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Higher Education Admission Policy and Social Class of Ethnic Minority: The Case of Guangxi Zhuang Autonomous Region, China

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ABSTRACT

Gaokao has been considered as the gatekeeper of intergenerational class reproduction in today's slowing social mobility in China. In order to bolster the fairness of Gaokao, the Policy of Bonus Scores for Ethnic Minority Candidates (PBSEMC) has been issued, whose, however, effectiveness in promoting upward social class has not been adequately empirically explored. The difference-in-differences (DID) analysis based on cross-sectional data, which is distinct from the traditional DID analysis paradigm, was implemented to assess the Reform of PBSEMC in the Guangxi Zhuang Autonomous Region in 1988. The results showed that PBSEMC had a significant and positive impact on the social classes of ethnic minorities, and gender, residence type and occupation type were also relevant to social class, aligning with the previous literature. The PBSEMC is effective in improving the social classes of ethnic minorities. However, the PBSEMC policy should be made more precise, in order to benefit the candidates who are in genuine need of assistance.

Keywords: Gaokao; Policy of bonus scores; Ethnic minority; Social class; Difference-in-differences analysis; Higher education

1. Introduction

Since the economic reform and participation in globalisation, China's total social wealth has increased substantially. However, the structural income difference between urban and rural areas, regions, industries, and communities has also continually grown. According to China's National Bureau of Statistics, the Gini coeffi-

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cient was approximately 0.17 to 0.18 in the 1960s and increased to 0.21 to 0.27 in the 1980s in China. Notably, since 2003, this coefficient has lingered within the alert zone (over 0.46) [1], which suggests an ever-widening gap between the rich and the poor. It is believed that some structural problems have already surfaced, such as the forming of the benefit distribution mechanism within the vested interests and the slowdown of social mobility [2].

An influential theoretical work, the status-attainment model, has claimed that individuals' professional achievement depends mainly on their level of education [3], which also brought a growing series of research efforts confirming the significant effect of education on status attainment [4,5]. Higher education is found to be strongly associated with social mobility [6]. Having higher education could widen occupational choices, and enhance economic and social status [7]. In addition, higher education can be a chief channel of intergenerational class reproduction [8].

The Gaokao (i.e., the Chinese college entrance exam) not only determines an individual's access to higher education, but also has a large influence on their subsequent career choice, income, and social status [9]. However, people's ability to obtain educational resources varies greatly across such a large country. Thus, whether candidates are treated fairly during the Gaokao has become a common concern for candidates, their families and the general public.

The Chinese government has issued a series of policies to bolster the fairness of Gaokao. One policy is the Policy of Bonus Scores for Ethnic Minority Candidates (PBSEMC). Although a significant amount of research has been conducted into the PBSEMC, the width and depth of this research are still insufficient [10]. The PBSEMC should not be regarded as a purely educational issue, since it is interlinked with the distribution of social benefits, and therefore power, in society. So far, however, many studies are of theoretical analysis [11,12]. This research provides some empirical evidence for these theoretical arguments.

However, there are not many empirical studies to demonstrate the effectiveness of this policy in promoting upward social class. This study will explore the impact of PBSEMC on the social classes of ethnic minorities.

2. The literature review and research questions

2.1 Policy context and content for PBSEMC

The Gaokao is the college entrance examination in mainland China. The Examination Centre within the Ministry of Education prepares the test papers, which are penned according to the latest programme of the test category constitution approved by the Ministry of Education, together with the Curriculum Reform and the teaching materials available across the various regions. Therefore, the test questions differ per region [13,14]. Previous research on social class focuses on how different social factors, such as economic development, institutional influence and history, have an effect on social class [2,15]. Some scholars claimed that the design of institutions under socialist national policies had a profound impact on the mobility of the national population [16]. The bonus scores policies of the Gaokao are the classic example of this institutional design.

The PBSEMC is a preferential policy that aims to promote ethnic equality in Gaokao [17]. There are 56 officially recognised ethnic groups in China. The Han ethnic group constitutes 90% of the population, and therefore the remaining 55 are classified as ethnic minorities. The PBSEMC aims to allow underprivileged ethnic minority students the opportunity to receive higher education by taking into account the relative difficulties they face in attaining a full education [17]. The PBSEMC can be divided into three main aspects [18]: (1) different treatment of different ethnic minority groups, who get different amounts of bonus scores for Gaokao marks depending on the size of populations of that group; (2) different treatment of ethnic minority groups in different regions, who get different amount of bonus scores for Gaokao marks depending on the level of education quality in different regions; and (3) uniform preferential treatment of all ethnic minority groups nationwide.

Results from the Gaokao determine which candidates will progress to higher education. A higher education level is most often indicative of a higher level of working efficiency, making highly educated individuals suitable for industries and occupations which demand high productivity [19]. Thus, higher education directly affects candidates' future social class [20]: The Gaokao is therefore a tool for both upward mobility and downward mobility. When educational resources are distributed equally—occupational and economic resources may be distributed relatively fairly, resulting in equitable social stratification. Therefore, we propose the following hypothesis:

The implementation of PBSEMC has a positive impact on the social classes of ethnic minorities.

2.2 Debates and existing research findings

The PBSEMC has an effect on every student who takes the Gaokao examination and hopes to progress to further education. As a result, the policy has received much attention from the public and academia [11,12,21]. Some scholars argue that Gaokao itself is an accurate measurement of students' educational attainment, providing each student with a fair opportunity to compete. However, for ethnic minority candidates, who are disadvantaged because of economic and historical reasons, the Gaokao represents merely formal equality, not substantive equity [10,12,21]. From this perspective, the government has a responsibility to regulate and redistribute societal resources to balance the interests of different ethnic groups [11]. The PBSEMC has the same objective.

There have been heated debates about the shortcomings of PBSEMC [22-24]. Some scholars found PBSEMC has a negative impact on both the quality of minority students in higher education institutions and the quality of minority candidates of Gaokao [25,26]. They expressed concern that the policy might ultimately result in minorities having 'diplomas without practical abilities'. Aside from this, some scholars consider it unfair to simply add a bonus score purely based on the ethnic identity of a given candidate, regardless of their actual economic situation [23]. The policy's definition of 'ethnic minorities' is also ambiguous, considering all minorities as a monolithic whole. In fact, there are vast differences between those belonging to the same ethnic group, in terms of social class and economic background. As a result, the PBSEMC policy may lead to new forms of social injustice due to the unclear targeting of beneficiaries, or negligence of other potential beneficiaries [24]. A few members of an ethnic group would receive its benefits and greatly improve their situation, but the rest of the ethnic group would receive none. Hence, 'the Matthew effect'—the rich get richer while the poor get poorer—may result in further inequality within ethnic minority populations [22,23].

Most of the existing scholarly research concerns the relationship between social mobility and Gaokao [19,20], but few studies focus on the effect of a specific policy, such as the PBSEMC, on social class.

The PBSEMC policy has now been implemented for over three decades and has attracted a great deal of attention from academic figures [11,12,22,24]. However, the majority of academic research has investigated the theoretical basis of PBSEMC and its shortcomings [10]. Relatively little research analyses the relationship between this preferential policy and its intended goal—improved social class of ethnic minorities. In addition, much of the existing research uses qualitative methodology, and few adopt quantitative or mixed methods of analysis [27]. This study adopts quantitative comparative analysis which would be helpful to infer the causal relations between the PBSEMC policy and social classes of ethnic minorities. Therefore, this study will analyse publicly available data from a random sample of China's 1% population survey in 2005. The analysis seeks to answer the question of whether PBSEMC has effectively promoted the social classes of ethnic minorities candidates of Gaokao.

3. Methods

3.1 Data source

Guangxi is a provincial autonomous region for ethnic minorities in China, and as of 2020, approximately 37.52% of its population, including 11

ethnic minorities such as Zhuang, Yao and Miao. Meanwhile, the region's government was an early implementer of PBSEMC, and therefore the case of Guangxi was chosen to study in this paper. The data for this study were drawn from the Chinese 1% National Population Sample Survey (CNPSS), which is also called mini-census. As the regularly and systematically collected census data about the Chinese population show, CNPSS is often used to identify long-term trends of Chinese social change. This study is based on a random sample of the 2005 1% mini-census survey. In the 2005 1% mini-census approximately 17,050,000 individuals were interviewed, representing 1.31% of the total estimated population of China in 2005.

The PBSEMC has undergone several stages of development. In the 1950s, its primary version stated that 'Ethnic minority candidates with lower scores can also be admitted to higher education institutions. In the 1980s, new legislation ruled that ethnic minority candidates should be differentiated according to the regions they lived, dividing Gaokao candidates by ethnic minority autonomous regions, mountainous areas, pastoral areas and areas where ethnic minorities were interspersed in predominantly Han areas. Candidates were offered different bonus scores depending on their region of origin [28]. The PBSEMC in Guangxi was also reformed in 1988 [29]. Accordingly, this study will limit its research to the impact of PBSEMC on candidates' social class in Guangxi. This study sample was selected by the following criteria, requiring each individual to meet either criteria 1 or 2, and must meet criteria 3.

Criteria 1. Individuals must belong to one of these 10 specific ethnic minorities: Zhuang, Yao, Miao, Mulao, Maonan, Hui, Yi, Jing, Shui or Gelao. Alternatively, the individual could belong to any of the minorities from Guangxi's 11 ethnic minority autonomous counties: Rongshui, Sanjiang, Jinxiu, Dahua, Duan, Bama, Luocheng, Longlin, Longsheng, Fuchuan, or Huanjiang. The Gaokao bonus score given to those who met the first criteria was 10 prior to the PBSEMC reform in 1988: After the reform, it was doubled to 20.

Criteria 2. Individuals must belong to an ethnic minority from one of the 33 counties and districts of Guangxi, including Baise City, Hechi City and Chongzuo City. Those who met the second criterion were not affected by the PBSEMC reform in 1988, and resultantly their bonus score remained at 10.

Criteria 3. Individuals belonging to any of China's ethnic minorities living in Guangxi, with a level of education equal to or greater than senior high school. This is due to the fact that only graduates of senior high school are eligible to take the Gaokao.

After removing the missing data, the research sample of this study involved 1,775 individuals.

3.2 Empirical strategy

Currently, the methods to quantitatively evaluate policy effects include Difference-in-Differences (DID) analyses, Regression Discontinuity (RD) analyses, Synthetic Control Methods (SCM) analyses, and Propensity Score Matching (PSM) analyses, among others [30-32]. Each method is applicable in certain conditions, which will not be detailed in this study. This article will adopt the DID analysis for the case study.

DID analysis may be extended to include multiple periods and multiple policy implementation points. Traditional DID analysis, however, is often applicable to panel data. Since the CNPSS data are cross-sectional, the DID analysis will be constructed based on cross-sectional information [33-38].

The 1988 reform of PBSEMC in Guangxi was not predictable. Therefore, this policy change represents an exogenous intervention and may be regarded as a quasi-experiment (or natural experiment). The effects of the policy implementation on the social classes of ethnic minorities may be defined as:

$$\Delta^2 = \left(Social\ class_{Policy=1}^{Cohort=1} - Social\ class_{Policy=1}^{Cohort=0}\right) - \left(Social\ class_{Policy=0}^{Cohort=1} - Social\ class_{Policy=0}^{Cohort=0}\right) \quad (1)$$

Based on Equation (1) (the meaning of values of dummy variables such as *Cohort* will be explained in the next paragraph), the baseline model for cross-sectional data was constructed in terms of the

variance of the birth cohort and whether individuals were affected by the policy intervention:

$$Social\ class_{icp} = \beta_0 + \alpha \cdot Cohort_{ic} + \gamma \cdot Policy_{ip} + \delta \cdot Cohort_{ic} \cdot Policy_{id} + X_{icp}\beta + \varepsilon_{icp} \quad (2)$$

In Equation (2), the dependent variable *Social class*$_{icp}$ is the socio-economic index (SEI) of individual *i,* belonging to the birth cohort *c*. The subscript *p* indicates whether the individual was affected by the policy intervention. For the explanatory variable, α is the fixed effects of the birth cohorts, and *Cohoe-*t_{is} represents the dummy variable of the individual *i*'s birth cohort *c*. *Policy*$_{ip}$ is a dummy variable for whether individual *i* was affected by the policy intervention. δ is the coefficient of the interaction term of the birth cohort and whether individuals were affected by the policy intervention, which is also the policy effect the study focuses on. Moreover, X_{icp} is a series of selected control variables, and ε_{icp} is a random error term.

3.3 Measures

Although there are many studies that measure social stratification [39], in order to distinguish the Chinese population's social strata, a commonly used indicator, SEI, will be adopted to measure individuals' social classes. An estimate of the SEI was obtained using the formula found in the Chinese Occupational Prestige of Urban Residents Survey of 1999 [40]. This formula is:

$$SEI = 5.622 + 15.816 * \textit{years of education} + 0.763 * \textit{income} \quad (3)$$

In this study, **the educational level** in the survey was transformed into **years of education**, according to the following rubric: senior high school graduates have 12 years of education; professional college graduates have 15; university undergraduates have 16; and master's degree graduates have 18. The other independent variable, **income**, was represented by **personal monthly income** in the survey.

There are two core explanatory variables: The first is whether the individual was affected by the PBSEMC reform, and the second is their birth cohort. As previously discussed, the policy intervention of the PBSEMC reform is only relevant to the samples that meet condition 1 (see Section 3.1). For individuals who meet condition 2, their bonus Gaokao scores were 10 both before and after the implementation of the PBSEMC policy. Moreover, since the average age for individuals taking the Gaokao is 18 years old, individuals who were born before 1970 are very unlikely to be affected by the reform, as it was initiated in 1988. Resultantly, the research samples were divided into two cohorts: individuals born before 1970, and individuals born in 1970 and afterwards. These are shown in **Table 1** below. In addition to the core explanatory variables, a series of control variables were also included, containing **sex**, **age**, **registered residence type** (either agricultural or non-agricultural household registration), **marital status**, and **occupation types**. These factors were considered in order to exclude any other potential influencers of an individual's social class. **Table 2** details the assignments of values to variables.

Table 1. The birth cohort.

Age at the time of the survey	Year of birth	Age in 1988	Birth cohort	N
> 35	< 1970	> 18	Cohort1	956
≤ 35	≥ 1970	≤ 18	Cohort2	819

Table 2. The assignment of variables.

Variable	Assignment
Birth cohort	Cohort1 = 0; Cohort2 = 1
Policy intervention	No = 0; Yes = 1
Sex	Female = 0; Male = 1
Age	Continuous
Registered residence type	Agricultural household registration = 0; Non-agricultural household registration = 1;
Marital status	Unmarried = 0; Married = 1
Occupation types	Other = 0; Land contractor = 1; Government-affiliated institutions = 2; National enterprises = 3; Collective enterprises = 4; Individual businesses = 5; Private enterprises = 6

4. Results

This section describes the results obtained from

the analytical approach detailed in the previous section. The main analysis of results will be divided into two different stages:

(1) *Descriptive statistics*: exploring the features and scale of the data;

(2) *Difference-in-Differences analysis*: estimating the overall effects of the policy.

The primary stage of the analysis will provide a thorough descriptive representation of the data. The secondary stage will investigate whether the 1988 reform to the PBSEMC policy had an influence on the social classes of ethnic minorities.

4.1 Exploring the data

Table 3 shows the descriptive statistics of each main research variable. The relative proportion of men in the sample is greater than that of women; the average age of individuals in the sample is approximately 37 years old; more than half of them are married. The results showed that the average SEI of Cohort 2 was higher than the average SEI of Cohort 1, implying that the reform might have an association with the socioeconomic status of ethnic minorities. Most individuals in the sample were registered as living in non-agricultural housing. In terms of occupation, individuals engaged in government-affiliated institutions accounted for the largest proportion. Notably, there are more individuals engaged in individual businesses and private enterprises in *Cohort 2* than in *Cohort 1*, implying an observed change in the economic structure of this area.

4.2 Estimation of baseline model

As a result of the above data analysis, it is assumed that the reform of PBSEMC is positively associated with the socio-economic class of ethnic minorities. According to the estimation of the baseline model displayed in column (1) of **Table 4**, the interaction term of **birth cohort** and **policy intervention** is 69.096 ($p < 0.05$), which is statistically

Table 3. Descriptive statistics.

	Cohort1 (N = 956)	**Cohort2 (N = 819)**	**Full sample (N = 1775)**
Socio-economic index (SEI)	3250.437 (459.932)	3271.277 (385.901)	3260.053 (427.379)
Policy intervention	0.621 (0.485)	0.649 (0.477)	0.634 (0.482)
Sex	0.687 (0.464)	0.576 (0.494)	0.636 (0.481)
Age	44.558 (5.762)	28.279 (4.511)	37.047 (9.651)
Registered residence type	0.658 (0.475)	0.742 (0.438)	0.697 (0.459)
Marital status	0.962 (0.190)	0.602 (0.489)	0.796 (0.403)
Occupation types			
Other	*6.49*	*6.84*	*6.65*
Land contractors	*23.33*	*11.48*	*17.86*
Government-affiliated institutions	*37.34*	*33.09*	*35.37*
National enterprises	*15.59*	*15.87*	*15.72*
Collective enterprises	*3.03*	*5.13*	*4.00*
Individual businesses	*10.56*	*17.46*	*13.75*
Private enterprises	*3.66*	*10.13*	*6.65*

Notes: The sample means are numbers without brackets. The sample standard deviations are numbers in parentheses, and the percentages are numbers in italics.

significant at the 5% significance level, indicating a positive correlation between the policy intervention and the social classes of ethnic minorities. These results confirm the previous hypothesis: When all other conditions remain the same, the 1988 reform of PBSEMC has significantly benefitted the social classes of ethnic minorities in Guangxi. Additionally, other independent variables such as **sex**, **registered residence type** and **occupation type** are statistically significant, which is consistent with the pre-existing scholarly literature [41-43]. Specifically, the average social class of men tends to be higher than that of women; also, the average social class of individuals registered in non-agricultural housing is higher than that of those registered in agricultural houses. As for occupation, those who are employed in government-affiliated institutions, national enterprises, collective enterprises and private enterprises are shown to be members of a higher social class than individuals employed in other sectors. In particular, the social class of land contractors is lower than the other types of occupation.

Table 4. The results of estimation.

	(1)	**(2)**	**(3)**	**(4)**
Birth cohort	–25.573 (37.936)	52.093 (54.569)	–85.939 (77.349)	–19.882 (37.787)
Policy intervention	41.156* (23.047)	131.945*** (29.009)	–14.253 (49.818)	–63.413 (48.925)
Birth cohort * Policy intervention	**69.096**** **(34.246)**	**–86.041** **(53.088)**	**164.710**** **(65.454)**	**80.033**** **(34.156)**
Sex	96.463*** (17.496)	38.075 (23.736)	142.699*** (32.489)	99.770*** (17.490)
Age	2.120 (1.699)	7.989* (4.747)	-0.510 (9.489)	2.093 (1.693)
Registered residence type	108.721*** (27.478)	67.592* (35.289)	143.951 (52.061)	101.458*** (27.362)
Marital status	39.744 (24.691)	15.514 (30.766)	52.534 (51.769)	52.923* (24.741)
Occupation types (Other = 0)				
Land contractors	–374.568*** (39.901)	–378.752*** (59.565)	–409.095*** (81.814)	–371.314*** (39.765)
Government-affiliated institutions	210.196*** (36.587)	173.842*** (49.673)	167.012** (65.604)	227.652*** (36.730)
National enterprises	184.209*** (39.849)	173.694*** (53.843)	118.816* (71.616)	192.119*** (39.830)
Collective enterprises	227.753*** (52.834)	277.501*** (67.878)	188.585* (102.554)	224.389*** (52.653)
Individual businesses	18.360 (38.880)	66.575 (51.981)	–3.955 (70.271)	22.840 (38.749)
Private enterprises	134.714*** (45.383)	127.351** (57.043)	112.250 (85.432)	142.164*** (45.284)
Adjusted R^2	0.351	0.279	0.244	0.360
N	1775	819	617	1775

Notes: (a) column (1) represents the estimation of the baseline model corresponding to equation (2); column (2) represents the estimation of the baseline model but using only the samples of individuals born after 1970, corresponding to *Cohort2* in **Table 1**; column (3) represents the estimation of baseline model using the subsample aged between 30 and 40; column (4) represents the estimation of baseline model controlling regional fixed effects. (b) * indicates $p < 0.1$, ** indicates $p < 0.05$, *** indicates $p < 0.01$; and standard errors in parentheses.

4.3 Robustness checks

The estimated results have verified the hypothesis proposed before. Nevertheless, the key to the identification of DID model is the so-called 'common trends' assumption, that is to say, if there had been no reform of PBSEMC, individuals in *Cohort2* would have been in the same trend of social class as *Cohort1* [44]. In this case, the study applied four methods to test the robustness of obtained results.

Firstly, Permutation Test (PT) was conducted to confirm whether the estimated results are truly statistically significant, or whether the significance shown is a result of Random Chance. The null hypothesis is that the reform of PBSEMC has had no effect on the social classes of ethnic minorities, which can be noted as H_0: $\delta = 0$. Under this null hypothesis, the estimated coefficients of the random sample will constitute a Permutation Distribution. This study randomised the time of the PBSEMC reform; in other words, it randomised the birth cohort of individuals in the original sample. Next, the baseline model was re-estimated, and the process was repeated 1000 times. As seen in **Figure 1**, the histogram shows the distribution of policy effects estimated from 1000 separate random samples. The dotted line represents the policy effect which was estimated in column (1) of **Table 4**, in which $\delta = 69.096$. The P-value indicates the proportion of the number of policy effects, that is δ in Equation (2), is greater than or equal to 69.096 across the 1000 total estimates in the permutation distribution. The P-value is 0.018, which rejects the null hypothesis that the PBSEMC reform has had no effect on the social classes of Guangxi's ethnic minorities. Thus, the estimated results of the baseline model are robust.

The second method was adopted to further test the robustness of the result, and to ensure that the implied policy effects were not actually caused by missing systemic factors which had a continuous impact both before and after the policy implementation [33-35]. If missing factors were involved, it would be expected that the re-estimated baseline model only with individuals born after 1970 should be similar to the results shown in column (2) of **Table 4**. Correspondingly, if there were no missing variables, the PBSEMC reform's effects should not be statistically significant for the birth cohort after 1970. To carry out this analysis, a 'virtual birth cohort' is built, consisting of individuals born after 1980. In other words, the baseline model was re-estimated using the cohort of individuals born between 1970 and 1980 as the control group and the virtual cohort as the treatment group. It was anticipated that the effects of the PBSEMC policy would not exist for the virtual cohort. As shown in column (2) of **Table 4**, the coefficient of the interaction term of birth cohort and policy intervention was estimated to be not statistically significant ($\delta = -86.041$, $p = 0.105$) and its direction is negative, suggesting that the effect of the policy is not due to missing variables. Therefore, the key assumption of DID analysis has not been violated, and the results are validated as robust.

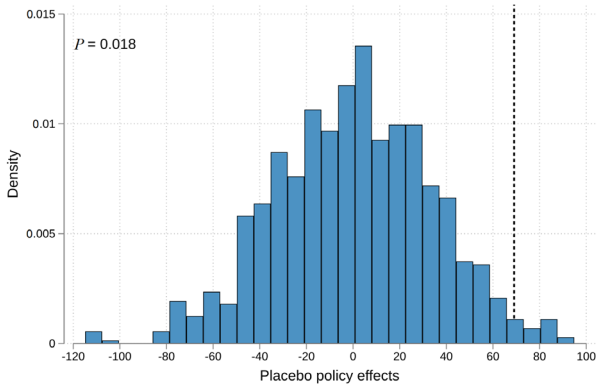

Figure 1. The permutation test.

Thirdly, given the large difference in the age means between the two cohorts in the baseline model, unobserved historical events over a long time span may become a confounder in the estimation of the policy effect of PBSEMC. Therefore, a sub-sample aged between 30 and 40 at the time of survey implementation in 2005 was selected to re-estimate the baseline model. The mean values of sample age for the two cohorts were 38.190 (N = 247) and 32.568 (N = 370) respectively, allowing the effect of historical events to be excluded to some extent. The results are shown in column (3) of **Table 4**, where it can be seen that the policy effect remains significant ($\delta = 164.710$, $p < 0.05$), again demonstrating that the

estimates from the baseline regression are robust.

Finally, considering the heterogeneity among the different regions where the sample is located, the dummy variables of locations at the prefecture level are included in the baseline model. As shown in column (4) of **Table 4**, the estimated policy effect on social classes of ethnic minorities is more prominent ($\delta = 80.033$, $p < 0.05$) compared with the baseline model after controlling regional fixed effects, and the effect is also significant at the 5% significance level.

5. Discussion

This article aimed to investigate the relationship between the 1988 reform of PBSEMC and the social classes of ethnic minorities in Guangxi. It aimed to utilise its results to assist policymakers to adjust and improve related policies in the future. This section is divided into four parts: The first will discuss and summarise the main findings of the research; the second will discuss the implications on policies and practises; the third will consider areas of potential future study; and the fourth will address the limitations of this study.

5.1 Discussion of main findings

PBSEMC has had a significant role in promoting the social classes of ethnic minorities in Guangxi

This study regards SEI as the basis for measuring the social classes of individuals, using a definition calculated by Xu [40]. It is clear that the PBSEMC policy has made it possible for a greater number of ethnic minority candidates to receive higher education, which also extends the average education years of the entire ethnic group. Since the official implementation of PBSEMC, the overall enrolment rate of minorities in universities has significantly risen. This is particularly significant considering that the lack of educational resources in ethnic minority areas, coupled with the restrictions of taking an examination in a different language, put ethnic minorities at a disadvantage when taking the Gaokao. Without the help of PBSEMC, it is immensely difficult for a member of an ethnic minority from a remote, rural region of China to gain access to prestigious higher education institutions, especially considering the fierce competition of the Gaokao examinations [12,21]. In 1950, the number of ethnic minority students in the Chinese higher education system was 1,285, accounting for 1.4% of the total number of students in higher education. By 1978 the number was 3,603, or 4.2% of the total; in 1996 it increased to 19,680, 6.5% of the total; by 2003 it increased massively to 625,200, 5.9% of the total; by the end of 2006, it was 1,226,900, 6.09% of the total. The most recent figures, released in 2018, show that there were 1.51 million ethnic minorities in Chinese higher education, making up 9.16% of the total number of students [45]. This is now almost identical to the overall proportion of minorities in the general population, suggesting that the PBSEMC policy has made the Chinese education system representative. The rapid increase in this proportion shows the remarkable effect of this policy, proving that higher education in ethnic minority areas has developed very quickly under the impetus of PBSEMC. Concordantly, the average income level of ethnic minorities who have received higher education has also increased. Therefore, aligning with the previous literature, the Gaokao have an indirect effect on the future social classes of ethnic minorities graduates through the educational diversion result that determines whether ethnic minority individuals can receive higher education [19,20,27].

Other factors that significantly impact the social classes of ethnic minorities in Guangxi

In addition to PBSEMC, the gender, the type of occupation and the registered residence type of individuals were also shown to have a significant impact on ethnic minority social class. It should be noted that this impact is not limited to ethnic minorities, but is also reflected across various demographic groups in the Chinese population [43,46]. Firstly, male students dominate in all key areas of society. A comparative study of social class and gender found not only that the proportion of men is greater in the upper and middle classes of Chinese society, but also that men of any class have more advantages in gaining political, cultural and economic resources [47].

Similarly, economic stratification and education stratification are also biased in favour of men [41,48]. As for the household registration type of the sample population, discrimination exists in all regions with different levels of development. This discrimination is primarily reflected in the amount of salary [43]. Particularly for individuals on average or low salaries, the earning differences triggered by household registration types are fairly considerable [42]. The results also indicate that occupation has a potent effect on ethnic minority social class. Those working in government-affiliated institutions, national enterprises, collective enterprises or private enterprises tend to be members of a higher social class than those employed in other occupations, and land contractors tend to be members of a lower social class than the other listed occupations. Indeed, different types of occupations are often considered as a symbol of the economic resources, power resources and cultural resources possessed by individuals, or as being synonymous with certain social classes, as they strongly correlate with an individual's wealth, power, and social prestige [46,49].

5.2 Implications

This research analysed the case study of the 1988 reform of PBSEMC in Guangxi, where the policy was reasonably comprehensive, with detailed divisions for the various ethnic groups and different regions, including ethnic minority autonomous counties, which means only a few specific ethnic groups or any ethnic minority groups from specific regions were able to take advantage of the policy. Nevertheless, there are still several elements of the policy which operate on a 'one size fits all' basis in other regions of China [50,51], where all the ethnic groups except the dominant ethnic group, Han ethnic group, are able to earn bonus points, leading to other potential problems regarding fairness and equality [23,24]. In addition, existing studies mostly focus on the social class discrepancies between Han citizens and ethnic minorities [10,12,21], largely neglecting the issues of social class within ethnic minority populations. In fact, there are significant differences within ethnic minority groups [23], and the inequalities in educational attainment within ethnic minority groups are greater than within the Han contingent [52]. This is proven by the researcher's calculation of the education differences amongst three ethnic minority groups, which considered the proportion of the population who were in the lower class, middle class and upper class. For these minorities, the standard deviation of the Generation Rate of Higher Education (GRHE①) was 3.73, compared to the 1.95 value of the Han ethnic group. Among the ethnic minorities, the GRHE of the lower class was 0.85; the GRHE of the middle class was 1.57; and the value for the upper class was far higher, at 7.64. These values indicate that wealthy ethnic minorities from these three groups are 9 times more likely to access higher education than their lower-class counterparts. In other words, PBSEMC may in fact benefit a small proportion of ethnic minorities, particularly those who have more comfortable lives. On the contrary, the individuals who urgently need assistance and who have struggled with the vicissitudes of poverty, are still excluded despite the PBSEMC policy [24]. Therefore, research on the internal social stratification of ethnic minorities would have profound importance.

In particular, regions inhabited by ethnic minorities are mostly areas with low levels of economic development and limited educational resources. But some minority-populated regions are richer and have an abundance of educational resources. Apparently, the living and educational conditions of these regions are completely different. We may therefore assume that it is unfair to insist that candidates from all minority regions receive the same amount of bonus points, since the richer minorities have already benefitted from a higher quality of life [22], which is worthy of further study. The effects of PBSEMC policy could be further evaluated along four dimensions: ethnicity, region, language, and college. The results would then inform how to design PBSEMC to benefit the candidates who are in most need of assistance.

① GRHE refers to the ratio between the proportion of the individuals of a social class in the students of higher education and the proportion of that social class in the whole professional population.

5.3 Limitations of the study

This study used the DID analysis based on cross-sectional data from the CNPSS of 2005. It analysed the success rate of the 1988 reform to the PBSEMC policy, with a specific focus on China's Guangxi Zhuang Autonomous Region. This study confirmed the positive effect of PBSEMC on the social classes of ethnic minorities in the region. Nevertheless, inevitable constraints still engendered the following limitations:

(1) The data source for this study was drawn from the CNPSS of 2005, which is now over 15 years past. However, this was the most recent data available, since the CNPSS of 2010 and 2015 are not yet in the public domain.

(2) This research only involves pilot policies in some areas of Guangxi. As a result, the sample is not adequately represented, and conclusions may not be applicable elsewhere in China.

Each of these limitations could be addressed by further research.

6. Conclusions

The Gaokao, which is the primary channel for accessing higher education in China, is also a channel for social mobility [19]. Since the preferential policies have an effect on every student who takes the Gaokao examination and hopes to access higher education, the bonus score admission policies of the Gaokao have been persistent and highly controversial in recent years [17,18]. PBSEMC is a typical example of a bonus score admission policy enforced by the national government, and discussions of it have often been heated [12,21]. Some scholars claim PBSEMC is beneficial to balance the interests of different ethnic groups, while others note that it may have a negative impact on the quality of higher education or the disadvantaged groups among ethnic minorities [22-25]. Most of them, however, admit that those who benefit from PBSEMC have a greater probability of receiving higher education than other candidates [18,26]. The results of the DID analysis of cross-sectional data confirmed that the 1988 reform of PBSEMC had a significantly positive effect on the social class of ethnic minorities in Guangxi. The findings also proved that gender, residence type and occupation type were relevant to social class, aligning with the previous literature [43,46]. The results suggest that PBSEMC is effective in improving the social classes of ethnic minorities, but the PBSEMC policy should be made more precise, in order to benefit the candidates who are in genuine need of assistance.

Authors' Contributions

All authors contributed equally to this work. All authors read and approved the final manuscript.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Data Availability

The CNPSS survey data are free and available in the public domain, and were accessed through the internet. Within this census, all respondents agreed to participate in the research and gave their consent for their personal data to be used in secondary research. Therefore, ethical approval was not required.

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