needed to make up for the lack and give play to the efficiency of the allocation of resources in the job market [6]. In addition, some scholars have also analyzed the employment policies of college graduates in different countries, and Tian Wenquan and Gui Zeyuan have studied the significance of french youth employment policies for China from the aspects of employment channels, employment security and employment contracts[7]. Wu Libao and Zhang Bin found that the United States and Japan have introduced policies from the aspects of demand, supply and

supply and demand matching to actively intervene in the employment of college graduates under the market employment model, which provides reference for The introduction of relevant policies in China [8].

Rao Pingui et al. pointed out that the internalization of macro policies into the decision-making behavior of micro individuals is a valuable challenge in current academic research [9]. So, does the employment policy for college graduates affect the employment decisions of graduates, and what impact will it have? Lupin believes that education expenditure has a significant positive effect on employment growth rate[10], if the level of education expenditure in colleges and universities is maintained basically stable, will the government's employment policy still have a positive impact on the employment of college graduates? Under the new development pattern, in order to stabilize China's employment situation, it is necessary for the government to insist on adopting active employment policies to intervene in the labor market and improve market functions, so it is of practical significance to assess the effectiveness of employment policies in the new era. However, there is a major problem in the empirical research process of policy evaluation, that is, the measures of policy are not easy to measure. Scholars have done a lot of work in scientifically calculating policy indicators, but rarely applied to the evaluation of employment policies for college graduates, the mainstream method of empirical research in this field is to obtain first-hand data through questionnaire surveys and then describe statistics and model analysis, more representative is Chen Chengwen and others using the cross-sectional data of 2008 undergraduate graduates of 6 universities in the eastern, central and western regions, from the three aspects of demand promotion, supply promotion and supply and demand matching, the research findings. All three policies have a positive effect on the employment of college graduates to varying degrees [11]. Through textual analysis, Wang Ting et al. divided employment policies into six categories and designed questionnaires to empirically study the impact of employment policies on the employment quality of college graduates in Beijing, and found that different types of employment policies will increase the employment opportunities or employment satisfaction of college graduates [12]. Gao Yao et al. found that human capital and family capital have a positive effect on the performance of the employment policy and the independent entrepreneurship policy of college graduates in the western region [13].

In addition, it should be noted that measuring policy performance can be started from the perspective of government policies supporting the employment of college graduates on the one hand, and whether colleges and universities optimize the employment and entrepreneurship guidance services for graduates in accordance with the instructions of the government employment policy. The Ministry of Education has issued notices to guide colleges and universities to promote the employment of graduates, such as the Notice of the Ministry of Education on Doing a Good Job in the Employment and Entrepreneurship of Graduates of Ordinary Colleges and Universities in 2019 (hereinafter referred to as the "Notice") in terms of employment channels, guarantees, education publicity and entrepreneurship, etc. The rapid implementation and effectiveness of the above policies has a premise, that is, the local universities can adjust their work in a timely manner to meet the requirements of the government's

employment policy. Therefore, quantifying the degree of policy awareness of universities can be used as an entry point for evaluating policy performance. The so-called policy perception, Wang Xuedong believes that it refers to the ability of individuals to perceive, understand and interpret relevant policy documents [14], and some scholars measure policy perception from the two aspects of policy perception ability and perception degree, and then further explore the impact of policy perception on individual development [15]. The above explanations of policy perception are based on subjective perspectives, and in order to facilitate the quantification of this indicator, this paper interprets policy perception as the degree to which the behavior of colleges and universities to promote the employment of graduates responds to the government's employment policy. Limited by the availability of data and the feasibility of the methodology, there is currently a lack of indicators of policy perception of guest observation.

In recent years, text data analysis has been widely used in social sciences, such as Saremento and other policy tendencies to analyze user comments using policy text data mining techniques[16]; Hopkins and King using automatic non-parametric methods to analyze blog policy opinions[17]; Zhang Tao et al. used text data analysis methods to calculate the text similarity of big data policies in the central and 22 regions, thus exploring the characteristics of big data policy formulation in different provinces[18]; Xiong Daping used LDA to calculate question-sentence similarity from three dimensions and integrate it into an overall similarity, thus realizing a community question answering system (CQA) that can be user-interactive.[19] This series of studies provides new ideas and methods for constructing policy perception indicators, using natural language processing methods to convert unstructured text data (employment policy texts and college graduate employment texts) into structured data, and it is possible to measure the relationship between structured data. Subsequently, based on the micro perspectives of different time and regions, the sensitivity of university employment and entrepreneurship services to employment policies is studied, and the impact of university policy perception on the employment level of graduates is further explored.

In summary, most of the existing literature from the perspective of the evolution of employment policies for college graduates, policy types, and the realistic positioning of policies, etc., or to explore the reference significance of foreign employment policies, a small number of empirical studies usually use questionnaire surveys to take different types of employment policies as the research subject, to explore the impact of policies on policy target objects, there is little empirical analysis of policy target objects as the research body, and there is a lack of effective application of policy indicator measurement methods, based on this, This paper aims to use natural language processing technology to evaluate the impact of university policy perception on the employment status of graduates from the perspective of quantifying the degree of response of universities to government policies, and then examine the effectiveness of government policies.

3. the construction of policy awareness indicators for colleges and universities

The construction of university policy perception indicators mainly involves two

types of texts: First, the "Notice" from 2015 to 2019, which is a policy document issued by the Ministry of Education every year to guide colleges and universities to do a good job in graduate employment and entrepreneurship, which not only reflects the government's long-term guidelines for the employment and entrepreneurship of college graduates, but also makes temporary adjustments according to the actual situation every year, which has the advantages of authority, high text quality and easy access. In 2013, the General Office of the Ministry of Education issued the "Notice on the Preparation and Publication of the Annual Report on the Employment Quality of College Graduates", which requires colleges and universities to compile an annual report on the employment quality of graduates every year to track and reflect the employment situation of their graduates, and standardize the content and form of the report, so that the employment activities of college graduates at different levels in different regions are comparable, and to a certain extent, they can reflect the efficiency and quality of employment and entrepreneurship services in colleges and universities.

(1)Text data collection and pre-processing

The employment policy documents used in this article are derived from the official website of the Ministry of Education, and the annual report on the employment quality of college graduates is mainly obtained from the information disclosure network of various universities.

In order to improve the accuracy of word segmentation, it is necessary to build a suitable word segmentation dictionary, referring to the approach taken by many scholars, this paper expands the existing dictionary by adding a proper noun dictionary according to the research needs. There are mainly proper nouns that describe regions and institutions, such as names of cities, provinces, regions, universities, government agencies, etc., combined with the "14th Five-Year Plan" employment promotion plan issued by the State Council, and the heuristic word segmentation algorithm is used to construct a proper noun dictionary. Secondly, the constructed dictionary is imported into Python's jieba word segmentation toolkit for word segmentation processing of text data, and then the words are stopped, and finally a corpus based on the data of employment policy documents and the annual report data of college graduates' employment quality is established, involving a total of 10568 words and phrases.

(2)Construction of policy perception indicators

Text similarity calculation has important application value as a text data analysis method and is widely used in social science research. In terms of connotation and calculation method, there are also differences in text similarity according to the change of application scenario. D.Lin explains how text similarity measures commonality and difference from the perspective of information theory, that is, the commonality of texts with high similarity is large and the difference is small [20]. Therefore, this paper assumes that high text similarity represents the large commonality between the employment policy text and the employment quality annual report, and the university is highly sensitive to employment policy. By summarizing the method of calculating the similarity of texts, Chen Erjing et al. believes that the bag-of-word model (suitable for short texts with normative characteristics) and the word vector model (suitable for large-scale texts) are the most widely used [21]. Through the analysis of the structure,

content, and data volume of the research object, it is found that: First, the language refinement and structure of the policy text and the employment quality annual report are refined and structurally standardized. Second, the policy texts and employment quality annual reports studied in this paper have a relatively small corpus. Third, the research subjects are all employment-related texts, and the keywords are more consistent, but there are also differences. Fourth, the subjects of study are all long texts. According to the characteristics of the research object in this paper, combined with the conclusions of Cao Qi et al.'s comparative analysis of the traditional text similarity model and the Doc2Vec model [22], the policy text and employment quality annual report are calculated using the static word vector model Doc2Vec, and then the policy perception index is constructed. In the robustness test, the degree of policy perception measured by the dynamic word vector model Sentence-Bert is used as a substitute.

Zhang Tao et al. decomposed the organizational structure of the corpus into texts, sentences and words according to the idea of macro to micro, as shown in Figure 1:

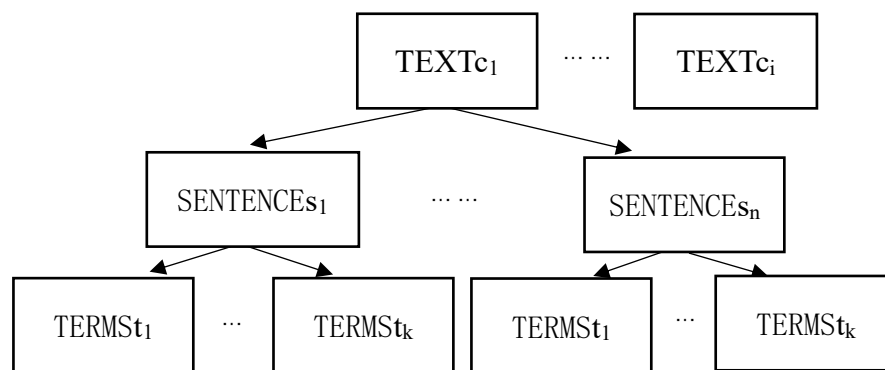


Figure 1 Tree hierarchy of text organization

The corpus C is $C = \{c_1, c_2, \dots, c_i\}$, i is the number of text.

Suppose c_i is a text of corpus C , s_i is a statement in text c_i , t_i is a word in statement s_i , and text c_i and statement s_i can be expressed as:

$$c_i = (s_1, s_2, \dots, s_i, \dots, s_n) \quad (1)$$

$$s_i = (t_1, t_2, \dots, t_i, \dots, t_k) \quad (2)$$

where n is the number of statements in the text c_i and k is the number of words in the statement s_i .

Suppose any two texts c_1 and c_2 are represented by equation (3) and equation (4), respectively:

$$c_1 = (s_{11}, s_{12}, \dots, s_{1i}, \dots, s_{1m}) \quad (3)$$

$$c_2 = (s_{21}, s_{22}, \dots, s_{2i}, \dots, s_{2n}) \quad (4)$$

m and n are the number of statements in the text, respectively.

To calculate the similarity between statements, assuming that c_{12} is a similarity matrix of c_1 and c_2 , then matrix c_{12} can be represented by equation (5):

$$c_{12}=c_1^T \times c_2 = \begin{bmatrix} s_{11}s_{21} & s_{11}s_{22} & \cdots & s_{11}s_{2n} \\ s_{12}s_{21} & s_{12}s_{22} & \cdots & s_{12}s_{2n} \\ \vdots & \vdots & \cdots & \vdots \\ s_{1m}s_{21} & s_{1m}s_{22} & \cdots & s_{1m}s_{2n} \end{bmatrix} \quad (5)$$

Any formula $s_{1m}s_{2n}$ is analyzed, and formula (6) and formula (7) are the statements after the participle.

$$s_{1m}=(t_{11},t_{12},\dots,t_{1i},\dots,t_{1m}) \quad (6)$$

$$s_{2n}=(p_{11},p_{12},\dots,p_{1i},\dots,p_{1n}) \quad (7)$$

Among them, t_{1m} and p_{1n} represent the word vectors of s_{1m} and s_{2n} , respectively.[23]

This paper uses the cosine similarity formula (8) to calculate the text similarity between the policy document and the annual report on employment quality, the value range is 0-1, the larger the cosine value, the higher the similarity, and vice versa.

$$\text{Sim}=\cos(s_{1m},s_{2n})=\frac{s_{1m} \cdot s_{2n}}{\|s_{1m}\| \cdot \|s_{2n}\|}=\frac{\sum_{m=1}^m \sum_{n=1}^n t_{1m} \cdot p_{1n}}{\sqrt{\sum_{m=1}^m t_{1m}^2} \sqrt{\sum_{n=1}^n p_{1n}^2}} \quad (8)$$

(3)Description of indicators of the degree of policy perception

This paper calculates the policy perception of 110 colleges and universities in China from 2015 to 2019 by calculating the cosine similarity of the policy text and the annual report on employment quality, in order to compare the difference in the policy perception of colleges and universities in various provincial regions and the trend of change over time, the policy perception of different provinces at different times is represented by a column chart, as shown in Figure 2, in terms of time trend, the policy awareness of colleges and universities in most provinces in China has improved, and the universities in the eastern and central provinces and cities have improved more significantly, such as Shanghai, Guangdong, Hebei, Hunan, etc. From the perspective of regional dimension, there are significant regional differences in the policy perception of colleges and universities in China, and the higher policy awareness of colleges and universities is that of provinces and cities in the central region, such as Hebei, Henan, Hunan, Hubei, etc., and the policy awareness of colleges and universities in eastern and western provinces and cities is low. It can be seen that the policy perception of China's colleges and universities is unbalanced at the provincial and regional levels.

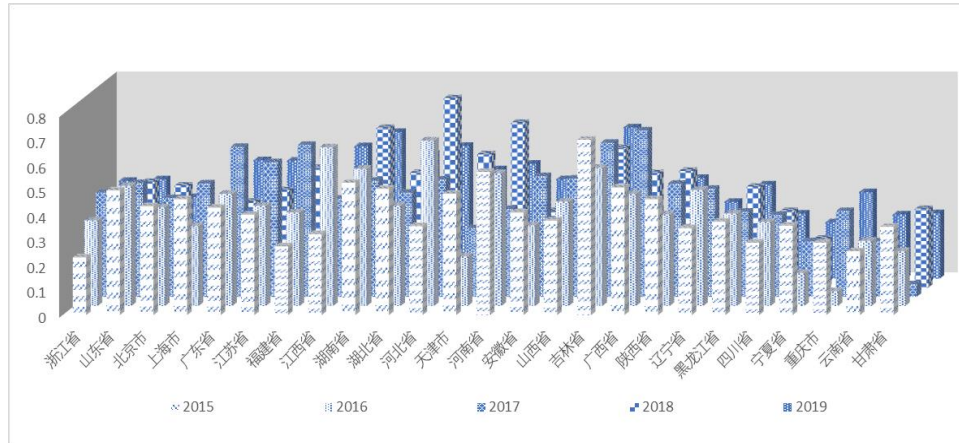


Figure 2 Comparison of changes in policy perception of colleges and universities in

various provinces in China

4.research design

(1)Data source and variable definition

This paper selects 110 domestic universities (59 in the eastern region and 51 in the central and western regions) to study the policy perception of the Notice and its impact on the employment of college graduates from 2015 to 2019. Among them, the relevant data of college graduates come from the annual report on the employment quality of graduates, the annual report on teaching quality, and the annual financial statements prepared by various universities, which are collected and sorted out by hand.

Table 1 Variable definitions

Variable category	Variable name	Variable symbol	Computing method
Dependent variable	Employment	num	Logarithm of the total number of graduates
	Employment rate	rate	Total employment rate of graduates
	Further study	sxnum	Logarithm of the number of graduates entering higher education in China
	Further study abroad	cgnum	Logarithm of the number of graduates going abroad for further study
	Direct employment	zjnum	The logarithm of the number of employed graduates after deducting the enrollment part
Independent variable	Policy Perception	S _{IT}	Text similarity calculated using the Doc2Vec method
	Policy Perception	S _{DT}	Text similarity calculated using the Sentence-Bert method
Control variable	Per capita education expenditure	lnjy	Logarithm of the ratio of higher education expenditure to the number of students
	Per capita financial allocation	lncz	Logarithm of the ratio of financial allocation to the number of students in Colleges and Universities
	Number of graduates	lnby	Logarithm of the number of graduates
	Changes in housing security expenditure	zbzc	Change rate of housing security expenditure in Colleges and Universities

(2) Model setting

Considering the large differences in fixed factors such as geography and school running among universities, in order to further reduce the influence of unobservable fixed factors on the estimated results, this paper uses a fixed effect panel data model to empirically study the impact of policy perception on the employment of college graduates, and the specific function model is shown in (9):

$$y_{it}=\beta_0+\beta_1Sim_{it}+\beta_2X_{it}+\mu_i+v_t+\varepsilon_{it} \quad (9)$$

Among them, y_{it} is the employment level of college graduates, Sim_{it} is the policy perception of colleges and universities, X_{it} is the other control variables, μ_i is the fixed effect of the region, v_t is the fixed effect of time, ε_{it} is the random error term, and the subscripts i and t represent the region and time respectively.

5. Analysis of empirical results

(1) Descriptive statistics of variables

Prior to regression analysis, this paper eliminates the effect of outliers on regression results by performing bilateral indentation on 5% quantiles for all control variables. Table 2 reports descriptive statistical results for variables:

Table 2 Descriptive statistics for variables

variable	Observed value	Average value	Standard deviation	Minimum	Maximum
num	538	8.7266	0.3801	6.8576	9.6533
rate	547	0.9500	0.0337	0.7840	0.9979
sxnum	485	7.0489	0.6727	4.2606	8.7432
cgnum	478	5.6545	0.9737	0.6931	7.3993
zjnum	538	8.4394	0.3965	6.4853	9.2862
S _{JT}	465	0.2590	0.0988	0.1078	0.4594
S _{DT}	538	0.9353	0.0736	0.5500	0.9870
lnjy	495	10.9961	0.5941	9.9802	12.0223
lncz	490	10.3161	0.5379	9.3051	11.1278
lnby	540	8.7855	0.3219	8.1870	9.4016
zbzc	413	0.1259	0.2206	-0.2204	0.6963

(2) Basic regression results

Table 3 reports the regression results before and after the model adds control variables:

Table 3 Benchmark regression results

Variable	Model(1) Num	Model(2) Num	Model(3) Num	Model(4) Num
S _{JT}	0.1932* (0.1101)	0.2294** (0.1154)	0.1158** (0.0502)	0.1197** (0.0510)
lnjy		0.0764* (0.0472)		0.0497* (0.0307)
lncz			-0.0212 (0.0282)	-0.0559* (0.0338)
lnby			1.5403*** (0.1643)	1.5404*** (0.1643)
zbzc			0.0091 (0.0119)	0.0088 (0.0118)
Intercept term	8.6718*** (0.0438)	7.8178*** (0.5235)	-4.6092*** (1.4169)	-4.8016*** (1.4259)
Individual effect	Yes	Yes	Yes	Yes
R ²	0.0157	0.0150	0.9279	0.9281
N	456	420	339	339

Note: ***, **, * indicate that the parameter estimates are significant at the level of 1%, 5%, and 10%, respectively, and the values in parentheses are cluster robust standard errors, and the following table is the same.

It can be seen from the results that the coefficient of policy perception is significantly positive regardless of whether the control variable is added or not, indicating that the more sensitive the policy trend, the higher the employment level of graduates. In Table 3, different from model (1) and model (3), model (2) and model (4) control the level of education expenditure of colleges and universities through the variable *lnjy*, the results show that in the case of controlling the level of education expenditure, the government employment policy has a significant positive impact on the employment of graduates. Based on the above arguments, under the premise of controlling the level of education expenditure, the more sensitive the colleges and universities are to employment policies, the higher the employment level of graduates, indicating that the employment policies for graduates can significantly promote the employment of college graduates. This conclusion effectively explains the previous doubts.

(3) Heterogeneity analysis

Heterogeneity of colleges and universities

The above analysis evaluates the impact of policy perception on the employment of college graduates from a full-sample perspective, but this effect may vary for colleges and universities at different levels, different regions, and different types of schools. Therefore, it is necessary to test the impact of university policy perception on the employment level of graduates by sample. As we all know, there are large differences in the allocation of resources by the government to colleges and universities at different levels of education, so this paper divides the sample according to whether it is a double-first-class university or not, to explore the heterogeneity of the degree of policy perception of colleges and universities at different levels of education on the employment level of graduates. Governments take into account differences in economic development between regions when formulating and implementing policies, so it is necessary to explore whether there are differences in the degree to which universities in different regions are affected by employment policies. This paper divides the sample into universities in the eastern region and universities in the central and western regions according to the different locations, to explore the heterogeneity of the impact of policy perception on the employment of college graduates in different regions. In addition, there are differences in the types of schools in China's colleges and universities, so the impact of policy perception of different types of universities on the employment level of graduates can be assessed. This paper divides the sample into comprehensive universities and professional colleges and universities according to the types of schools in different universities.

Table 4 The impact of policy perception on the employment of different types of college graduates

Variable	Double world-class Model (1)	Non Double world-class Model (2)	Eastern Model (3)	Midwestern Model(3)	Comprehensive Model(4)	Professional Model(5)
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	Num	Num	Num	Num	Num	Num
S _{JT}	0.1117* (0.0663)	0.0849 (0.0752)	0.0512* (0.0282)	0.1681 (0.1011)	0.0583** (0.0240)	0.1455** (0.0677)
Intercept term	-3.8799** (1.5037)	-6.2876*** (1.9934)	-1.9102*** (0.6665)	-5.6559*** (1.7272)	-0.6918 (0.4828)	-6.0154*** (1.2858)
Individual effect	Yes	Yes	Yes	Yes	Yes	Yes
Control variable	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.9562	0.8143	0.9834	0.9042	0.9646	0.8937
N	231	108	181	158	105	233

Table 4 reflects the heterogeneity of policy perception effects. Among them, the model (1) and model (2) are based on the level of university education, the model (3) and model (4) are based on the region where the university is located, and the model (5) and model (6) are based on the type of university. These estimates show that the policy perception has a significant positive effect on the employment of double-first-class college graduates, not on non-double-first-class universities, and has a significant promotion effect on the employment level of college graduates studying in the eastern region, but not on college graduates studying in the central and western regions. As far as the type of school is concerned, regardless of whether it is a comprehensive university or not, the coefficient of the policy perception index is significantly positive, and when the policy perception coefficient of different types of schools is examined by the intersection of policy perception and university running type, it is found that there is no difference in the type of university school running at the high employment level brought about by the increase in policy perception (the coefficient corresponding to the cross item is -0.0809, and it is not significant).

From the perspective of running schools, many double-first-class universities are subordinate to the Ministry of Education or other ministries and commissions, and are often more sensitive to national policy trends, and the policy supports them more strongly, so the impact of policy perception on the employment of double-first-class college graduates is higher than that of non-double-first-class universities. From a regional point of view, the policy encourages college graduates to flexibly employment, independent entrepreneurship, due to the high degree of openness in the eastern region, more developed economy, flexible and diverse employment directions, and a more superior entrepreneurial environment, which makes the policy perception of the employment level of college graduates in the eastern region more obvious.

Heterogeneity of different levels of employment

The impact of policy perception on the employment of college graduates may vary at different levels of employment, and this paper uses panel quantile regression to analyze this phenomenon. Table 5 reports estimates of the impact of policy perception on the employment of university graduates at different quantiles of employment levels. The analysis found that the effect of policy perception on promoting the employment of college graduates varies significantly depending on the level of employment. Among

them, at quantiles of 50% and 75%, the estimated coefficient of policy perception is significantly positive. Further observation shows that with the increase of the quantile, the influence coefficient of policy perception gradually decreases, indicating that the promotion effect of policy perception on graduate employment gradually decreases with the increase of employment level.

Table 5 Impact of policy perception on the employment of different types of college graduates

Variable	Q25 Model(1) Num	Q50 Model(2) Num	Q75 Model(3) Num
S _{JT}	0.1448 (0.1016)	0.1179** (0.0518)	0.1015** (0.0470)
Control variable	Yes	Yes	Yes
N	339	339	339

The reason is that the purpose of the government's employment policy is to guide college graduates to achieve fuller employment, compared with colleges and universities where employment has been maintained at a high level, the government pays more attention to colleges and universities with lower employment levels, in fact, when the employment level is close to full employment, the effect of employment policies is gradually decreasing.

(4) Further education and direct employment

As mentioned above, the policy perception of colleges and universities will affect the employment behavior of graduates, but it is not clear how employment behaviors such as domestic further education, overseas (abroad) further education, and direct employment have changed. Therefore, in accordance with the provisions of the Notice of the General Office of the Ministry of Education on Further Strengthening and Improving the Statistical Report on the Employment Status of College Graduates, this paper returns to each sub-item separately, and finds through Table 6 that the policy perception only has a significant impact on direct employment, and the impact on the graduates' further education is not significant. The results show that policy perception mainly promotes the employment of college graduates through direct employment.

Table 6 Impact of policy perception on college graduates' further education and direct employment

Variable	Model(1) Zjnum	Model(2) Sxnum	Model(3) Cgnum
S _{JT}	0.1463*** (0.0565)	0.0754 (0.0908)	-0.0198 (0.1605)
Intercept term	-4.1939*** (1.3671)	-10.0255*** (1.9454)	-13.3285*** (3.6138)
Individual	Yes	Yes	Yes

effect			
Control variable	Yes	Yes	Yes
R ²	0.7654	0.5467	0.3748
N	339	297	295

Table 7 shows that in terms of direct employment, universities with a high degree of policy awareness in general have a higher direct employment promotion effect. According to the sample, this phenomenon exists in double-first-class universities, universities in the eastern region and universities of different types of schools. By introducing the intersection of policy perception and school-running type, the regression coefficient of the policy perception variable of different types of university-running universities was further tested, and it was found that there was no difference in the type of school-running school (the coefficient corresponding to the cross-term was -0.1265, and it was not significant).

Table 7 Impact of policy perception on the direct employment of different types of college graduates

Variable	Double world-class Model(1) Zjnum	Non Double world-class Model(2) Zjnum	Eastern Model(3) Zjnum	Midwestern Model(3) Zjnum	Comprehensive Model(4) Zjnum	Professional Model(5) Zjnum
S _{JT}	0.1759*** (0.0621)	0.0492 (0.1181)	0.1002*** (0.0369)	0.1763 (0.1147)	0.0799*** (0.0281)	0.1655** (0.0778)
Intercept term	-3.1385** (1.4097)	-5.8895*** (2.1293)	-1.9335*** (0.6604)	-4.5920 (1.5978)	-0.0123 (0.5769)	-5.4060*** (1.2474)
Individual effect	是	是	是	是	是	是
Control variable	是	是	是	是	是	是
R ²	0.8280	0.8364	0.8269	0.8459	0.8794	0.8465
N	231	108	181	158	105	233

6. Robustness test

This paper conducts robustness tests from three dimensions to ensure the reliability of the core conclusions, including:

Firstly, the logarithmic number of employed persons is replaced by the employment rate of college graduates as the interpreted variable; Secondly, the calculation method of the core explanatory variables is replaced by the static word vector model Doc2Vec with the dynamic word vector model Sentence-Bert; Finally, in order to obtain a robust empirical conclusion, this paper uses bilateral indentations on the 1% quantile to deal with each control variable. In addition, it is worth thinking about whether the impact of policy perception on the employment of college graduates has

endogenous problems such as missing variables or reverse causes and effects (whether the policy will be adjusted due to the employment status of graduates of individual colleges and universities). First of all, on the problem of missing variables, comprehensive references and empirical results, from the 19 variables collected, 4 control variables as regression models were selected, as far as possible to make up for the problem of missing variables, and at the same time, the time fixation effect of the model was found to be not strong, so only the individual effect was controlled, so that the individual factors that affected the employment of college graduates and did not change with time in the short term could be controlled. For the problem of reverse causation, considering that the "Notice" is a national official document issued by the Ministry of Education every year by comprehensively integrating various macro factors, the possibility of modifying the policy content due to the employment status of graduates of a certain university is low, so it is believed that there is little possibility of reverse causation in policy perception.

After considering the above, the results of the retest of the benchmark regression model are shown in Table 8. Through observation, it can be found that the estimation coefficient of policy perception is significantly positive in all three models, indicating that policy perception has a significant role in promoting the employment of college graduates. This shows that the core conclusion of this article is robust.

Table 8 Robustness test

Variable	Sentence-Bert method model(2) num	Replacing interpreted variable model(1) rate	Bilateral tailing treatment on 1% quantile model(3) num
S _{JT}		0.0291 ^{**} (0.0130)	0.0382 ^{***} (0.0144)
S _{DT}	0.2044* (0.0881)		
Intercept term	8.5354 ^{***} (0.0824)	1.0860 ^{***} (0.1508)	-0.3537* (0.2106)
Individual effect	Yes	Yes	Yes
Control variable	No	Yes	Yes
R ²	0.0034	0.0598	0.9908
N	538	339	339

7. Conclusions and Recommendations

The "Circular" is an important material for policy research, and it contains the government's policy orientation and support measures for the employment of college graduates in the coming period. However, through empirical research to measure the

degree of policy impact of textual information such as the Notice and to further explore, it has always faced the problem that policy texts are not easy to quantify. In recent years, the rise and widespread application of text data analysis and machine learning methods has provided new perspectives on policy quantification. The "Notice" is the text carrier of employment policy, and the employment information in the annual report on the employment quality of college graduates reflects policy support, so there must be similarity and consistency in the data and structure of the two types of texts, which is used to reflect the sensitivity of colleges and universities to employment policies, that is, policy perception, which is more logical. The key to this paper is to measure the similarity between the policy text and the annual report on the employment quality of college graduates, so the natural language processing technology with objectivity and scientific nature is selected to solve this problem, and then the impact of policy perception on the employment of college graduates is empirically analyzed from multiple angles, which provides a new idea for the study of the employment policy performance of colleges and universities, and at the same time, the research conclusions have certain theoretical and practical significance.

The main findings of this article are the following four points. First, there are temporal and regional differences in university policy perceptions. On the one hand, the policy awareness of most provinces and cities in China will increase with the increase of time; on the other hand, the policy awareness of colleges and universities located in the provinces and cities in the central region is higher than that in the eastern and western regions. Second, the increase in policy perception can significantly improve the employment level of college graduates, a conclusion that is still true after controlling the education expenditure variable, and it is still true after changing the indicator of employment level. Third, due to the heterogeneity of different levels of education, different regions and different types of universities, this paper examines the impact of policy perception on the employment level of college graduates, and the research results indicate that the heterogeneity of the impact only exists in the level of university education and the region where the university is located, and the type of university school is not, specifically, the policy relevance degree has a more significant employment promotion effect on double-first-class universities and universities in the eastern region, and the employment promotion effect on non-double-first-class universities and the central and western regions is not significant. In addition, under different employment levels, the effect of university policy perception on the employment of graduates may be different, so quantile regression is used to test it, and the study found that the policy perception to promote the employment of college graduates will gradually decrease with the improvement of employment level. Fourth, after further decomposing employment into domestic further education, overseas (abroad) further education and direct employment and testing, it is found that policy perception has a significant positive effect on direct employment, but the impact on domestic further education and overseas (abroad) education is not significant. In the case of sub-samples, the direct employment level of colleges and universities with high degree of policy perception is also high, and this impact is only significant for double-first-class construction universities and universities in the eastern region.

The above findings show that the policy is an important factor in improving the employment level of college graduates, on the one hand, the government to promote the multi-channel employment of college graduates and a series of preferential policies for independent entrepreneurship will directly affect the employment decisions of college graduates and improve the level of direct employment; on the other hand, the employment level reflects the social prestige of colleges and universities to a certain extent, and colleges and universities have the motivation to optimize their own employment and entrepreneurship guidance service level in accordance with policy requirements to promote the employment of college graduates. The employment level of graduates of universities in the eastern region is more sensitive to policy perception.

Through the analysis of policy perception and empirical results, it can be found that the improvement of policy perception can significantly promote the employment of colleges and universities, but this promotion effect is heterogeneous in colleges and universities at different levels of education, different regions and different employment levels, in order to improve the performance of employment policies, this paper puts forward three policy suggestions. First, the formulation and implementation of employment policies can vary according to the level of education of colleges and universities. This paper found that the employment of non-double-first-class college graduates with high policy awareness has not received more policy support, but among the graduates, non-double-first-class college graduates account for the majority, to improve the overall level of employment of college graduates in China, it is necessary to promote the employment of non-double-first-class college graduates in a prominent position, so the government can closely combine the labor market development needs under the new development pattern when formulating policies, and appropriately tilt resources to non-double-first-class universities. At the same time, the role of a series of preferential policies in the optimal allocation of human resources will be strengthened, thereby improving the performance of government employment policies. Second, the formulation and implementation of employment policies should distinguish between regional differences in universities. The study found that policy perception can significantly improve the employment level of college graduates in the eastern region, which shows that there are geographical location differences in the performance of national policies, so local governments in the central and western regions should increase support for the employment of graduates in combination with the actual situation of the region when formulating policies to achieve a balance in the allocation of policy resources. Third, employment and entrepreneurship guidance services for college graduates at different employment levels should be focused differently. Colleges and universities with higher employment levels should pay attention to "maintaining employment", and strive to maintain the employment rate of graduates at a high level while paying attention to improving the employment quality of graduates, while colleges and universities with lower employment levels should put the improvement of graduate employment rate in a prominent position and cannot ignore the employment quality of graduates. To improve the efficiency and quality of employment and entrepreneurship services, colleges and universities need to rely on the government's "east wind". Government policies usually have a guiding role and will

introduce a series of preferential policies, so colleges and universities need to pay attention to national policy trends in a timely manner, actively use policy convenience and resource support, and optimize the employment and entrepreneurship guidance service model according to the employment policy combined with their own advantages, so as to promote the employment level and employment quality of graduates.

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