

Regional favouritism and education development

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ABSTRACT

Regional studies have found significant agglomeration effects of education development on economic growth. Regional favouritism is potentially closely related to public investment in education, further impacting regional growth. This paper provides significant empirical evidence on the potential impact of favouritism on education development in the Chinese context. Using data for 282 Chinese cities from 1996 to 2016 with treatment for endogeneity (Lewbel two-stage least squares estimator), the results provide evidence that Chinese provincial political leaders favour their birthplaces' education resource development, and that the effect is larger for within-provincial impact and higher tier cities ranked by income.

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INTRODUCTION


The recent literature has shown increased interest in how regional favouritism, mainly defined as political leaders' personal preferences in developing a particular region (usually their birthplace), can influence a wide range of economic development outcomes such as per capital income growth, research and development (R&D) and city size development in that region (e.g., Chen et al., 2017; Chen et al., 2019; Fisman et al., 2018; Hodler & Raschky, 2014). The issue of regional favouritism, however, is not a recent development. It is widely acknowledged among economists that bias in policymaking towards favoured cities due to personal preferences and political reasons in developing countries is a major issue (e.g., Ades & Glaeser, 1995; Davis & Vernon Henderson, 2003), especially in China (World Bank, 2014), and the theoretical reasoning behind this phenomenon is suggested at least by the distributive politics framework (e.g., Bates, 1974; Ferejohn, 1974; Goss, 1972; Kramon & Posner, 2013).

The literature so far is at best inconclusive about whether the impact of favouritism on development is positive or negative. On the one hand, favouritism is thought to be closely related to kleptocracy and corruption, with the notable example of Mobutu Sese Seko of Zaire (e.g., Edgerton, 2002; Hodler & Raschky, 2014), so that favouritism leads not only to impaired

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overall development due to resources being inequitably distributed to a particular region favoured by the leader, but also generally harms the favoured region as well due to corruption.

Alternately, favouritism is considered possibly an extra level of incentive for political leaders to engage with the nation's development goals. This is especially relevant for a large developing country such as China, where traditional Chinese values centres around family, community and ethnic values that are tightly tied to a leader's birthplace (e.g., Radhakrishnan, 2014; Xu, 2011), which generates a level of altruism, motivated by ethnic and cultural favouritism from the political leader towards its birthplace. This is relevant not only for China but also for all countries in general (e.g., Berry et al., 2010; Dahlberg & Johansson, 2002; De Luca et al., 2018). This level of altruism is then combined with the career incentives of politicians in China, generated from the 'regionally decentralized authoritarian' political governance system (Li, 2005; Lim et al., 2011; Xu, 2011) to make economic favours largely dispensed based on regional affinities. The career incentives of China's political leaders motivate them not only to exert a positive influence on their direct constituents (especially in the context of the direct constituent being the birthplace), but also to provide political and economic favours to the birthplace that are outside of their direct jurisdiction, but within their direct political network, as China has a relationship-based culture (Huang et al., 2016; Li & Zhou, 2005; Piotroski et al., 2015). The 'favour' generated by altruism and reinforced by practical career incentives, therefore, is largely benign and can have a positive impact on local development. So far, the empirical evidence on Chinese favouritism is certainly increasing (e.g., Chen et al., 2017; Chen et al., 2019; Fisman et al., 2018); however, none focuses on a nationwide survey of political leaders' birthplace, which according to Hodler & Raschky (2014) is the strongest source of regional favouritism, and none has specifically examined the impact of favouritism on education development, which is a critically important input generating human capital that partially determines a nation's endogenous growth.

In this study we focus on favouritism generated from provincial political leaders (i.e., governors, party secretaries and their deputies). The reasons are three-fold: (1) Chinese provincial political leaders are the most powerful ones with jurisdiction power over on average tens of millions of people; (2) the central government is heavily regulated, especially after the anti-corruption campaign, which is still ongoing since 2013, so that any favouritism is closely scrutinized and the cost of providing favouritism is considerably higher for a central government leader; and (3) under the Chinese government system, provincial governments can conduct economic policies and matters with a reasonably high degree of autonomy. We then focus on specific types of development indicators of the Chinese economy: education resources and development (education expenditure by provincial government, education infrastructure, such as number of teachers, schools and enrolment per capita). The reasons are mainly twofold. (1) Since we include all provincial political leaders in our dataset, it is important to recognize that they are from different backgrounds; therefore, the priority of their favoured matters differs. For example, a leader with an engineering background might have his/her birthplace's engineering development in mind, while others with finance and economics background might pay less attention to this field. Therefore, the altruism they provide towards their birthplace might result in a different development path. However, one common metric all provincial leaders are likely to pursue is education. It is, after all, the primary and secondary education of a region that gives birth to the human capital that enables the development of all areas of a society. (2) As mentioned, education resources and development are important inputs generating human capital that partially determine a nation's endogenous growth. The fact that there is a significant lack of research on the relationship between favouritism and education development prompts us to bridge this gap in the current literature.

Our work, therefore, provides the following contributions to the current literature:

- We investigate an important issue from the perspective of political leaders' altruism (due to ethnic and cultural favouritism) towards their birthplace, complementing a wide range of the literature examining the impact of regional favouritism solely from the kleptocracy and corruption perspective.
- We examine the impact of regional favouritism on education resource development, which is a largely neglected field in the current literature, despite the utmost importance of education development in a nation's endogenous growth. The policy implications that can be derived from this study are significant as policymakers weigh the potentially positive influence of favouritism on education development and adjust their education development policies (e.g., regions with 'rich' favouritism endowment may deploy less education aid to better allocate the resources).
- We not only provide empirical evidence on the possible association between regional favouritism and development (as do in many current literature), but also attempt to establish a causal relationship between the two variables using sophisticated identification strategy such as Lewbel two-stage least squares (2SLS) (Lewbel, 2012).
- We examine favouritism from two levels: within province and inter-province, to cover not only direct jurisdictional power but also cross-jurisdictional power stemming from political connections and networks, which is highly relevant for China.
- We examine the differing impacts of favouritism on education development in Chinese cities with different level of development, characterized by the city tier system, to provide empirical evidence on city tier as a potential moderator for the relationship between favouritism and development in the Chinese context.

Using data for 282 Chinese cities from the period 1996–2016 with treatment for endogeneity (Lewbel 2SLS), the results provide empirical evidence that Chinese provincial political leaders favour their birthplaces' education resource development. The impact of this favouritism is significant both qualitatively and quantitatively, suggested by the significant coefficients on favouritism dummies and counts (number of political leaders born in a particular city and who hold active provincial political leading roles in a particular year). There is also a significant larger impact for within (inner) provincial favouritism (i.e., political leaders hold office in the same province where their birthplace locates) as compared with interprovincial favouritism. Moreover, the effect is significantly larger in higher tier Chinese cities, which may be a result of heavy central government policy towards aiding development in less privileged regions (i.e., no need of favouritism in these regions for development purposes). Finally, the effect is robustness to alternative measures of education resource and an alternative estimator treating endogeneity.

The rest of this paper is structured as follows. The next section provides a literature review and discusses the theoretical arguments. The third section discusses the data, provides the identification strategy and the core empirical results. The fourth section concludes.

LITERATURE REVIEW AND THEORETICAL FRAMEWORKS

Theoretical reasoning on favouritism, development and the Chinese context

The thesis on regional favouritism and its potential impact on development is rooted in the theory of distributive politics, which involves the allocation of goods, services and other economic benefits by the governing authorities. The decision on who gets what in this regard is made based on mainly political considerations on race, ethnicity, electoral strategies, personal connections, religion and geographical affinities (Chen et al., 2019; Faccio & Parsley, 2009; Gray et al., 2016). These politically motivated redistributions often manifest itself in some forms of regional favouritism.

The altruism of political leaders toward their birthplace is primarily motivated by ethnic and cultural favouritism, that is, preferential public policies targeted at the political leader's own ethnic and cultural group. Earlier studies on ethnic favouritism focus on Africa, such as Posner (2005, p. 97) in his *Zambian study*, who observes that the 'lesson that the president will favour his own ethnic group has become, for many Zambians, an axiom of politics'. Wrong (2009) points out that Kenya is a prime example of ethnic favouritism as both major periods of governance in Kenyan politics (the Kalenjin-dominated government around Daniel arap Moi (1978–2002), and the Kikuyu-dominated government around Mwai Kibaki (2002–13)) engaged in patronage and ethnic favouritism. The outcome of these types of favouritism manifested in educational attainment and road-building across areas with ethnic compositions is investigated by Kramon and Posner (2013) and Burgess et al. (2015), respectively.

De Luca et al. (2018) suggest that ethnic and cultural favouritism is not just an African issue, but rather a global phenomenon. "Using a panel dataset of 2022 ethnographic regions from 139 countries and night-time light intensity as an output measure to capture the distributive effects of a wide range of policies, their research find that political leaders' ethnographic regions enjoy 10% higher night-time light intensity, and that this phenomenon is present in poor as well as rich countries, and that ethnic favouritism is most prevalent in ethnically fractionalized and segregated countries with long established polities." In two cross-country studies, Franck and Rainer (2012), find widespread evidence for outcomes of ethnic favouritism in various education attainment outcomes and reduction in infant mortality by using a panel data of Sub-Saharan African countries. Kramon and Posner (2013) show that the pattern of ethnic favouritism varies across policy areas in six Sub-Saharan African countries, in particular, one area that receives favouritism is often compensated with rationing in another area.

While regional favouritism generated by the altruism of political leaders toward their birthplace due to ethnic and cultural favouritism is also highly relevant for China, as suggested by De Luca et al. (2018), the Chinese context also has its uniqueness in terms of political system. As well documented by Li (2001, 2002, 2005) and Lim et al. (2011), the Communist Party of China (CPC) has several well-classified factions. Leaders at the top of a faction (like a food chain) are considered as patrons to those below within that faction. At the city level, local leaders rely on their connections with provincial leaders, whose reputation and power play an important role in city leaders' promotion and career advancement. As a result, city leaders may deliberately reach out to provincial leaders who belong to the same political factions and whose birthplace coincides with the underlying city. This mechanism acts like a positive feedback loop that reinforces the incentive of city leaders to seek favouritism from provincial leaders, and the incentive of provincial leaders to give favouritism to their birth cities. This positive feedback loop is especially important for the education sector, since traditional Chinese culture focuses a lot on education as a way to achieve future successful outcomes (e.g., Wang & Lin, 2019; Yang et al., 2006). Therefore, prominent figures (such as a political leader at the provincial level) are often expected to give back to their birthplace by propping up especially local education resources and outcomes. Moreover, favouritism provided through education development is often less likely to be perceived as being unfair or corruptive in the Chinese context, due to again the traditional Chinese value that giving back to the community (even in the form of political favouritism) by propping up education development is viewed as being virtuous (e.g., Mingyuan, 2006). Therefore, it is more likely that any favouritism provided by political leaders (such as those at the provincial level) will focus on the education sector, since it has relatively low risk of corruption perception, which is important to especially the provincial leaders as their positions are not on the top and are under constant scrutiny of corruptive behaviours.

It is also essential to understand the finance system of education in China for understanding the mechanisms of political favouritism in education spending. The current system is based on the 'Compulsory Education Law' launched in 1992 and the 'Decision on the Reform and

Development of Elementary Education' distributed in 2001. These documents defined a financial management system in which provincial-level administration has the direct control of local-level education finance (Tsang, 2000). The local governments within the jurisdiction of a provincial government, as the strategic unit of public education financing, are mainly responsible for the provision, financing and management of public education (Gu, 2012). The regional favouritism from the provincial leadership can be imposed mainly by two ways. On the one hand, transfer payments from the higher level of governments to local governments have increased to develop local education and support the current education finance system. Since the provincial decision-makers can decide which local governments to be subsidized, the favoured cities would naturally have a greater chance of being supported. On the other hand, the annual financial budgets of local governments need to be approved by the provincial governments before the implementation, which further strengthens the provincial government's ability to control over prefecture-level cities.

Empirical evidence on favouritism and economic development

Empirical evidence on favouritism stemming from distributive politics and its impact on various level of development is certainly increasing in recent years, with both cross-country and specific country (especially on the United States and China) studies widely available. However, most of these studies focus on favouritism motivated by corruption and kleptocracy, with a few focusing on the altruistic side of politicians (i.e., favouring their birthplace due to ethnicity and cultural affinity), and the evidence for China and its education resource development is, to the best of our knowledge, non-existent. For example, Larcinese et al. (2006) find that regions that show the greatest support for the incumbent president in previous elections tend to be 'rewarded' with more government spending on education and infrastructure using a case study of the United States presidential election. Particularly, states that are controlled by the same party as the incumbent president are awarded more budget from federal funds, while states that voted largely against the incumbent president's party in congressional elections are punished with fewer resources. Recent empirical evidence also shows that corporations also benefit from favouritism in US politics. For example, Pantzalis and Park (2014) suggest that a firm's geographical nearness to state capitals is highly correlated with its abnormal returns (also see Wang et al., 2017 for evidence on Canada). Kim et al. (2012), in another US study, using a political alignment index (PAI), which measures the alignment between state politicians and the ruling party, show that firms headquartered in states with high PAI values perform better than those from low PAI states in terms of stock returns.

Cross-country studies examining distributive politics also yield similar results. Hodler and Raschky (2014) provide evidence that "regional favouritism in those regions that are the birthplaces of the countries' political leaders and enjoy greater economic development". Dahlberg and Johansson (2002) find that the incumbent parties in Sweden transfer a significant number of social benefits to regions with many swing voters who are likely to determine the outcome of an election. Faccio and Parsley (2009) provide consistent evidence of regional favouritism by investigating the sudden disappearance of incumbent leadership. With samples recorded worldwide, their research documents that the stock price of firms headquartered in politicians' birth place may declined by 1.7% decline with the decrease of incumbent leadership decrease.

On China, Golden and Min (2013) provide a comprehensive analysis with over 150 non-US based studies of favouritism politics, however, there is no Chinese-based analysis can be found. Since then, recent years saw a significant increase in China-related studies. For example, Chen et al. (2019) investigate the potential regional favouritism in corporate tax avoidance in China, and find that firms were benefited by formerly provincial leadership through higher tax avoidance. The regional favouritism may affects tax avoidance through two major mechanisms: (1) personal relationships between former-leadership and incumbent governor, and (2) a firm-

level connection with the governor. Fisman et al. (2018) find that in Chinese science, candidates' election successful rate increased by 39% when they have hometown-ties with the members in selection committee, even in the case that candidates did not have personal connection with the committee members. These indicate that hometown favouritism are significantly contributing to the resource allocation. Chen et al. (2017) examine political favouritism of cities in national capital markets and the effect of that favouritism on city sizes and find that the elasticity of the city growth rate with respect to the price of capital is estimated to range from -0.07 to -0.12 . Even though prior studies have investigated the effect of regional favouritism on taxation and capital markets, empirical evidence on the relationship between regional favouritism and education resource development in the Chinese context is lacking.

Furthermore, Jackson (2018) and Jackson et al. (2016) both highlight the importance of education resource development (e.g., school spending) on student outcomes and economic development in general. Jackson (2018) contends that the literature that focuses on quasi-experiment overwhelmingly support the view that school spending has a strong positive impact on student outcomes. Jackson et al.'s (2016) specific quasi-experiment (using school finance reforms and related policy changes in the states as a natural experiment) also confirms the above result. These studies highlight the importance of education resource development in developing human capital, which is a main driver for economic growth. Therefore, combining the above empirical results with the results of the relationship between regional favouritism and economic development, it is important to understand how regional favouritism might impact education resource distribution and development.

EMPIRICAL ANALYSIS

Data

Table 1 provides summary statistics for core variables. The unbalanced panel data on education resources, regional favouritism, income, land area and unemployment for 282 cities in China are collected and processed for empirical analysis. Our raw data are collected from two major sources. First, detailed information of provincial government officials (e.g., reporting period, birthplace, date of birth and position) during the period from 1996 to 2016 is provided by the China Stock Market and Accounting Research Database (CSMAR). Based on provincial official data, we measure favouritism in mainly two ways: (1) count measure: we use the number of officials born in a specific city when they are in power; and (2) dummy variable measure: we generate dummy variables which equal 1 if a city has any officials born there when these officials are in power, and 0 otherwise. Second, variables that measure education resources development (i.e., expenditure for education administration and number of schools, students and teachers) and control variables (i.e., income, unemployment rate and land area) are constructed based on data from the *China Statistical Yearbook* 1996–2016.

Following the previous literature on government expenditure (e.g., Hitiris & Posnett, 1992; Mauro, 1998), dependent variables in this study are normalized. Specifically, we normalize education expenditure, school and enrolment by population to generate education resources per capita in a city as a measure for development of education. Regarding the number of teachers, we use labour force for normalization. For the control variables, the unemployment rate is not directly given by the *China Statistical Yearbook*. Thus, we use the number of registered unemployed people divided by the labour force (total number of unemployed people and employees) to obtain the registered unemployment rate in China, which is suggested by Giles et al. (2005).

It is notable that our dataset covers 278 prefecture-level cities and four municipalities. Although municipalities (i.e., Beijing, Shanghai, Tianjin and Chongqing) are generally considered to be provincial-level administrative regions in China, the *China Statistical Yearbook* has not provided the data for districts under municipalities. In addition, provincial leaders

Table 1. Summary statistics and variable definition.

Variables	Definition	Observations	Mean	SD	Minimum	Maximum
<i>edu. expenditure</i>	Expenditure for education administration per capita (yuan)	3965	84.69	80.90	4.89	1035.61
<i>schools</i>	Number of primary and regular secondary schools (per 10,000 people)	5517	3.46	3.44	0.08	116.15
<i>enrolment</i>	Student enrolment in primary and regular secondary schools (% of the population)	5756	0.15	0.08	0.005	3.22
<i>teachers</i>	Full-time teachers in primary and regular secondary schools (% of the labour force)	5666	0.09	0.06	0.001	0.31
<i>favouritism (amount)</i>	Number of provincial officials born in a particular city	5899	0.23	0.54	0	5
<i>inner favouritism (amount)</i>	Number of provincial officials born in a particular city that is within the official's current jurisdiction	5899	0.05	0.22	0	2
<i>outer favouritism (amount)</i>	Number of provincial officials born in a particular city that is without the official's current jurisdiction	5899	0.19	0.49	0	4
<i>favouritism (dummy)</i>	Dummy variable that represents the existence of provincial officials born in a particular city	5899	0.19	0.39	0	1
<i>inner favouritism (dummy)</i>	Dummy variable that represents the existence of provincial officials born in a particular city that is within the official's current jurisdiction	5899	0.05	0.21	0	1
<i>outer favouritism (dummy)</i>	Dummy variable that represents the existence of provincial officials born in a particular city that is without the official's current jurisdiction	5899	0.15	0.36	0	1

(Continued)

Table 1. Continued.

Variables	Definition	Observations	Mean	SD	Minimum	Maximum
<i>income</i>	Household income (thousands of yuan)	5713	24.55	18.61	3.26	320.63
<i>unemployment</i>	Unemployment rate (ratio)	4984	0.06	0.04	0	0.56
<i>land</i>	Land area (10,000 km ²)	5722	1.54	2.04	0.008	25.34

Note: Summary statistics are given for major variables in both core specifications and robustness checks, and cover the largest sample possible (unbalanced panel). The expenditure for education administration is normalized by population. Schools, enrolment and teachers are alternative measures for development of education, which are also normalized by either population or labour force. For regional favouritism, we manually count the number of provincial officials born in a particular city that is within and without the official's current jurisdiction separately. The largest time span covered is from 1996 to 2016 for all variables.

born in municipalities can also take care of their birthplace through inter-governmental connections or direct administrative power. Therefore, we believe that the observations of municipalities should not be omitted. It should also be noted that data on Tibet are missing in the *China Statistical Yearbook*.

Variables

Education resources (dependent variable)

We measure education resources development using four variables. Expenditure on education administration per capita is a measure of education development. The Organisation for Economic Co-operation and Development (OECD) (2016) notes that governmental budget allocation is the main source of public educational expenditures in China. The *China Statistical Yearbook* provides data on education administration expenditure in municipalities from 1997 to 2016, but for prefecture-level cities, it only covers the period after 2003. In addition, to examine whether expense and investment of local government on education results in matched output, we also collect data on the education resources of primary and secondary schools, including the number of schools per capita, number of enrolments per capita and share of number of teachers in the total labour force. Similarly, the *China Statistical Yearbook* provides data on education resources in municipalities from 1996 to 2016, but only covers the period between 1999 and 2016 for prefecture-level cities.

Regional favouritism (explanatory variable)

Empirical analysis will verify the hypothesis based on information in the CSMAR provincial leadership database. Specifically, the regional favouritism includes a sample of the governors and secretaries of the provincial CPC committee, which represents the actual highest power holders of the government in Chinese provincial administrative regions. As mentioned in many papers (e.g., Chen et al., 2019; Zhang et al., 2012), leaders in China who have a strong sense of identity of their hometown favour their own city of birth when making important development policies.

Two metrics are used to measure regional favouritism, and we generate six different variables that cover the period from 1996 to 2016. First, we generate three variables based on whether a provincial official was born in a particular city within or outside of the current jurisdiction to examine whether the effect of an official's regional favouritism varies depending on their

jurisdiction. In other words, we are interested in the difference between the effects of regional favouritism on education expenditure within and outside of the jurisdiction of the underlying leader giving favouritism. Second, we generate the dummy variables based on whether a city had incumbent provincial leaders in a certain year. The dummy variable ‘favouritism (dummy)’ equals 1 if there is at least one provincial official who was born in a particular city and is in power in a given year, and 0 otherwise. Third, we count the number of provincial officials born in a particular city who are in power in a given year and generate the count variable ‘favouritism (amount)’ to examine whether the degree (as opposed to the existence) of favouritism affects education resource development. Lu and Wang (2020) noted that if there is more than one provincial official born in a particular city, more officials can result in more effective translation of regional preferences into resource allocation because the CPC stresses the principle of collective leadership.

Income, unemployment and land (control variables)

We control a series of demographic variables including income (average wage), unemployment rate and land in our core model to account for their potential influence on education resources and development. The impact of income on both government expenditure and educational attainment has been addressed in the literature. A causal and positive relationship between per capita income (regardless of household or national) and government expenditure has been confirmed in many empirical studies for a long time (e.g., Aziz et al., 2012; Kolluri et al., 2000; Ram, 1986). The literature (Barro, 2001; Blanden & Gregg, 2004; Gylfason, 2001) also confirms that the increase in income levels and economic development promotes the growth of education resources, and ultimately drives the development of educational attainment.

For the unemployment rate, government spending is considered as a tool for stimulating the economy and reducing the high unemployment rate. Among the choices of sectors for the government to spend and invest, the education sector stands out because of its nature of high positive externality. The existing literature also reveals a significant positive correlation between government expenditure and unemployment rate. For example, Holden and Sparman (2018) examined the effect of government purchases on unemployment using the sample of OECD countries for the period 1980–2007. They found that a 1% increase in government purchases results in an approximately 0.3% decrease in unemployment rate. Similar findings can also be found in other empirical studies (e.g., Nwosa, 2014; Owyang et al., 2013).

Last, we control the effect of land area on education resources. We believe that the cities with a larger actual land area require more education resources such as schools and teachers and more government expenditure on education, since the population in these areas may be sparsely populated and the requirement is for more establishments to be set up. Moreover, in Chinese cities/prefectures with large land area, the duplication costs of establishing education facilities in sparsely populated areas is high, thereby increasing education spending. Another important reason why we include land area is that it is a highly exogenous factor affecting public education spending, which makes the estimation more efficient.

Endogeneity and identification strategy

It is plausible that regional favouritism is endogenous in its relationship with education resources development because reverse causality could exist in the relationship between an official’s birthplace and education resources allocation. Specifically, we argue that more developed cities may have more adequate education resources and higher opportunities to be the birthplace of provincial government officials. Examples can be easily found: Shanghai is a city in which many Chinese government leaders were born, and even the CPC itself was started in Shanghai.

Some empirical studies (Lu & Wang, 2019) on regional favouritism mention the endogeneity issue of regional favouritism and development, but we are trying to address this endogeneity issue by using Lewbel 2SLS. The Lewbel 2SLS estimator (see Lewbel, 2012) can be used to achieve the identification of a causal relationship without external instruments when the errors of exogenous variables are heteroskedastic. The main idea is that effective internal instruments can be used to eliminate endogeneity when an effective external instrument is difficult to find (see e.g., Lechner, 2010; Puhani, 2012; Roberts & Whited, 2013; Wang & Lu, 2020; Wang & Wang, 2021).

The specification of main model is:

$$\text{Education}_{i,t} = \alpha_0 + \alpha_1 \text{favouritism}_{i,t} + \alpha_2 X_{i,t} + \delta_i + b_t + \varepsilon_{i,t}, \quad (1)$$

where $\text{favouritism}_{i,t}$ denotes the dummy and number of provincial officials born in a particular city; $X_{i,t}$ is a vector of control variables including income, unemployment and land; δ_i denotes the city fixed effect; b_t denotes the time fixed effect; and α_1 measures the impact of regional favouritism on education resources and development, which is the coefficient we are mainly interested in.

RESULTS

Before presenting the result of core specifications, we provide preliminary evidence for the impact of regional favouritism on education expenditure. Figure 1 shows the change in government expenditure on education administration over time. We split data into ‘regions with political leaders during the observed period’ and ‘regions without political leaders during the observed period’ and take averages of education expenditure across cities. It shows that government spending on education has grown rapidly in the past decade: total education expenditure in 2016 was nearly 10 times higher than it was in 2003. Figure 1 also shows that the growth speed of expenditure on education in favoured cities is higher than in non-favoured cities. Specifically, the expenditure difference between favoured cities (represented by the blue line) and non-favoured cities (represented by the red line) has kept increase during the sample period.

Figure 2 preliminarily shows a significant positive relationship between regional favouritism and government education spending per capita. With an increase in the average number of political leaders, per capita education expenditure in a city is increasing. The samples with expenditure on education per capita above 300 yuan are recognized as outliers (i.e., Shenzhen city, Dongguan city and Karamay city). Both statistical errors and administrative changes are a reasonable explanation for these abnormal expenditures. Shenzhen city was established as a special economic zone by the central government in 1980, which has led to the explosive growth in its education resource and infrastructure development.

OLS and Lewbel 2SLS results in core specifications

The results of panel fixed-effects regressions and Lewbel 2SLS regressions with city and time fixed effects are reported in Table 2. We report the results with control variables excluded from the core model in columns (1), (3), (5) and (7). With the control variables removed, all estimations show the existence of a significant positive correlation between regional favouritism and education expenditure. The remaining columns are estimated with control of demographic variables related to the education resource development, and the results are still consistent.¹

The results are consistent across panel fixed effects and Lewbel 2SLS: all coefficients of favouritism in the core specification results are positive and significant, which indicates that if a city is the birthplace of the incumbent provincial official, its per capita education expenditure will be higher than in other cities. Specifically, we use two results from models with control

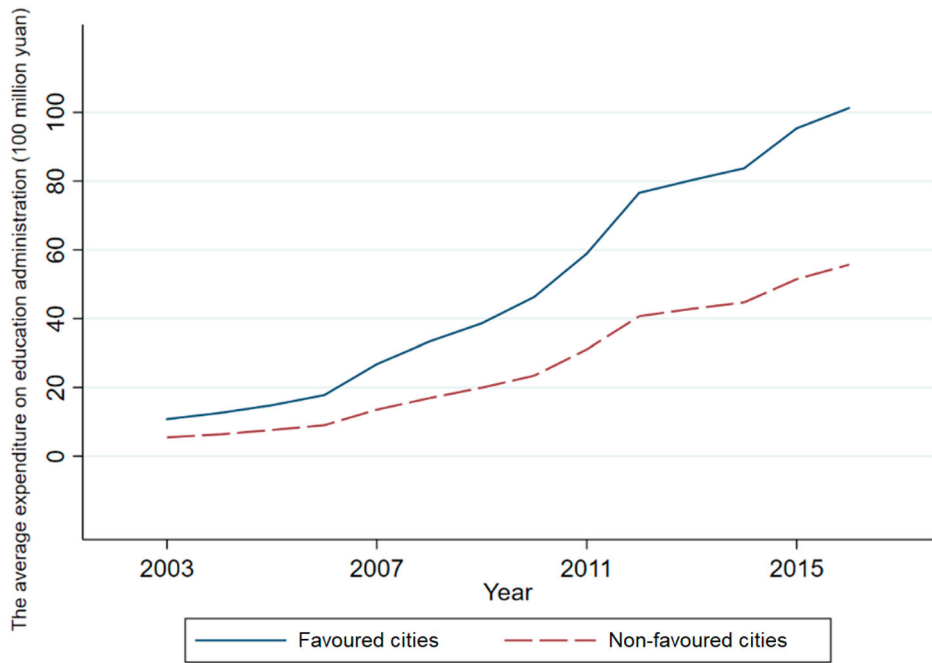


Figure 1. Average expenditure on education administration.
Note: The graph is produced using average expenditures on education (across the district dimension) on the y-axis, and time on the x-axis. We calculate the average expenditure on education as 100 million yuan in all favoured or all non-favoured cities in each separate year.

variables estimated by Lewbel 2SLS to explain. The coefficient of favouritism (dummy) from column (8) indicates that per capita education expenditure in regions with favouritism is 6.25 Chinese yuan higher (the mean of education expenditure is 84.69 yuan) than in non-favoured regions. The coefficient of favouritism (amount) from column (6) shows the relationship between the number of officials and education expenditure: for each additional provincial leader born in a particular city, the per capita education expenditure increases by 5.39 Chinese yuan. Therefore, it can be seen from our results that coefficients of favouritism (amount) are smaller than coefficients of favouritism (dummy), which also supports the robustness of the result. In addition, coefficients of income (control variable) indicate its positive and significant impact on education expenditure, which is consistent with the previous literature (Aziz et al., 2012; Kolluri et al., 2000; Ram, 1986). The magnitude of coefficients of income is approximately half that of favouritism. For example, result from column (8) illustrates that if average income rises by 1000 yuan, per capita education expenditure only increases by 3.28 yuan (only 52.5% of the impact of regional favouritism). This further indicates that the impact of favouritism on education expenditure is considerable. It is also noticeable that coefficients estimated by Lewbel 2SLS are higher than those estimated by panel regression. We believe these findings are at least partly the result of the endogeneity issue since there could be measurement errors in measuring education resource variables such as education expenditure. This further justifies the use of Lewbel 2SLS to address endogeneity in the core model. For the core specification, we include both city and time fixed effects.²

We report information on first-stage regressions to prove the validity of our specification in panel B of Table 2. Lewbel’s instrumental variables (IV) approach assumes the presence of heteroscedasticity. The results from the Breusch and Pagan (1979) test suggest that such a

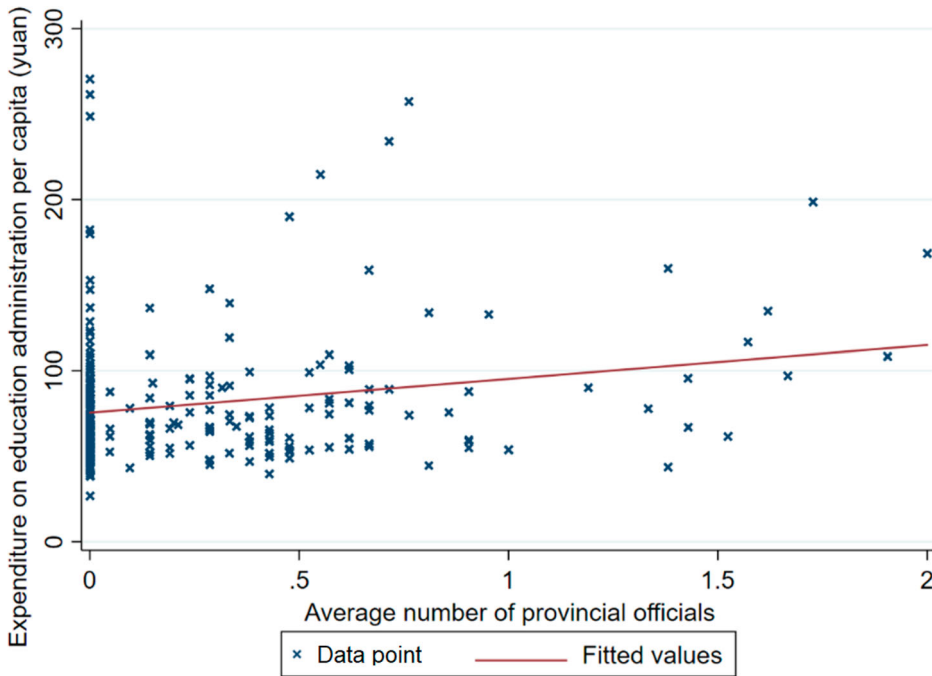


Figure 2. Number of provincial officials and education expenditure.

Note: The graph is produced using average education expenditure on the y-axis and average amount of favouritism on the x-axis. We collapse the time dimension, which means the means are taken across the time-series.

heteroscedasticity assumption is satisfied in our dataset. Additionally, our specification is suggested to be valid by Hansen's J -test for over-identification (the null hypothesis is that the instruments generated from residual of regression are over-identified) and the Kleibergen–Paap Lagrange multiplier (LM) test for under-identification. As expected, all the p -values suggest the validity of Lewbel's IV specification. The F -statistics from the first-stage regressions are above 10, which can address the concerns of weak instrument issue (Stock & Yogo, 2002).

In general, how do our results compare with those in the current literature? Our findings corroborate the literature which suggests the motivations of cooperation between local leaders and provincial leaders, as well as the theoretical mechanism of the incentive of provincial leaders to give favouritism to their birth cities because of well-established factions within the CPC (e.g., De Luca et al., 2018; Li, 2001, 2002, 2005; Lim et al., 2011). In addition, our findings are consistent with the results of other empirical analysis of political leaders' altruistic behaviours that promote regional development. The results of many empirical studies show that the governors' preference for a particular region will promote the development of multi-aspects of the region, whether it is a cross-country study (Dahlberg & Johansson, 2002; Faccio & Parsley, 2009) or focusing on a specific country (for China studies, see, e.g., Chen et al., 2019; Fisman et al., 2018; Golden & Min, 2013; for US studies, see Kim et al., 2012; Larcinese et al., 2006; Pantazis & Park, 2014).

In addition, we also conduct robustness checks on alternative measures of regional favouritism and education development; as well as the effect in different regions characterized by city development (different city tier system). For these results as well as discussions on them, see Section 1 in the supplemental data online. A summary of these results is the following:

Table 2. Effect of regional favouritism on expenditure for education administration: panel fixed effect and Lewbel two-stage least squares (2SLS) results.

Dependent variable: <i>edu. expenditure</i>	Fixed-effects regressions				Lewbel 2SLS regressions			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Second-stage results								
<i>favouritism (amount)</i>	4.16** (2.56)	4.22*** (2.65)			8.82** (2.37)	5.39** (2.18)		
<i>favouritism (dummy)</i>			3.79* (1.80)	4.05** (1.97)			7.15*** (2.60)	6.25** (2.22)
<i>income</i>		1.18*** (15.22)		1.18*** (15.24)		3.69*** (36.38)		3.28*** (13.55)
<i>unemployment</i>		0.01 (0.00)		1.63 (0.08)		70.71 (0.76)		−308.82 (−1.11)
<i>land</i>		−4.70 (−0.45)		−4.13 (−0.39)		2.22 (0.26)		−10.24 (−0.78)
Observations	3965	3943	3965	3943	3683	3281	3683	3281
No. of cities	282	282	282	282	282	282	282	282
Two-way fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.73	0.74	0.73	0.74	0.73	0.60	0.73	0.62
Panel B: First-stage information								
Breusch–Pagan test (p -value)					14696.56 (0.000)	15761.95 (0.000)	14742.57 (0.000)	15810.83 (0.000)
Hansen's J -statistics (p -value)					11.968 (0.887)	1.909 (0.592)	12.689 (0.854)	5.466 (0.486)
Kleibergen–Paap LM (p -value)					341.89 (0.000)	14.43 (0.006)	392.54 (0.000)	17.67 (0.014)
F -statistics					233.20	25.32	204.57	17.84

Note: Regressions are estimated using ordinary least squares (OLS) and Lewbel (2012) 2SLS estimators with fixed effects for both city and time dimensions based on the unbalanced panel data. We report both results that control variables are included and excluded in panel A. The year coverage ranges from 1996 to 2015; z -values are reported in the parentheses. For Lewbel 2SLS, which uses heteroskedasticity-based instruments and treat favouritism, income and unemployment as endogenous variables and land as exogenous variable, we report a set of identification diagnostic tests in panel B, including Breusch–Pagan test for heteroscedasticity, Hansen's J -test for over-identification, Kleibergen–Paap Lagrange multiplier (LM) statistics for under-identification and F -statistics for weak instruments. Significances at the 10%, 5% and 1% levels are indicated by *, ** and ***, respectively.

- The impact for within (inner) provincial favouritism (i.e., political leaders hold office in the same province as their birthplace) is significantly larger in magnitude as compared with inter-provincial (outer) favouritism. We believe that a provincial leader without direct jurisdiction of his/her favoured city can still affect the favoured city's education development policy due to inter-province connections being established through other channels (e.g., alumni and colleagues).
- Alternative measures of education resource development such as the number of schools, enrolment ratios and number of teachers all yield consistent results compared with the core results.
- We examine the differing impacts of favouritism on education development in different types of Chinese cities characterized by different levels of development by looking at the Chinese city tier system. The results further suggest that regional favouritism can significantly increase the level of education development across different Chinese cities, regardless of their development status. Moreover, the results show that the impact of officials' favouritism is stronger in more developed cities than in less developed cities.
- Finally, the results from robustness checks estimated by estimators that take care of endogeneity (Lewbel 2SLS) are also consistent with those in the core results.

CONCLUSIONS

This paper explores the potential effect of regional favouritism generated by the altruism of political leaders toward their birthplace on education development in the Chinese context and we found empirical evidence to support the following:

- Regional favouritism (measured by the existence and number of provincial officials born in a particular city) has significant positive effects on education resources development (measured by education expenditure, number of schools, enrolled students and teachers). The significant coefficients on favouritism dummies and counts (number of political leaders born in a particular city and who hold active provincial political leading roles in a particular year) suggest that the impact of favouritism is significant both qualitatively and quantitatively. Our core results are consistent with previous empirical studies (e.g., Chen et al., 2019; Faccio & Parsley, 2009; Golden & Min, 2013).
- The above findings have significant implications for policymakers. In particular, they may want to take advantage of the positive impact of regional favouritism on city education development and focus on regions where such impact is lacking, that is, spend money wisely on regions that do not receive such favouritism and increase education development aid programmes in those regions. This is necessary to ensure a fair and equitable level of development for Chinese cities, and to direct better resource allocation in this regard to improve the efficiency of fiscal spending on education. Moreover, the evidence on the impact of favouritism intensity on education development should be noted by policymakers when trying to manage such a phenomenon. Particularly, priority should be given to the regions with the least level of favouritism for education development aid.
- Finally, the results presented in this study should be interpreted with caution. While estimators that address endogeneity (Lewbel 2SLS) are used to form an identification strategy that is as strong as possible, it could still be argued that the lack of physical instruments remains a concern. This paper therefore gives significant empirical evidence to support a causal relationship between regional favouritism and education development. However, such support is not definitive. Future work can certainly contribute to the existing literature by finding meaningful physical instruments to address endogeneity.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

NOTES

¹ We also estimate the relationship between the central leadership's favouritism and education expenditure. The estimated results suggest that there is no statistically significant effect of such a relationship. These results are available from the authors on request.

² For the Lewbel 2SLS with control variables in columns (6) and (8) of Table 2, part of the year dummies was automatically partialled out by the models where the multicollinearity between control variables and year dummies was detected.

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