"头重脚轻"的官僚制:
职业锦标赛理论和经验证据

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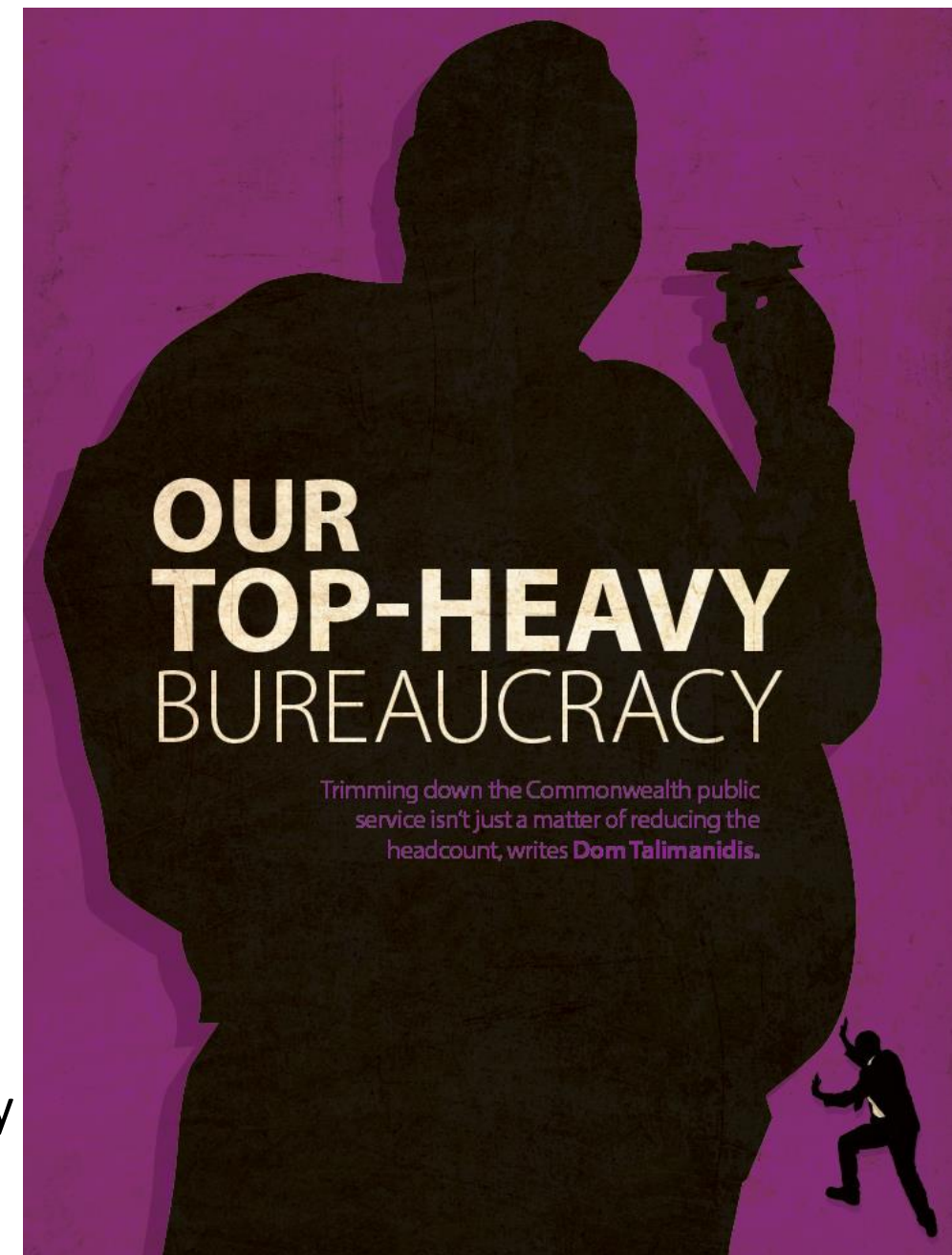
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The top-heavy shape of authoritarian bureaucracy:
the career-tournament theory framework and evidence from Russia and China

Reference:

1) Li, T., & Wang, Z.M. (2023). The top-heavy shape of authoritarian bureaucracy: evidence from Russia and China. *International Review of Administrative Sciences, 89*(3), 703–721. doi.org/10.1177/00208523211058865

2) 朱雯茜. (2023). 地方领导副职规模影响因素研究——基于中国地级市的实证分析(硕士学位论文,澳门科技大学, 指导老师：王振宇)

Motivation

- Too many deputies in the governments of China and Russia. In contrast, there are far fewer deputy in western countries.

- SOC (span of control)
  - the number of subordinates under one superior.

- Bigger SOC at the top in China and Russia than that of western countries.

- Standard prescriptions: SOC should either remain constant or increase when one moves down the levels of the hierarchy (Gulick, 1937; Williamson, 1967).

- We call a bureaucracy *top-heavy* if the SOC is relatively wider at the top of the hierarchy.

OUR TOP-HEAVY BUREAUCRACY

Trimming down the Commonwealth public service isn't just a matter of reducing the headcount, writes **Dom Talimanidis.**

Image source: Talimanidis, D. (2014). Our top-heavy bureaucracy. Institute of Public Affairs Review: A Quarterly Review of Politics and Public Affairs, The, 66(2), 26-27.

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Motivation

- Far more deputies in China than in the USA
  - An comparison of Beijing and Chicago

beijing.gov.cn/gongkai/sld/

市政府领导

崔述强
常务副市长

殷勇
副市长

张建东
副市长

隋振江
副市长

卢彦
副市长

杨斌
副市长

王红
副市长

杨晋柏
副市长

亓延军
副市长

卢映川
副市长

靳伟
副市长

戴彬彬
秘书长

市长：陈吉宁

Mayor of Chicago

Vice mayor [edit source]

In accordance with Illinois law, the city council elects a vice mayor who serves as interim mayor in the event of a vacancy in the office of the mayor or the inability of the mayor to serve due to illness or injury, until the city council elects one of its members acting mayor or until the mayoral term expires. The current vice mayor is Walter Burnett.

The position was created by state law in response to the power struggle over succession that took place following Richard J. Daley's death in office.[9][15][16]
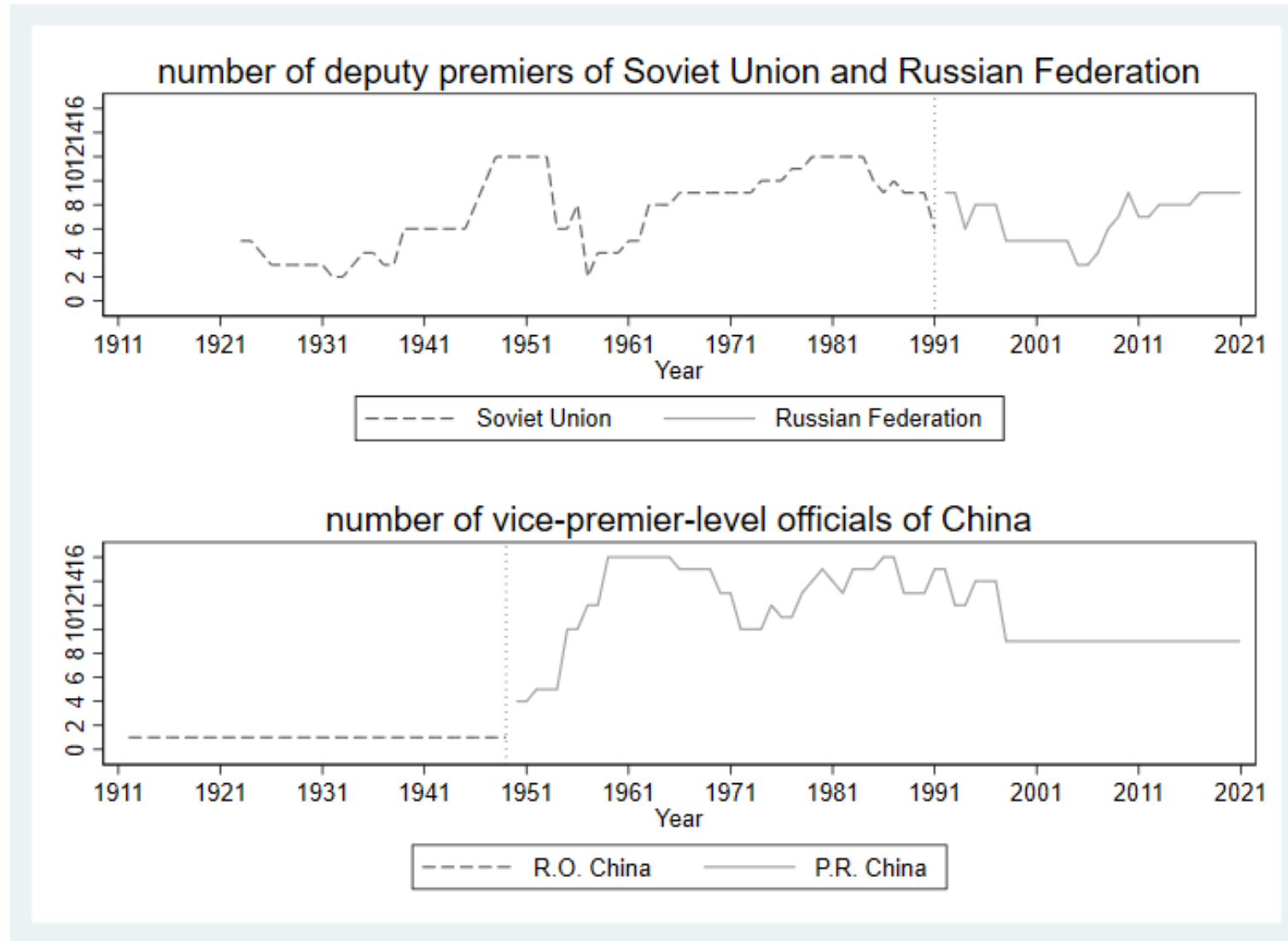
The position is considered to be largely ceremonial.[17][18][19]

If neither the mayor nor president pro tempore can preside over a City Council meeting, then the vice mayor presides.[11]

List of vice mayors [edit source]

Vice-Mayor	Tenure	Mayor(s) serve under	Notes	Citations
Casey Laskowski	1976–1979	Michael Bilandic		[20][21]
Richard Mell	1979–1987	Jane Byrne Harold Washington		[22]
David Orr	1987–1988	Harold Washington Eugene Sawyer	Served as Acting Mayor for 1 week	[8][23][24]
Terry Gabinski	1988–1998	Eugene Sawyer Richard M. Daley		[23][25]
Bernard Stone	1998–2011	Richard M. Daley		[24][26][27]
Ray Suarez	2011–2015	Rahm Emanuel		[17][18]
Brendan Reilly	2015–2019	Rahm Emanuel		[28][29]
Tom Tunney	2019–2023	Lori Lightfoot		[7]
Walter Burnett	2023–present	Brandon Johnson		[30]

Motivation

number of deputy premiers of Soviet Union and Russian Federation

------- Soviet Union ——— Russian Federation

number of vice-premier-level officials of China

------- R.O. China ——— P.R. China

Motivation

(I) Western Ministry

Political Head: Minister (junior ministers)
|
Administrative Head: Top Civil Servant (L3)

Director General $L2_A$ Director General $L2_B$

Director $L1_{A_1}$ Director $L1_{A_2}$ Director $L1_{A_3}$ Director $L1_{B_1}$ Director $L1_{B_2}$ Director $L1_{B_3}$

(II) Soviet Ministry

Minister (L3)

Vice Minister $L2_A$ Vice Minister $L2_B$ Vice Minister $L2_C$

Dept Head $L1_{A_1}$ Dept Head $L1_{A_2}$ Dept Head $L1_{B_1}$ Dept Head $L1_{B_2}$ Dept Head $L1_{C_1}$ Dept Head $L1_{C_1}$

FIGURE 1   Organization tree.

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从"分管"到"辅佐":中国副职问题研究

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1. 南开大学周恩来政府管理学院政治学系   2. 南开大学滨海学院

摘要: 在中国,"分管型副职模式"普遍存在于政府机关、群众组织、事业单位和国有企业。"分管型副职模式"必然与"副职过多"、机构庞大、效率低下等问题相联系。中国现存的所谓"副职问题",其关键不在于职数"多",而在于功能和结构失调,在于分管型副职这种制度安排。因此,结合目前的实际情况并借鉴国外的经验,分阶段、分步骤逐步推动由分管型副职模式向辅佐型副职模式转变,完全可以通过体制调整,从源头上达到削减副职数的目的。

副职分管制的利弊分析

所谓副职分管制,是指在一个组织领导体系中,一个正职领导负责全面的工作,而设置有若干副职领导各自管某些具体领域的工作。至于一个组织内部究竟应该设置多少副职,一般没有明确的规定。

分析起来、副职分管制产生的原因主要有如下几点:其一,是学习前苏联政府体制所产生的结果。在前苏联的政府机构中,较早地设置了副职的职务。这种任实职的行政副职对中国的行政职务设置产生了一定的影响。其二,是政府职能扩张的产物。面对日益扩张的政府职能,要求一名行政首长熟悉所有的领域,对各行业工作进行全面控制,是不现实
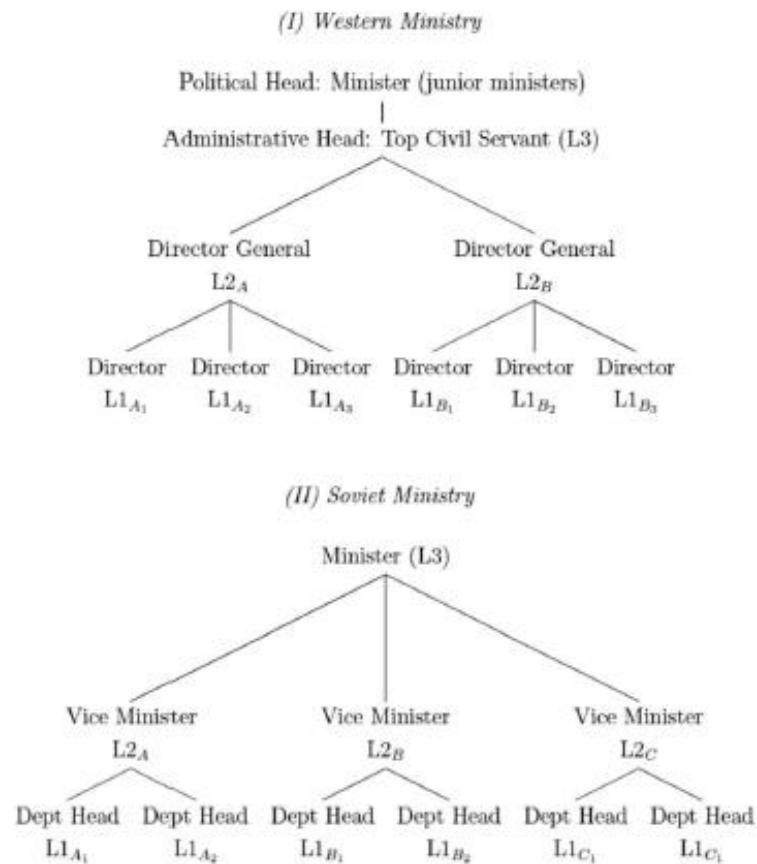
Puzzle(s)

- Why China and Russia nowadays have more top-heavy bureaucracies than other western countries?

- What drives the bureaucracy shape? And why do reforms fail?

- How did the bureaucracy shape evolve in the longer history of China?

- How will the bureaucracy shape develop in the future?

- More specifically, what factors drive the difference in the number of deputies in the prefectures of China? (ongoing work)

Literature Review and Theory

- Tullock (1965, 1974) and Niskanen (1971) focused on the overall size of the bureaucracy.

- Parkinson (1957) suggested that declining bureaucracies may become more top-heavy.

- According to Simon (1976) and Qian (1994), there is a tradeoff between SOC and the number of tiers in a hierarchy.

- Authoritarian bureaucracy, with its extremely centralized power structure, resembles a winner-take-all tournament.

Literature Review and Theory

- Following the Public Choice Theory, developed by Buchanan and Tullock, which sees bureaucrats as economically rational agents, inspired by Tullock (1965, 1974) , Simon (1976) and Qian (1994), our model is designed to understand how the number of players at various stages affects the desirability of a tournament, other than focusing on how prize allocation across stages affects the desirability of a tournament.

- What our research is not about:
  - We do not try to engage with abundant literatures which argue about the relationship between performance tournament and bureaucrats' promotion in today's China.

Model

- Basic Settings
  - We model the top three layers of a bureaucracy as a two-stage career tournament.
  - N identical department heads compete for k positions of deputies;
  - k deputies then compete for one chief position.
  - The chief position carries rent θR, each of the k deputy positions carries rent (1-θ)R/k.

- **Definition 1**. An optimal bureaucracy maximizes total contest efforts $\sum_{j=1}^{N} I_{1j} + \sum_{j'=1}^{k} I_{2j'}$

- **Definition 2**. A perfect winner-take-all bureaucracy has θ=1.

Model

- An official's chance of promotion is decided by a fair lottery, with her chance of winning the lottery proportional to her efforts.
  - In the first stage, $p_{1i}(I_{1i}) = \frac{I_{1i}}{\sum_{j=1}^{N} I_{1j}}$;
  - In the second stage, $p_{2i'}(I_{2i'}) = \frac{I_{2i'}}{\sum_{j'=1}^{k} I_{2j'}}$

- In the second stage, A deputy i' chooses $I_{2i'}$ to maximize her expected gains
  - $E(I_{2i'}) = p_{2i'}R - I_{2i'}$

- The symmetric equilibrium effort level is $(k-1)R/k^2$;

- Therefore, the total equilibrium efforts of the deputies are as follows:
  - $Z_2(k) = \frac{k-1}{k}R$

Model

- a deputy's expected equilibrium payoff is R/k^2
- the total efforts of *N* department heads in the equilibrium can be written as:
  - $Z_1(\text{k}) = \frac{R}{k^2}[\frac{k(N-1)}{N} - \sum_{j=1}^{k-1}\frac{k-j}{N-j}]$
- The total efforts as follows:
  - $Z(k) = Z_1(\text{k}) + Z_2(\text{k}) = R[\frac{(N-1)}{kN} - \frac{1}{k^2}\sum_{j=1}^{k-1}\frac{k-j}{N-j} + \frac{k-1}{k}]$

- **Remark 1**. For a winner-take-all bureaucracy with N > 2, a three-layer bureaucracy (with 1 < k < N) always induces higher total efforts than does an effective two-layer bureaucracy (with k = 0; 1;N).

Model

- **Remark 2**. When the number of deputies increases in a winner-take-all three-layer bureaucracy with N > 2 and 1 < k < N, the total efforts of the deputies increase, whereas the total efforts of the department heads decrease.

  - When k $\uparrow$, $Z_2(\text{k}) = \frac{k-1}{k}\text{R}\uparrow$, $Z_1(\text{k}) = \frac{R}{k^2}\left[\frac{k(N-1)}{N} - \sum_{j=1}^{k-1}\frac{k-j}{N-j}\right]\downarrow$

- **Proposition 1**. When the number of deputies increases for a winner-take-all three-layer bureaucracy with N > 2 and $1 \leq k \leq N$, the total contest efforts first rise and then fall with k. There is a unique optimum at k^*, with $1 < k^* < N$.

Model

- **Proposition 2**. For a three-layer bureaucracy with N > 2 and $1 \leq k \leq N$, suppose the chief position carries rent θR and each of the k deputy positions carries rent (1-θ)R/k. The optimal number of deputies that maximizes the total efforts is a non-decreasing function of θ where k^* is the upper bound when θ=1.

- The optimal number of deputies tends to decline when power is decentralized.

- The SOC of a chief in a winner-take-all bureaucracy should be approximately three times wider than that of his deputies. Such a hierarchy is highly top-heavy.
  - $k^* \approx \sqrt{3N}$-1.38; when N is big enough, k^* can simply be approximated as $\sqrt{3N}$.
  - Dividing the optimal SOC of the chief by the average optimal SOC of the deputies in a winner-take-all bureaucracy, we obtain $\sqrt{3N}$(N/ $\sqrt{3N}$) $= 3$.

Hypotheses

- **Hypothesis 1**: When power is more centralized, the equilibrium optimal number of deputies climbs higher to maximize the total efforts .

- **Hypothesis 2**: Reforms that deviate from the equilibrium optimal number of deputies cannot persist, and are likely to backslash to the equilibrium state.

Some Empirical Evidence

- We define an H index as follows:

  - $H = \dfrac{k}{\sqrt{N}}$

  - Why this way ? $H^2 = \dfrac{k}{N/k}$
  - According to Sir Ian Hamilton, who developed the concept of SOC a century ago, k—the SOC of the chief—should not exceed N/k—the average SOC of the deputies. In other words, Hamilton's principle of SOC is equivalent to H ≤ 1. If H > 1, the bureaucracy is more top-heavy than what is prescribed by Hamilton (Gulick, 1937) and Williamson (1967).

- The former and current communist states (China, Russia and other Eastern Europe countries) have more top-heavy ministry bureaucracy than what is prescribed by managerial theories.
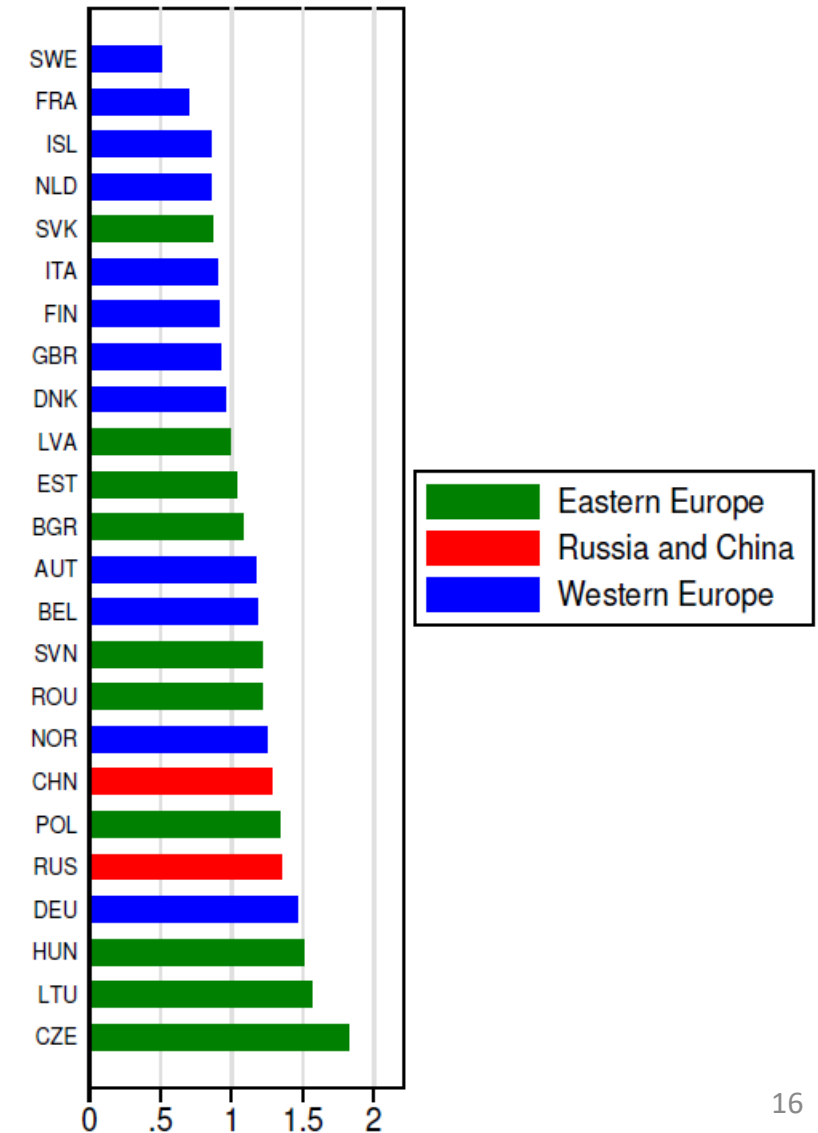
Some Empirical Evidence
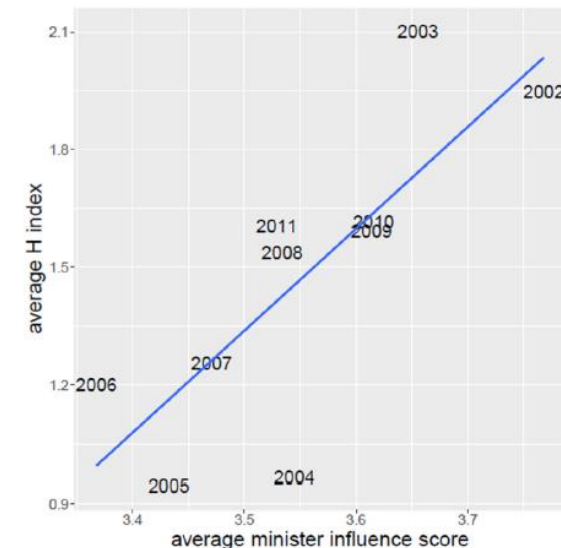
- Evidence from Russia and China
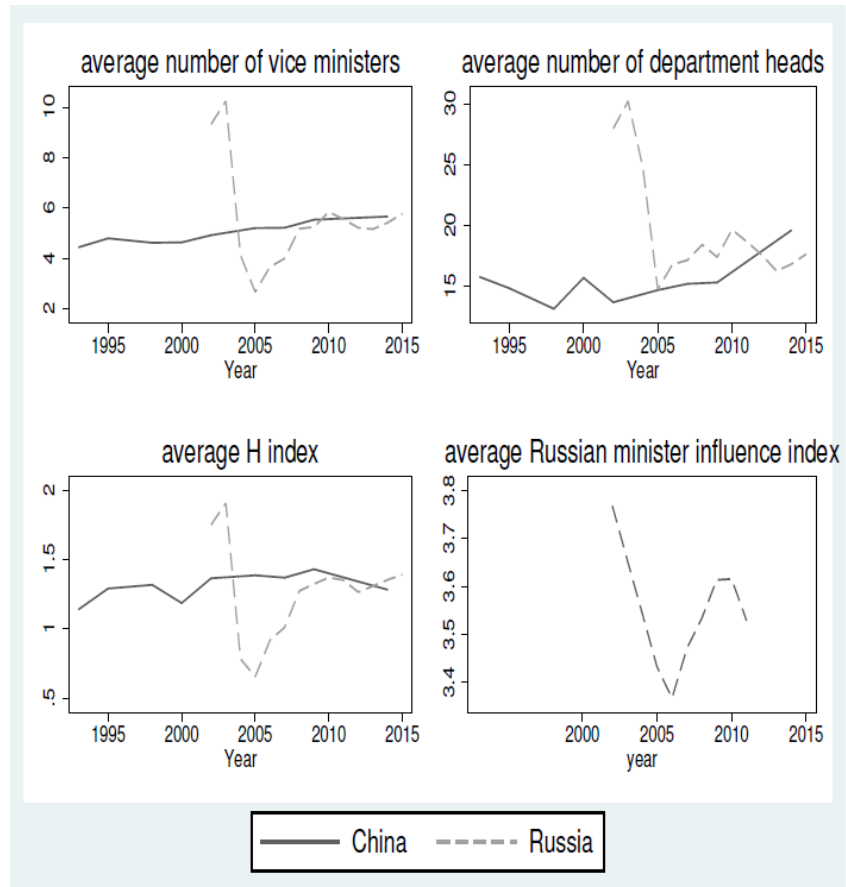
Table 3. How does minister power affect bureaucracy size and shape in Russia
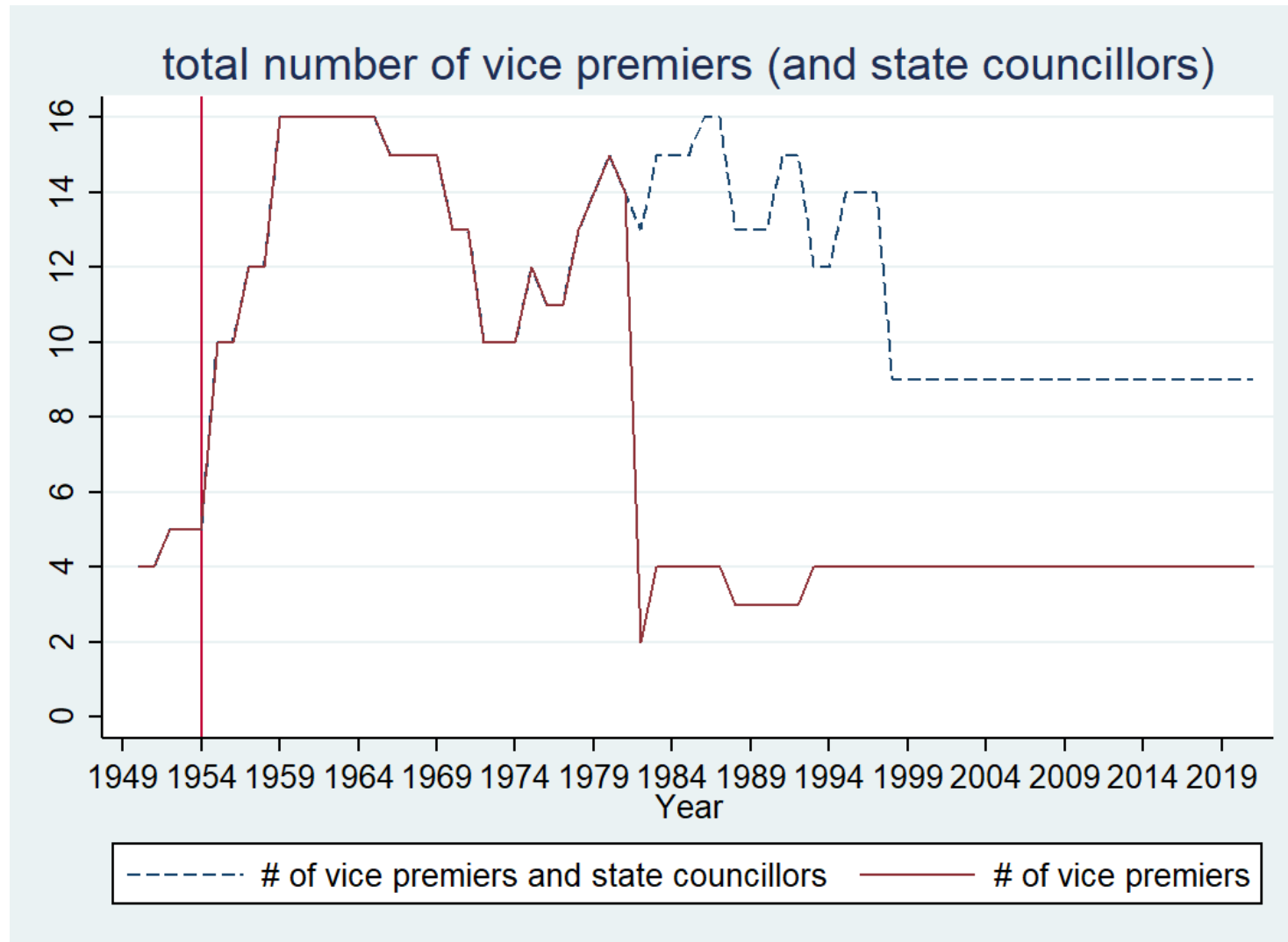
	(1) No. of department heads	(2) No. of vice ministers	(3) H index
Minister power	2.848[†]	1.299*	0.266[†]
	(1.435)	(0.599)	(0.144)
Constant	9.261	1.557	0.509
	(5.081)	(2.122)	(0.509)
Ministry fixed effects	Yes	Yes	Yes
R^2	0.020	0.033	0.043
Observations	102	107	102

Clustered robust standard errors in parentheses.
[†]$p < 0.10$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

The Trend of Ministry Bureaucracy Structures in China and Russia

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Some Empirical Evidence

total number of vice premiers (and state councillors)

Legend: ----- # of vice premiers and state councillors ——— # of vice premiers

Some Empirical Evidence

- According to the new data, the average top-heaviness index of Russian ministries today is higher to 1.742.

- The official webpages in 2021 mix vice ministers with several vice-minister-level officials. The number of effective vice-minister-level officials has nearly doubled over the past few years. the revised top-heaviness index of Chinese ministries today becomes 1.746, which is almost identical with the index in Russia today. The jump probably reflects further power centralization in both Russia and China.

Tentative work on deputies in the prefectures of China

- Results from cross-section data 2022
  - The number of deputies varies a lot, ranging from 4 to 12, with its mean 7.31.
  - In prefectures with lower per capital GDP, the number of deputies is higher.

- Tentative explanations for the result:
  - Institutional legacy: areas with a longer tradition of command economy, have more centralized power (which leads to more deputies) and lower per capital GDP at the same time.

表 5-3 OLS 回归分析結果（N=329）

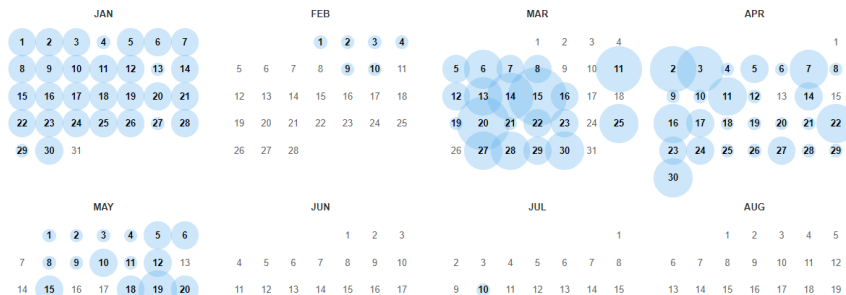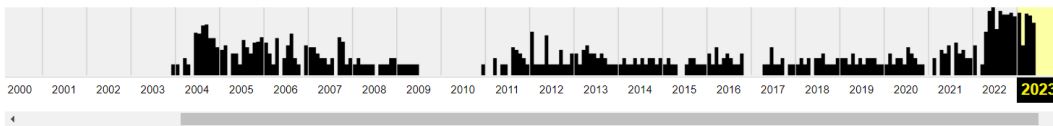|	副職規模		
	模型 1	模型 2	模型 3
控 制 變 量			
轄區面積	1.07E-6	3.26E-6	1.21E-6
自變量			
少數民族比例	1.11**		0.96**
人均 GDP 水平		-0.06**	-0.04**
R^2	0.29	0.24	0.31
ΔR^2	0.84	0.06	0.10
F 值	14.96**	10.26**	11.71**

* $p < 0.05$ ** $p < 0.01$

Ongoing data collection of panel data

- More data that need to collect
  - Numbers of deputies in previous years
  - State-enterprise economy ratio

- Internet Archive
  - Wayback Machine

Conclusion and Discussion

- According to our winner-take-all career tournament model, countries with more centralized power tend to have more top-heavy bureaucracy.
- Both China and Russia's top-heavy bureaucracy can be attributed to their similar Soviet roots.
- We build an H index to quantify top-heaviness, making it clear and more comparable.
- In both China and Russia, after several reforms aiming to lower the number of deputies, reforms constantly failed and backslash to higher top-heaviness.
- With the new trend of power concentration, both China and Russia are getting more top-heaviness than before.

- Empirical measures needs to be more quantitative and straightforward.
  - Need a better measure of power centralization, other than qualitative typology.
- Prefectures in China vary a lot in the number of deputies. It asks for a reasonable explanation with further research.