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Logrolling under fragmented authoritarianism: theory and evidence from China

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Abstract This paper provides a rigorous theoretical and empirical analysis of the effect of logrolling between interest groups on social welfare in a non-democratic political system. In particular, we focus on China, where bureaucratic interest groups are separate vertical organizations reaching down from Beijing to the provinces and cities. The key question in this paper is: what are the effects of the logrolling of parochial interest groups on state policies and social welfare in autocracies? We address this question both theoretically and empirically. The theory predicts a specific distortion in resource allocation because of logrolling, while the empirical results confirm the theoretical prediction. We find policy outcomes under logrolling are characterized by excessive spending on all the interest groups' preferred goods and insufficient spending on public goods. We test the existence of logrolling between the Ministry of Civil Affairs and Ministry of Health in China. Our result shows logrolling between the two ministries lead to inefficiencies in social security and health care policies.

Keywords Authoritarianism · Policy making · Logrolling · China

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The Chinese government makes policy according to a decision rule of delegation by consensus…. If the agents reach consensus, the decision is automatically ratified by the higher level if the agents cannot agree, then the authorities step into make the decision…."
(Shirk 1993, p. 116).

1 Introduction

The policy-making process in autocratic countries is a highly interesting, but understudied topic in the public choice literature. This paper tries to open the black box of decision-making in autocracies by focusing on logrolling among interest groups, which, in fact, is one of the most important features of decision-making in all autocratic countries (Snyder 1991). In particular, we focus on China, where bureaucratic interest groups are separate vertical organizations reaching down from Beijing to the provinces and cities that operate with little coordination. Each bureaucracy pushes for policies in its interest—to increase its budgets, staffing, and so forth (Shirk 2014). They make decisions following the rule, "I will go along with what you want to do in your domain if you let me call the shots in my domain".[1]

That view leads to the key question of this paper: what are the effects of interest-group logrolling on state policies and social welfare in autocracies?

1.1 Previous literature

The issue of whether logrolling undermines social well-being is a long-standing debate in the literature (Buchanan and Tullock 1962; Tullock 1970; Bernholz 1973, 1978, 2012; Riker and Brahms 1973; Miller 1977; Enelow 1986).[2] Tullock's works, starting with *The Politics of Bureaucracy* (Tullock 1965), is seminal for understanding the natures of bureaucracy and logrolling. In particular, he argues that the primary bureaucratic motivation is to curry favor with their supervisors and that the same goal drives behavior in any hierarchial organization or political regime. However, to the best of our knowledge, no one has focused specifically on the problem within autocracies. Especially, the literature lacks empirical analysis of logrolling, probably because proof of the existence of logrolling depends on recording the trading of favors; such information may not exist (Evans 1994) or be difficult to acquire (Buchanan and Tullock 1962). Stratmann (1992, 1995) made some exceptional breakthroughs, founding evidence of logrolling in US congressional voting in the 1960 s and 1980 s. Later, Irwin and Kroszner (1996), Crombez (2000) and Copelovitch (2010) provided indirect evidence of how interest groups logroll with one another in determining US tariffs, EU policies and IMF lending. Given all of the empirical challenges faced by such studies, our paper contributes to the literature by providing indirect empirical evidence of autocratic logrolling by studying the effects of the interaction between two vertical bureaucracies in China—the Ministry of Civil Affairs (MCA) and the Ministry of Health (MOH). Building on Stratmann (1995), we report evidence of logrolling among interest groups as well as the inefficient policy outcomes generated by logrolling in a non-democratic polity.

Snyder (1991) first proposed logrolling as the decision-making processes in prewar Germany and Japan, which helped explain how interest groups drove overreaching in foreign

[1] Interview with Susan Shirk in 2012.

[2] See also Mueller (2003) for a complete review.

and security policy. Our paper is the first to study how Leninist systems with interest groups organized as vertical bureaucracies make decisions by logrolling. We define such decision making as reciprocal endorsement of one another's proposed spending programs. One might expect that Leninist systems would face problems of stasis because of consensus requirements, but not overreaching. Nevertheless, our theory shows how and why one can expect overprovision of goods that benefit particular interest groups and under-provision of other general public goods. In particular, we are able to show that overreaching is more severe with logrolling under autocracies than it is under democracies.

1.2 A case of autocratic logrolling

Both the Ministry of Civil Affairs (MCA) and the Ministry of Health (MOH) are ministries under the jurisdiction of the State Council of China.[3] Every year, the State Council assigns major tasks and a budget to all central ministries, including the MCA and the MOH, in an action plan according to the Annual Report on the Work of the Government (similar to a US president's State of the Union address).[4] That action plan lists the major tasks of the State Council and the names of the ministries that are responsible for each task. Sometimes one ministry can be in charge of several tasks. Furthermore, one task can be shared among several ministries. Nonetheless, only one leading ministry bears major responsibility for carrying out each task. A ministry's performance is evaluated mainly on its performance with respect to its core responsibility. According to the action plans released in recent years, one of the core responsibilities of MCA is to manage the Dibao program (or "Minimum Livelihood Guarantee Scheme"); and one of the core responsibilities of MOH is to manage the Rural Health Insurance program (or "Rural New Cooperative Medical Scheme"). Dibao was initiated in the 1990 s to provide assistance for the urban poor. In particular, such assistance consists of a sort of minimum income guarantee that tops up recipients' incomes to a minimum level set by local governments. By the end of year 2013, the number of beneficiaries of Dibao exceeded 20 million people.[5] The two ministries have different priorities, however, and sometimes need the other ministry's support to ensure smooth programmatic implementation or to increase the resources allocated to their priority tasks, which makes logrolling between them possible.

A typical logrolling arrangement between MCA and MOH involves three policies: Dibao, Rural Health Insurance, and Mental Health Care. MCA has incentives to expand the size of the budget for social assistance programs and to provide in-cash and in-kind assistance for households identified as Dibao households. A Rural New Cooperative Medical Scheme (or Rural Health Insurance) was initiated in 2004 and is considered to be one of the core responsibilities of MOH. Given that major task, MOH has incentives to increase the budget of the Rural Health Insurance scheme and also expand its coverage, and MOH's ideal goal is to achieve universal coverage.[6] Both ministries are responsible for providing

[3] In the 2013 reforms, the MOH was dissolved and its functions integrated into a new agency called the National Health and Family Planning Commission.

[4] For example, an 2016 action plan can be accessed at http://www.gov.cn/zhengce/content/2016-03/29/content_5059540.htm; last accessed October 4, 2016.

[5] Statistical Communique of the People's Republic of China on the 2013 development of social services.

[6] Another incentive for the MOH to increase the coverage of rural health insurance is because the government provides financial subsidies for each enrollee and the size of the budget increases with the number of enrollees. For example, in 2015, a 420 RMB government subsidy per enrollee was provided by the central and local governments combined.

Mental Health Care; however, Mental Health Care, although an important public health issue, is not the core responsibility or a major task for either MCA or MOH and, in particular, has not been listed in the action plans of the State Council in recent years. Nonetheless, both ministries have managed and operated mental hospitals.

Since the early 2000 s, the budget-making process in China follows a formal procedure called "two-ups" and "two-downs" ("Liang Shang Liang Xia") (Niu 2011). Under that procedure, each individual governmental department submits budgetary estimates initially to Ministry of Finance (MOF), but then must adjust the budget for resubmission after a ceiling on its budget ("Kong Zhi Shu") is set by MOF.[7] In the two-round procedure, the budgets eventually allocated to individual government departments largely are exogenously determined (i.e., subject to the ceilings imposed by the MOF). In practice, it is observed that the budgetary decision-making process is very fragmented amongst MOF and the other ministries. The MOF determines ministerial budgets largely on the basis of available fiscal resources rather than on changes in the financial requirements of policy programs (Wang 2014). In other words, given the fragmented decision-making structure, the MOF is unlikely to adjust budgets dynamically in line with the changing demands of individual public policy initiatives. Hence, the budget allocated to each government department can be treated as given.

As stated in the quotation at the beginning of this article, the Chinese government makes policy according to a decision rule known as "delegation by consensus" (Shirk 1993). If both the MCA and the MOH stick to their department-specific preferences without coordination, they may not be able to realize their objectives given the budget constraint. Thus, they cannot reach consensus. The ministries' different budgetary priorities then either will be tabled or referred to a higher-level authority, e.g., the premier or vice-premier of the State Council, for resolution. As explained previously, the MOF makes decisions about budget allocations, it is not likely to be involved in managing social programs directly, however, because the function of each government department in the post-Mao era increasingly has been differentiated and professional knowledge is required for policy making.[8] Alternatively, the two ministries might logroll, i.e., exchange favors regarding each other's existing policy responsibilities at the expense of one that is not essential for either of them. In reality, MOH supports the Dibao program by allowing Dibao recipients automatically to be eligible for subsidies and sometimes free healthcare services in urban hospitals/clinics under the urban medical assistance programs.[9] In that way, MCA can provide more benefits to Dibao recipients, while MCA receives funding to cover some of the medical expenses incurred by the Dibao program's beneficiaries. In exchange, MCA pays the insurance premiums for poor households[10] in rural areas from the medical assistance fund that it manages. MOH then can increase the number of enrollees and, hence, manage a larger budget. In contrast, Mental Health Care, which is not a priority for either of the two ministries, receives insufficient funding. That situation also resembles Niskanen's (1971) analysis of bureaucracy wherein he distinguishes between an agency's total budget (our

[7] See MOF's website, http://www.mof.gov.cn/zhuantihuigu/2006ysbgjd/bjzl/200805/t20080519_23194.html.

[8] See Huang (2013).

[9] The free treatments that the Dibao recipients can receive include a basic package of services and drugs according to the decision of MOH.

[10] Note that these poor households are defined as poor households who have difficulties to afford medical fees and these poor households are not necessary to be Dibao recipients.

budget constraint) and its discretionary budget, to be allocated to more parochial purposes. Figure 1 shows how MOH and MCA exchange favors.

Logrolling may be problematic if no third party guarantees the enforcement of the agreement (Shirk 1993, p. 127). However, in China, the following institutional arrangements facilitate ministries' commitments to the exchange of favors. First, the expectation that logrolling will take place stabilizes the logrolling process (Enelow 1986). Second, a committee system serves as a means of enforcement (Weingast and Marshall 1988). For example, inter-ministerial joint conferences ("Lianxi Huiyi") among representatives from MOH, MCA and other government departments regularly have been held since 2003 to discuss Dibao, Rural Health Insurance, and Mental Health Care.[11] Moreover, some future logrolling deals are institutionalized in policy documents released jointly by the ministries involved. For example, in the guidelines for medical assistance released in 2009 (jointly issued by MOH, MCA and the MOF), the roles and responsibilities of different government departments are stated explicitly.[12]

The remainder of the paper proceeds as follows. Section 2 presents our model of autocratic logrolling and compares it to more familiar legislative bargaining process. The main point of the model is to show the significant distortions in resource allocation associated with logrolling. Section 3 tests the existence of logrolling between MCA and MOH. Section 4 describes the inefficient policy outcomes regarding Dibao, while Sect. 5 describes similar outcomes for Rural Health Insurance and Mental Health Care. The final section concludes. Details for the theoretical and empirical models can be found in online Appendices A and B.

2 Inefficient policy outcomes and autocratic logrolling

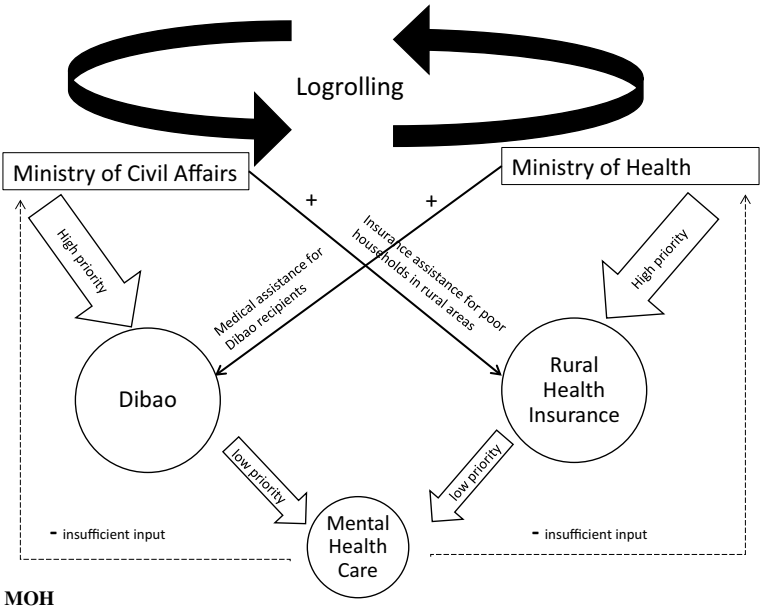
Logrolling can be defined as an informal agreement whereby one agent supports the favorite project of another agent in exchange for latter's support of its own preferred project, though neither agent likes the other's.[13] Thus, in logrolling, we observe agents who are highly interested in one particular project, and only mildly interested in others. That is exactly the case of MCA and MOH for Dibao, Rural Health Insurance and Mental Health Care. What are the consequences for resource allocation of logrolling between the two ministries? The intuition is that spending on the two ministries' most preferred goods (Dibao and Rural Health Insurance) will be excessive and under spending on the two ministries' less preferred goods (Mental Health Care), which is similar to a public good with no directly accountable agents, i.e., residual claimants. Whereas any model wherein a public good has no residual claimant would end up being underprovided (Grossman and

[11] For rural health insurance, eleven ministries including MOH and MCA have been involved. Representatives from MCA and MOH are appointed as deputy coordinators of this joint conference.

For medical assistance program, MOH, MCA and other ministries hold regular working meetings to coordinate their policies for the recipients of medical assistance program. For mental health care, the joint conferences have regularly been held since 2006, where both MCA and MOH sit in the conference.

[12] According to this guideline, households under Dibao must be covered by the medical assistance programs and appointed health care institutions will provide both inpatient and outpatient services to these families. Additionally, Rural Health Insurance premiums for rural low-income households should be covered by the medical assistance fund. See http://www.mca.gov.cn/article/zwgk/fvfg/zdshbz/200906/20090610031974.shtml accessed on June 24, 2016.

[13] Bernholz (2012).



MOH
Major duty: Rural health financing. Minor duty: Mental health care. Reasons for logrolling: MCA's support may increase the number of enrollees of rural health insurance. Arena of logrolling: Joint conference among ministries. Policy instruments for logrolling: Providing subsidized health care services to Dibao beneficiaries.

MCA
Major duty: Providing monetary means for urban poor. Minor duty: Mental health care. Reasons for logrolling: MOH's support may improve the economic conditions for enrollees of Dibao program. Arena of logrolling: Joint conference among ministries. Policy instruments for logrolling: Subsidizing the rural poor to join rural health insurance.

Fig. 1 Logrolling between MCA and MOH

Helpman 2001; Padro i Miquel 2007), our model shows that the distortion in resource allocation under autocratic logrolling is more grave and systematic than the usual case of a legislatively provided public good. The next subsection presents a simple model showing the difference between autocratic logrolling and legislative bargaining. In particular, our analysis of the policy outcomes will illustrate show the peculiar characteristics of inefficiency in an autocratic logrolling processes. That result addresses our descriptive analysis of the actual inefficient policy outcomes regarding Dibao, Rural Health Insurance, and Mental Health Care in China. The test of causal relations between the inefficiencies and logrolling are presented in later sections of this article.

2.1 A simple logrolling model

What are the main differences between democratic and autocratic logrolling? We believe that in democratic systems, logrolling involves agents who trade their votes on policy platforms, i.e., on complex mixes of different policy measures, the case of implicit logrolling as defined in Tullock (1970), or of closed rules on proposals reported out of legislative committees as defined in Baron and Ferejohn (1989). In the Chinese autocratic system, logrolling involves agents who support one policy issue they care little about in exchange for

the other's support on a policy issue that is much more important to them. Thus, sequential bargaining on each specific proposal arises and the set of policy issues is implemented if and only if full consensus is reached.

Therefore, modelling logrolling means considering specific sequential bargaining protocols. We aim to capture the main features of logrolling in autocracies and in democracies in the simplest possible ways so to reach a clear conclusion on allocative inefficiency, comparing equilibrium outcomes in autocratic and in legislative logrolling. We consider the simplest variant of the legislative bargaining framework proposed initially by Baron and Ferejohn (1989): in an autocracy, each interest group proposes a policy limited to its own parochial concerns, and the implementation must achieve full consensus among all agents; in a democracy, the proposer chooses a general platform to be voted on. In both cases, the proposals are constrained by budget balance rules and if no agreement emerges, a default outcome, normally the status quo ante, prevails.

As usual, we assume complete information and that the groups' policy proposals are known perfectly and observable. The situation we analyze involves two distinct and homogeneous interest groups α and β, so that each interest group can be seen as a single player. The interest groups' are distinguished by their payoff functions, $U^i(h, x, y)$, $i \in \{\alpha, \beta\}$, where h is a pure public good without a clear bureaucratic beneficiary, x is the good relevant for group α, and y is the good relevant for group β. Without loss of generality, we consider (h, x, y) in percentages, so that $(h, x, y) \in [0,1] \times [0,1] \times [0,1]$ and $x + y + h \leq 1$. The payoff functions, $U^i(h, x, y)$, are assumed to be smooth and concave such that $\frac{\partial U^i(h,x,y)}{\partial h} > 0$, $\frac{\partial U^\alpha(h,x,y)}{\partial x} > 0$, $\frac{\partial U^\alpha(h,x,y)}{\partial y} = 0$, $\frac{\partial U^\beta(h,x,y)}{\partial y} > 0$, $\frac{\partial U^\beta(h,x,y)}{\partial x} = 0$, i.e., each group is interested in the public good and its own relevant good but not in the other player's relevant good. Moreover, to model the idea that players care more for their own than for pure public good we assume $\frac{\partial U^\alpha(h,x,y)}{\partial x} > \frac{\partial U^\alpha(h,x,y)}{\partial h}$ and $\frac{\partial U^\beta(h,x,y)}{\partial y} > \frac{\partial U^\beta(h,x,y)}{\partial h}$. Finally, we assume a form of local symmetry, i.e., $\frac{\partial U^\alpha(h,x,y)}{\partial h} = \frac{\partial U^\beta(h,x,y)}{\partial h}$, $\frac{\partial U^\alpha(h,x,y)}{\partial x} > \frac{\partial U^\beta(h,x,y)}{\partial y}$.

Using the budget constraint $x + y + h \leq 1$, we rewrite the payoff functions with obvious abuse of notation, as $U^\alpha(1 - x - y, x)$ and $U^\beta(1 - y - x, y)$. As a result, our assumptions guarantee that the best reply functions $BR^\alpha(y)$ and $BR^\beta(x)$ are well defined. The timing is as follows:

1. one of the interest groups, say α, is chosen to make its policy proposal $x^{\alpha L} \in [0,1]$;[14]
2. the other player, β, chooses whether to support α's proposal, i.e., $c^\beta \in \{Y, N\}$;
3. β chooses its policy proposal, $y^{\beta L} \in [0,1 - x^{\alpha L}]$;
4. α chooses whether to support or not β's proposal, i.e., it chooses an action $c^\alpha \in \{Y, N\}$;
5. If the two players supported each other's proposal, i.e., if $c^\beta = c^\alpha = Y$, we say that a logrolling bargain $(h^{\alpha L}, x^{\alpha L}, y^{\beta L})$ is forged, where $h^{\alpha L} = 1 - x^{\alpha L} - y^{\beta L}$, and the proposals in the logroll are implemented;
6. Otherwise, if any player rejected the other's policy proposal, we say that logrolling failed. Then a default outcome (h^D, x^D, y^D) is implemented and both players receive a reserve utility,

$U^D = \theta$ such that $\theta \leq U^\alpha(0,1,0) = U^\beta(0,0,1)$.

[14] Using β would be immaterial because of symmetry.

7. The other group β chooses whether to accept or to reject the proposal.
8. If accepted, the proposal is implemented; if not, a default outcome (h^D, x^D, y^D) is implemented, such that both players will get a reserve utility $U^D = \theta < U^{\alpha}(0,1,0) = U^{\beta}(0,0,1)$.

Note that only one round of proposals is permitted, and amendments are not allowed.[15] As a comparison to emphasize the distortion from autocratic logrolling, we consider a simple legislative bargaining process, adapting to this setting the models discussed in the seminal works by Baron and Ferejohn (1989), Persson (1998) and Persson and Tabellini (2000). The timing of this legislative bargaining is as follows:

1. One of the interest groups, say α, makes a policy proposal platform ($h^{\alpha LB}$, $x^{\alpha LB}$, $y^{\beta LB}$);[16]
2. The other player, β, chooses whether to accept or to reject proposal.
3. If accepted, the proposal is implemented; if not, a default outcome (h^D, x^D, y^D) ensues such that both players will get a reserve utility $U^D = \theta < U^{\alpha}(0,1,0) = U^{\beta}(0,0,1)$.

For generic payoff functions, the conditions are too complex to derive precise equilibrium properties for the subgame perfect equilibrium outcome in both games. However, we can prove the following result for the equilibrium provision of the public good without a clear bureaucratic beneficiary.

Theorem 1 *Denoting the utilitarian efficient allocation by (h^E, x^E, y^E) and supposing that the previous assumptions on the payoff functions are satisfied, then*

$$h^E \geq x^E = y^E,$$

while the subgame perfect outcome of the autocratic logrolling game (indicated by superscript L) and the quantity of the public good provided without a clear bureaucratic beneficiary, $h^{\alpha L}$ will be suboptimal and smaller than the quantity of the public good provided with legislative bargaining (indicated by superscript LB), $h^{\alpha LB}$.

In general,

$$\begin{aligned} h^{\alpha L} &\leq h^{\alpha LB} \lesseqgtr h^E, \\ x^{\alpha L} &\geq x^{\alpha LB} \lesseqgtr x^E, \\ y^{\alpha L} &\lesseqgtr y^E \geq y^{\alpha LB}. \end{aligned} \tag{1}$$

Proof can be found at online Appendix A.

Several interesting points are worth noting. First, the allocation is suboptimal in both situations. However, the distortion caused by autocratic logrolling is more severe and systematic, as the pure public good provided is systematically smaller. Under legislative bargaining, excessive spending on goods with clear bureaucratic advocates and, consequently, inefficient provision of goods with no clear bureaucratic advocate is possible, but not necessary and systematic. The result means that the problem of policy overreaching is more severe under autocratic logrolling. Second, the first-mover advantage we observed in the case of legislative bargaining is less important in the case of autocratic logrolling.

[15] In the jargon of the legislative bargaining literature, we are thus considering a closed rule.

[16] Using β would again be immaterial because of symmetry.

The foregoing findings highlight the fundamental difference between autocratic logrolling and legislative bargaining. With legislative bargaining, one player's gain is at the expense of the other player's welfare, whereas with autocratic logrolling effective coordination between the interest groups can increase their mutual benefit at the expense of society's welfare. Thus, the under-provision of public goods is more severs under autocratic logrolling. In summary, according to our model, autocratic logrolling between MOH and MCA should result in inefficient policy outcomes owing to overreaching in both the Dibao and rural health insurance programs (the particular interests of MCA and MOH), and insufficient budgetary resources for mental healthcare (the public good).

In Appendix A, we consider two specific payoff functions, such that the quantity of public good provided through autocratic logrolling is zero, so to derive closed-form solutions.

3 Empirical evidence on the existence of autocratic logrolling

In this section, we test empirically the existence of logrolling between MCA and MOH by examining provincial-level budget allocations. Following the literature on logrolling (Stratmann 1992), the following empirical model is used to verify the existence of interministerial logrolling:

$$Y_{D,i,t} = \gamma_{D,R} Y_{R,i,t} + \beta_D X_{D,i,t-1} + \mu_i + \varepsilon_{D,i,t}, \tag{2}$$

$$Y_{R,i,t} = \gamma_{R,D} Y_{D,i,t} + \beta_R X_{R,i,t-1} + \mu_i + \varepsilon_{R,i,t}, \tag{3}$$

where $Y_{D,i,t}$ is the allocation of resources to MOH's support for Dibao, $Y_{R,i,t}$ is MCA's budgetary support for Rural Health Insurance, and $X_{D,i,t-1}$ and $X_{R,i,t-1}$ are control variables to capture other factors that can influence the allocations of resources to those two spending programs. The budgets for Mental Health Care also are taken into account. Lagged values of the control variables are entered since they are predetermined; μ_i is a provincial dummy.

If logrolling takes place between the two ministries, then $\gamma_{D,R}$ and $\gamma_{R,D}$ are expected to be positive and significant, as those result indicate that support for Rural Health Insurance can explain support for Dibao and vice versa. One could also interpret positive $\gamma_{D,R}$ and $\gamma_{R,D}$ as showing Rural Health Insurance and Dibao to be complementary. However, we can rule out that possibility because Rural Health Insurance and Dibao are independent programs. First, the two programs target two different, albeit somewhat overlapping groups of beneficiaries. Dibao targets urban and rural low-income households and Rural Health Insurance targets all rural households.[17] Second, programmatic eligibility for Rural Health Insurance and Dibao differs considerably. Rural Health Insurance is a voluntary program and any rural household can participate, whereas Dibao is a means-tested program for which only low-income households are eligible. Thus, a positive relation between $Y_{D,i,t}$ and $Y_{R,i,t}$ in our empirical model would be significant evidence for the existence of logrolling.

3.1 Data

The time span of our data runs from 2007 to 2013 (i.e., 7 years). The relevant information is taken from the China Civil Affairs Statistical Yearbook and China Health Statistical Yearbook. We measure MOH's support for Dibao as that program's share of the total

[17] Both Dibao and rural health insurance require that a household rather than an individual as a basic unit.

government health budget. Similarly, we measure MCA's support for Rural Health Insurance as the proportion of the total civil affairs budget allocated to that program. Spending on Mental Health Care as a share of total health and civil affairs expenditures measures support for the third program. The control variables include total government expenditures per capita, expenditures for Rural Health Insurance as a share of the budget, the population density of hospital doctors, and the urbanization rate.

Note that during the period being studied, some regions experienced severe natural disasters, such as the fatal earthquake in Sichuan province that claimed hundreds of thousands of lives in 2008. When a natural disaster is of sufficient magnitude, logrolling will break down, since the central government will intervene in disaster relief efforts and change the funding allocation patterns for the programs managed by the two ministries. Therefore, periods with major natural disasters were excluded from our sample. We defined the magnitudes of natural disasters of a province in certain years as the ratio of local economic losses to local fiscal revenue. We use 20% as the threshold ratio for economic losses in our data analysis.[18] Detailed summary statistics can be found in the Appendix.

3.2 Results

The regression results reported in Table 1 support the logrolling hypothesis. Columns 1 and 2 show the regression results for the observations in which no large-scale natural disasters occurred. We can see that MOH's spending on medical assistance is positively associated with that of MCA (although not statistically significant). MOH's support for Dibao and MCA's support for Rural Health Insurance are significantly and directly related to one another: a 1% increase in MOH support for Dibao leads to can a 0.3% increase in MCA's support for Rural Health Insurance. Note that the finding falls apart when disaster periods are included (See the Appendix). One caveat in interpreting the positive correlation between spending is that some unobserved time-variant factors may influence the budget allocations to both ministries simultaneously.

4 Autocratic logrolling and inefficiency in Dibao

According to the predictions from the theoretical model, autocratic logrolling between MOH and MCA should result in inefficient policy outcomes in all three programs (Dibao, rural health insurance and mental health care). In this section, we test whether logrolling among the ministries causes inefficient allocation of resources to Dibao.

4.1 Inefficiency in Dibao

After MCA and MOH trade budgetary support, a Dibao recipient also is entitled to claim benefits from MOH's complementary social assistance programs (e.g., urban medical assistance program). Hence, the resources allocated to Dibao recipients may be inefficiently too large. That inefficiency is evident in Dibao's crowding out of unemployment insurance, whose aim is to protect workers financially if they lose their jobs. It is meaningful to study the interactions between Dibao and unemployment insurance because they

[18] The threshold of 20% is chosen because the mean of economic losses as a share of fiscal revenue is 20%.

should not crowd out each other even in the absence of resource misallocations. However, if Dibao crowded out unemployment insurance that would mean that the resources allocated to Dibao recipients are inefficiently too large. We will show that such inefficiency is explained by ministerial logrolling.

Note that while the direct benefit to Dibao recipients itself is sufficiently modest,[19] the aggregate Dibao benefit (including medical assistance and related programs) may exceed the net benefit from unemployment insurance.[20] In addition, unemployment insurance enrollees are required to pay premiums to qualify for benefits (about 1% of their salaries), but no premium is required to participate in Dibao. Importantly, Dibao is a means-tested program, implying that people can claim Dibao only when their incomes are lower than the Dibao-qualification line. People usually collect benefits from at most only one program because the annual cash transfers from unemployment insurance are much higher than needed to become eligible for Dibao.[21]

While it is compulsory for formal sector workers to enroll in unemployment insurance, informal sector workers, who are subject to less intensive enforcement of social insurance regulations, may have incentive to opt out of the unemployment insurance program and claim Dibao if they become unemployed (Qian and Mok 2016).

The crowding out effect may cause welfare losses in two ways. First, misallocation of resources among households is an issue. Some poor households marginally above the poverty line are not eligible for claiming the Dibao benefit. However, households claiming Dibao, who receive cash transfers as well as benefits from other safety net programs, may actually have more purchasing power than the marginal households. Second, the crowding out effect may result in an under-coverage by Dibao. With the crowding out effect, some workers who could have been covered by unemployment insurance are claiming Dibao benefits. Local governments with limited fiscal capacities may set the Dibao line in a relatively conservative manner if the number of potential recipients is beyond the reach of their budgetary resources (Ravallion 2007).

One stylized fact supporting crowding out is that many more urban workers participate in another social insurance program—the Basic Pension Scheme (BPS)—than in unemployment insurance. From Fig. 2, we can see that only 40% of the urban labor force is registered in unemployment insurance while more than 60% of them register for the Basic Pension Scheme. Both BPS and unemployment insurance are compulsory for the urban labor force and, in principle, the enrollment rates should be similar. Furthermore, from official statistics, most of the people enrolled in Dibao are unemployed or flexibly employed (about 60% in 2013), so we can infer that many of those who choose not to pay unemployment insurance premiums opt to join Dibao instead.

4.2 Estimation methods and results

To test whether MOH's support causes inefficiently large allocations of resources to Dibao, we only need to test whether the benefits associated with urban medical assistance crowds out unemployment insurance. We therefore estimate the following model:

[19] The direct Dibao benefit, which is in the form of cash transfer, is allocated to urban households whose incomes fall below a threshold value. The annual cash transfer was RMB 4,000 per recipient in 2012.

[20] The annual benefit for unemployment insurance was about RMB 8,800 per recipient in 2012.

[21] For example, between 1997 and 2011, the ratio of unemployment insurance benefit to Dibao benefit varied between 1.5 and 2.3 (China Civil Affairs Statistical Yearbook; China Human Resources and Social Security Yearbook, various years).

Table 1 Without large scale natural disasters: mutual support between MOH and MCA can explain each other

	MOH support for Dibao	MCA support for rural insurance
MCA support for RI	0.158 (2.009)	
MOH support for Dibao		0.0304** (0.0155)
MOH input for mental care (lagged)	0.00174 (0.00393)	
MCA input for mental care (lagged)		2.478 (4.172)
Rural health insurance (lagged)	0.0571*** (0.0131)	
Doctors (lagged)	0.785 (0.498)	
Dibao (lagged)		− 0.0247 (0.362)
Urbanization (lagged)		− 2.175*** (0.322)
Disposable income (lagged)	− 0.145*** (0.0480)	0.0261*** (0.00739)
N	128	128

Standard errors in parentheses and clustered by province (31 clusters)

*$p < .1$, **$p < 0.05$, ***$p < 0.01$

$$UI_{i,t} = \beta Med_A ss_{i,t} + \delta X_{i,t} + \omega_t + e_{i,t}, \tag{4}$$

where the dependent variable $UI_{i,t}$ is the ratio of the number of unemployment insurance enrollees to the number of employees in city i during year t. $Med_A ss_{i,t}$ is the amount of government health expenditures per person, which is the proxy for measuring the complementary Dibao benefit for urban medical assistance programs supported by MOH. Medical assistance expenditures have been counted as a subcategory of government health expenditure since 2007. $X_{i,t}$ are the covariates, including Dibao's direct benefit, fiscal expenditure per capita, the unemployment rate and city-level gross products per capita. ω_t is a set of yearly dummy variables. If a crowding-out effect between urban medical assistance programs and unemployment insurance exists, the number of enrollees in unemployment insurance should decline with the urban medical assistance benefit.

Evidence for crowding-out is shown in the regression results reported in Table 2. Column (1) indicates that the direct Dibao benefit is not correlated significantly with the number of enrollees covered by unemployment insurance. In column (2), we enter MOH-supported social assistance (i.e., medical assistance) as another independent variable. The coefficient for the direct Dibao benefit remains statistically insignificant. It confirms the earlier result that direct Dibao benefit does not crowd out unemployment insurance. However, the coefficient of MOH-supported social assistance is negative and significant. One standard deviation above the mean of MOH-supported social assistance reduces the number of enrollees under unemployment insurance by 3.3%, a result suggesting that urban medical social assistance may crowd out unemployment insurance, implying that many urban residents have avoided unemployment insurance because the aggregate Dibao benefit

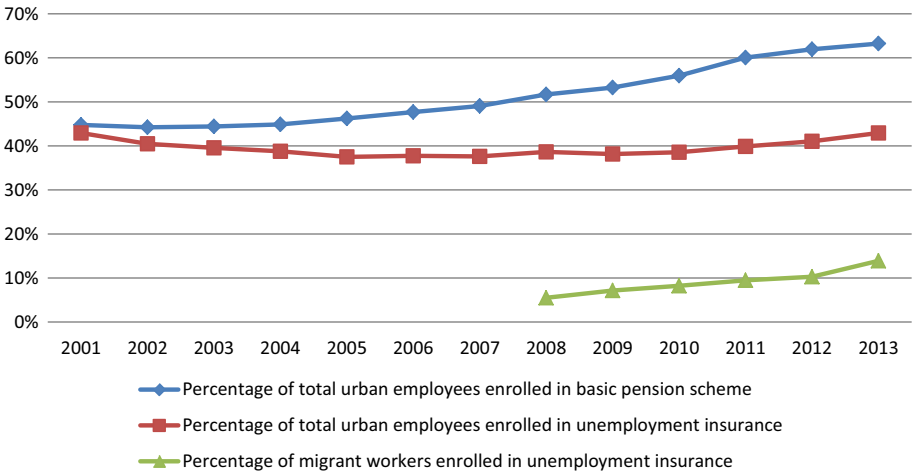


Fig. 2 Share of enrollees in unemployment insurance and basic pension scheme in total urban labor force *Source*: Ministry of human resources and social security: statements of social insurance, various years

Table 2 Crowding out between MOH-supported social assistance and unemployment insurance

	(1) Unemployment Insurance	(2) Unemployment Insurance	(3) Unemployment Insurance
MOH-supported social assistance		− 20.65** (9.002)	
Direct benefit of Dibao	− 1.987 (2.590)	− 1.683 (2.520)	− 2.079 (2.585)
Education assistance			1.935 (2.457)
Fiscal expenditure	0.431 (0.331)	0.543* (0.326)	0.424 (0.330)
Average income	0.428* (0.236)	0.491* (0.251)	0.413* (0.234)
Informal sector size	0.309 (15.74)	− 1.335 (15.26)	0.476 (15.70)
Gross product	0.0872 (0.0646)	0.0912 (0.0645)	0.0809 (0.0667)
Unemployment	31.38 (70.71)	28.32 (69.75)	32.01 (71.35)
Year dummy	Yes	Yes	Yes
N	789	789	789
overall R^2	0.135	0.175	0.134

Standard errors in parentheses, standard errors are clustered by city (277 clusters)

*$p < .1$, **$p < 0.05$, ***$p < 0.01$

(but not its direct benefit) exceeds the net unemployment insurance benefit. Our findings also suggest that the crowding-out effect is a result of logrolling, since the complementary social assistance programs from other ministries have raised the aggregate Dibao benefit. A detailed description of the data underlying Table 2 can be found in the Appendix.

Moreover, we use the level of government educational expenditures as a placebo for checking whether urban education assistance can have an effect similar to that of urban medical assistance. Government education spending is managed by the Ministry of Education, which targets poor urban households. The Ministry of Education, unlike the Ministry of Health, has little authority overlapping the Ministry of Civil Affairs. Our model, in case at hand, will predict that educational assistance, which is proxied by government education expenditures, will not crowd out enrollment in unemployment insurance. In Column 3 of Table 2, we find that educational assistance is not associated significantly with the number of unemployment insurance enrollees, implying no crowding out. That result supports our arguments that other ministries not involved in the logrolling process do not implement overreaching policies. Those findings also provide support for the robustness of our theory identifying links between the logrolling process and inefficiency in implementing the Dibao program. In the Appendix, we additionally use natural disaster shocks to test the robustness of our theory.

5 Autocratic logrolling and inefficiency in rural health insurance and mental healthcare

According to our model, autocratic logrolling between MOH and MCA should cause overreaching in rural health insurance programs (the salient good for MOH), and insufficient resources for mental healthcare (a public good with no clear bureaucratic advocate). Owing to insufficient Due to data, we cannot test for causality between logrolling and inefficiency in those policies. Here we try to provide a descriptive analysis instead.

5.1 Inefficiency in rural health insurance

With logrolling, MCA would support MOH by subsidizing enrollees in the Rural New Cooperative Medical Scheme (or Rural Health Insurance) using its medical assistance fund. Resource allocations in Rural Health Insurance from the medical assistance fund can be inefficiently too large. Note that unlike the social health insurance programs in developed countries, which usually are mandatory for all citizens, Rural Health Insurance in China is a voluntary program. Many of the rural households in China actually enroll in Rural Health Insurance because they receive subsidies for paying insurance premiums from the medical assistance fund. Inefficiency can be a concern in that context. When enrolling in Rural Health Insurance, many of those households may not claim health insurance benefits because the program's financial protections are insufficient (Wagstaff and Lindelow 2008). Instead, while rural households may register for (subsidized) Rural Health Insurance, they also may enroll in other social health insurance programs that can offer better coverage. For example, migrant workers from rural areas, who participate in Rural Health Insurance, are likely to enroll in urban social health insurance provided by their current host cities. Empirically, we find that along with the Rural Health Insurance scheme's expanding coverage, thanks to MCA's subsidy, the utilization of healthcare services has not risen. Table 3 shows that the number of enrollees subsidized by MCA's medical assistance

Table 3 Inefficiency in rural health insurance coverage and utilization rate of health services

	(1) revenue	(2) inpatients	(3) outpatient	(4) Clinic outpatients
Rural insurance (assisted)	0.0382 (0.669)	− 0.0158 (0.0493)	− 0.177 (1.662)	2.333 (1.957)
Provincial dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes
N	149	149	149	149
adj. R^2	0.918	0.974	0.726	0.887

The table shows a wider insurance coverage is not associated with a higher utilization rate of health services
Controlling for number of beds, doctors, coverage of health insurance, income level, and population age, etc
Standard errors in parentheses and clustered by province (31 clusters)
$^*p < .1$, $^{**}p < 0.05$, $^{***}p < 0.01$

fund for paying Rural Health Insurance premiums (i.e., the variable "rural insurance (assisted)") is not positively associated with the revenue from or the volume of inpatient or outpatient services. Those results suggest that the effectiveness of rural medical assistance, which supports enrollment in Rural Health Insurance, is in question. A detailed explanation of how we generated Table 3 is in the Appendix.

It is also noteworthy that in excess of 100 million people are covered by more than one social health insurance program in China,[22] but they can claim benefits only from one of those social health insurance programs. The total number of enrollees under the three major social health insurance plans[23] in 2013 exceeded 1.37 billion, which is greater than China's total population (1.36 billion, National Bureau of Statistics 2013). Increasing subsidies from other governmental departments are the main reason behind the excessive enrollment rates in rural health insurance.

5.2 Inefficiency in mental healthcare

The allocation of resources to Mental Health Care is inefficiently low.[24] Figure 3 shows that the government funding of mental hospitals as a share of total public health and civil affairs budgets has been declining under the MOH and the MCA. The World Health Organization's (WHO) threshold level is that at least 2% of total health expenditures should be allocated to mental healthcare; spending in China falls short of that threshold.

Empirically, we discover that an undersupply of infrastructure rather than demand-side reasons (e.g., income, education, insurance status) is the major constraint for mental healthcare in China (see Table 4). The supply of infrastructure includes both physical inputs, such as the number of beds in the hospitals, and non-physical inputs, such as the number of hospital-based medical professional. In columns (1) and (2), the estimated coefficients

[22] See http://news.xinhuanet.com/politics/2014-08/15/c 126873413.htm, Accessed Oct 4, 2016.
[23] The three major social health insurance plans refer to Basic Health Insurance, Urban Resident Basic Medical Insurance, and Rural New Cooperative Medical Scheme.
[24] Qian (2012) reviews this in detail.

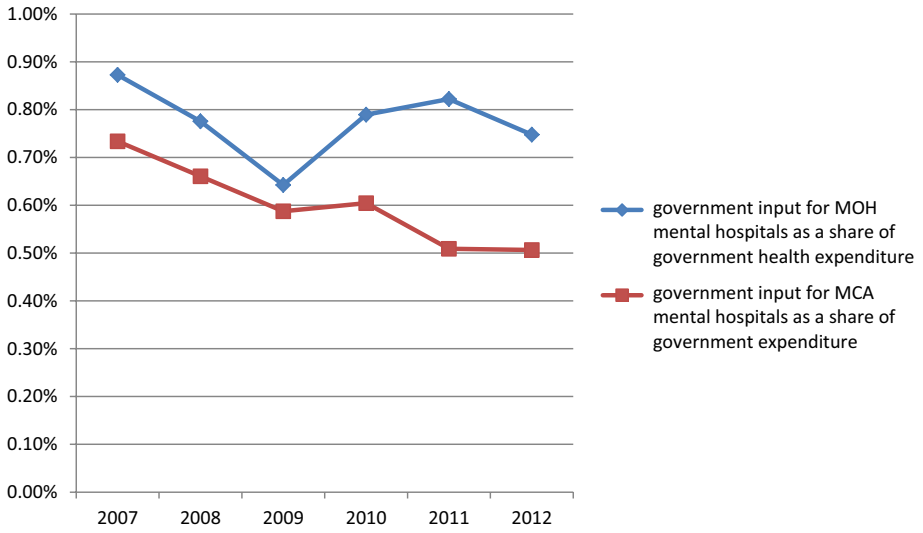


Fig. 3 Government inputs in mental hospitals as a share of total government health expenditure *Source*: China Health Statistical yearbook & China Statistical yearbook, various years

on infrastructure supply are positive and statistically significant. In columns (3) and (4), demand-side factors, such as income, urbanization, the size of the manufacturing sector, and educational level are not statistically significant. The results imply that undersupply of physical infrastructure and human capital non-physical is the major reason for the lack of treatment options for patients with mental diseases in both MCA and MOH hospitals. A detailed explanation of how we generated Table 4 is in the Appendix.

6 Conclusion

The hardest target for social science analysis of Leninist systems like China is the decision-making process that purposefully is kept secret by the Communist Party. This paper is an effort to model the process, predict its outcomes, and test empirically the model and its predictions. We believe that such research is important because public choice has tended to look either at de-institutionalized abstract settings, or to electoral politics in developed democracies. However, authoritarian regimes play important roles in the world, and China's is foremost among them.

This paper works to open the black box of decision-making in contemporary China by studying logrolling among vertically fragmented interest groups, both theoretically and empirically. The theoretical model, although very simple, helped to focus on a specific distortion in resource allocation because of logrolling. Policy outcomes in the presence of logrolling are characterized by excessive spending on interest groups' preferred social programs and insufficient spending on public goods.

The econometric results confirmed the theoretical forecasts in a very robust way. The paper first tests the existence of logrolling between the MCA and the MOH; and then also shows that logrolling leads to inefficiently large resource allocations to Dibao, the major social assistance program in urban China. Dibao recipients are entitled to claim benefits

Table 4 Regression results showing the determinants of utilization of mental healthcare

	(1) MOH inpatients	(2) MCA inpatients	(3) MOH inpatients	(4) MCA inpatients
Doctors	279.4**	4.474**	87.22	5.279***
	(116.2)	(2.124)	(88.64)	(1.789)
Beds	4.737***	1.655	5.097***	1.280
	(1.137)	(1.083)	(0.847)	(1.043)
Education ratio			− 5.262	1.931
			(3.287)	(1.433)
Urban insurance			0.601	0.779
			(1.215)	(0.537)
Industry ratio			3.227	− 0.571
			(2.199)	(1.819)
Disposable income			15.29	0.542
			(9.531)	(4.653)
Provincial dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes
N	212	200	212	200
adj. R^2	0.794	0.129	0.811	0.122

The table shows the supply side reasons (hospital infrastructure, e.g. doctors, beds) are the main constraints on the utilization of mental health care. All the demand sides reasons are not significant

Standard errors in parentheses and clustered by province (31 clusters)

*$p < .1$, **$p < 0.05$, ***$p < 0.01$

from complementary social assistance programs supported by other ministries. As a result of logrolling, the complementary social assistance programs raised the aggregate Dibao benefit, leading to the crowding out of other social programs. These results provide useful insights into the far-reaching consequences of logrolling in policy-making in autocracies.

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References

Baron, D., & Ferejohn, J. (1989). Bargaining in legislatures. *American Political Science Review, 83,* 1181–1206.

Bernholz, P. (1973). logrolling, arrow-paradox and cyclical majorities. *Public Choice, 15,* 87–95.

Bernholz, P. (1978). On the stability of logrolling outcomes in stochastic games. *Public Choice, 33,* 66–82.

Bernholz, P. (2012). From *The calculus of consent* to extended logrolling, negative externalities, and the Coase theorem. *Public Choice, 152,* 265–271.

Buchanan, J., & Tullock, G. (1962). *The calculus of consent: logical foundations of constitutional democracy*. Ann Arbor: University of Michigan Press.
Copelovitch, M. (2010). Master or servant? Common agency and the political economy of IMF lending. *International Studies Quarterly, 54*(1), 49–77.
Crombez, C. (2000). Spatial models of logrolling in the European Union. *European Journal of Political Economy, 16,* 707–737.
Enelow, J. (1986). The stability of logrolling: An expectations approach. *Public Choice, 51*(3), 285–294.
Evans, D. (1994). Policy and pork: The use of pork barrel projects to build policy coalitions in the house of representatives. *American Journal of Political Science, 38*(4), 894–917.
Grossman, G., & Helpman, E. (2001). *Special interest politics*. Cambridge MA and London UK: The MIT Press.
Huang, Y. (2013). *Governing health in contemporary China*. Abingdon and New York: Routledge.
Irwin, D., & Kroszner, R. (1996). Logrolling and economic interests in the passage of the Smoot-Hawley tariff. *Carnegie-Rochester Conference Series on Public Policy, 45,* 173–200.
Miller, N. (1977). Logrolling, vote trading, and the paradox of voting: A game-theoretical overview. *Public Choice, 30*(1), 51–75.
Mueller, D. (2003). *Public choice III*. Cambridge: Cambridge University Press.
Niskanen, W. A. (1971). *Bureaucracy and representative government*. Chicago: Aldine-Atherton.
Niu, M. (2011). Accountability building through budgetary reform: China's experience. In C. Menifield (Ed.), *Comparative public budgeting: A global perspective*. Burlington: Jones and Bartlett Publishers.
Padro i Miquel, G. (2007). The control of politicians in divided societies: The politics of fear. *Review of Economic Studies, 74*(4), 1259–1274.
Persson, T. (1998). Economic policy and special interest politics. *The Economic Journal, 108,* 310–327.
Persson, T., & Tabellini, G. (2000). *Political economics: Explaining economic policy*. London: MIT Press.
Qian, J. (2012). Services for under-treated patients. *Journal of Mental Health Policy and Economics, 15,* 179–186.
Qian, J., & Mok, K. (2016). Dual decentralization and fragmented authoritarianism in governance: Crowding out among social programmes in China. *Public Administration and Development, 36*(3), 185–197.
Ravallion, M. (2007). Geographic inequity in a decentralized anti-poverty program, *World Bank policy research working paper* no 4303.
Riker, W., & Brahms, S. (1973). The paradox of vote trading. *American Political Science Review, 67,* 1235–1247.
Shirk, S. (1993). *The political logic of economic reform in China*. California: University of California Press.
Shirk, S. (2014). The domestic context of Chinese foreign security policies. In S. Pekkanen, C. Ravenhill, & R. Foot (Eds.), *The Oxford handbook of the international relations of Asia* (pp. 391–410). New York: Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199916245.013.0020.
Snyder, J. (1991). *Myths of empire: Domestic politics and international ambition*. New York: Cornell University Press.
Stratmann, T. (1992). The effects of logrolling on congressional voting. *The American Economic Review, 82*(5), 1162–1176.
Stratmann, T. (1995). Logrolling in the US congress. *Economic Inquiry, 33*(3), 441–456.
Tullock, G. (1965). *The politics of bureaucracy*. Washington, D.C: Public Affairs Press.
Tullock, G. (1970). A simple algebraic logrolling model. *The America Economic Review, 60*(3), 419–426.
Wagstaff, A., & Lindelow, M. (2008). Can insurance increase financial risk? The curious case of health insurance in China. *Journal of Health Economics, 27*(4), 990–1005.
Wang, Y. (2014). Addressing three types of alienation in budge making process. *China Reform, 6,* 60–62.
Weingast, B., & Marshall, W. (1988). The industrial organization of congress; or, why legislatures, like firms, are not organized as markets. *Journal of Political Economy, 96*(1), 132–163.