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Diffusion of Marketization Innovation with Administrative Centralization in a Multilevel System: Evidence from China

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Abstract

How does the vertical power structure of government shape innovation adoption? This study explores the relationship between administrative centralization and the adoption of local marketization innovation in China. In the central–provincial–city hierarchical structure of China, political interactions across different levels of governments significantly influence the marketization reform process. We argue that, although the intervention policies from the central or provincial governments independently stimulate the city adoption of marketization innovation, their combined impact on city governments tend to be competitive rather than complementary. We empirically examine the diffusion of probusiness administrative licensing centers across Chinese cities between 1997 and 2012. Statistical findings supported by robustness checks confirm our theoretical hypotheses.

Introduction

How does the vertical power structure shape the process of innovation adoption? Previous studies have explored the mechanisms of emulation, coercion, learning, and competition in innovation diffusion (Berry and Berry 1990; Graham, Shipan, and Volden 2013; Shipan and Volden 2008). However, the extant literature on diffusion continues to suffer from two general limitations. On the one hand, the effects of a multilevel power structure on the diffusion of local innovations have yet to be adequately explored and explained. Hardly any empirical investigation has been conducted on the innovation diffusion behaviors of local governments under the pressures of multiple levels of authorities. Given that the vertical power structure in a multilevel political system is one of the most important issues in social science, the continued neglect of this significant variable in diffusion research is surprising. On the other hand, most existing diffusion studies mainly focus on developed Western countries. Therefore, we require theoretical insights and empirical evidence to support the development of policy diffusion theory in transitioning contexts that lack an established market economy.

The literature on vertical power structure has extensively studied the policy consequences of fiscal, political, and administrative decentralization or centralization around the world (Bardhan and Mookherjee 2005; Escobar-Lemmon and Ross 2014; Treisman 2007). Nonetheless, most existing research on this

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topic focuses on the binary distribution of power and resources between national government and subnational governments and pays little attention to the different motivations and constraints between different levels of subnational governments, thereby disregarding an important link between decentralization and various policy outcomes in countries with multitiered hierarchical systems: the behaviors of lower-level governments. Given that lower-level governments are the direct providers of most public goods to residents (Besley and Coate 2003; Zhuravskaya 2000), the reactions of these governments during the reformation of the vertical power structure deserve significant attention. Only when we profoundly understand the structural dynamics of the reactions of multilevel subnational governments can we determine the process by which the form of power structure ultimately influences the effectiveness of public policies.

The current study clarifies the aforementioned theoretical questions by connecting the literature on vertical power structure with that on innovation diffusion theory. We specifically focus on the impact of administrative centralization on innovation adoption in transitioning countries. In the past decades, transitioning countries have undergone significant decentralization of their administrative powers (Bird and Vaillancourt 2008; Malesky and London 2014). Various theories have been proposed to associate decentralization with local public participation, competition, oversight, and accountability (Faguet and Sanchez 2008; Goldfrank 2007; Keefer, Narayan, and Vishwanath 2006), but the practical results of undertakings related to decentralization remain varied. In recent years, a few countries attempted to recentralize previously decentralized power structures (Dickovick 2011; Malesky, Nguyen, and Tran 2014). Unfortunately, the impact of centralization on local innovation diffusion has yet to be fully analyzed. In a multilevel hierarchical power structure, superior-level governments can decrease the administrative autonomy of subordinate-level localities by imposing regulatory requirements to intervene in subnational policy practices. Accordingly, when such an administrative centralization occurs in a transitioning country, the following question should be addressed: What will be the impact of an administrative centralization on the adoption of marketization innovation among lower-level governments?

In a transitioning country with a multitiered hierarchical system, when the administrative autonomy of lower-level localities is reduced by the regulatory policies imposed by the upper- and middle-level governments, the career motivations and political constraints of lower-level governments determine that such policies can independently stimulate the diffusion of the regulated policy innovations at the lower level. However, lower-level governments have limited attention, time, and resources for responding to the dual pressures from their superior authorities. Hence, upon receipt of redundant or potentially conflicting policy signals from the upper-level government, a lower-level government will have limited response to policy signals from the middle-level government. Moreover, upon receipt of redundant or potentially conflicting policy signals from the middle-level government, a lower-level government will have limited response to policy signals from the upper-level government. Therefore, we hypothesize that the relationship between policy signals issued from the upper- and middle-level governments tend to be competitive rather than complementary.

We test such theoretical hypotheses by analyzing the diffusional process of a probusiness administrative innovation across Chinese cities. A trend in recent decades shows that market-oriented administrative reforms have spread worldwide. Many countries have attempted to attract foreign direct investments (FDIs) by streamlining their business registration procedures and creating one-stop public service centers. Between 1997 and 2012, 268 out of 281 cities in China created their own version of one-stop centers called administrative licensing centers (ALCs). In this process, central and provincial governments issue various political signals through policy documents or official media to regulate the direction and scope of local marketization innovation. We used event history analysis (EHA) to inspect these empirical data, thus enabling us to explore the interaction effect of national and provincial policy interventions in the diffusional process of city-level ALCs. Consistent with our theoretical expectations, empirical results confirm that although either national or provincial policies can positively stimulate the innovation adoptions of city governments, their interaction effects are significantly negative. These findings are supported by robustness checks.

The rest of this paper is organized as follows. First, we review the literature on vertical power structure and innovation diffusion. Second, we propose the core theoretical hypotheses on administrative centralization and marketization innovation in China. Moreover, we provide a brief introduction of the diffusional process of China's city-level ALCs. Thereafter, we present the data analysis and empirical results. Finally, we conclude with the theoretical contributions of this research.

Power Structure Debate and the Puzzle of Subnational Policy Diffusion

Policy diffusion refers to the process whereby government policy making is influenced by the policy choices of other governments (Berry and Berry 1990; Shipan and Volden 2012). A diffused policy is viewed as an

innovation if the government adopting it considers it novel, regardless of whether the same policy has been previously adopted in another place (Walker 1969). Innovation diffusion mechanisms can be classified into two main categories: horizontal and vertical mechanisms. Horizontal mechanisms, such as learning, competition, imitation, and coercion, have been intensively analyzed in different policy contexts since Walker's seminal research in 1969 (Gilardi 2010; Volden 2006; Walker 1969; Weyland 2005). Vertical dynamics in the local innovation diffusion process (e.g., bottom–up and top–down federalism) recently gained increasing attention among scholars (McCann, Shipan, and Volden 2015; Shipan and Volden 2006). Researchers have extensively tested various policy diffusion mechanisms with evidence from broad policy fields, such as the state lottery (Berry and Berry 1990), tobacco control (Shipan and Volden 2008), civil service reform (Tolbert and Zucker 1983), and e-government (Tolbert, Mossberger, and McNeal 2008).

In terms of the dynamics of power distribution, a consensus exists in the academia that the vertical power structure can lead to certain economic and social consequences, but limited agreement is reached concerning the direction of the effect. The dynamics of vertical power structure can be viewed as the centralization or decentralization of power and resources by the national government. Researchers often classify centralization or decentralization as political, fiscal, and administrative (Escobar-Lemmon and Ross 2014; Faust and Harbers 2012; Schneider 2003). For example, political decentralization means that constituents are empowered to directly elect subnational governments. Fiscal decentralization reflects the increased share of total fiscal resources controlled by subnational governments. Finally, administrative decentralization indicates the degree of administrative autonomy of local bodies or the absence of interference by the upper-level governments. An influential academic argument is that a decentralized power structure can effectively align the incentives of local government officials with the citizen's welfare by addressing the problems of "state predation" or by encouraging inter-jurisdictional competition (Oates 1999; Qian and Weingast 1997). Others disagree and claim that centralization can facilitate the spread of beneficial discoveries and discipline local governments to favor growth and social welfare provisions (Blanchard and Shleifer 2001; Cai and Treisman 2006; Malesky, Nguyen, and Tran 2014).

Despite the abovementioned findings, the extant literature suffers from two general limitations. First, the effect of vertical power structure on subnational policy innovation is yet to be analyzed. Centralization or decentralization can substantially shape the motivations and constraints of each government level, possibly influencing the process of subnational policy adoption. Nevertheless, hardly any research on diffusion has emphasized the effect of various vertical power structures on the behaviors of innovation adoption by local governments. Moreover, most existing studies on power structure pay little attention to the difference between different levels of subnational governments. However, most modern countries have multiple levels of power structures within which each authority level has its own motivations and constraints. In addition, no studies have explored whether the relationship between the effects on innovation adoption by lower-level governments of the upper- and middle-level governments is linearly additive, complementary, or competitive. Resolving these issues is both academically and practically significant because local governments are the specific executors of most public policies. Additionally, the local governments' choices of policy instruments have a potentially substantive impact on the quality and quantity of the provision of local public goods.

Second, despite the numerous theoretical achievements of the literature on diffusion, most prior studies remain driven by the metaphor of *democratic laboratories* based on empirical evidence from the US or European countries, which are typical Western industrialized nations with electoral democracies (Boushey 2010; Desmarais, Harden, and Boehmke 2015). Hence, additional theoretical and empirical studies are required to explore the phenomenon of innovation diffusion in the context of a non-democratic system or a transitional economy (Berry and Berry 2014). China's case serves as a good example because existing works hardly provide theoretical insights into how city governments (i.e., lower-level governments) would react to the adoption of a marketization innovation when the central and provincial governments attempt to set limits on the direction or scope of local behaviors.

The current research bridges the studies on vertical power structure with the literature on innovation diffusion by exploring how administrative centralization shapes the diffusion of public policies. We argue that, during innovation diffusion, specific political interactions across different levels of governments in a hierarchical system exert a significant impact. When superior-level governments attempt to regulate the behaviors of subordinate-level governments (e.g., through restrictive policy signals), career incentives and political constraints often prompt the latter to respond to the former. However, when multiple levels of superior-level governments attempt to intervene in the same policy area while attention and resources are lacking, the response of the lower-level governments to the upper-level government is negatively contingent

on the policy signals they receive from middle-level governments.

The next section explores the mechanisms behind these theoretical arguments through a case of local marketization innovation in China. In recent decades, many transitioning countries have adopted promarket or probusiness administrative reforms to support their economic transition (Cheung 2005). As a transitioning country with decades of marketization reforms and a multilevel power structure (Cai 2008), China presents a valuable opportunity for analyzing the theoretical relationship between administrative centralization and the adoption of marketization innovation, as well as providing a good setting for testing the generalizability of innovation diffusion theory. More broadly, the case of China facilitates our understanding of government behaviors and bureaucratic interactions in transitioning societies.

China's Administrative Centralization and Local Marketization Innovation in the Reform Era

After 1978, the Chinese government adopted marketization reform initiatives to improve bureaucratic efficiency and facilitate its smooth transition to a free market-based new economy. These marketization initiatives can be classified into two categories. The first category of reforms focuses on disciplining the government itself, which includes reducing government size, streamlining government structure, and developing the rule of law (Fan, Wang, and Zhang 2001; Lin, Cai, and Li 2003). The second category of reforms aims to restructure the economy to improve market forces, such as privatizing state-owned enterprises, relaxing price controls, and canceling state control over investments (Caulfield 2006; Wei 2001). However, the central government lacked a grand plan during the reform process (McMillan and Naughton 1992). Furthermore, many market-oriented deregulation or privatization practices were initiated by a few local governments and were subsequently recognized and promoted by the central government to the entire country.

Over the years, the central government tended to avoid specifying particular technologies or procedures for local governments with respect to local marketization innovation; instead, the former has increasingly relied on a guideline-style regulation, thereby setting a scope for the local behaviors but failing to describe the precise process of executing directives (Heilmann 2008a). After 1978, the new leadership led by Deng Xiaoping adopted the strategy of "Crossing the River by Feeling the Stones" based on lessons drawn from China's "Great Leap" famine and "Great Proletarian Cultural Revolution" (Kanbur and Zhang 2005; Kung and Chen 2011). Moreover, Deng's government rebuilt the five tiers of government organizations, namely, the central, province, city, county, and town governments. Subsequently, China's central government delegated a significant number of economically relevant administrative functions and powers to local authorities (Landry 2008; Mertha 2005; Xu 2011; Zhu and Zhang 2016). Nevertheless, within this set-up, China's central government can still monitor and intervene in local marketization practices by directly releasing policy documents to set constraints on the direction or scope of reform (Mei and Pearson 2014). Chinese experts have extensively cited this pattern of central–local interaction in generating such policies as "experimentation under hierarchy" (Heilmann 2008b; Tsai and Dean 2014).

A typical example is China's Administrative Licensing System (ALS; i.e., China's business registration system) reform. After the southern tour of Deng Xiaoping in 1992, the Chinese subnational governments were encouraged to attract businesses and investments (*Zhaoshangyinzi*) to stimulate economic development. In this case, the central government only set the policy goal rather than the policy instruments. Hence, a few local governments' policy instruments were mainly relevant to privatization or tax reduction, whereas other local governments focused on streamlining ALS by building one-stop government service centers. Compared with the privatization or tax reduction instruments, ALS reform is an organizational innovation that has encountered additional resistance within the local government structure. However, this system did not directly influence the fundamental economic system (e.g., state ownership or tax system) and maintained economic stability while improving business efficiency. Only when the central government finally decided to promote the ALS reform in 2001 (the year when China gained entry into the World Trade Organization [WTO]) did streamlining ALS and building one-stop government service centers gain popularity among all local governments in China.

During ALS reform, the central, provincial, and city governments had different motivations, constraints, powers, and actions (see table 1). China's central government leaned toward formulating market-oriented policies based on macroeconomic targets (Xu 2011) and was motivated by the exogenous marketization pressures from the WTO (Lin 2001). However, the central government collected inadequate information on the local governments from the hierarchical bureaucracy and had limited resources to intervene in the specific economic policies of hundreds of local governments in China (Chan and Zhao 2015; Tirole 1986; Zhou 2010). Hence, instead of maintaining an all-encompassing strong control at the local level, the central government often released de jure "supportive"

Table 1. Motivations and Constraints of the Chinese Multitiered Governments During ALS Reform

	Motivations	Constraints	Political Powers	Actions
Central government	Macroeconomic target; marketization pressures from the WTO	Scarce information and resources	Setting uniform policy goals; ad hoc intervention in local politics	Issuing general policies that ignore regional disparities
Provincial governments	Economic growth; maintaining policy autonomy	Political constraints from the central government	Fiscal discretion; intervention in city-level politics	Issuing policies that suit local circumstances
City governments	Economic growth	Limited time and resources; potentially conflicting demands from multiple superior-level governments	Choice of policy instruments	Restricted choice of innovations under the dual pressures

but de facto "restrictive" policy signals to restrict the scope or direction of local marketization innovations. These policies tended to be general and even ignored regional disparities to a certain extent.

Decentralization reform in the past decades mainly occurred between the central and provincial governments of China (Lin and Liu 2000). "Federalism, Chinese style" (Montinola, Qian, and Weingast 1995) has provided provincial governments with substantial policy autonomy and protected their jurisdictions from political intrusion by the central government. Nonetheless, China's central government can still control the political mobility of provincial leaders through the nomenklatura-style personnel system. When the central government attempts to intervene in local economic policies, provincial governments should issue "supportive" policies in response to the policy signals from the central government (Luo, Xue, and Han 2010). Nevertheless, provincial governments tended to design numerous specific policies to suit local circumstances, thereby supporting economic growth. For provincial governments, another important benefit of issuing their own policies is to indirectly protect their provincial autonomy by demonstrating their presence and competing with the central government to attract the attention of city governments.

Given that economic performance is one of the most important criteria for evaluating and promoting local leaders, Chinese city governments have strong incentives to support economic growth by adopting marketization innovation. However, the city governments' choice of policy instruments is often constrained by superior-level governments. When the central and provincial governments issue policy signals to guide local marketization innovation, such information may be redundant or even potentially conflicting. Moreover, city governments may not be completely responsive to these policy signals due to limited time and resources.

Hypotheses

What are the mechanisms through which China's vertical power structure shapes the process of policy innovation? Given the motivations and constraints of each government level, policy signals from China's superior-level authorities can positively stimulate the adoption of certain economic policies by the city governments. The nomenklatura-style personnel control of government officials (*Dangguanganbu*) enables the superior-level party commissions to determine the career mobility of subordinate government leaders (Chan 2004; Chan and Li 2007; Rothstein 2015). Hence, local leaders have strong political incentives to respond to the policy signals from superior-level governments. At the same time, superior-level government policy interventions can offer restrictions and support for local innovation processes simultaneously. On the one hand, such interventions tend to set the scope or the direction for local innovation with general guiding principles or prescribe restrictions on the range of choices concerning local policy instruments. On the other hand, policy signals from superior-level governments can also improve the political legitimacy of certain local marketization practices, thus reducing the costs or risks that may be absorbed by the decision making at the local government level (Heilmann 2008b). Therefore, when the central government or provincial governments issue policies to support a local marketization reform, city governments accelerate their adoption of targeted marketization innovations (Landry 2008; Tsai and Dean 2014).

Hypothesis 1: When the central or provincial governments issue policies to support a local marketization reform, the likelihood that city governments shall adopt the targeted marketization innovation will be relatively high.

Are the influences of the central (provincial) government policy signals contingent on the strength of provincial (central) policy signals during the diffusional process of local marketization innovation? In particular, would the marginal influence of the former on local innovations increase or decrease as the latter's strength increases? Intuitively, people may expect provincial policies to complement central policies when combined and used in a communist country. Nevertheless, no research has empirically tested the interaction effect between policy signals from the central and provincial governments. In the market-oriented policy areas, when China's central government attempts to centralize administrative authority by issuing uniform policies to intervene in local policy choices, we expect that the total impact of the combined central and provincial policy signals will be less than the sum of their separate impacts.

Three reasons clarify the political motivations and constraints of governments in China's multilevel power structure. First, unlike provincial governments, which can tailor policies according to the specific demands and resources of city governments, the central government tends to decide in response to international or macroeconomic pressures and formulate uniform policies by assuming the same distribution of administrative competencies between government levels (Ngok and Zhu 2007). Hence, even with the same policy goals (e.g., economic growth), the effect of central policy signals may cancel out the effect of provincial policies on the city governments' adoption of policy instruments by imposing regulations with relatively low compatibility. To adapt to the new international trade and market regulations after China's entry to the WTO in 2001, the central government began to issue several policy documents to guide and support annual ALS reforms. However, these regulations were not necessarily compatible with each province's policies or the preferences or interests of the city governments across the country.

Second, the existing policy autonomy of provincial governments is threatened by the new policy interventions from the central government. Specifically, policies from the central government may impose certain restrictions on the policy autonomy of provincial governments. Although the provincial governments are required to formally follow the uniform commands of the central government, such governments still have incentives to maintain their policy autonomy and produce appropriate policies for local contexts (Besley and Coate 2003; Tirole 1986). Hence, provincial governments would issue "supportive" but specific policies to preempt the policy signals from the central government.

Third, city governments have limited attention, time, and resources for responding to the dual pressures of policy implementation from the central and provincial governments. When the central- and provincial-level governments issue policies to support the local governments' adoption of the same policy instruments, a city governments' response to the central government is negatively contingent on the policy signals from the provincial government. Administrative centralization enables the central government to increase regulation over areas that are already covered by the provincial governments. This situation allows the central- and provincial-level governments to impose additional regulatory requirements on the same policy areas, thereby increasing the number of bureaucracies that city governments must deal with. In addition, the central and provincial governments' policies may produce a significant amount of redundant information, which can be partially ignored by the city governments. Moreover, even if the city governments have abundant time and resources, they do not necessarily have adequate capabilities to completely and simultaneously respond to both types of policy signals due to the potentially conflicting demands from both the central and provincial governments. Hence, city governments' responses to the central (provincial) government's policy signals generally become less elastic after the provincial (central) government's provision of policy signals.

Hypothesis 2: When the central and provincial governments issue policies to support a local marketization reform, they tend to counteract each other's impacts on the adoption of the targeted marketization innovation by the city governments.

Diffusion of City ALCs in China

This study tests the preceding hypotheses by examining the diffusion of the market-oriented city-level administrative licensing (i.e., business registration) centers in China. Administrative licensing reform is one of the most important issues on the marketization agenda of China's leadership in the reform era. Since the late 1990s, China's administrative licensing reform has aimed to streamline administrative procedures, a process that is similar to the business registration reform worldwide (Bhatti, Olsen, and Pedersen 2011; Bruhn 2011; Bruhn and McKenzie 2014; Malesky and London 2014; Sander 2003). The main objective of administrative licensing reform is to create an improved investment environment and attract foreign investments. Every premier (i.e., the leader of the central government) in recent years would hold multiple meetings and issue numerous policy documents to facilitate the reform of the existing ALS.

During the administrative licensing reform, the creation of one-stop ALCs, including the integration of

traditionally distributed functions, the restructuring of redundant agencies, and the establishment of the office buildings, constitutes a typical marketization innovation to attract foreign enterprises and stimulate economic growth (Zhu and Zhang 2016). The first city-level ALC was established in 1997 by Jiangmen City in Guangdong Province. Jiangmen City created a government building as an ALC to assemble the functions of 53 government departments and advisory services, including enterprise registration, real estate registration, tax payment, and various licensing services.[1] By 2012, 268 out of the 281 cities (including the subprovincial and prefecture-level cities) have established city-level ALCs (figure 1). The Central Compilation and Translation Bureau, a major think tank working for the Chinese central government, commended many city governments mainly because of their innovative reforms regarding ALCs (Wu, Ma, and Yang 2013). For instance, Chengdu City, the capital of Sichuan Province, first adopted the "one-window parallel licensing system" in 2007 and won the Fourth Chinese Local Government Innovation Award because of its positive effect on improving business registration efficiency (Zhu 2014). In the reform era, the establishment of ALCs is a politically low-risk innovation for city governments, and limited ideological controversy or factional politics surrounds this endeavor. This fact significantly simplifies the research case and assists us in isolating the effect of the causal mechanisms in our theoretical hypotheses from the factional politics or ideological conflicts that typically influence such undertakings (Cai and Treisman 2006).

During the reform process, the central and provincial governments issued various encouraging but unfunded political signals through policy documents or official media, thereby providing us with a useful opportunity for analyzing the multilevel government interaction dynamics in China. For example, the Chinese central government released an order in 2001 establishing a "state council leading group of administrative licensing system reform" and other documents to initiate a formal national-level ALS reform. In 2003, the Standing Committee of the National People's Congress promulgated the Chinese Administrative Permission Law, the first statute to regulate the licensing power of the Chinese government. From 2001 to 2012, the central government led six waves of reforms to either cancel or simplify extant licensing procedures. At the same time, each provincial government issued policy documents to promote the creation of ALCs. After intensively reading many of these documents and articles, we ascertained that most provincial governments issued political signals according to their own particular provincial contexts instead of merely replicating the central directives.

Methods and Data

Following the classic approach in diffusion studies (Berry and Berry 1990; Shipan and Volden 2006), we employ EHA with logit models to analyze the determinants of the diffusion of local marketization innovation in China. Hence, our analysis uses city–year as the research unit. In addition, every city only exists in the sample until its adoption of ALC. To construct the dependent variable, we utilize information of city ALCs found in official websites of all cities in China and set a dummy to 1 if a city establishes a city-level ALC in a particular year, and 0 otherwise. We exclude the observations of a city after it adopts an ALC because the possibility that the city can readopt an ALC no longer exists.

To determine the change in the vertical power structure in the area of ALS reform, we employ the political signals from the central or provincial governments as the key independent variables. Two types of routine political signals in China include the official policy documents and newspapers published in official media controlled by the different levels of government. We measure these two types of political signals separately. Official policies directly represent the main intention of governments, and we measure them with the frequency of central or provincial policy documents for central or provincial political signals, respectively. However, a few scholars have identified the governments' strategic use of official media as a means to issue certain political signals (Huang 2013; Shih 2008). Therefore, to avoid measurement errors and improve empirical robustness, we construct central and provincial media signals according to the number of relevant articles on the topic of "administrative licensing" published in the main official newspapers each year (Shih 2008). We employ information on central and provincial policies collected from the Legal Information Center of Peking University, the newspapers controlled by the central government from the Renmin Ribao (People's Daily) Archive, and the newspapers controlled by the provincial governments from the Newspaper Database in the China National Knowledge Infrastructure (CNKI).[2]

During our observation period, both the central government and the provincial governments consistently approved the restructuring of the existing ALS and the streamlining of business registration procedures, which is the main purpose of creating ALCs.

1 The Administrative Licensing Center of Jiangmen City: http://xzzx.jiangmen.gov.cn/zxgk/zxjj/.

2 Shandong Province was excluded because of data unavailability in the CNKI.

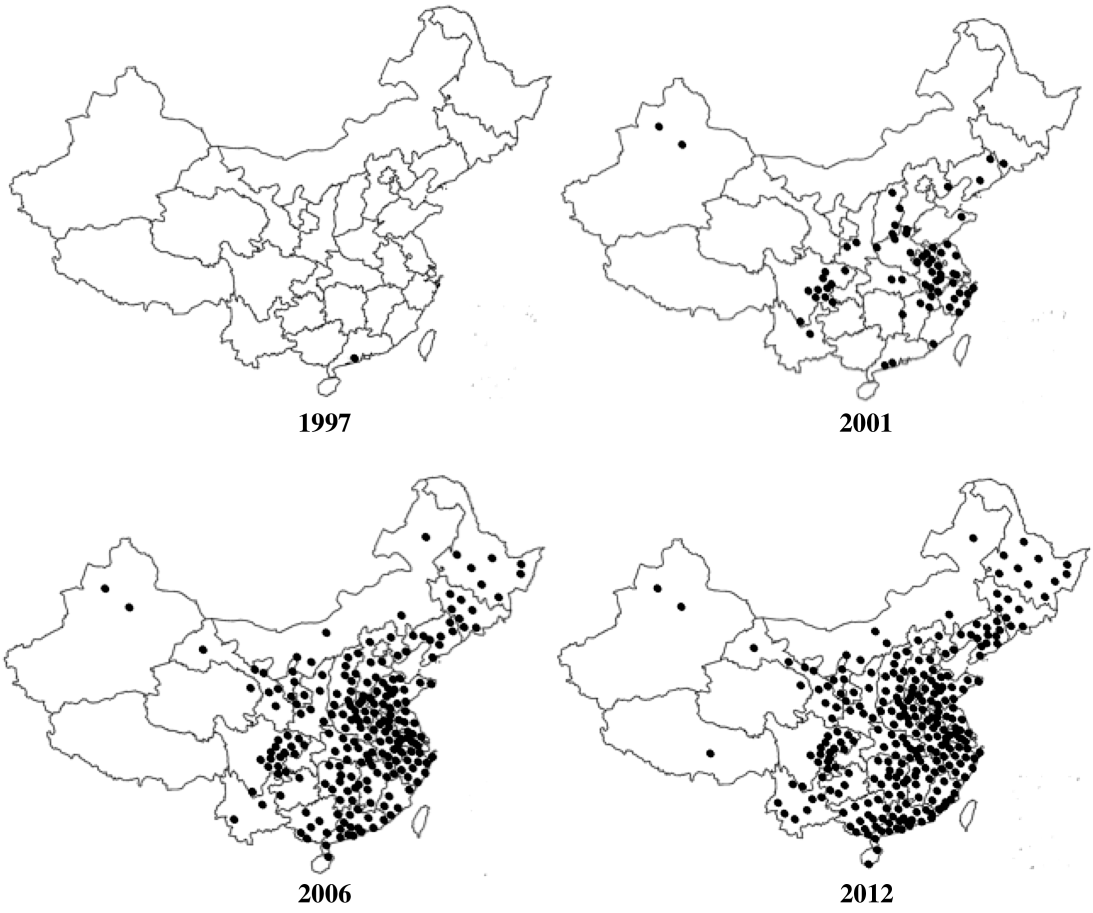

Figure 1. Cumulative Diffusion of City-Level ALCs in China.

The consistent policy support from various government levels can probably be explained by the limited ideological controversy or political conflicts surrounding ALS reform and this reform's noticeable contribution to economic development (Wu, Ma, and Yang 2013). Our review of a subset of the policy documents suggests that the central government tends to set a general scope for local ALS reform that is uniform across jurisdictions, whereas the provincial governments produce more detailed regulations on specific local practices. For instance, on October 17, 2008, the State Council released a policy document requiring subnational governments to accelerate administrative licensing reform.[3] However, the document only provided several general guiding principles, such as "enhancing leadership," "improving coordination," "conducting research," and "strengthening accountability." Soon after, on December 29, 2008, the provincial government of Hebei Province released a policy document, which included a detailed plan for each city government to follow to enable them to simplify business registration procedures and improve the business environment in real estate development.[4] Of course, in China's party-state system, even if subnational governments disagree with the central government, they are forbidden from issuing any policy signals that formally conflict with central policies. Therefore, the frequency of policy documents should be a valid measure of government intention.

We follow the extant policy diffusion literature by including three aspects of control variables (Wu and Zhang 2018; Zhang 2012; Zhu and Zhang 2016). The first aspect is the influence of neighboring diffusion. We set the variable "Neighboring City Innovation Yearly" as the annual rate of the number of city governments that have newly built city-level ALCs within each province. We employ the information of city ALCs to calculate the variable.

3 Notice of the General Office of the State Council on Forwarding the Opinions of the Ministry of Supervision and Other Authorities on Deepening the Reform of the Administrative Examination and Approval System: http://www.pkulaw.cn/fulltext_form.aspx?Db=chl&Gid=109717.

4 Notice of the General Office of the Hebei Provincial Government on the Plan of Reducing Administrative Licensing Procedures and Fees Regarding Real Estate Development Projects: http://www.pkulaw.cn/.

The second set of control variables is local determinants. Previous research suggests that economic development encourages citizens and private companies to demand more efficient delivery of public service (Berry and Berry 1990). Hence, we utilize "GDP per capita" as gross domestic product per capita in each city to measure economic development. As some scholars suspect that China's GDP statistics can be falsified (Holz 2014), we also use the annual night-time lights data from the digital archives of the Defense Meteorological Satellite Program Operational Line Scanner (DMSP/OLS) to produce an alternative measure of local economic development (Henderson, Storeygard, and Weil 2012; Lü and Landry 2014). Specifically, we employ the average of light values from all pixels within each city to measure its economic level (Alesina, Michalopoulos, and Papaioannou 2016; Baskaran, Min, and Uppal 2015). The correlation coefficient between GDP per capita and night-time light intensity in our sample is 0.6.[5] Moreover, most businesses registered through the ALS belong to the manufacturing and service sectors. Therefore, we expect that local economic dependence on these two sectors is positively associated with each city's incentives to create an ALC. Nevertheless, given the existence of serious collinearity between the manufacturing and service sectors (the second and third industries in China, respectively) and the relatively prominent contribution of the service sector to local tax and employment status, we decided to only use "service sector" as the percentage of the third industry in the city's GDP in our subsequent analyses (same as Zhu and Zhang 2016). In addition, a local government with low economic openness might have more incentives to adopt an ALC; hence, we also include "economic openness" as the percentage of FDI in the city's GDP in the models. Further, a local government with a higher administrative ranking might have lower probability of creating an ALC due to the stronger internal resistance caused by a more complex organizational structure. We set "administrative ranking" as a dummy equal to 1 if the city is subprovincial or a provincial capital, and 0 otherwise. We collect the socioeconomic data of each city from the *China City Statistical Yearbook*.[6]

The third set of control variables is political mobility. In the Chinese nomenklatura-style personnel management system, the situation of political mobility generally determines the local leaders' incentives to adopt innovations. We use previous empirical research on the political mobility of local officials in China (Li and Zhou 2005) as a basis to filter four institutional parameters, namely, age, tenure, the current leader's original position, and the predecessor's new position after leaving office. We create the database of the career histories of city leaders using data collected from multiple sources.[7] In particular, we set "party chief older than 55" as a dummy equal to 1 if the current PS's age is over 55 years in the current year, "mayor older than 55" as a dummy equal to 1 if the current mayor's age is over 55 years in the current year, and "tenure of party chief" and "tenure of mayor" as the cumulated years in their positions. Officials above 55 years have significantly limited promotion opportunities because of the age limit in China's personnel system. Hence, we expect that officials aged above 55 have fewer incentives to adopt an innovation than officials aged below 55. A past research indicates that tenure may have a nonlinear effect on the decision making of officials (Damanpour and Schneider 2009). Chinese state constitution and party constitution specifically stipulate that all local officials' term of office should be 5 years and there might be an election cycle in terms of policy innovation (Guo 2009). Hence, we add the squared value of the officials' tenure in the statistical models.

Furthermore, we set "original position of mayor" as a dummy equal to 1 if the current mayor is not from this city government and provincial government, and "predecessor of party chief" as a dummy equal to 1 if the previous party secretary holds a post that directly administrates his or her successor in the provincial government, including the governor, vice provincial party secretary, vice-governor, and member of the standing committee in the Communist Party of China's (CPC) provincial committee. We exclude the predecessor of the current mayor and original position of the party chief because leadership in Chinese local governments is a combination of two different but closely affiliated roles, namely, party chiefs and mayors. Most city party chiefs are promoted from

5 We also attempted to construct the measure of aggregated light per capita. Nevertheless, the correlation coefficient between aggregated light per capita and GDP per capita in our sample is only 0.08. Furthermore, including this variable in our model does not substantively change our main findings.

6 The unemployment rate can also be a potential determinant of the creation of ALCs. However, unlike the GDP data, China's labor statistics only count urban citizens who register for unemployment benefits with local governments as unemployed, and its reliability has been frequently criticized in recent years (Giles, Albert, and Zhang 2005; Gustafsson, Shi, and Sato 2014; Liu 2012). Moreover, the unemployment rate in each individual city is unlikely to be the cause of the provincial and central policy signals in terms of ALS (i.e., the regressions still satisfies the exogeneity assumption because the errors are not correlated with the key independent variables) and, thus, should not confound the results of interest. Hence, we opted to exclude the unemployment rate in our models.

7 *The Yearbook of China Cities* (Chinese Academy of Social Sciences 1997–2012), CPC cadre database: http://cpc.people.com.cn/gbzl/index.html; Zhengtan website: http://www.zt360.cn/jgzyjl/dfld/; Zecheng website: http://www.hotelaah.com/liren/index.html.

mayors (i.e., 71% in our data) and most promoted mayors immediately become party chiefs of the same cities (i.e., 88% in our data). Previous research indicates that bureaucrats from the outside tend to initiate policy innovations (Teodoro 2009). Hence, we expect that the "original position of mayor" would be positively associated with policy innovation. Moreover, the promoted predecessors in the provincial governments are considerably involved in the process of recommending, selecting, and appointing their successors (Chan 2004). Therefore, the successors should be extremely cautious regarding overthrowing the policy trajectories of their predecessors and adopting innovations. Therefore, we anticipate a negative relationship between the "predecessor of the party chief" and innovation adoption.

Finally, 268 city-level ALCs were adopted among 281 cities from 1997 to 2012, and 1831 observations among 281 cities in different periods are analyzed in our main models. Table A1 presents the measurements and descriptive statistics. Our analysis includes the duration and cubic splines of time to account for the potential time dependence problem in the models (Beck, Katz, and Tucker 1998; Nicholson-Crotty and Carley 2016). In addition, a potential feedback loop caused by the bottom-up diffusion process might exist. Previous studies on China's policy history suggest that subordinate governments are important information sources for the central government (Zhu and Zhao Forthcoming) and provincial governments (Zhang and Zhu Forthcoming), as these enable them to devise appropriate strategies to improve their policy-making

Table 2. Top–Down Policy Signals and Local ALC Diffusion in China

	Model 1		Model 2	
	Coefficient (Standard Error)	% Change Odds Ratio	Coefficient (Standard Error)	% Change Odds Ratio
Top–down political signals				
Central policy	0.014* (0.01)	1.4	0.026*** (0.01)	2.6
Provincial policy	0.151** (0.07)	16.3	0.332*** (0.11)	39.3
Central policy × provincial policy			−0.010** (0.01)	−1
Neighboring diffusion				
Neighboring City Yearly Innovation	0.025*** (0.01)	2.5	0.022*** (0.01)	2.2
Local determinants				
GDP per capita	0.024** (0.01)	2.5	0.025** (0.01)	2.6
Service sector	0.016* (0.01)	1.6	0.016 (0.01)	1.6
Economic openness	−0.076*** (0.02)	−7.4	−0.071*** (0.02)	−6.8
Administrative ranking	−0.536** (0.27)	−41.5	−0.548** (0.27)	−42.2
Political mobility				
Party chief older than 55	−0.486** (0.20)	−38.5	−0.499** (0.20)	−39.3
Mayor older than 55	0.497** (0.23)	64.3	0.503** (0.23)	65.3
Tenure of party chief	0.116 (0.13)	12.3	0.114 (0.13)	12.1
Tenure of party chief squared	−0.019 (0.02)	−1.8	−0.018 (0.02)	−1.7
Tenure of mayor	−0.316*** (0.10)	−27.1	−0.303*** (0.10)	−26.2
Tenure of mayor squared	0.042*** (0.01)	4.3	0.041*** (0.01)	4.2
Original position of mayor	0.242 (0.16)	27.3	0.249 (0.16)	28.3
Predecessor of party chief	−0.407** (0.17)	−33.4	−0.405** (0.17)	−33.3
Controls of duration dependence				
Duration	−1.087*** (0.38)	−66.3	−1.042*** (0.38)	−64.7
Cubic spline 1	−0.493*** (0.12)	−38.9	−0.468*** (0.12)	−37.4
Cubic spline 2	0.251*** (0.06)	28.6	0.239*** (0.06)	27
Cubic spline 3	−0.048*** (0.01)	−4.6	−0.045*** (0.01)	−4.4
Constant	−2.969*** (0.43)		−3.044*** (0.44)	
Observations	1,831		1,831	
AIC	1,345.59		1,342.60	
BIC	1,455.84		1,458.37	
Wald χ^2 (df)	155.31 (19)		167.38 (20)	
Pseudo-R^2	0.13		0.13	

Note: Robust standard errors clustered by city in parentheses. AIC, Akaike information criterion; BIC, Bayesian information criterion.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$ (two tailed).

processes. If the central government decides to support a local policy innovation, it might disseminate this policy through extensive media coverage or high-profile conferences (Heilmann 2008a, 2). To avoid the possibility of reverse causation, we lag the variables of the top–down political signals, neighboring diffusion, and local determinants by 1 year. This specification is reasonable given that the city leaders probably make the decision to establish an ALC on the basis of full information in the previous year. We also conduct robustness checks with generalized structural equation and multilevel logit models to ensure the consistency of our empirical findings (see Supplementary Appendix).

Empirical Findings

Main Results

This section analyzes the determinants of the diffusion of city-level ALCs by combining top–down political signals, neighboring diffusion, local determinants, and political mobility in one analytical framework. Table 2 shows the results of the two models tested. Model 1 presents the baseline results, and Model 2 tests the interaction effect between the policy documents of the state council and provincial governments. Table 2 also reports the coefficients, robust standard error clustered by each city in parentheses, percent change in odds ratio, Akaike information criterion (Akaike 1974), Bayesian information criterion (Schwarz 1978), and McFadden R^2 (McFadden 1974).

The empirical regression results in table 2 confirm our theoretical hypotheses. Model 1 confirms that after controlling for other factors, the central and provincial policy signals have independent and significant positive effects on the dependent variable. Model 1 implies that an additional central policy in 1 year is associated with a 1.4% increase in the odds of creating city-level ALC, whereas an additional provincial policy in 1 year increases the odds of creating ALCs by 16.3%. This finding suggests that city governments are significantly more responsive to provincial policies than central policies. One possible explanation is that provincial governments directly control the fiscal resources and personnel in city governments. By contrast, a city government is rarely directly commended or sanctioned by the central government.

Meanwhile, Model 2 shows a statistically significant and negative interaction effect between the central and provincial policy signals, thereby suggesting that provincial political signals can decrease the influence of central political signals on cities or vice versa. As all interaction effects are symmetric, we construct two marginal effect plots (Berry, Golder, and Milton 2012; Brambor, Clark, and Golder 2006). Figure 2 illustrates that when the number of provincial policy documents is below two, the average marginal effect of the central policy on the probability of the cities' adoption of ALC is statistically significant between 0.2% and 0.25%. However, when the number of provincial policy documents continuously increases, the average marginal effect of the central policy becomes negative and statistically indistinct from 0. Similarly, when the number of central policy documents is below 20, the average marginal effect of the provincial policy on the probability of the cities' adoption of ALC is statistically significant between 2% and 3%. Nevertheless, when

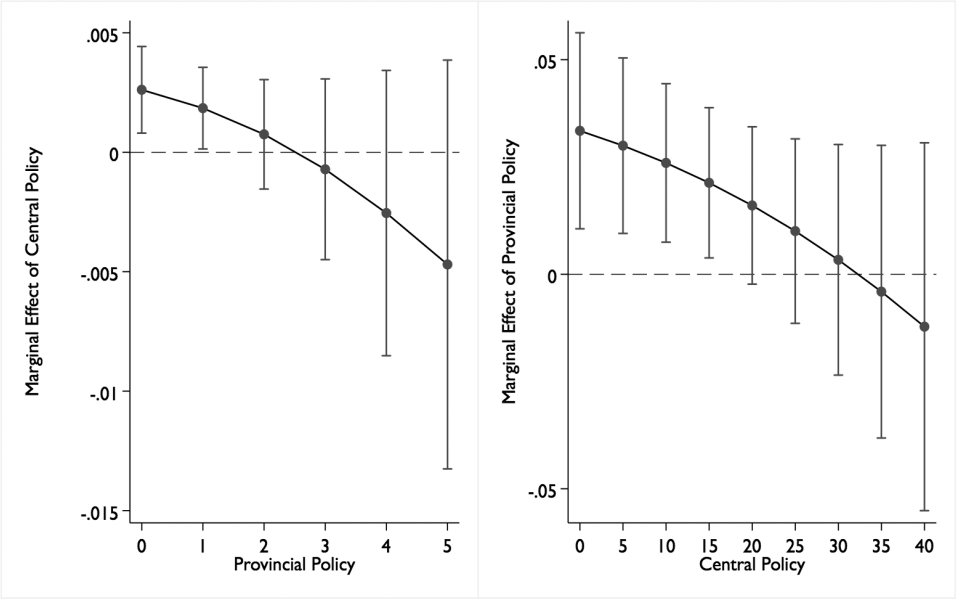

Figure 2. Average Marginal Effects of the Central and Provincial Policies on City Adoption.

the number of central policy documents continuously increases, the average marginal effect of the provincial policy also becomes negative and statistically insignificant. This finding confirms our theoretical expectation that, for city governments, the policy signals from the central and provincial governments are competitive rather than complementary.

In terms of the control variables, the regression results also demonstrate interesting estimated effects. Similar to the findings in previous diffusion research, the annual neighboring diffusion effects and economic determinants (e.g., GDP per capita and service sector) have significantly positive effects on policy diffusion. Moreover, we replicate the models in table 2 by replacing GDP per capita with night-time light intensity. We find no statistically significant effect of night-time light intensity. Nevertheless, as reported in table A2 and figure A1 in the Supplementary Appendix, our main findings regarding the effects of top–down policy signals remain constant with the alternative measure of economic development. Furthermore, the significantly negative coefficient of economic openness suggests that a city with limited economic openness has additional incentives to establish an ALC to attract external investments. Moreover, a city with high administrative rank is less prone to adopt an innovation because the high-ranking city often has a larger and more complex government organization, thereby bringing numerous obstacles to an organizational innovation.

In addition, the variables of political mobility also demonstrate a few interesting findings. Party chiefs aged above 55 have a greater tendency to create ALCs compared with those aged below 55. By contrast, mayors aged below 55 are likely to create ALCs compared with those aged above 55. The effect of the tenure

Table 3. Alternative Measurements: Official Media Signals

	Model 3		Model 4	
	Coefficient (Standard Error)	% Change Odds Ratio	Coefficient (Standard Error)	% Change Odds Ratio
Top–down political signals				
Central media	0.044*** (0.01)	4.5	0.052*** (0.01)	5.4
Provincial media	0.106** (0.04)	11.2	0.254*** (0.09)	28.9
Central media × provincial media			−0.009** (0.00)	−0.9
Neighboring diffusion				
Neighboring City Yearly Innovation	0.017*** (0.01)	1.7	0.017*** (0.01)	1.7
Local determinants				
GDP per capita	0.026** (0.01)	2.6	0.026** (0.01)	2.6
Service sector	0.013 (0.01)	1.3	0.012 (0.01)	1.2
Economic openness	−0.074*** (0.02)	−7.2	−0.076*** (0.03)	−7.3
Administrative ranking	−0.472* (0.28)	−37.6	−0.464* (0.28)	−37.1
Political mobility				
Party chief older than 55	−0.551*** (0.21)	−42.4	−0.546*** (0.21)	−42.1
Mayor older than 55	0.608** (0.25)	83.7	0.629** (0.25)	87.6
Tenure of party chief	0.070 (0.13)	7.2	0.076 (0.13)	7.9
Tenure of party chief squared	−0.012 (0.02)	−1.2	−0.012 (0.02)	−1.2
Tenure of mayor	−0.308*** (0.12)	−26.5	−0.311*** (0.12)	−26.7
Tenure of mayor squared	0.039** (0.02)	4	0.039** (0.02)	4
Original position of mayor	0.223 (0.16)	25	0.221 (0.16)	24.8
Predecessor of party chief	−0.454** (0.18)	−36.5	−0.452** (0.18)	−36.3
Controls of duration dependence				
Duration	−1.031*** (0.39)	−64.3	−1.003*** (0.39)	−63.3
Cubic spline 1	−0.483*** (0.12)	−38.3	−0.472*** (0.12)	−37.6
Cubic spline 2	0.252*** (0.06)	28.7	0.248*** (0.06)	28.1
Cubic spline 3	−0.050*** (0.01)	−4.9	−0.050*** (0.01)	−4.9
Constant	−2.861*** (0.46)		−2.902*** (0.46)	
Observations	1,713		1,713	
AIC	1,249.22		1,247.76	
BIC	1,358.14		1,362.13	
Wald χ^2 (df)	152.05 (19)		151.20 (20)	
Pseudo-R^2	0.13		0.14	

Note: Robust standard errors clustered by city in parentheses. AIC, Akaike information criterion; BIC, Bayesian information criterion.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$ (two tailed).

of the mayor is U shaped, suggesting that a newly appointed mayor is more inclined to adopt innovation than a mayor who has been in office for 3 or 4 years. The effect of the predecessors of the party chiefs is significantly negatively associated with innovation adoption. This outcome indicates that a party chief is substantially concerned with the legacy of his promoted predecessor, who directly administers the party chief. The different influences between the party chief and mayor are determined by their job characteristics, which are beyond the focus of the current research. Detailed explanations are provided by Zhu and Zhang (2016).

Robustness Considerations

Several robustness considerations regarding the main findings are provided in this study. (1) Can the policy documents issued by the central and provincial governments precisely measure their policy signals? (2) What are the implications if central policies affect city governments indirectly through provincial policies? Consequently, are the conditional indirect effects transmitted via provincial governments still negatively contingent on the frequency of the central policies? (3) The models shown in table 2 completely pool data across all provinces, thereby possibly disregarding variation among the provinces. (4) Given that the constituent ministries of the state council and provincial governments have the same administrative rank, would the effects of the central ministries' policy documents on the local governments differ from those of the state council?

To address the first concern, we collect information from the main official newspapers controlled by the central government and each provincial government in order to test the roles of the official media signals in the diffusion process of the city ALCs. Each level of the government's media signal is measured by the frequency of ALS-related news articles published in 1 year. Table 3 and figure 3 show that the estimated effects of the central and provincial media signals are significant and consistent with our theoretical hypotheses. When the number of provincial (central) media articles continuously increases, the average marginal effect of the central (provincial) media articles changes from a significantly positive impact into an impact that is statistically indistinct from 0. This result is in accordance with the findings presented in table 2 and figure 1.

Second, we derive the conditional indirect effects of central policies transmitted through provincial policies according to normal theory estimation using the delta method (Hayes 2013, 456). Tables 4 and 5 report the results based on the generalized structural equation model with 1,000 bootstrap replications. The conditional indirect effects are significantly positive, thereby suggesting that the central government may urge the provincial government to introduce relevant supporting policies. Therefore, this possible action indirectly promotes the adoption of ALCs among cities. Moreover, the conditional indirect effects transmitted through provincial policies become noticeably small as the number of central policies increases, which is consistent with our theoretical expectations. These findings imply that the city governments' response to the provincial governments' independent and transmitted policy effects is

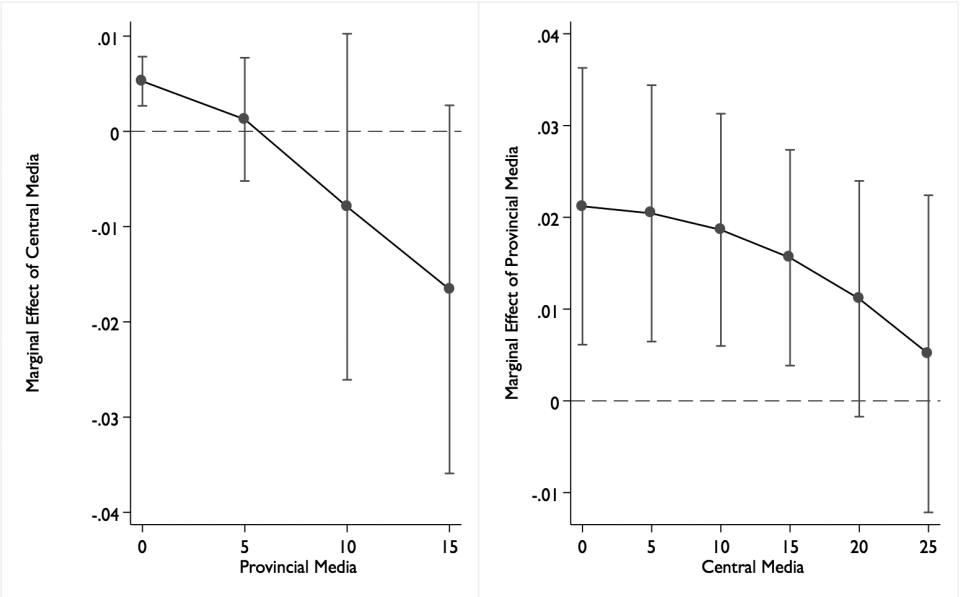

Figure 3. Average Marginal Effects of the Central and Provincial Official Media Signals on City Adoption.

Table 4. Generalized Structural Equation Model for the Moderated Mediation

	Negative Binomial Model	Logit Model
	DV: Provincial Policy	DV: City Adoption
	Coefficient (Standard Error)	Coefficient (Standard Error)
Top–down political signals		
Central policy	0.052*** (0.00)	0.026*** (0.01)
Provincial policy		0.332*** (0.11)
Central policy × provincial policy		−0.010** (0.01)
Neighboring diffusion		
Neighboring City Yearly Innovation		0.022*** (0.01)
GDP per capita		0.025** (0.01)
Service sector		0.016 (0.01)
Economic openness		−0.071*** (0.02)
Administrative ranking		−0.548** (0.27)
Political mobility		
Party chief older than 55		−0.499** (0.20)
Mayor older than 55		0.503** (0.23)
Tenure of party chief		0.114 (0.13)
Tenure of party chief squared		−0.018 (0.02)
Tenure of mayor		−0.303*** (0.10)
Tenure of mayor squared		0.041*** (0.01)
Original position of mayor		0.249 (0.16)
Predecessor of party chief		−0.405** (0.17)
Controls of duration dependence		
Duration		−1.042*** (0.38)
Cubic spline 1		−0.468*** (0.12)
Cubic spline 2		0.239*** (0.06)
Cubic spline 3		−0.045*** (0.01)
Constant	−1.110*** (0.05)	−3.044*** (0.44)
Ln (alpha)	−0.148 (0.13)	
Observations		1,975
Log pseudo-likelihood		−2,493.54
AIC		5,035.078

Note: Standard errors in parentheses. AIC, Akaike information criterion.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$ (two tailed).

Table 5. Conditional Indirect Effect of the Central Policy

Central Policy	Conditional Indirect Effect	Bias	Standard Error	95% Confidence Interval	
Mean – 1 SD	0.041	0.000	0.005	0.030	0.051
Mean	0.029	0.000	0.004	0.022	0.036
Mean + 1 SD	0.016	−0.000	0.003	0.010	0.023

Note: The conditional indirect effects are calculated through bootstrapping at specified values of central policy (1,000 replications):

$$\text{Provincial Policy} = a_0 + a_1\text{Central Policy};$$

$$\text{City Adoption} = b_0 + b_1\text{Provincial Policy} + b_2\text{Central Policy} + b_3\text{Central Policy} \times \text{Provincial Policy};$$

$$\text{Conditional indirect effect} = a_1(b_1 + b_3\text{Central policy}).$$

negatively contingent on the strength of the central governments' policy signals.

Furthermore, we use a varying-intercept (partial pooling) multilevel model to account for the potential province-level errors in table 2. Compared with the partial pooling model, the traditional complete-pooling model disregards the variation between groups, whereas the no-pooling analysis (also known as the

"fixed-effects" model) overstates it (Gelman and Hill 2007, 253). Given that the key independent variable is at the provincial level, the multilevel approach represents an appropriate compromise between these two extremes. Table A3 and figure A2 in the Supplementary Appendix report the multilevel logit results, which are consistent with the findings in the complete-pooling models. As empirical results based on the multilevel logit model might be unstable, we also report the results based on multilevel probit model and linear probability model in tables A4 and A5 in the Supplementary Appendix. The outcomes are fundamentally similar. Finally, we separately test the interaction effect between the policy documents of the state council or central ministries and provincial governments (see tables A6 and A7 in the Supplementary Appendix). Again, we identify significantly negative interaction effects between the central- and provincial-level signals. Therefore, these robustness checks support the theoretical hypotheses of this study and are consistent with the main findings shown in table 2.

Conclusion

Our review of the existing literature shows the limited findings reported regarding the relationship between multilevel vertical power structure and local innovation adoption in transitioning countries. This study investigates this relationship by analyzing the process by which the multilevel structural dynamics induced by administrative centralization shape the adoption of marketization innovation in China. As a transitioning authoritarian country, China has a multilevel power structure characterized by fiscal and administrative decentralization and political centralization in the reform era (Li and Zhou 2005; Montinola, Qian, and Weingast 1995; Xu 2011; Zhang and Zou 1998). Nevertheless, the Chinese central authority can arbitrarily intervene in local policy practices through coordination, guidelines, protection, and sponsorship. It can even provide political deterrence and impose punishment, thereby often leading to the centralization of administrative power by decreasing the autonomy of provincial-level authorities. Under these circumstances, administrative centralization enables the national government to enhance regulation over areas already covered by the provincial governments. Consequently, this government accommodation increases the number of bureaucracies that lower-level governments must deal with.

Analysis of the motivations and constraints of each government level enabled us to confirm that policy signals from the central and provincial governments can independently stimulate the city adoption of marketization innovation. However, when the central and provincial governments attempt to set restrictions on the direction of marketization innovation adopted by city governments, their impacts on the city government tend to be competitive rather than complementary. In other words, when central (provincial) policy signals are already in favor of a local marketization innovation, provincial (central) policies will not be as powerful as if central (provincial) policies are not already present.

This study's theoretical contributions are two-fold. First, this research contributes to the innovation diffusion literature by providing insights into the impact of governmental hierarchy on local policy adoption. In theory, as long as a lower-level government is politically or fiscally constrained by a higher-level government, the former is likely to be responsive to the latter's policy preference. Due to the potentially conflicting demands or redundant information from the higher-level authorities, a lower-level government with limited attention, time and resources cannot completely and simultaneously respond to multiple top–down policy signals. Specifically in transitioning China, the theoretical analysis in this work explains channels through which centralization affects the process of innovation diffusion by bridging the literature on the vertical power structure and innovation diffusion theory.

Second, this study deepens our understanding of government behaviors and interactions in transitioning societies. Modern transitioning countries often have multiple levels of authority, and many scholars tend to associate decentralization or centralization with various policy outcomes. Nevertheless, our findings show that upper-, middle-, and lower-level governments have different motivations and constraints during administrative centralization. Accordingly, such differences can substantially shape the behaviors of local governments. Our analysis highlights that before determining the policy outcomes of decentralization or centralization, researchers should first understand how the varied types of power structure reform affect the differential reactions of multiple-level subnational governments.

Nevertheless, our investigation mainly examines how two different types of top–down diffusional pressures interact in the same process of policy innovation. Future research can further investigates the potential interaction effects between vertical and horizontal diffusional pressures, which can enhance our knowledge on how a vertical power structure shapes horizontal policy diffusion. Additionally, upcoming works can further build on the current study and explore the effects of fiscal or political decentralization (or centralization) on local government innovations.

In sum, our study shows that administrative centralization can substantially influence the motivations and constraints of each government level, thus shaping the

process of vertical policy diffusion. Previous diffusion research often fails to analyze how a multilevel power structure could affect the innovation diffusion behaviors of local governments. Nevertheless, most modern countries have multiple levels of governments. A vertical power structure in such contexts largely determines the scope and depth of intergovernmental interaction and how subnational governments process policy information and make policy choices. Therefore, the relationship between vertical power structure and innovation diffusion is clearly an area where more research is needed.

Supplementary Material

Supplementary data are available at the *Journal of Public Administration Research and Theory* online.

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References

Akaike, Hirotugu. 1974. A new look at the statistical model identification. *IEEE Transactions on Automatic Control* **19**:716–23.

Alesina, Alberto, Stelios Michalopoulos, and Elias Papaioannou. 2016. Ethnic inequality. *Journal of Political Economy* **124**:428–88.

Bardhan, Pranab, and Dilip Mookherjee. 2005. Decentralizing antipoverty program delivery in developing countries. *Journal of Public Economics* **89**:675–704.

Baskaran, Thushyanthan, Brian Min, and Yogesh Uppal. 2015. Election cycles and electricity provision: Evidence from a quasi-experiment with Indian special elections. *Journal of Public Economics* **126**:64–73.

Beck, Nathaniel, Jonathan N. Katz, and Richard Tucker. 1998. Taking time seriously: Time-series-cross-section analysis with a binary dependent variable. *American Journal of Political Science* **42**:1260–88.

Berry, Frances S., and William D. Berry. 1990. State lottery adoptions as policy innovations: An event history analysis. *The American Political Science Review* **84**:395–415.

———. 2014. Innovation and diffusion models in policy research. In *Theories of the policy process*, ed. Paul A. Sabatier and Christopher M. Weible, 307–59. Boulder, CO: Westview.

Berry, William D., Matt Golder, and Daniel Milton. 2012. Improving tests of theories positing interaction. *The Journal of Politics* **74**:653–71.

Besley, Timothy, and Stephen Coate. 2003.Centralized versus decentralized provision of local public goods: A political economy approach. *Journal of Public Economics* **87**:2611–37.

Bhatti, Yosef, Asmus L. Olsen, and Lene Holm Pedersen. 2011. Administrative professionals and the diffusion of innovations: The case of citizen service centres. *Public Administration* **89**:577–94.

Bird, Richard M., and Francois Vaillancourt. 2008. *Fiscal decentralization in developing countries*. Cambridge, UK: Cambridge University Press.

Blanchard, Olivier, and Andrei Shleifer. 2001. Federalism with and without political centralization: China versus Russia. *IMF Economic Review* **48**:171–79.

Boushey, Graeme. 2010. *Policy diffusion dynamics in America*. New York, NY: Cambridge University Press.

Brambor, Thomas, William Roberts Clark, and Matt Golder. 2006. Understanding interaction models: Improving empirical analyses. *Political Analysis* **14**:63–82.

Bruhn, Miriam. 2011. License to sell: The effect of business registration reform on entrepreneurial activity in Mexico. *The Review of Economics and Statistics* **93**:382–6.

Bruhn, Miriam, and David McKenzie. 2014. Entry regulation and the formalization of microenterprises in developing countries. *The World Bank Research Observer* **29**:186–201.

Cai, Yongshun. 2008. Power structure and regime resilience: Contentious politics in China. *British Journal of Political Science* **38**:411–32.

Cai, Hongbin, and Daniel Treisman. 2006. Did government decentralization cause China's economic miracle? *World Politics* **58**:505–35.

Caulfield, Janice L. 2006. Local government reform in China: A rational actor perspective. *International Review of Administrative Sciences* **72**:253–67.

Chan, Hon S. 2004. Cadre personnel management in China: The nomenklatura system, 1990–1998. *The China Quarterly* **179**:703–34.

Chan, Hon S., and Edward Suizhou Li. 2007. Civil service law in the People's Republic of China: A return to cadre personnel management. *Public Administration Review* **67**:383–98.

Chan, Kwan Nok, and Shuang Zhao. 2015. Punctuated equilibrium and the information disadvantage of authoritarianism: Evidence from the people's republic of China. *Policy Studies Journal* **44**:134–55.

Cheung, Anthony BL. 2005. The politics of administrative reforms in Asia: Paradigms and legacies, paths and diversities. *Governance* **18**:257–82.

Damanpour, Fariborz, and Marguerite Schneider. 2009. Characteristics of innovation and innovation adoption in public organizations: Assessing the role of managers. *Journal of Public Administration Research and Theory* **19**:495–522.

Desmarais, Bruce A., Jeffrey J. Harden, and Frederick J. Boehmke. 2015. Persistent policy pathways: Inferring diffusion networks in the American States. *American Political Science Review* **109**:392–406.

Dickovick, J. Tyler. 2011. *Decentralization and recentralization in the developing world: Comparative studies from Africa and Latin America*. University Park, PA: Penn State Press.

Escobar-Lemmon, Maria, and Ashley D. Ross. 2014. Does decentralization improve perceptions of accountability? Attitudes in response to decentralization in Colombia. *American Journal of Political Science* **58**:175–88.

Faguet, J. P., and Sanchez, F. 2008. Decentralization's effects on educational outcomes in Bolivia and Colombia. *World Development* **36**:1294–316.

Fan, Gang, Xiaolu Wang, and Liwen Zhang. 2001. Annual report 2000: Marketization index for China's provinces. *China & World Economy* **5**:1–12.

Faust, Jörg, and Imke Harbers. 2012. On the local politics of administrative decentralization: Applying for policy responsibilities in Ecuador. *Publius* **42**:52–77.

Gelman, Andrew, and Jennifer Hill. 2007. *Data analysis using regression and hierarchical/multilevel models*. New York, NY: Cambridge University Press.

Gilardi, Fabrizio. 2010. Who learns from what in policy diffusion processes? *American Journal of Political Science* **54**:650–66.

Giles, John, Park Albert, and Juwei Zhang. 2005. What is China's true unemployment rate? *China Economic Review* **16**:149–70.

Goldfrank, Benjamin. 2007. The politics of deepening local democracy: Decentralization, party institutionalization, and participation. *Comparative Politics* **1**:147–68.

Graham, Erin R., Charles R. Shipan, and Craig Volden. 2013. The diffusion of policy diffusion research in political science. *British Journal of Political Science* **43**:673–701.

Guo, Gang. 2009. China's local political budget cycles. *American Journal of Political Science* **53**:621–32.

Gustafsson, Björn, Li Shi, and Hiroshi Sato. 2014. Data for studying earnings, the distribution of household income and poverty in China. *China Economic Review* **30**:419–31.

Hayes, Andrew F. 2013. *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.

Heilmann, Sebastian. 2008a. From local experiments to national policy: The origins of China's distinctive policy process. *The China Journal* **59**:1–30.

———. 2008b. Policy in China's economic rise. *Studies in Comparative International Development* **43**:1–26.

Henderson, J. Vernon, Adam Storeygard, and David N. Weil. 2012. Measuring economic growth from outer space. *American Economic Review* **102**:994–1028.

Holz, Carsten A. 2014. The quality of China's GDP statistics. *China Economic Review* **30**:309–38.

Huang, Haifeng. 2013. Signal left, turn right: central rhetoric and local reform in China. *Political Research Quarterly* **66**:292–305.

Kanbur, Ravi, and Xiaobo Zhang. 2005. Fifty years of regional inequality in China: A journey through central planning, reform, and openness. *Review of Development Economics* **9**:87–106.

Keefer, Philip E., Ambar Narayan, and Tara Vishwanath. 2006. Decentralization in Pakistan: Are local governments likely to be more accountable than central governments? In *Decentralization and local governance in developing countries: A comparative perspective*, eds Pranab Bardhan and Dilip Mookherjee, 285–303. Cambridge, MA: MIT Press.

Kung, James Kai-Sing, and Shuo Chen. 2011. The tragedy of the nomenklatura: Career incentives and political radicalism during China's Great Leap famine. *American Political Science Review* **105**:27–45.

Landry, Pierre F. 2008. *Decentralized authoritarianism in China*. New York, NY: Cambridge University Press.

Li, Hongbin, and Li-An Zhou. 2005. Political turnover and economic performance: The incentive role of personnel control in China. *Journal of Public Economics* **89**:1743–62.

Lin, Justin Yifu. 2001. WTO accession and financial reform in China. *Cato Journal* **21**:13–8.

Lin, Justin Yifu, and Zhiqiang Liu. 2000. Fiscal decentralization and economic growth in China. *Economic Development and Cultural Change* **49**:1–21.

Lin, Justin Yifu, Fang Cai, and Zhou Li. 2003. *The China miracle: Development strategy and economic reform*. Hong Kong: The Chinese University Press.

Liu, Qian. 2012. Unemployment and labor force participation in urban China. *China Economic Review* **23**:18–33.

Lü, Xiaobo, and Pierre F. Landry. 2014. Show me the money: Interjurisdiction political competition and fiscal extraction in China. *American Political Science Review* **108**:706–22.

Luo, Yadong, Qiuzhi Xue, and Binjie Han. 2010. How emerging market governments promote outward FDI: Experience from China. *Journal of World Business* **45**:68–79.

Malesky, Edmund, and Jonathan London. 2014. The political economy of development in China and Vietnam. *Annual Review of Political Science* **17**:395–419.

Malesky, Edmund J., Cuong Viet Nguyen, and Anh Tran. 2014. The impact of recentralization on public services: A difference-in-differences analysis of the abolition of elected councils in Vietnam. *American Political Science Review* **108**:144–68.

McCann, Pamela J. Clouser, Charles R. Shipan, and Craig Volden. 2015. Top-down federalism: State policy responses to national government discussions. *Publius* **45**:495–525.

McFadden, Daniel. 1974. Conditional logit analysis of qualitative choice behavior. In *Frontiers in econometrics*, ed. Paul Zarembka, 105–42. New York, NY: Academic Press.

McMillan, John, and Barry Naughton. 1992. How to reform a planned economy: Lessons from China. *Oxford Review of Economic Policy* **8**:130–43.

Mei, Ciqi, and Margaret M. Pearson. 2014. Killing a chicken to scare the monkeys? Deterrence failure and local defiance in China. *China Journal* **72**:75–97.

Mertha, Andrew C. 2005. China's soft centralization: Shifting tiao/kuai authority relations. *The China Quarterly* **184**:791–810.

Montinola, Gabriella, Yingyi Qian, and Barry R. Weingast. 1995. Federalism, Chinese style: The political basis for economic success in China. *World Politics* **48**:50–81.

Ngok, Kinglun, and Guobin Zhu. 2007. Marketization, globalization and administrative reform in China: A zigzag road to a promising future. *International Review of Administrative Sciences* **73**:217–33.

Nicholson-Crotty, Sean, and Sanya Carley. 2016. Effectiveness, implementation, and policy diffusion: Or can we make that work for Us? *State Politics & Policy Quarterly* **16**:78–97.

Oates, Wallace E. 1999. An essay on fiscal federalism. *Journal of Economic Literature* **37**:1120–49.

Qian, Yingyi, and Barry R. Weingast. 1997. Federalism as a commitment to perserving market incentives. *The Journal of Economic Perspectives* **11**:83–92.

Rothstein, Bo. 2015. The Chinese paradox of high growth and low quality of government: The cadre organization meets max Weber. *Governance* **28**:533–48.

Sander, Cerstin. 2003. *Less is more: Better compliance and increased revenues by streamlining business registration in Uganda*. London: Bannock Consulting.

Schneider, Aaron. 2003. Decentralization: Conceptualization and measurement. *Studies in Comparative International Development* **38**:32–56.

Schwarz, Gideon. 1978. Estimating the dimension of a model. *The Annals of Statistics* **6**:461–4.

Shih, Victor Chung-Hon. 2008. "Nauseating" displays of loyalty: Monitoring the factional bargain through ideological campaigns in China. *The Journal of Politics* **70**:1177–92.

Shipan, Charles R., and Craig Volden. 2006. Bottom-up federalism: The diffusion of antismoking policies from US cities to states. *American Journal of Political Science* **50**:825–43.

———. 2008. The mechanisms of policy diffusion. *American Journal of Political Science* **52**:840–57.

———. 2012. Policy diffusion: Seven lessons for scholars and practitioners. *Public Administration Review* **72**:788–96.

Teodoro, Manuel P. 2009. Bureaucratic job mobility and the diffusion of innovations. *American Journal of Political Science* **53**:175–89.

Tirole, Jean. 1986. Hierarchies and bureaucracies: On the role of collusion in organizations. *Journal of Law, Economics, & Organization* **2**:181–214.

Tolbert, Caroline J., Karen Mossberger, and Ramona McNeal. 2008. Institutions, policy innovation, and e-government in the American States. *Public Administration Review* **68**:549–63.

Tolbert, Pamela S., and Lynne G. Zucker. 1983. Institutional sources of change in the formal structure of organizations: The diffusion of civil service reform. *Administrative Science Quarterly* **28**:22–39.

Treisman, Daniel. 2007. *The architecture of government: Rethinking political decentralization*. New York, NY: Cambridge University Press.

Tsai, Wen-Hsuan, and Nicola Dean. 2014. Experimentation under hierarchy in local conditions: Cases of political reform in Guangdong and Sichuan, China. *The China Quarterly* **218**:339–58.

Volden, Craig. 2006. States as policy laboratories: Emulating success in the children's health insurance program. *American Journal of Political Science* **50**:294–312.

Walker, Jack L. 1969. The diffusion of innovations among the American States. *The American Political Science Review* **63**:880–99.

Wei, Yehua Dennis. 2001. Decentralization, marketization, and globalization: The triple processes underlying regional development in China. *Asian Geographer* **20**:7–23.

Weyland, Kurt. 2005. Theories of policy diffusion lessons from Latin American Pension Reform. *World Politics* **57**:262–95.

Wu, Jiannan, Liang Ma, and Yuqian Yang. 2013. Innovation in the Chinese public sector: Typology and distribution. *Public Administration* **91**:347–65.

Wu, Jiannan, and Pan Zhang. 2018. Local government innovation diffusion in China: An event history analysis of a performance-based reform programme. *International Review of Administrative Sciences* 84:63–81.

Xu, Chenggang. 2011. The fundamental institutions of China's reforms and development. *Journal of Economic Literature* **49**:1076–151.

Zhang, Yanlong. 2012. Institutional sources of reform: The diffusion of land banking systems in China. *Management and Organization Review* **8**:507–33.

Zhang, Youlang, and Xufeng Zhu. Forthcoming. Multiple mechanisms of policy diffusion in China. *Public Management Review*.

Zhang, Tao, and Heng-fu Zou. 1998. Fiscal decentralization, public spending, and economic growth in China. *Journal of Public Economics* **67**:221–40.

Zhou, Xueguang. 2010. The institutional logic of collusion among local governments in China. *Modern China* **36**:47–78.

Zhu, Xufeng. 2014. Mandate versus championship: Vertical government intervention and diffusion of innovation in public services in authoritarian China. *Public Management Review* **16**:117–39.

Zhu, Xufeng, and Youlang Zhang. 2016. Political mobility and dynamic diffusion of innovation: The spread of municipal pro-business administrative reform in China. *Journal of Public Administration Research and Theory* **26**:535–51.

Zhu, Xufeng, and Hui Zhao. Forthcoming. Experimentalist governance with interactive central–local relations: Making new pension policies in China. *Policy Studies Journal*. doi: 10.1111/psj.12254.

Zhuravskaya, Ekaterina V. 2000. Incentives to provide local public goods: Fiscal federalism, Russian style. *Journal of Public Economics* **76**:337–68.