# Authoritarian State Building and Talent Attraction: Evidence from China's Civil Servant Fever

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## Abstract

This paper investigates a novel consequence of authoritarian state building: attracting talent from society into the state apparatus. We analyze the impact of China's value-added tax reform on citizens' preferences for state employment, revealed by participation in the National Civil Servant Exam. Using a difference-in-differences approach that leverages pre-reform subnational tax composition variations and a dataset of 166,012 government job openings from 2010 to 2021, we find that the reform has attracted more and higher-quality individuals to tax-related state positions, particularly those involving greater regulatory power. An original survey reveals that exam takers perceive increased power and benefits in tax agencies after the reform. Evidence from Chinese General Social Surveys suggests the talent drawn to the state likely comes from the private sector. Overall, our research indicates that state power expansion, when paired with merit-based recruitment, significantly influences talent allocation between the state and society in authoritarian settings.

**Keywords**: State Building, Civil Servant Exam, Tax Reform, Talent Recruitment

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# 1    Introduction

In Democracy in America, Alexis de Tocqueville observed, "it is a constant fact that in our day, in the United States, the most remarkable men are rarely called to public offices" (Tocqueville 2000). Tocqueville believed that in democracies, civil servant jobs are not particularly enticing to society's brightest minds. This is because democratic institutions channel the public's aversion to elitism, particularly in government offices. The instability of government careers due to elections and term limits further dissuades accomplished individuals from pursuing them. In stark contrast, citizens in contemporary China exhibit a strong preference for government jobs. Every year, millions of individuals, especially recent college graduates, take the Civil Servant Exam in the hope of securing a position within the government. For example, in 2021, the most sought-after jobs saw a staggering 20,602 applicants competing for a single position.[1] At top Chinese universities such as Tsinghua and Fudan, 50% - 70% of graduates land positions within the state sector every year.[2] What explains this strong preference for state-sector jobs in an authoritarian country like China?

In this paper, we identify a key factor drawing talent to the state apparatus in authoritarian regimes: the often-unconstrained power of the state. We define state power narrowly as its capacity in taxing, spending, and regulating society, following Tilly (1985) and Levi (1988), and use "state power" and "state capacity" interchangeably. In contrast to mature democracies, where electoral process, transparency, the rule of law, and checks and balances limit the opportunities for public officials to benefit from state power, a powerful authoritarian state invariably yields tangible rewards for those within the system. State power helps the regime extract more resources, so that these regimes can provide state employees with better material benefits and improved career prospects. A strong state apparatus inherently signals great job security. More importantly, the power and regulatory prowess of state jobs

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[1]The Most Competitive Position Has a Ratio of 20,602:1. https://www.sohu.com/a/497478096_120979226.

[2]For more details about Tsinghua and Fudan graduates, see Figure A1 in the Appendix. Li et al. (2023) also shows that a majority of Chinese college students desired employment in the state sector in recent years.

grant employees opportunities to obtain privileges and extract graft from society, especially in regimes where checks on the authority of government officials are often limited (Frye and Shleifer 1997). Perceiving benefits of government jobs in a powerful authoritarian state, talented citizens are thus attracted to the state apparatus.

The ability of a powerful authoritarian state to attract talent is especially strong when combined with merit-based recruitment. Authoritarian leaders have long utilized the state sector to co-opt societal actors (de Mesquita et al. 2005; Magaloni 2006; Svolik 2012; Ang 2016; Rosenfeld 2017; Liu 2023). However, if the hiring of state employees relies on connections, clientism, or nepotism (Calvo and Murillo 2004; Fukuyama 2014; Jiang 2018; Hassan, Larreguy and Russell 2023), a powerful state may draw more individuals to the state sector but not necessarily those of high quality. Faction-based political selection and the tendency to prioritize loyalty over competence can also impede authoritarian regimes' capacity to attract high-quality talent from society (Shih, Adolph and Liu 2012; Zakharov 2016). Nevertheless, if a regime can implement merit-based recruitment, even partially, in its political selections–as has been observed in many countries such as China (Landry, Lü and Duan 2018; Liu 2023) and Ghana (Brierley 2021)–then a powerful state is likely to attract a significant amount of talent to the regime.

If authoritarian state power indeed affects state-society talent allocation, then we should expect to see a power expansion attracting more talent to the state apparatus in authoritarian regimes. In this paper, we leverage a recent effort of state power expansion in China. Specifically, we look at the impacts of China's value-added tax reform on citizens' preferences for public sector employment revealed through participation in the National Civil Servant Exam (NCSE) every year. Between 2012 and 2016, China implemented the most significant tax reform in the past two decades by effectively replacing the business tax (BT) with the value-added tax (VAT). The claimed purpose of the VAT reform is to ease the tax burden on service industries, while it has significantly increased central tax bureaus' tax-extraction capacity (Zhang 2021, Page 53). Moreover, VAT has a self-enforcing nature because it incentivizes downstream client firms to request receipts from suppliers to reclaim the VAT they have paid. This chain of tax enforcement makes tax evasion more challenging for private enterprises (Pomeranz 2015), especially when compared to the BT system, where high nom-

inal tax rates in China made evasion extremely prevalent (Zhang 2021, Page 77). Thus, the reform also enhanced tax agencies' regulatory power.

China's National Civil Servant Exam (NCSE) is a merit-based means to recruit government officials through standardized exams that are open to all Chinese citizens since 1994 (Liu 2023). In 2003, the number of applicants doubled to 120,000 from 2002's number and has kept rising ever since. In 2021, over 2.12 million participated in the exam, where applicants have just a one-in-68 chance of landing a government job. The sheer number of applicants and the exam's intense competition underscore the growing allure of government jobs in recent years. This phenomenon is known in China as the "civil servant fever", or "gong wu yuan re (公务员热)." Because different positions attract a varying number of exam takers, the competition for each position thus reflects citizens' preferences for specific government jobs.

In this paper, we use a difference-in-differences (DiD) strategy to causally identify the effect of the VAT reform on the popularity of government jobs and applicants' quality. We exploit variations in pre-reform business tax to value-added tax ratios across 289 Chinese prefectures and sort them into a high BT-VAT group and a low BT-VAT group based on the pre-reform mean BT-VAT ratio. Our DID strategy compares these two groups before and after 2016, the year when the VAT reform was fully rolled out. The rationale is that the VAT reform would have increased the power of tax agencies in prefectures with high BT-VAT ratios more than that of those with lower ratios. This is because the reform replaced the BT with the VAT, thereby giving tax agencies in high BT-VAT prefectures a larger increase in tax collection authority.

We collect a novel dataset that combines all NCSE job postings from 2011 to 2021. Out of the total 166,012 job posts, 151,944 contain information about application, recruitment, locations, and agency affiliations. The key outcome measures are the number of applicants and the applicant-to-recruitment (App-to-Recruit) ratio, which reflect the popularity and the competitiveness of a position, respectively. We also use the minimum score required for interview eligibility to measure the quality of applicants, as a higher cutoff score indicates a better candidate pool. Because the VAT reform directly affected the popularity of jobs in taxation-related bureaus rather than other bureaus, we divide the data into two subsamples:

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1) job openings affiliated with the State Administration of Taxation (the SAT sample), and 2) job openings outside the State Administration of Taxation (the Non-SAT sample). We primarily focus on the SAT sample, while the non-SAT sample serves as a placebo test and enables us to examine the spillover effects of power expansion in tax agencies.

We find that, among the SAT sample, the VAT reform increased the number of applicants, the App-to-Recruit ratio, and the minimum score required for interview eligibility by 20.7%, 18.4%, and 1.1% of their respective mean in the high BT-VAT group relative to the low BT-VAT group. These effects are statistically significant and remain robust when using a continuous treatment measure of BT-VAT ratio, controlling for time-varying prefecture-level covariates, and applying different methods to assign high-low BT-VAT groups. Conversely, no significant effects of the VAT reform were observed among the Non-SAT sample. In fact, the number of citizens applying for non-SAT state jobs did not decrease after the reform, suggesting that the talent attracted to SAT positions is unlikely to come from the pool of applicants for other government jobs.

To understand state-society talent allocation and provide generalizability of the findings from SAT jobs, we further analyze self-reported employment data from six waves of the Chinese General Social Survey and show that the VAT reform reduces the likelihood of an individual working in the private sector compared to the public sector. The above findings together suggest that state power expansion through the VAT reform likely attracts talent to the state apparatus from broader society.

State building helps attract talent to the state sector in the short run because citizens can easily *perceive* the increased power and benefits associated with government jobs following the expansion of state power. However, the long-term impact of state building on talent allocation may be ambiguous and contingent on specific contexts. If an authoritarian regime expands state power at society's cost, this can enhance the allure of government jobs even in the long run. On the other hand, state building may facilitate economic growth in countries where the state was previously too weak to offer basic public goods, infrastructure, and social order. If, in the long run, state building proves more beneficial to the private sector than the public one, it could redirect talent away from the state sector. Our evidence appears to support the former scenario in China, as five years following the VAT reform, there is a

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sustained influx of talent into tax agencies.

The key mechanism by which state building in authoritarian regimes attracts talent is the lack of constraints on state power, which can benefit state employees. To explore this mechanism, we categorize jobs into those with greater power and regulatory prowess, such as tax inspection jobs, and those with less power, such as office and front desk positions. We expect that positions with more power will become more attractive after the reform, as these roles can offer greater benefits in the absence of constraints. If power were constrained, we would not observe such heterogeneous effects. Consistent with our expectation, the VAT reform led to significantly larger increases in the attractiveness of jobs with more power and regulatory prowess.

We further conducted an online survey of 3,700 citizens and identified 788 eligible respondents who have either taken or plan to take the NCSE. We find that most individuals targeting SAT jobs are aware of the VAT reform. Among them, a vast majority perceive an increase in the power and benefits of SAT jobs following the reform. Regression analyses find that respondents with higher social status and greater educational attainment are more likely to associate the reform with an increase in the power of SAT agencies. These findings are consistent with our argument that state power expansion in authoritarian regimes could attract elites into the state due to amplified power and regulatory prowess under limited checks, contrasting with De Tocqueville's observations in America.

This paper bridges classical literature on both state building and political selection by exploring the impact of authoritarian state building on state-society talent allocation. Scholars have extensively studied the causes and consequences of state capacity (Tilly 1985; Herbst 2000; Migdal 1988; Wang 2022a,b; Jackson and Rosberg 1982; Besley and Persson 2009; Slater 2010; Fearon and Laitin 2003; Muralidharan, Niehaus and Sukhtankar 2016; Way 2005). Likewise, there is a substantial body of literature highlighting the tension between meritocracy and nepotism in political selections and their implications for both the regime and society (Calvo and Murillo 2004; Fukuyama 2014; Landry, Lü and Duan 2018; Liu 2023; Shih 2008; Zakharov 2016). However, few studies examine the impact of state building on political selections. The literature on Weberian state considers merit-based recruitment as a part of modern state building (Evans and Rauch 1999; Rauch and Evans 2000), blurring

the boundary between state building and talent recruitment. This paper disentangles this relationship, showing that in an authoritarian context, the expansion of state capacity, combined with merit-based recruitment, attracts talent from society to the state. Furthermore, this finding complements Huang (2023)'s discovery that talent inflows can strengthen the state, together suggesting a self-reinforcing cycle of state-building: state-building attracts talent, and talent makes the state stronger.

The literature on the relationship between the state and the market often debates the merits and drawbacks of state intervention versus free market. Ever since Adam Smith's foundational text in classical economics (Smith 1937), many scholars advocates the virtues of a free-market system and the concept of the 'invisible hand' guiding market outcomes (e.g., Friedman 2016; Hayek 2009). However, other scholars have argued for state intervention to moderate market failures (e.g., Stiglitz 2002; Piketty 2014), following the Keynesian tradition (Keynes 1937). As state intervention requires an expansion of state power to regulate the market, our paper contributes to the debate by highlighting an unintended consequence of state intervention: the reallocation of talent from the market to the state sector, which might undermine the prospects of the market if an authoritarian state becomes so powerful that it drains society's talent.

This paper contributes to a burgeoning literature on the empirical study of Civil Servant Exams (CSE) in China. The traditional Civil Servant Exam, or Keju, served as a meritocratic elite recruitment system that influenced elite circulation, talent allocation, bureaucratic competence, and political stability (Chang and Zhang 1955; Bai and Jia 2016; Huang and Yang 2022; Wen, Wang and Hout 2024). More recently, Huang (2023) argues that the traditional Chinese state was strong because Keju deprived society access to talent and preempted organized religion, commerce, and intelligentsia. Complementing prior studies, this paper looks at the reversed relationship–how state building affects talent allocation through the modern CSE in China. Moreover, the context has changed; today's industrialized societies have a much more vibrant private sector than traditional agrarian societies. Merely having a meritocratic recruitment system does not guarantee a steady inflow of talent to the government. This paper underscores the crucial role of state capacity in enabling authoritarian regimes to tap into the talent pool of contemporary society. However, state

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power expansion in authoritarian regimes does not always preclude talent acquisition, as official recruitment could be based on cronyism or nepotism (Calvo and Murillo 2004; Hassan, Larreguy and Russell 2023). This paper suggests that a combination of state building and merit-based recruitment is essential to attract talent in authoritarian regimes.

## 2 Authoritarian State Building and Talent Allocation

Government jobs in democracies are not always attractive to talented individuals in society. As Tocqueville noted, the equalization of conditions in democratic societies could lead to "tyranny of the majority" and a mediocrity in governance (Tocqueville 2000). Specifically, citizens' disdain for elites and elitism could be channeled by electoral systems and potentially affect the attractiveness of government positions for highly talented individuals. Moreover, in today's mature democracies, factors such as the electoral process, transparency, and checks and balances often limit officials' opportunities to benefit from public offices (Eggers and Hainmueller 2013).[3] In other words, the democratic framework can result in diminished incentives for talented individuals to pursue careers in the public sector. This view is consistent with recent empirical evidence on the relatively less meritocracy among U.S. federal employees compared with Chinese civil servants (Boittin, Distelhorst and Fukuyama 2016) and the public skepticism of science in democracies (Jiang and Wan 2021).

By contrast, government jobs in many authoritarian regimes are attractive because power in these regimes are often unconstrained. Authoritarian rulers leverage the state sector to co-opt the masses and elites (de Mesquita et al. 2005; Magaloni 2006; Svolik 2012), keep potential rivals close to deter opposition and rebellion (Gandhi and Przeworski 2007), and build patron-client networks to secure loyalty and maintain power (Blaydes 2010). These regimes often concentrate power and resources in the government, creating entry barriers and affording officials significant authority, privileges, and opportunities for personal enrichment, often through corrupt and non-transparent means (Haber 2006). The hierarchical structures

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[3] Private gains from public office are possible in democracies, but unethical behavior among politicians and bureaucrats is typically more restricted in mature democracies than in non-democracies.

and stability (i.e., lack of power alternations) in such systems also offer a long career path for talented individuals to pursue (Svolik 2012). Authoritarian countries often face systemic issues in the economy due to the lack of power constraints, including corruption, informal practices, and significant barriers to entry for those lacking political connections (Fisman 2001; Manion 2004; Shih 2008; Chen, Jin and Xu 2021). But precisely for these reasons, government jobs can be more lucrative than those in mature democracies, which can draw in talented individuals to the state sector.

However, not all authoritarian regimes are able to use the state sector for co-optation and patronage redistribution. Authoritarian regimes with a weak state often struggle to establish systems to effectively extract resources, build infrastructure, distribute benefits, and secure loyalty through patron-client networks. Therefore, while the state sector in authoritarian regimes can potentially offer lucrative opportunities and benefits to government officials, the actual dynamics can be significantly influenced by state capacity. In this paper, we define state capacity as the capacity to extract taxes and revenues, spend incomes, and regulate society, following Tilly (1985) and Levi (1988). This definition differs from concepts such as coercive capacity, which pertains to the monopoly on violence (Weber 1919), or legal capacity, which relates to the rule of law (North, Wallis and Weingast 2009). It is also slightly different from the organizational and bureaucratic ability to implement governing projects as described by Centeno, Kohli and Yashar (2017). Our focus is on the power of the state to regulate society, disregarding the intentions and outcomes of the state power.

Our main argument is that, due to the often-unconstrained power of authoritarian states, state building in such contexts will attract talent to the state sector, especially when paired with merit-based recruitment. This attraction of talent through state building may be unintentional, though it can also be a deliberate move by an authoritarian regime.

Authoritarian state building has several advantages in attracting talent to the state sector. First, a stronger state is more effective at extracting taxes and resources for the regime, allowing it to offer better material benefits to state employees. Second, the increased regulatory power affords state employees more privileges in society and potentially more opportunities to engage in graft, a scenario frequently observed in many authoritarian regimes with weak constraints and regulations on officials. Third, a larger and stronger state sector also means

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longer career paths and brighter career prospects for state employees. Fourth, when the power and regulatory capacity of the state grow, state employees enjoy higher social status. Last but not least, expanding state power also increases job security in the public sector as it signals that the government is too big to fail. While some of these factors might be applicable in democracies during phases of state power expansion, they are certainly more salient in authoritarian regimes. Importantly, these constitute immediate benefits of government employment that citizens can easily perceive from observing state power expansion.

It is worth noting that changes in the power dynamics between the state and society is not necessarily a zero-sum game. Sometimes, the increase of state capacity may not weaken the private sector but strengthen it. For example, in countries where the state is too weak to provide basic public goods and infrastructure for economic growth, increasing state power may lead to the development of the private sector through securer property rights, better infrastructure, or lower crime rates (Fukuyama 2014; Dincecco and Katz 2016). Once the enhanced state power takes effect on the economy, it might increase the attractiveness of private jobs. *In the long run*, if the enhanced state capacity benefits the private sector more than the state sector, it may drive talent away from the state sector. But this effect is unlikely to be immediate.

More importantly, people choose between state and private jobs based on *perceived* changes in benefits and costs. For most citizens, it is difficult to predict the long-term benefits of state power expansion to the economy, if there are any. Studies of public opinion have long questioned citizens' competence in understanding complicated political discourse due to limited information (e.g., Converse 1964; Zaller 1992). On the other hand, when citizens observed the expansion of state power, they immediately see expected increases in regulatory power, material benefits, career prospects, social status, and job security associated with government jobs. Thus, authoritarian state building should attract more talent to the state sector, at least in the short run. This entails the following hypotheses:

H1: Authoritarian state building increases the number of applicants to government jobs in the short run.

H2: Authoritarian state building increases the competitiveness of application to government

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jobs in the short run.

Of course, if the job recruitment systems of the state sector is biased towards loyalty and connections rather than pure talent or ability, the expansion of state power would not attract higher-quality individuals to the state sector. However, if the expansion of state power is paired with a merit-based recruitment system, we would expect it to increase the quality of applicants for government jobs.

H3: Authoritarian state building combined with a merit-based recruitment system increases the quality of applicants to government jobs in the short run.

An important mechanism through which state building in authoritarian countries makes government jobs more attractive to citizens is the often-unconstrained power and regulatory prowess associated with those jobs. Since some jobs involve greater regulatory authority than others, state power expansion will have varying effects on jobs with different levels of power and regulatory prowess.

H4: Authoritarian state building increases the attractiveness of government jobs offering greater power and regulatory prowess compared to those offering less power.

As discussed, in the long run, the expansion of state power may have ambiguous, indirect effects on the popularity of public jobs, depending on whether the country has had a booming economy already in place, how powerful the state has been, how much the expansion benefits the private sector, and how predatory the state is. Thus, we propose the following research question (RQ), which is context-dependent:

RQ: What is the long-run effect of authoritarian state building on the popularity of government jobs in a particular country?

Two scope conditions are crucial for observing state power expansion and talent attraction in authoritarian regimes. First, an authoritarian regime must have both the incentives and capabilities to expand the power of the state. Thus, our argument may not apply to rentier states where rulers can attract talent through resource rents without the need to expand state power. Similarly, it may not apply to failed or failing states where rulers lack the ability to

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increase state power or exert control over society. Second, the regime must implement at least partially merit-based recruitment for political positions. Without this, the expansion of state power is unlikely to attract high-quality individuals to the state sector, particularly in countries where cronyism, nepotism, and connections predominate in official recruitment.

# 3 Institutional Background

This section provides a brief overview of state power expansion, particularly through the VAT reform, and "Civil Servant Fever" in China in the past two decades.

## 3.1 State Power Expansion and the VAT Reform

In the early years of its economic reform, China witnessed the liberalization of a command economy and the retreat of the state. But this trend appeared to reverse since the 2000s. In addition to the revitalization of state-owned economy (Hsueh 2011), the so-called "the state advances and the private sector retreats", the Chinese state imposed more regulations and enhanced oversight over private firms, particularly during the Xi Jinping era.[4] As a critical aspect of state power expansion, the Chinese state's capacity to extract tax revenues has significantly increased over the past two decades, particularly in the collection of VAT.

In 1994, the CCP Central Committee introduced a tax-sharing system (*fenshuizhi*) where the central and local governments had different tax sources and shared taxes. The most important new tax was the value-added tax (VAT) levied on most manufactured goods at a uniform rate of 17%, while other industries still paid the Business Tax (BT). The VAT was collected by a new central tax agency, the State Administration of Taxation (SAT). The SAT is a ministerial-level department under the direction of the State Council, and is responsible for the collection of taxes and enforces the state revenue laws. It has branch offices in most counties in China. The VAT revenues were shared on a 75%-25% basis between the central and local governments in the 90s.

As part of the revision to the 1994 tax arrangement, the central government implemented the "VAT for business tax" reform ("ying gai zeng", or VAT reform for short) to replace business taxes with the VAT from 2012 to 2016. Table 1 shows the timeline of the gradual

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[4]How the State Runs Business in China. The Guardian. https://bit.ly/3T2dvko.

roll-out of the VAT reform. The VAT reform started in 2012 with a pilot only in Shanghai. In the same year, the pilot was expanded to two more central-administered municipalities, Beijing and Tianjin, and other eight provinces as shown in Table 1. In these pilot regions, the BT was replaced with the VAT partly in transportation and modern service industries. From August 2013 to June 2014, the central government expanded the VAT reform to the rest of the country, but only covers a few small industries, such as the transportation and modern service industries and part of radio, film, and television products and telecommunication industries. In May 2016, the VAT reform was fully implemented for the entire country and covered all industries.[5]

Table 1: The Timeline of Experimentation and Completion of VAT reforms in China

| Time | Experimented Locations | Experimented Industries |
|---|---|---|
| Jan 2012 | Shanghai | **Part** of transportation and modern service industries |
| Sept 2012 | Shanghai, Beijing | **Part** of transportation and modern service industries |
| Oct 2012 | Shanghai, Beijing, Jiangsu, Anhui, | **Part** of transportation and modern service industries |
| Nov 2012 | Shanghai, Beijing, Jiangsu, Anhui, Fujian, Guangdong | **Part** of transportation and modern service industries |
| Dec 2012 | Shanghai, Beijing, Jiangsu, Anhui, Fujian, Guangdong, Tianjin, Zhejiang, Hubei | **Part** of transportation and modern service industries |
| Aug 2013 | Nationwide | **Part** of transportation and modern service industries + Radio, film, and television products |
| Jan 2014 | Nationwide | **All** of transportation and modern service industries + Radio, film, and television products |
| June 2014 | Nationwide | **All** of transportation and modern service industries + Radio, film, and television products + Telecom industries |
| **May 2016** | Nationwide | **All** of transportation and modern service industries + Radio, film, and television products + Telecom industries + Housing and real estates, finance, construction, consumer service industries |

The VAT is an important tax in China because it can reduce tax evasion. Like many other developing countries, China relies heavily on indirect taxes that are levied on goods and services instead of individual payers because indirect taxes are easier to collect. But this led

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[5]After the reform, central government now return 50% of the VAT to local governments, but that is after the SAT collects VATs for the central government.

to a narrower tax base and a high nominal tax rate. In China, most taxes come directly from private enterprises, while the nominal tax rates are too high to afford. Consequently, local officials give firms huge amounts of tax breaks to foster economic growth, especially before officials' performance evaluations (Chen and Zhang 2021), and tax evasion was rampant in the post-reform era (Zhang 2021). Since the business tax is levied on private firms' total sales revenue without subtracting firms' intermediate input costs, tax evasion is easy as long as firms do not issue invoices for their sales (and they have no incentives to do so). But the VAT is a different story. With the VAT, a downstream firm needs its upstream suppliers to issue invoices to deduct the costs of its intermediate inputs in the value-added tax calculation. The supply chain and the mutual monitoring make tax evasion much harder. Thus, a shift from the BT to the VAT can significantly enhance the state's power in tax extraction.

The VAT reform marked an important milestone in the expansion of taxation capacity in China. Figure A2 in the Appendix shows VAT revenues and total tax revenues relative to the total budgetary fiscal revenues at the national level over time. Following the reform in 2016, the share of VAT in government fiscal revenues has significantly increased. With more reliance on VAT as tax sources since 2016, the government has seen an increase in the share of total tax revenue within the overall fiscal revenue, reversing the previous downward trend. Both figures suggest an increase in the government's tax extraction capacity following the reform.[6] The reform particularly empowered the local branches of the State Administration of Taxation (SAT), the tax agency responsible for collecting VAT. Our empirical analysis exploits the VAT reform to examine the impact of state power expansion on citizens' preferences for jobs in the SAT and its local branches all over China.

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[6]We show that the VAT reform enhanced taxation capacity using national-level data because local-level tax data after the reform are not available, yet this enhancement varies locally due to the differing degrees to which local governments relied on business taxes as tax sources before the reform.
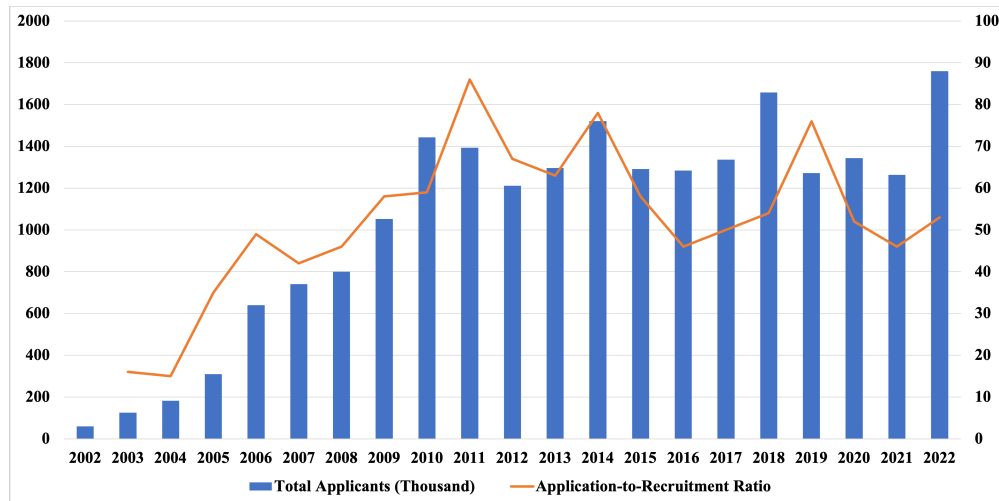
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Figure 1: Total Number of Applicants and Application-to-Recruitment ratio by Year

## 3.2   China's Civil Servant Fever

Corresponding to the power expansion of the Chinese state, the number of NCSE applicants increased sharply in the 2000s. In 2003, the number doubled to 125,000 from that of the previous year. Since then, there was a steady increase in the number of applicants and the applicants-to-recruitment ratio (Figure 1). The number of applicants reached 1.4 million in 2010 and became relatively stable afterward. In 2022, more than 2.12 million participated in the NCSE, while the total number of college graduates in that year was 9.1 million. There are also huge variations in the applicants-to-recruitment ratio. In 2022, the average number of applicants per job opening is 68. Some jobs received zero applicants, whereas the most popular job attracted 20,602 applicants. With a waning job market due to the COVID-19 pandemic, more and more individuals, including many fresh college graduates, prioritize seeking stable civil service jobs by taking the NCSE.

The NCSE is administered by the State Administration of Civil Service (SACS). It fills positions for three types of government organizations: central party organs, central state administrations (including their local branches), and public administrations governed by the Civil Servant Law. The NCSE fills positions in central departments as well as their branch offices at all levels of government, including the provincial, prefecture, county, and township levels. Parallel to the NCSE is the Provincial Civil Service Exam (PCSE), which

fills positions only at local levels. Our empirical study focuses on the NCSE because it includes positions at both central and local levels, especially considering that the VAT reform directly influences the power of the State Administration of Taxation, a central tax agency with local branches all over China.

# 4 Data and Empirical Strategy

We compiled a comprehensive database of NCSE job openings and used a difference-in-differences strategy based on the VAT reform to causally estimate the effect of state power expansion on citizens' preferences for civil servant jobs.

## 4.1 Data and Measures

Our novel and comprehensive NCSE database contains both the demand side and supply side information for the civil servants' job market in China from 2011 to 2022. Each year in October, the central government opens application for the next year's NCSE with detailed vacancy postings. Applicants can log on to the application system and choose *one* position that best matches their preferences. The first part of the exam is a written exam. After the written exam, the central government announces the minimum score required for the next-round interview for each position.

The demand-side information of our NCSE data comes directly from the job postings that detail the central governments' needs and requirements for potential civil servant candidates. The supply side information is reflected by the number of applicants for each NCSE position every year. We also collected information about the minimum score required for interview eligibility for each position, which can be understood as a proxy for the threshold quality of the candidate pool. The 2011-2014 NCSE data were collected from the government website. The 2014-2021 NCSE data were scraped from the websites of two major companies that provide training materials to the NCSE exam takers, Huatu Education and Zhonggong Education.[7]

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[7]For the NCSE information on Huatu Education Online, see https://chuzhou.huatu.com/ v/kaoshi/guojia.html. For Zhonggong Education Online, see https://www.eoffcn.com. We hand coded geographic information for the years 2011 to 2018 using information in each job

The prefecture-level business tax (BT) and value-added tax (VAT) data for 2007 to 2011 are from the Regional Statistical Yearbooks 2008 to 2012 as in Zhang, Lu and Liu (2022). We merge the prefecture-level tax data with the NCSE dataset based on the job location at the prefecture level and calculate the BT-to-VAT ratio in year 2011, before our earliest NCSE sample year. See Figure 2 for the distribution of BT-VAT ratios. Excluding prefectures with missing information and extreme values for BT-VAT ratios, we end up with 288 prefectures.[8] Besides, we collected a set of prefecture-level economic variables from the China City Statistical Yearbook 2011 to 2021 as our covariates.

From the NCSE database, we focus on three outcome variables. The first outcome variable is the total number of applicants for a NCSE position $i$ in year $t$, denoted as $Applicants_{i,t}$.[9] To measure the competitiveness of a position, we construct the *Applicants-to-Recruitment (App-to-Recruit)* ratio of position $i$ in year $t$ as the ratio of the total number of applicants and the total number of actual recruitment, i.e., $App\text{-}to\text{-}Recruit_{i,t} = \frac{Applicants_{i,t}}{Recruitment_{i,t}}$. The last outcome measure is the minimum score required for interview eligibility for position $i$ in year $t$, denoted as *Min. Score for Interview$_{i,t}$*. This variable is only available from 2014 to 2021. To compare applicant qualities across years, we rescale the minimum score for interview into a 200-point scale for all positions.[10] Out of a total of 166,012 positions, we exclude those with missing information in the application, recruitment, locations, and agency affiliations, which reduces our sample to 151,944 positions. We further exclude observations

posting.

[8]The tax data for 48 prefectures, primarily ethnic minority regions in Yunnan, Xinjiang, and Tibet, are not included in the yearbooks. Sanya City in Hainan Province recorded an extreme BT-VAT ratio of 23.25 in 2011 (the national average, excluding Sanya, is 2.164).

[9]$t$ represent the year of registration and examination, which is the year preceding the recorded NCSE year. For example, applicants for the 2022 NCSE registered and took the written exam in 2021.

[10]Most positions use a generic exam with a maximum score of 200 points, whereas exams for law enforcement roles, positions requiring uncommon languages, or specialties in financial regulations have a maximum score of 100 points.

with missing BT-VAT ratios, retaining a sample of 137,245 job openings across all hiring agencies over 12 years.

## 4.2 Empirical Strategy

To causally identify the effect of state building on citizens' preferences for civil servant jobs in China, we take advantage of the 2012-2016 VAT reform and exploit subnational variations in pre-reform tax compositions—the ratios of business taxes to value-added taxes (BT-VAT ratios). Figure 2 presents the geographic distribution of BT-VAT ratios across prefectures in China in 2011, the year before the VAT reform. Intuitively, the VAT reform should have a larger impact on localities where the government levied more business taxes than value-added taxes prior to the reform because the reform replaced the business tax with the value-added tax. In particular, because the VAT makes tax evasion more difficult, tax agencies in localities with higher BT-VAT ratios thus have larger increases in regulatory power and can potentially collect more tax after the reform. In addition, since the SAT collected the VAT whereas the Local Administration of Taxation levied the BT before the reform, replacing the BT with the VAT enlarges the tax base for the SAT. This gives more power and revenue for the SAT in localities with higher BT-VAT ratios than the SAT in localities with lower BT-VAT ratios. Given these perceived increases in power and revenue in State tax agencies, we expect the VAT reform to have a larger effect on individuals' preferences for working for the SAT, especially in its branch offices located in localities with higher BT-VAT ratios.

Based on this logic, we construct a dummy variable that equals 1 if a prefecture has a pre-reform BT-VAT ratio greater than the national mean and 0 otherwise. We end up with 113 prefectures with pre-reform BT-VAT ratios above the national mean and 175 prefectures with pre-reform BT-VAT ratios below the national mean. Note that, following the common practice in the field (e.g., Cao, Xu and Zhang 2022), we did not use the BT-VAT ratio as a continuous treatment measure for two reasons. First, prefectures' BT-VAT ratios are likely left-skewed because few prefectures have an advanced tertiary industry in China. Second, individuals' responses to the VAT reform are unlikely to be linear with respect to the reform's intensity in different localities: they tend to remain insensitive to small to moderate changes
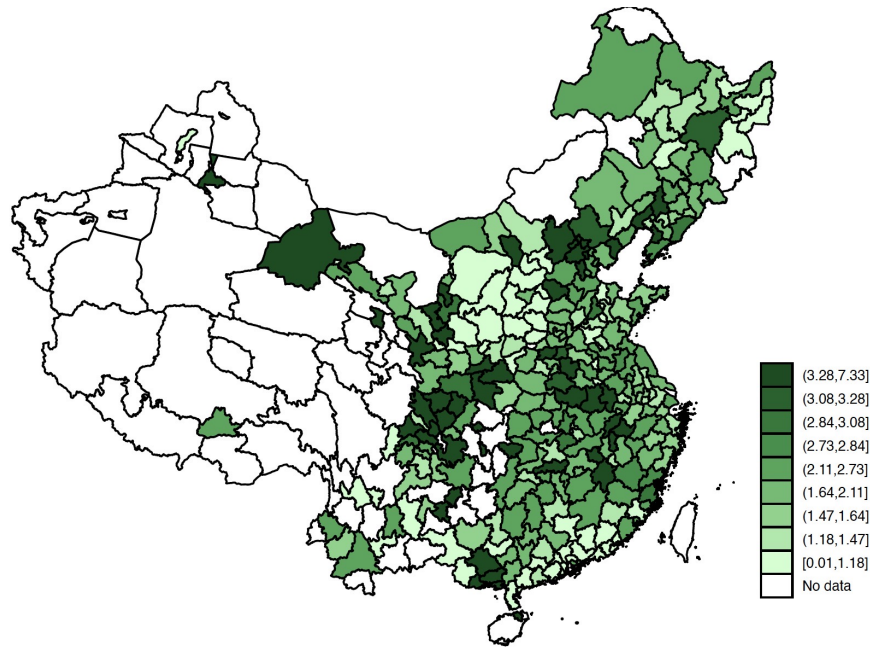
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Figure 2: BT-to-VAT Ratio by Prefectures, 2011

in tax composition until a certain threshold is reached. Nevertheless, we use the continuous measure in Section 5.2 for robustness checks and the results are similar.

We further divide our sample into two categories: SAT job openings, which are jobs affiliated with the State Administration of Taxation, and non-SAT job openings, which are jobs affiliated with all other state agencies. We expect the VAT reform to influence people's preferences for the SAT jobs rather than non-SAT jobs. Table 2 presents the summary statistics of the treatment and outcome variables by the two subsamples. The average prefecture-level BT-VAT ratio in our sample is 2.16. Panels A and B give summary statistics on SAT job openings and non-SAT job openings respectively. Overall, there are more job openings in the SAT sample versus the non-SAT sample. Within the SAT sample, the number of applicants per position is close to 100 in the past 12 years, with about 15 more applicants per position in the high BT-VAT regions than in the low BT-VAT regions on average. The average App-to-Recruit ratio and the minimum score required for interview eligibility are also higher in the high BT-VAT regions than in the low BT-VAT regions. These patterns are similar in the non-SAT sample. Note that our DiD strategy should account for regional differences to identify the impact of the VAT reform in the SAT sample.

We designate post-2016 as the treatment period because the VAT reform was not fully

Table 2: Summary Statistics. NCSE 2010-2021

| | **All** | | **Low BT-VAT** | | **High BT-VAT** | |
|---|---|---|---|---|---|---|
| | Obs. | Mean | Obs. | Mean | Obs. | Mean |
| Pref. BT-VAT Ratio (2011) | 288 | 2.164 | 175 | 1.393 | 113 | 3.357 |
| | | | | | | |
| ***Panel A: SAT Sample*** | | | | | | |
| # of Applicants | 75,498 | 98.56 | 40,100 | 93.18 | 35,398 | 104.7 |
| App-to-Recruit | 75,498 | 63.12 | 40,100 | 61.53 | 35,398 | 64.92 |
| Min. Score for Interview | 56,892 | 120.5 | 29,486 | 120.1 | 27,406 | 120.9 |
| Recruitment Quota | 75,881 | 1.761 | 40,237 | 1.702 | 35,644 | 1.828 |
| | | | | | | |
| ***Panel B: Non-SAT Sample*** | | | | | | |
| # of Applicants | 61,747 | 122.9 | 24,258 | 92.33 | 37,489 | 142.8 |
| App-to-Recruit | 61,747 | 85.12 | 24,258 | 72.05 | 37,489 | 93.58 |
| Min. Score for Interview | 41,794 | 119.4 | 16,615 | 118.7 | 25,179 | 119.9 |
| Recruitment Quota | 64,504 | 1.698 | 24,936 | 1.486 | 39,568 | 1.832 |

implemented until mid-2016. The pre-2016 pilot reform in transportation and related sectors only affected a small fraction of the economy. As shown in Figure A3 in the Online Appendix, the share of output from the transportation, storage, and postal-service sectors constituted of roughly 4% of the total GDP. Given the minimal share of these sectors in the economy, the pilot reform should have a negligible impact on individuals' job preferences. Therefore, we define our post-treatment year starting from 2017 and estimate the following model:[11]

$$Y_{i,t} = \alpha_0 + \beta \left( \text{High BT-VAT}_p \times Post2016_t \right) + \alpha_1 X'_{i,t} + \alpha_2 P'_{p,t} + \delta_p + \delta_t + \epsilon_{i,t}, \qquad (1)$$

where $Y_{i,t}$ is one of the three outcome variables: the total number of applicants per position, the App-to-Recruit ratio, and the minimum score required for interview eligibility. High BT-VAT$_p$ is a dummy variable that equals 1 if a position locates in a prefecture with high BT-VAT ratio before the reform (in 2011), and zero otherwise. $Post2016_t$ is a dummy variable that equals 1 if the calendar year is after 2016. $\delta_p$ and $\delta_t$ are prefecture and year fixed effects, respectively. $X_{i,t}$ is a set of position-specific characteristics, and $P'_{p,t}$ a set of prefecture-level covariates. See Online Appendix A1 for detailed information about the

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[11]We checked if individuals respond to the VAT reform between 2012 and 2016. We did not find empirical evidence supporting that exam takers change their preferences from 2012 to 2016. See Figure 4 for details.

covariates. We are interested in $\beta$, which captures the change of individuals' preferences for civil servant jobs located in the high BT-VAT regions versus low BT-VAT regions following the VAT reform.

The main threat to our research design is that individuals' preferences for the civil servant jobs in prefectures with high BT-VAT ratios might be different from individuals' preferences in prefectures with low BT-VAT ratios before the reform. We address this concern in two ways. First, we compare the means of the outcome variables between the high BT-VAT ratio regions and the low BT-VAT ratio regions by year. Figure 3 shows that the number of applicants, the App-to-Recruit ratio, and the minimum scores required for interview eligibility *per position* in the SAT sample between the high and low BT-VAT-ratio regions follow parallel trends before 2016. Second, we conduct placebo tests to examine the parallel trend assumption of the DiD model using the following dynamic-effect specification. In particular, we interact the indicator for high BT-VAT prefectures, High BT-VAT$_p$, with year dummies $D_k$, using 2016 as the base year for comparison (k $\neq$ 2016).



(a) # of Applicants      (b) App-to-Recruit Ratio      (c) Min. Score for Interview
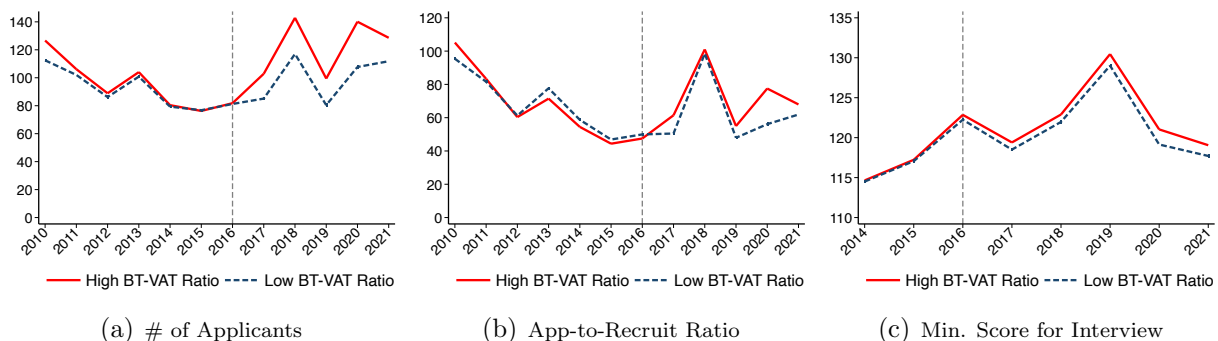
Notes: Annual averages by high versus low BT-VAT groups are plotted using the SAT sample.

Figure 3: Average NCSE Outcomes by High and Low BT-VAT Prefectures

$$Y_{i,t} = \alpha_0 + \sum_{\substack{k=2010 \\ k \neq 2016}}^{2021} \beta_k \left( \text{High BT-VAT}_p \times D_k \right) + \beta_2 X'_{i,t} + \alpha_2 P'_{p,t} + \delta_p + \delta_t + \epsilon_{i,t}. \qquad (2)$$

The estimates of $\beta_k$ indicate the difference in NCSE outcomes between high and low BT-VAT-ratio prefectures in years relative to year 2016. These estimates for the SAT sample are plotted in Figure 4. We can see that the estimated coefficients are not significantly different from zero in pre-treatment periods, which is consistent with our observation in the raw data.
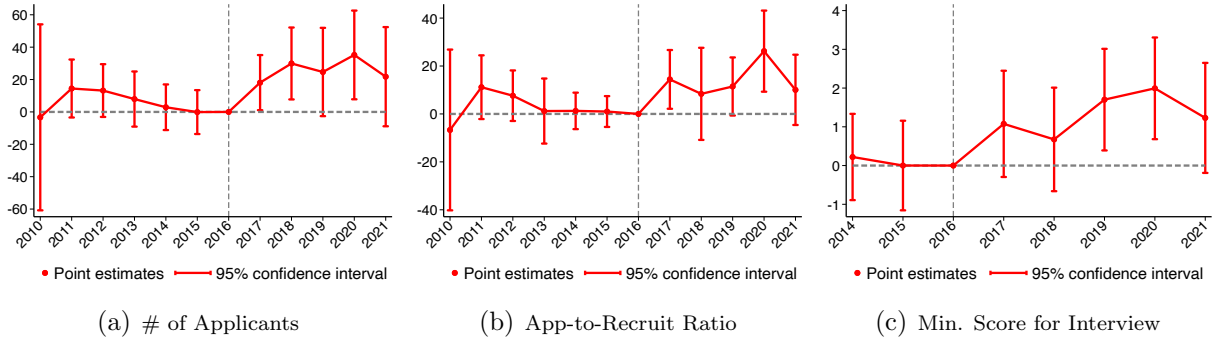
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Figure 4: Dynamic Effects on NCSE Outcomes

# 5 Empirical Findings

This section presents the main results, conducts robustness checks, tests mechanisms, and explores implications for the general labor market.

## 5.1 Main Results

Table 3 Panel A reports the main effects of the VAT reform on talent recruitment for civil servant jobs affiliated with the State Administration of Taxation (the SAT sample). Columns (1), (3), (5) include prefecture and year fixed effects. In Columns (2), (4), and (6), we add prefecture-level and position-level covariates. Consistent with our expectations, job openings in prefectures with high pre-reform BT-VAT ratios after the VAT reform see increases in the number of applicants (H1), the App-to-Recruit ratio (H2), and the minimum scores for interview (H3) compared with job openings in prefectures with low pre-reform BT-VAT ratios. The magnitudes are large. We observe an increase of 20 more applicants (Column [2]) and an 11-point increase in the Applicant-to-Recruit ratio (Column [4]) for each job opening in high BT-VAT ratio prefectures compared with that in low BT-VAT ratio prefectures after the reform, both representing increases of more than 20% relative to their pre-reform means. Column (6) further indicates that the minimum score for interviews increased by 1.6 points for each job opening in high BT-VAT ratio prefectures compared with those in low BT-VAT ratio prefectures (the mean is 120 points). This is a significant increase because, in a standard exam, a one-point difference can eliminate a large number of

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contestants. The findings suggest that the VAT reform increased the number of applicants, made jobs more competitive, and improved the quality of the recruited talent for jobs afflicted to the State Administration of Taxation and its local branches.

Table 3: Effects of the VAT Reform on NCSE Outcomes

| **Panel A (SAT Sample, Main Analysis)** | # of Applicants | | App-to-Recruit Ratio | | Min. Score for Interviews | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| D.V. Mean | 98.56 | 97.07 | 63.12 | 61.29 | 120.5 | 120.5 |
| High BT-VAT × Post2016 | 18.943* | 20.050** | 10.895** | 11.271** | 1.098*** | 1.310*** |
| | (9.627) | (9.252) | (4.793) | (4.548) | (0.397) | (0.401) |
| Observations | 75,498 | 70,498 | 75,498 | 70,498 | 56,892 | 56,086 |
| R-squared | 0.068 | 0.104 | 0.059 | 0.094 | 0.357 | 0.422 |
| Prefecture FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Prefecture Covariates | No | Yes | No | Yes | No | Yes |
| Position Covariates | No | Yes | No | Yes | No | Yes |
| **Panel B (Non-SAT Sample, Placebo)** | # of Applicants | | App-to-Recruit Ratio | | Min. Score for Interviews | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| D.V. Mean | 122.9 | 119.5 | 85.12 | 83.42 | 119.4 | 119.5 |
| High BT-VAT × Post2016 | -11.183 | -6.454 | -6.735 | -5.451 | 1.303*** | 0.707* |
| | (10.975) | (10.208) | (6.265) | (4.206) | (0.395) | (0.371) |
| Observations | 61,747 | 56,502 | 61,747 | 56,502 | 41,794 | 40,244 |
| R-squared | 0.043 | 0.095 | 0.038 | 0.107 | 0.225 | 0.338 |
| Prefecture FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Prefecture Covariates | No | Yes | No | Yes | No | Yes |
| Position Covariates | No | Yes | No | Yes | No | Yes |
| Number of Provinces | 31 | 31 | 31 | 31 | 31 | 31 |
| Number of Prefectures | 288 | 288 | 288 | 288 | 288 | 288 |

Notes: Prefecture-level and position-level covariates are added in Columns (2), (4), and (6). Standard errors reported in parentheses are clustered at the prefecture level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

We do not expect the VAT reform to have a significant impact on the non-SAT sample, as the reform does not alter the powers of those non-SAT government agencies. Indeed, Table 3 Panel B shows that the reform has no statistically significant effects on the popularity and competitiveness of non-SAT jobs. After controlling for prefecture and position covariates, the effect of the reform on the minimum score for interviews in the non-SAT sample is

only significant at the 10% level and is half of the magnitude observed in the SAT sample. These results are not only consistent with our expectations but also suggest that the talent attracted to SAT-affiliated departments is unlikely to be drawn from the talent pool of other State departments.

## 5.2 Checking Robustness and Alternative Explanation

In the main analysis, we divide the sample into two groups by the mean value of the pre-reform BT-VAT ratio at the prefecture level because individuals' perception about the VAT reform is unlikely to be linear: they may be insensitive to small to moderate changes in tax composition until a certain threshold is reached. Nevertheless, we replicate the analysis using the continuous measure of the pre-reform BT-VAT ratio (Appendix Table A2). The results are consistent with those from Table 3. We also use the 2007-2011 (pre-reform period) average BT-VAT ratio instead of the 2011 value to divide the sample, and the results remain robustness (Appendix Table A3).

One may be concerned that our results could be driven by an increase in government job openings in prefectures with high BT-VAT ratios after the reform rather than reflecting changes in applicants' preferences. We address this concern by looking at the impact of the VAT reform on SAT agencies' recruitment quota directly. Results are presented in Appendix Table A4. In Column (1), we examine the impact of the VAT reform on the recruitment quota per position. We find no significant change in high BT-VAT ratio prefectures relative to the low BT-VAT regions. In Column (2), we aggregate the position-level recruitment quotas across all SAT positions for each prefecture and create a prefecture-year panel. We find that the total number of openings did not change significantly in high BT-VAT regions relative to low BT-VAT regions after the reform. These results suggest that the main pattern we find in Table 3 is unlikely driven by an increase in job openings.

Our results are unlikely to be driven by the integration of National and Local Tax Administrations. The Chinese central government proposed this integration towards the end of 2018, and it was not expected to take effect until 2019. However, our dynamic model (Figure 4) identifies effects as early as 2017. This timeline suggests that the observed changes are a direct result of the VAT reform, predating the effects that the integration of tax adminis-

trations might have had. Furthermore, the integration of tax administrations would likely have a negative impact on individuals' willingness to join the SAT, because it consolidates too many employees within the tax administrations, which reduces each individual's share of power and benefits, and diminishes their career prospects.

## 5.3 Testing Mechanisms: Power and Benefits

To test the mechanisms through which the VAT reform made SAT jobs more attractive, we first conduct an online survey of 3,700 individuals from 28 provinces in China to identify NCSE takers and ask their perceptions about the VAT reform directly. Online Appendix A4 provides details about this survey. Table 4 presents descriptive statistics. Out of the total 2,216 respondents whose education attainment are potentially eligible for the NCSE, around 35% (788 individuals) respondents had taken or will take the NCSE. Within this group, a significant proportion, 70% of respondents (546 individuals), had applied or will apply for positions affiliated to the SAT. Among them, awareness of the VAT Reform was high, with 86% (471 individuals) indicating familiarity to the reform. Consistent with our argument, a majority (62%, 292 individuals) of those aware of VAT Reform believed that the VAT reform increased the power of the SAT department. Additionally, 70% (320 individuals) perceived that after the VAT reform, government officials who work in the SAT experienced an increase of compensation and welfare.

Table 4: Individual Perceptions of Government Jobs in Response to the VAT Reform

| Take NCSE? | Apply SAT? | Know VAT Reform? | Power? | Compensation & Welfare? |
|---|---|---|---|---|
| | | | Increase (292/62.26%) | Increase (320/69.57%) |
| | | Yes (471/86.26%) | No Change (85/18.12%) | No Change (85/18.48%) |
| | Yes (546/69.47%) | | Decrease (92/19.62%) | Decrease (55/11.96%) |
| Yes (788/35.12%) | | No (75/13.74%) | | |
| | No (240/30.53%) | | | |
| No (1456/64.88%) | | | | |

Notes: The sample includes individuals whose education attainment is eligible for the NCSE. See Appendix A4 for details about the survey items.

Moreover, Table A1 presents a regression analysis based on survey data. Results show that elites–individuals in higher social classes or with higher educational attainments–are more likely to perceive increases in the power and benefits associated with SAT agencies

after the VAT reform. In particular, elites are significantly more likely to expect an increase in power following the VAT reform. Together, the two pieces of evidence from this survey support our argument that job applicants, especially those in higher social classes or with higher education levels, applying for positions affiliated with the SAT in the NCSE perceive that the reform has made those positions more powerful and lucrative.

As discussed in the theory section, state power expansion in authoritarian regimes makes government jobs particularly attractive because the lack of power constraints on government officials allows them to benefit from the amplified power and regulatory prowess. This logic implies that powerful positions in the state sector should attract more applicants than positions with less power. To test this, we examine the heterogeneous effects of the VAT reform on the popularity of different job openings within the SAT agencies. Certain roles in the SAT agencies entail greater discretionary power over taxation issues of the private sectors, endowing SAT employees with more authority, privileges, and graft opportunities. Our interviews with SAT employees indicate that roles in tax-base management, auditing, and enforcement possess greater authority than other jobs, such as front desk and office jobs. If the VAT reform amplified the power and benefits linked to certain SAT roles, job posts involving such roles would be perceived by applicants as particularly empowering and therefore attract more applicants.

We utilize the description and title of job posts in the NCSE dataset to identify powerful positions. Following the suggestions of our interviewees working in tax agencies, we consider a position "powerful" if the text information contains keywords such as: "tax base," "tax inspection," "tax audit," and "tax law enforcement," In total, we identified around 12% of all SAT positions as "powerful". Note that "powerful" and "less powerful" positions are in relative terms. Appendix A5 provides detailed information of the categorization.

Table 5 presents the results for both "powerful" and "less powerful" jobs. We observe an 80% larger increase in the number of applicants and a 130% larger increase in the applicant-to-recruitment ratio for "powerful" positions, compared to "less powerful" positions. This evidence suggests that the VAT reform made powerful SAT positions much more attractive to applicants than less powerful ones. We find that the increase in the minimum score required for interview eligibility for "powerful" positions is less significant. This is reasonable, as

Table 5: Effects of the VAT Reform on NCSE Outcomes: Heterogeneous Analysis

| Variables | # of Applicants | | App-to-Recruit | | Min. Score for Interview | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Positions | **Powerful** | Less powerful | **Powerful** | Less powerful | **Powerful** | Less powerful |
| D.V. Mean | 95.01 | 96.14 | 62.15 | 61.79 | 120.6 | 119.5 |
| High BT-VAT × Post2016 | 31.713* | 17.751* | 21.274** | 9.381** | 0.278 | 1.381*** |
| | (16.869) | (9.451) | (8.838) | (4.695) | (0.790) | (0.405) |
| N of Observations | 7,723 | 62,757 | 7,723 | 62,757 | 4,636 | 51,431 |
| R-squared | 0.157 | 0.109 | 0.140 | 0.097 | 0.499 | 0.423 |
| Prefecture FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Prefecture Covariates | Yes | Yes | Yes | Yes | Yes | Yes |
| Position Covariates | Yes | Yes | Yes | Yes | Yes | Yes |
| Number of Provinces | 29 | 31 | 29 | 31 | 28 | 31 |
| Number of Prefectures | 190 | 288 | 190 | 288 | 151 | 288 |

Notes: Columns (1), (3), and (5) are for powerful SAT-agency positions, while Columns (2), (4), and (6) are for less powerful SAT-agency positions. Prefecture fixed effects, year fixed effects, prefecture-level covariates, and position-level covariates are included across all the specifications. Standard errors reported in parentheses are clustered at the prefecture level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Please refer to Appendix A5 for the details of categorizing powerful and less powerful SAT positions.

"powerful" positions have already been attracting high-ability applicants even before the VAT reform, as indicated by their higher pre-reform average minimum score (120 points for powerful positions versus 117 points for less powerful positions). After the reform, the average minimum score for "powerful" positions (120.6) is still higher than that for "less powerful" positions (119.5). Nevertheless, the heterogeneous effects of the VAT reform among different positions provide strong evidence for the mechanism that state power expansion makes government jobs more attractive by increasing the power and regulatory prowess of those jobs.

It should be noted that applicants may perceive different benefits from the increased power. On one hand, positions with greater power provide more opportunities for officials to solicit graft from individuals and businesses. On the other hand, increased discretionary power allows officials more chances to demonstrate their competence for promotion within the administrative hierarchy, thereby enhancing their career prospects. Additionally, the amplified power also improves job security for officials in those positions. Although it is challenging to distinguish each benefit clearly, the analyses above strongly suggest that

applicants to SAT jobs are drawn to the increased power and regulatory authority that comes with the reform.

## 5.4 State-Society Talent Allocation

The analyses so far have focused on tax agencies, which may raise questions about the generalizability of the findings. Another important question is whether the talent attracted to state agencies experiencing power expansion comes from other state sectors or from society at large, especially the private sector. To explore the impact of the VAT reform on the general labor market, we use six waves of the China General Social Survey (CGSS) from 2010 to 2017.[12] The CGSS is a national representative survey project run by Chinese academic institutions since 2003. It contains a wide range of employment information, including the ownership type of an individual's employer. We aggregate our prefecture-level BT-VAT measure to provincial level and merge it to the CGSS data, as province is the finest geographic unit in the CGSS.[13] The average BT-VAT ratio at the provincial level is about 2.4, which is comparable to the prefecture-level average. Following our main analysis, we construct a dummy variable, "High BT-VAT", which equals 1 if a province's 2011 BT-VAT ratio is above the national mean, and 0 otherwise.

We use a generalized difference-in-differences specification to estimate the effect of the VAT reform on the general labor market outcome. The outcome variable is a dummy variable that equals 1 if an individual works in the private sector and 0 if this individual works in the public sector.[14] Within survey respondents who have active employment in non-agricultural sectors (24,103 observations in 28 provinces), we focus on individuals with college educations

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[12]We use the CGSS data because data on China's private sector labor market are not available. The CGSS data after 2017 has not published yet. During the sample period, the CGSS was not implemented in 2014 and 2016. We exclude data from Xinjiang and Tibet due to small size (85 obs and 204 obs across six waves respectively).

[13]Following our main analysis, we exclude Hainan Province because of its extremely high BT-VAT ratio.

[14]Individuals who work in the private sector include those with their own business, or those who work in an enterprise with domestic employers, employers from Hong Kong, Macaw, or

(the higher educated group, 7,497 observations), since the NCSE requires all applicants to have a bachelor degree or above. Consequently, the subgroup who has a high-school or below education (the lower educated group, 16,606 observations, unqualified for the NCSE) serves as a placebo test. The VAT reform should have no effect on their occupation choice, since they are not qualified for the NCSE.

Table 6: The Effect of the VAT Reform on Private Sector Employment, CGSS 2010-2017

| | Work in the Private Sector (as opposed to the Public Sector) | | | | | |
| | Higher educated group | | | **Placebo**: Lower educated group | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| D.V. Mean | 0.425 | 0.425 | 0.425 | 0.786 | 0.786 | 0.786 |
| High BT-VAT $\times$ Post2016 | -0.069** | -0.069** | -0.069* | 0.002 | 0.005 | 0.005 |
| | (0.027) | (0.027) | (0.038) | (0.016) | (0.016) | (0.028) |
| High BT-VAT | 0.175*** | 0.159 | 0.159 | -0.233*** | -0.085 | -0.085 |
| | (0.051) | (0.178) | (0.261) | (0.031) | (0.108) | (0.077) |
| Post2016 | 0.151*** | 0.147*** | 0.147** | 0.060*** | 0.092*** | 0.092*** |
| | (0.023) | (0.044) | (0.065) | (0.012) | (0.026) | (0.022) |
| Male | | 0.012 | 0.012 | | -0.035*** | -0.035*** |
| | | (0.011) | (0.011) | | (0.006) | (0.007) |
| Log GDP | | 0.006 | 0.006 | | -0.051 | -0.051* |
| | | (0.058) | (0.090) | | (0.035) | (0.026) |
| N of Observations | 7,497 | 7,497 | 7,497 | 16,606 | 16,606 | 16,606 |
| R-squared | 0.013 | 0.031 | 0.031 | 0.005 | 0.008 | 0.008 |
| Province FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Cluster SE at Provinces | No | No | Yes | No | No | Yes |
| Number of Provinces | 28 | 28 | 28 | 28 | 28 | 28 |

Note: *** p<0.01, ** p<0.05, * p<0.1.

Table 6 presents the results. Columns (1), (2), and (3) show that the VAT reform significantly reduced the likelihood of higher-educated individuals working in the private sector as opposed to the public sector. In contrast, the placebo tests in Columns (4), (5), and (6) reveal that the VAT reform has no significant impact on the group with lower education. This suggests that the enhanced tax extraction capacity of the Chinese state may have redirected talent away from the private sector. This shift could be attributed to both the increased power and benefits within the state sector and a decline in the private sector due to state power expansion, although it is challenging to separate these effects.

Taiwan, or foreign employers.

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# 6 Conclusion

This paper links authoritarian state building to state-society talent allocation. Using a comprehensive database on the civil servant recruitment compiled based on the NCSE in China in the past decade, we causally identify positive effects of the VAT reform—a recent effort of state power expansion—on the popularity and competitiveness of government jobs in tax agencies. The reform also increases the quality of job candidates. The findings are based on a specific state sector–tax agencies–but they imply a broader conclusion: power expansion in a state sector should attract talent to that sector as long as citizens *perceive* it. Using the CGSS data, we further show that the VAT reform has redirected talent from the private sector to the public sector in general.

This paper highlights a crucial mechanism by which state building in authoritarian regimes attracts talent to government positions: state employees can benefit from the amplified power and regulatory prowess due to the lack of constraints on government officials in such regimes. Empirically, our original survey shows that candidates for the NCSE perceive an increase in power and benefits associated with SAT jobs after the VAT reform in China. Furthermore, we find that the VAT reform significantly boosted the popularity and competitiveness of powerful positions within the SAT, much more so than for less powerful roles. This finding is particularly notable against the backdrop of an ongoing corruption crackdown that deters applications for government positions (Lai and Li 2022). Theoretically, this attraction to power and regulatory prowess is more pronounced in authoritarian regimes than in democracies, which potentially explain the high appeal of civil servant jobs in China compared to the U.S. This may also explain why Chinese civil servants exhibit a relatively more meritocracy than U.S. federal employees (Boittin, Distelhorst and Fukuyama 2016). Future research could explore the impact of state power expansion on talent allocation in democratic contexts.

The theory and findings from this paper have several implications. First, although this paper does not examine talent attraction and regime stability, it highlights a potential mechanism of authoritarian survival–authoritarian rulers may enhance state capacity to attract talent to the regime, instead of leaving them in society as sources of instability (Rosenfeld

2017). Second, there might be an irreconcilable tension between authoritarianism and the market economy. Authoritarian governments have a tendency to restrict the private sector because a thriving private sector may threaten regime survival. Moreover, efforts to expand state power and limit the private sector could drain talent from the market, further exacerbating its decline. Thus, even though some authoritarian regimes may experience rapid economic growth initially, the long-term economic prospects of these regimes might be questionable. Third, as we show that state building, along with merit-based recruitment, attracts talent to the state sector, it would be interesting to see how talent could further enhance state capacity. This feedback loop may explain why strong states emerged in some authoritarian regimes, such as Communist China, Vietnam, Singapore, pre-war Japan, and South Korea before 1988. Future research in these directions is worth exploring.

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# Online Appendix

## Table of Contents

# A1   Covariates in the Constructed NCSE Data

We include a set of position-specific characteristics and a set of prefecture-level covariates in the main empirical model. Position-level covariates include dummy variables for position types (regular positions or special positions such as those with special language requirements), location of jobs (whether the position is in remote or poor areas), nature of the hiring agencies (e.g., the Party organs, State Council administrative units, functional departments of the government etc.), the administrative rank of the hiring agency's director, and requirements on education, majors, and gender. We consider these position-level covariates because job characteristics and requirements affect individuals' preferences for the position and their eligibility to apply. Prefecture-level covariates include logged GDP per capita, logged population of permanent residents, and the combined share of the secondary and tertiary sectors' outputs in total GDP.

# A2   Appendix Figures
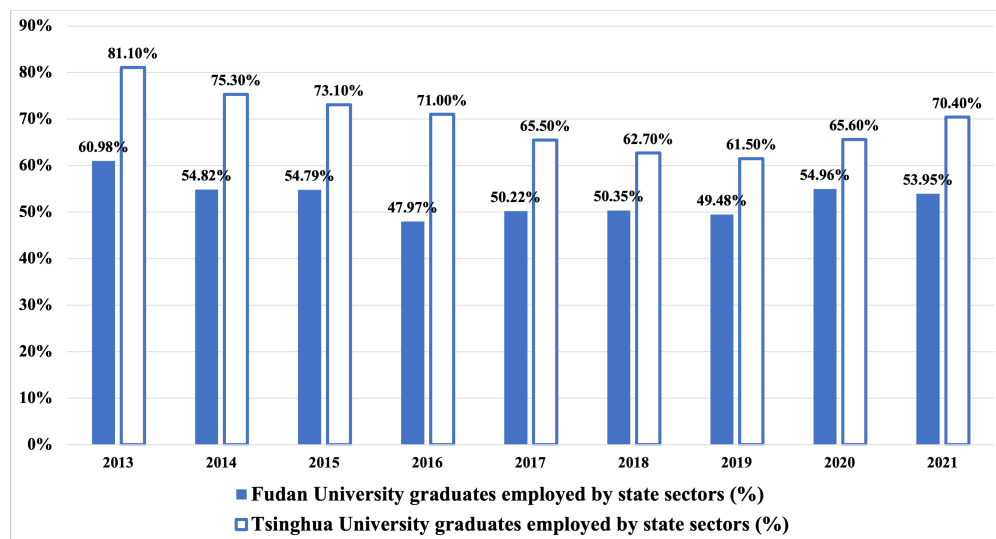


Notes: Data on state-sector employment proportions for Fudan University and Tsinghua University graduates are from https://xxgk.fudan.edu.cn/bysjyzlndbg/list.htm and https://career.tsinghua.edu.cn/tzgg.htm, respectively. State sectors include: (1) party and government organs ("党政机关"); (2) public institutions ("事业单位", including scientific R&D institutions, medical and public health agencies, schools, and others); (3) state-owned enterprises ("国有企业"); (4) the military ("部队").

Figure A1: State Sector Employment (%) among Fudan and Tsinghua University Graduates

A-2
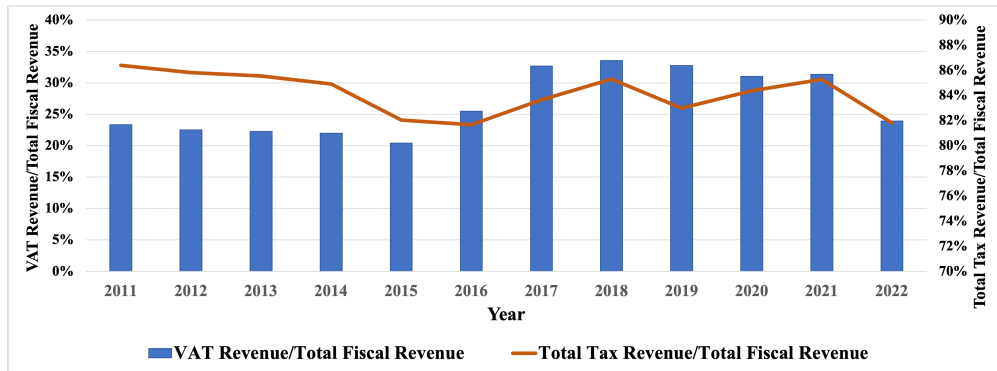
Notes: Data on VAT revenue, total tax revenue, and total fiscal revenue are from the China Statistical Yearbook (2012-2022), compiled by the National Bureau of Statistics of China. The y-axis on the left-hand side indicates the level of VAT/Total Fiscal Revenue, and the y-axis on the right-hand side indicates the level of Total Tax/Total Fiscal Revenue.

Figure A2: VAT and Total Tax Revenues as Shares of the National Total Fiscal Revenue
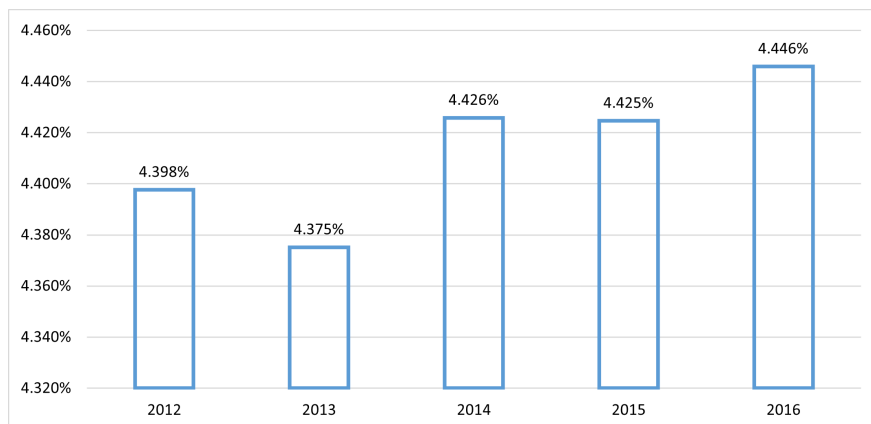


Notes: Data on GDP and sector outputs are from the China Statistical Yearbook (2013-2017), compiled by the National Bureau of Statistics of China.

Figure A3: The GDP Shares of Transportation, Storage, and Postal Industries Outputs

# A3  Appendix Tables

Table A1: Social Elites and Individual Perception of Power and Benefits

| | Power: Increase | | | Compensation & Welfare: Increase | | |
|---|---|---|---|---|---|---|
| | OLS | OLS | Probit | OLS | OLS | Probit |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| D.V. Mean | 0.627 | 0.634 | 0.635 | 0.631 | 0.636 | 0.635 |
| Social status | 0.036*** | 0.044*** | 0.125*** | 0.028 | 0.026 | 0.078 |
| | (0.008) | (0.010) | (0.031) | (0.017) | (0.020) | (0.062) |
| College or above | 0.189** | 0.155* | 0.416** | 0.042 | 0.031 | 0.110 |
| | (0.071) | (0.078) | (0.206) | (0.074) | (0.101) | (0.308) |
| Age | | -0.002 | -0.006 | | -0.003 | -0.008 |
| | | (0.003) | (0.008) | | (0.004) | (0.011) |
| Female | | -0.055 | -0.136 | | 0.136** | 0.423*** |
| | | (0.055) | (0.151) | | (0.050) | (0.152) |
| CCP member | | -0.089 | -0.249 | | 0.069 | 0.208 |
| | | (0.081) | (0.227) | | (0.070) | (0.230) |
| Married | | 0.072 | 0.200 | | -0.091* | -0.283* |
| | | (0.055) | (0.150) | | (0.048) | (0.153) |
| Minority | | -0.002 | 0.006 | | -0.216 | -0.586* |
| | | (0.143) | (0.384) | | (0.130) | (0.344) |
| Observations | 453 | 415 | 411 | 444 | 407 | 392 |
| R-squared | 0.058 | 0.116 | | 0.019 | 0.110 | |
| Pseudo R-squared | | | 0.0825 | | | 0.0759 |
| Province FEs | No | Yes | Yes | No | Yes | Yes |
| Number of Provinces | 28 | 27 | 23 | 28 | 27 | 21 |

Notes: The sample includes individuals with at least short-course college education level ("大专学历"). The dependent variable "Power: Increase" for Columns (1), (2) and (3) is a dummy variable which equals 1 if an individual perceived that the VAT reform increased the power of government positions affiliated with the SAT agencies, and 0 otherwise. The dependent variable "Compensation & Welfare: Increase" for Columns (4), (5) and (6) is a dummy variable which equals 1 if an individual perceived that the VAT reform increased the welfare and compensation associated with government positions affiliated with the SAT agencies, and 0 otherwise. "Social status" is a continuous, self-reported measure of an individual's social class and status, quantified on an 11-point scale ranging 0 (the lowest status) to 10 (the highest class). "College or above" is a dummy variable which equals 1 if an individual had a bachelor degree or above, and 0 if only short-course college education. "Age" is a continuous measure of individuals' age, which equals 2023 minus the numeric values of their birth years. "CCP member" is a dummy variable, which equals 1 if an individual is a CCP member, and 0 otherwise. "Married" is a dummy variable, which equals 1 if an individual is in a marriage, and 0 otherwise. "Minority" is a dummy variable, which equals 1 if an individual is an ethnic minority, and 0 otherwise. Columns (1), (2), (4) and (5) present OLS estimates, while Columns (3) and (6) present Probit estimates. Province fixed effects are added in Columns (2), (3), (5) and (6). Standard errors reported in parentheses are clustered at the province level: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A2: Effects of the VAT Reform on NCSE Outcomes with Continuous BT-VAT Ratio Treatment

| SAT Sample | # of Applicants | App-to-Recruit Ratio | Min. Score for Interviews |
|---|---|---|---|
| | (1) | (2) | (3) |
| D.V. Mean | 97.07 | 61.29 | 120.5 |
| | | | |
| BT-VAT 2011 Ratio × Post2016 | 8.961* | 4.746** | 0.474** |
| | (5.041) | (2.013) | (0.185) |
| | | | |
| Observations | 70,498 | 70,498 | 56,086 |
| R-squared | 0.105 | 0.094 | 0.422 |
| Prefecture FEs | Yes | Yes | Yes |
| Year FEs | Yes | Yes | Yes |
| Prefecture Covariates | Yes | Yes | Yes |
| Position Covariates | Yes | Yes | Yes |
| Number of Provinces | 31 | 31 | 31 |
| Number of Prefectures | 288 | 288 | 288 |

Notes: Results are based on the SAT sample. "# of Applicants" is the number of applicants for each position. "App-to-Recruit" is the abbreviation of position-level ratio of the number of applicants to recruitment quota. "Min. Interview Score" is the minimum entry scores for interviews, normalized to a 200-point scale for all the job positions. BT-VAT Ratio 2011 is a prefecture's 2011 BT-VAT ratio (logged). $Post2016$ equals 1 for all years later than 2016 and 0 otherwise. Prefecture fixed effects, year fixed effects, prefecture-level covariates, and position-level covariates are included across all the specifications. Standard errors reported in parentheses are clustered at the prefecture level: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Effects of the VAT Reform on NCSE Outcomes with Alternative Treatment Assignment

| **SAT Sample** | # of Applicants | | App-to-Recruit Ratio | | Min. Score for Interviews | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| D.V. Mean | 98.56 | 97.07 | 63.12 | 61.29 | 120.5 | 120.5 |
| I(Ave. BT-VAT > Mean) × Post2016 | 17.738* | 15.813* | 10.368** | 9.063** | 0.994** | 1.090*** |
| | (9.692) | (9.420) | (4.816) | (4.567) | (0.401) | (0.408) |
| | | | | | | |
| Observations | 75,498 | 70,498 | 75,498 | 70,498 | 56,892 | 56,086 |
| R-squared | 0.068 | 0.104 | 0.059 | 0.093 | 0.357 | 0.422 |
| Prefecture FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Prefecture Covariates | Yes | Yes | Yes | Yes | Yes | Yes |
| Position Covariates | Yes | Yes | Yes | Yes | Yes | Yes |
| Number of Provinces | 31 | 31 | 31 | 31 | 31 | 31 |
| Number of Prefectures | 288 | 288 | 288 | 288 | 288 | 288 |

Notes: Results are based on the SAT sample. "# of Applicants" is the number of applicants for each position. "App-to-Recruit" is the abbreviation of position-level ratio of the number of applicants to recruitment quota. "Min. Interview Score" is the minimum entry scores for interviews, normalized to a 200-point scale for all the job positions. "I(Ave. BT-VAT > Mean)" equals 1 if a prefecture's average BT-VAT ratio during years from 2007 to 2011 is higher than that period's cross-prefecture average. $Post2016$ equals 1 for all years later than 2016 and 0 otherwise. Prefecture fixed effects, year fixed effects, prefecture-level covariates, and position-level covariates are included across all the specifications. Standard errors reported in parentheses are clustered at the prefecture level: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Effects of the VAT Reform on NCSE Position-Level Demand and Prefecture-Level Aggregate Demand

| SAT Sample | Recruitment Quota (position-level) | Aggregate # of Recruitment Quota (prefecture-level) |
|---|---|---|
| | (1) | (2) |
| D.V. Mean | 1.774 | 38.99 |
| | | |
| High BT-VAT × Post2016 | -0.041 | 2.411 |
| | (0.061) | (2.111) |
| | | |
| Observations | 70,867 | 3,385 |
| R-squared | 0.260 | 0.776 |
| Prefecture FEs | Yes | Yes |
| Year FEs | Yes | Yes |
| Prefecture Covariates | Yes | Yes |
| Position Covariates | Yes | No |
| Number of Provinces | 31 | 31 |
| Number of Prefectures | 288 | 288 |

Notes: In Column (1), the dependent variable is the position-level recruitment quota for SAT agencies. In Column (2), the dependent variable is the total number of recruitment quotas across all SAT positions, aggregated to the prefecture level. "High BT-VAT" equals 1 if a prefecture's 2011 BT-VAT ratio is higher than the average. $Post2016$ equals 1 for all years later than 2016 and 0 otherwise. Prefecture fixed effects, year fixed effects, and prefecture covariates are included across all the specifications, while position covariates are added in Column (1). Standard errors reported in parentheses are clustered at the prefecture level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

# A4 Survey Questionnaire

The survey questions regarding the National Civil Servant Exam (NCSE) were included in two other online surveys conducted by one of the authors of this paper. The samples for the two surveys were collected by a US-based survey company from July to August, and from August to November 2023, respectively.

We have given careful consideration to ethics. These surveys were approved by the Institutional Review Board (IRB) of the author's home institution. We also adhere to EGAP principles regarding research transparency and the protection of research team staff. Furthermore, we implemented two measures to minimize potential risks to respondents and research team staff. First, we collected only non-identifiable information, which is securely stored on servers outside China. We informed respondents about the protection of privacy and data security at the beginning of the survey and allowed them to exit the survey at any time. Second, the survey questions for this study ask respondents about whether they have taken civil servant exams and their understanding of the Value Added Tax Reform, which are not sensitive at all. Together, these measures minimize any potential risks to the survey participants and research staff.

In total, we obtained a sample of 4,585 respondents. These respondents are all adults and come from most provinces in China, except Qinghai, Ningxia, Xinjiang, and Tibet, due to data availability issues in those regions. While this sample is not nationally representative, we employed a quota sampling strategy to target age, gender, education, and geographic distributions as closely as possible.

Below we present survey questions that we use for our analysis in Table 4 and Table A1:

- (**Question: sedu**) Your highest education attainment is: (您的最高学历[最高已完成的学历]是:)

  - (1) Primary school or below (小学或小学以下)

  - (2) Junior high school (初中)

  - (3) Vocational secondary or high school, or equivalents (职业高中或同等技术学校)

- (4) Regular senior high school (普通高中)

- (5) College with short-cycle courses (大学专科)

- (6) College with normal courses (大学本科)

- (7) Master degrees (硕士)

- (8) Doctoral degrees (博士)

- (**Question: sbirthy**) What is your birth year? Please fill in a 4-digit integer. (您的出生年份是[请填写4位整数]?) —————

- (**Question: sprov**) Which province and city are you permanently living? (您目前长期居住的省市是?) —————

  - (**Variable name: sprov_1**) Province (省)
  - (**Variable name: sprov_2**) City (市)

- (**Question: dparty**) What is your political identity? (您的政治面貌是")

  - (1) CCP member (共产党员)
  - (2) CCP Youth League member (共青团员)
  - (3) Democratic parties' member (民主党派)
  - (4) Mass (群众)

- (**Question: dclass**) Which social class do you think you are in? 0 means the lowest class, and 10 means the highest class. (您认为您的家庭在中国社会中处于哪个阶级层次? 0表示最底层, 10表示最顶层")

  - (0)
  - (1)
  - (2)
  - (3)
  - (4)

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- (5)

- (6)

- (7)

- (8)

- (9)

- (10)

- (**Question: dmarri**) What is your current marital status? (您目前的婚姻状况是")

  - (1) Unmarried (未婚)

  - (2) In marriage (已婚)

  - (3) Divorced (离异)

  - (4) Widowed (丧偶)

- (**Question: dethn**) What is your ethnic identity? (您的民族是)

  - (1) Han (汉族)

  - (2) Minority (少数民族)

- (**Question: djob**) Do you have a full-time job, currently or before retirement? If you are a student, please choose "No." (您目前(或退休前)是否有全职的工作?若您是学生, 选择"否")

  - (1) Yes (是)

  - (2) No (否)

- (**Question: ncse1**) Have you applied for, or are you planning to apply for, the National Civil Service Examination (the NCSE)? (请问您是否曾经参加过, 或正打算参加国家公务员考试?)

  - (1) Yes (是)

  - (2) No (否)

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- (**Question: ncse2**) [If "Yes" to **Question ncse1**] Have you applied for, or are you planning to apply for, any government job openings affiliated with the State Administration of Tax (SAT)? (请问, 对于公务员考试, 您是否曾经报考过或计划报考税务系统的职位? )

    – (1) Yes (是)

    – (2) No (否)

- (**Question: ncse3**) [If "Yes" to **Question ncse2**] Do you know about the Value-Added Tax (VAT) reform? (请问您知道"营改增"这一政策吗? )

    – (1) Yes (是)

    – (2) No (否)

- (**Question: ncse4**) [If "Yes" to **Question ncse3**] Do you think that the VAT reform increased or decreased the power of the SAT agencies? (请问您觉得"营改增"这一政策, 是增加了还是减少了国税部门的权力?)

    – (1) Increase (增加)

    – (2) Decrease (减少)

    – (3) No Change (保持不变)

- (**Question: ncse5**) [If "Yes" to **Question ncse3**] How do you think the VAT reform would affect the welfare and compensation for the bureaucrats affiliated to the SAT agencies? (请问您觉得"营改增"这一政策, 如何影响国税系统工作人员的待遇和福利?)

    – (1) Increase (增加)

    – (2) Decrease (减少)

    – (3) No Change (保持不变)

The NCSE requires that applicants should have at least college education levels (including college with short-cycle courses). Hence, to estimate the results in Table 4, we limit our

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sample to the following two subgroups (A) and (B), whose education attainment is eligible for the NCSE:

(A) those respondents who chose one of the last four options in **Question sedu** (with at least a college education level, 大学专科), and

(B) those respondents who chose the fourth option in **Question sedu** (regular senior high school, 普通高中) and "No" for in **Question djob** (no full-time job) but with a birth year 1998 or later in **Question sbirthy** (25 years old or younger).

We include the second subgroup because they are most likely undergraduate students who were still in the college when participating in the survey.

The responses to Questions **ncse1**, **ncse2**, **ncse3**, **ncse4**, and **ncse5** are used to estimate the results in Column (1), (2), (3), (4) and (5) of Table 4, respectively.

To estimate the results in Table A1, we further limit our sample to subgroup (A) only, the group who had *at least* short-course college education level (大学专科) when participating in the survey. We calculate respondents' age by subtracting the numeric values of their birth years from 2023.

# A5 Powerful and Less powerful Positions within the SAT Agencies

In this section, we detail our methodology for identifying relatively powerful positions from the SAT within the NCSE dataset. We elicit information on the nature of work for different job openings from the texts that the following four identification variables contain: the names of job posts ("职位名称"), the names of affiliated agencies or departments ("部门名称"), the names of the agency branches ("用人司局"), and the descriptions of job posts ("职位简介").

We conduct expert interviews with employees of the State Administration of Taxation (SAT) in China, who possess at least eight years of working experience in tax administration. These interviews are separate field work activities from the survey we introduce in Appendix A4. These interviews did not need IRB review, because they did not involve human subjects, determined by the home institution of one of the authors with the IRB protocol number 7060X. The questions appearing in the interviews are only about the func-

tioning of the institutions in which the interviewees work. No question in the interview is about the interviewees themselves.

During the interviews, we provided them with a comprehensive list of keywords extracted from the texts contained by the above four identification variables in our dataset. The list presented to the experts is shown below.

- Tax Sources & Collection: Tax Base Management, Tax Collection, Tax Collection and Management and Non-tax Revenue Department.

- Tax Services & Administration: Tax Services, Tax Handling Services, Tax Law Enforcement, Tax Business/Operations, Tax Comprehensive Business/Operations, Tax Comprehensive Management Department, Tax Comprehensive Department.

- Tax Inspections & Cases: Tax Inspections, Tax Audit, Case Review/Trial, Case Execution/Enforcement, Tax Management.

- International & Special Taxes: International Tax Affairs, Goods and Services Tax, Horse Racing Taxation, Vehicle Purchase Tax, Vehicle Acquisition Tax, Import and Export Tax, Income Tax

After reviewing the list, these SAT-employee interviewees identified a set of keywords that, based on their experience, signify "powerful" positions. Specifically, the keywords used to identify "powerful" positions include: "**tax base** (税源)," "**tax inspections** (稽查)," "**tax audit** (审计)," and "**tax law enforcement** (执法)."

All the other positions whose identification variables do not include the above four keywords in their texts are categorized as "less powerful." Furthermore, we regard positions with designated locations in financially challenged areas, remote locations, or poor areas as "less powerful" as well. The geographic locations of such job openings indicate that it is less likely for their roles to be empowered by the VAT reform than those "powerful" positions. To identify these positions with special designated geographic locations, we use information extracted from the texts contained by the above four identification variables that include the following keywords: "financially challenged (财政困难)," "difficult (困难)", "poor county

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(贫困县)," "poor areas (贫困地区)," "hardship (艰苦)," and "geographically peripheral areas (偏远)."