

EVOLUTION OF INSTITUTIONAL DESIGNS: ENDOGENIZING THE HISTORY OF ALLOCATION PROCEDURES FOR THE INDIAN CIVIL SERVICES*

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ABSTRACT. In India, the allocation of elite civil servants to a particular state matters for that state's development and growth. So, when, how, and why are the institutions governing the allocation of elite civil servants reformed? In this paper, I endogenize the evolution of allocation procedures used to assign Indian Administrative, Police, and Forest Service officers to states across India post-Independence. Using detailed knowledge of the history of matching mechanisms and the civil servants' rank-order preferences, I highlight the constant struggle over allocation procedures between the Prime Minister and the civil service. The Prime Minister wants a more equitable distribution of bureaucratic quality across the country for balanced growth and development. Whereas the civil service wants more weight to be given to their own preferences over where to work. The aspirations of the executive and the bureaucracy remain at odds with one another because bureaucrats' preferences are correlated: avoiding lifelong assignments to underdeveloped areas and conflict zones. I find that over time the institutional pendulum swings between allocation procedures the Prime Minister favors and those that the bureaucracy favors, depending on the strength of the Prime Minister. Strong Prime Ministers (proxied by majority governments) can resist pressure from the bureaucracy. Thereby, they institute allocation procedures that achieve a more equitable balance of bureaucratic quality across the country, albeit by giving bureaucrats' preferences less weight or restricting their ability to express certain types of preferences. On the other hand, weak Prime Ministers (proxied by coalition governments) are more prone to the bureaucracy's pressure. In turn, they institute allocation procedures that give most bureaucrats more preferred assignments, though this comes at the expense of disadvantaged regions systematically receiving lower-quality bureaucrats.

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1. INTRODUCTION

“Institutions are created by human beings. They evolve and are altered by human beings.”
 - North, (1990)

The institutional architecture that governs an organization can sometimes be enduring, yet it can also be susceptible to reform. While institutional change can be driven by external actors who upend the fundamental principles through revolution and overthrow, institutions can also be reformed internally.

The allocation of elite civil servants to particular states across India has been shown to matter for that state’s development and growth (Thakur, 2021). The allocation procedure used to assign these Indian Administrative, Police, and Forest Service (collectively, known as the “All India Services”) officers to states across India post-Independence is a key institutional pillar of the civil service. So when, how, and why are these institutions governing the allocation of elite civil servants reformed?

Generally, answering such macro-level, historical questions primarily relies on verbal accounts and narratives that analyze and try to rationalize the character, philosophy, and mindset of key leaders who undertook such reforms. Instead, I will use detailed knowledge of the history of matching mechanisms and the civil servants’ rank-order preferences therein to give a micro-founded, empirical theory that endogenizes the history of allocation procedures for these elite Indian civil services. This setting and the data allow the construction of crisp counterfactuals allowing me to document the relative sizes of the coalitions that would seek change versus those opposed to reform.

In this paper, I endogenize the evolution of allocation procedures used to assign All India Service officers to states across India post-Independence. I highlight the incessant struggle over allocation procedures between the Prime Minister and the civil service, using detailed knowledge of the history of allocation procedures and the rank order preferences of civil servants in these matching mechanisms. I argue that within the set of relevant actors who can lobby for change/upholding the assignment procedures, the Prime Minister and civil service have different primary objectives. The Prime Minister wants a more equitable distribution of bureaucratic quality across the country for balanced growth and development. Whereas the civil service wants more weight to be given to their own preferences over where to work. I show that these aspirations of the executive and the bureaucracy remain at odds with one another because bureaucrats’ preferences are correlated. Bureaucrats systematically avoid lifelong assignments to underdeveloped areas and conflict zones by ranking such states low on their preference rank orders. I find that over time the institutional pendulum swings between allocation procedures the Prime Minister favors and those that the bureaucracy favors, depending on the strength of the Prime Minister. Strong Prime Ministers (proxied by majority governments) can resist pressure from the bureaucracy. Thereby, they institute

allocation procedures that achieve a more equitable balance of bureaucratic quality across the country, albeit by giving bureaucrats' preferences less weight or restricting their ability to express certain types of preferences. On the other hand, weak Prime Ministers (proxied by coalition governments) are more prone to the bureaucracy's pressure. In turn, they institute allocation procedures that give most bureaucrats more preferred assignments, though this comes at the expense of disadvantaged regions systematically receiving lower-quality bureaucrats.

The paper is organized as follows. Section 2 provides a brief historical overview of the colonial origins of the modern-day All India Services. This helps to establish the underpinnings of today's power structure, key operating procedures, and fundamental objectives and expectations from the All India Services. Section 3 describes the organization and governance structure of modern-day All India Services to underscore who the key players are and their powers and ability to influence institutional reform. Section 4 develops a model highlighting how the tension between the Prime Minister and bureaucracy impacts the design of cadre allocation procedures. I describe the key empirical measures and proxies I use in my empirical tests in Section 5. Section 6 describes the five different cadre allocation procedures that have been implemented from 1966 to the present. I empirically test the model of endogenous institutional reform in Section 7. Lastly, Section 8 highlights how bureaucrats' manipulation of a non-strategyproof mechanism undermines the Prime Minister's objectives.

2. A BRIEF HISTORY: COLONIAL ORIGINS OF MODERN-DAY ALL INDIA SERVICES

In order to appreciate the institutional framework in which the All India Services operates today, it is imperative to consider how this civil service came about. In this section, I briefly overview the history—colonial origins and early nation-building—that led to the establishment of the All India Services post-Independence.

2.1. Pre-colonial origins: The East India Company's Administrators (1600-1857).

The origins of British colonial rule in India began with the East India Company, a joint-stock company founded in 1600 to trade in the Indian Ocean region. As the East India Company's power and influence expanded across the region, the Company's administrators gained increasing power and jurisdiction. These administrators (civil servants) were initially appointed by the Board of Directors, a system often wrought with nepotism. The operations of this Covenanted Civil Service of the East India Company, soon resulted in a blurred distinction between the Company's commercial and political activities in India. Moreover, a norm of seniority-based promotions developed: starting from an apprentice, to a factor, to a writer, to a junior merchant, to a senior merchant, and finally to an administrator.

In the late 1760s and early 1770s, leading up to his ascension as the first Governor-General of Bengal (the British monarchy's then highest-ranking representative in India) in

1773, Warren Hastings transformed the originally commercial East India Company into a British government entity used to extract revenue and maintain law and order.

With the 1786 Act, Lord Cornwallis, the Governor-General and commander-in-chief of India, organized the civil services into an administrative framework and Europeanized the services.

The Charter Act of 1833 re-designated the Governor-General of Bengal as the Governor-General of India, thereby unifying the country's administration under one control and introducing an exam-based open competition system to source personnel within the East India Company. These competition-based exam procedures were instituted by the Charter Act of 1853 by Macaulay, who headed the Civil Service Commission of India.

2.2. Colonial Origins: The Imperial Civil Service (1858-1946).

The British Crown took over the Company Rule of India in 1858 and formally colonized India up until its independence in 1947. The Indian Civil Service Act of 1861 allowed Indians to join the civil service and established the Civil Service Commission. However, Indians faced several practical impediments to joining the civil service, such as ridiculously low age limits (e.g., 19 years), a syllabus covering subjects like European history and Latin grammar, and the only exam location being in London. Thus, Indians were *de facto* kept out of the civil service, which was confined to elite families educated at elite universities in Britain.

By the 1870s, protests started against this *de facto* discrimination against Indians in the civil service. The Indian Association (which later became the Indian National Congress), founded by SN Banerjee, pushed for civil service reforms. SN Tagore was the first Indian to qualify for the civil service in 1863, but was disqualified on a technical basis.

In 1886, the Aitchison Public Service Commission was set up to promote Indian civil liberties and increase their access to public service employment. Aitchison suggested relaxing the age requirements for entry into the civil service and advocated for transitioning from the two-tier Covenanted and Uncovenanted civil services to a three-tier classification of Imperial, Provincial, and Subordinate civil services. However, it upheld that the examinations should only be conducted in England. The Aitchison Committee recommendations were implemented in 1892, when the Covenanted and Uncovenanted civil services were abolished and the hierarchy of Indian Civil Service, Provincial Civil Service, and Subordinate Civil Service was established.

In 1912, the Islington Commission accepted simultaneous examinations in England and India, which only began from 1922 onward. In 1924, the Lee Commission recommended that a Public Service Commission be formed, and finally, in 1935, the Government of India Act established the Federal Public Service Commission.

By 1947, almost 60% of the civil service comprised of Indians. This fact was also used in India's fight for independence to justify the capability and self-sufficiency of Indians.

2.3. Nation-building: transition to All India Services (1947-1965).

India gained independence in 1947 and during the early nation-building years, India's first Prime Minister, Jawaharlal Nehru, appointed several Indian Civil Service officers to many important posts, e.g., C.D. Deshmukh was made Finance Minister and K.P.S Menon the Foreign Minister. However, there was a great debate among the founding fathers on whether to maintain and adapt or dismantle and scrap the existing Imperial Civil Service (Potter (1989)). Those in favor of maintaining the system stressed its efficiency in public administration and saw in it the ability to unify the diverse country; while those opposed to it saw in the Imperial Civil Service primarily its oppressive purpose and deeply-rooted colonial character.

The strongest proponent of maintaining and adapting the civil service was Deputy Prime Minister and Home Minister Vallabhbhai Patel. Patel famously argued that the civil service was the "Steel Frame of India." In the Constituent Assembly of India, in discussing the role of the Indian Civil Service, Patel said, "here is no alternative to this administrative system... The Union will go, you will not have a united India if you do not have good All-India Service which has the independence to speak out its mind, which has sense of security that you will standby your work... If you do not adopt this course, then do not follow the present Constitution. Substitute something else... these people are the instrument. Remove them and I see nothing but a picture of chaos all over the country."

Ultimately, the deliberate choice was made to maintain i) All India Services whose personnel would be interchangeable between state and central governments, ii) Central Civil Service, and iii) State Civil Service. Moreover, the principles of open entry based on Civil Service Examination, permanency of tenure, and the establishment of the National Academy of Administration to train recruits (1958) would be continued.

The Indian Administrative Service, based on the former Imperial Civil Service, and the Indian Police Service, based on the former Imperial Police Service, became the All India Services in 1947, established by India's Constitutional Provision (Articles 315-323). The Indian Forest Service was to All India Services in 1966.

Importantly, the Indian Administrative Service mandates continued to be revenue collection and maintenance of law and order; however, a third mandate of implementing development and aiding in maintaining fair elections was also added.

Thus, the key objectives in the Indian government creating the All India Services were: i) preserving national unity and integrity and uniform standard of administration, ii) maintaining neutrality and objectivity through a non-political, secular, and non-sectarian outlook, and iii) ensuring competence, efficiency, and professionalism by attracting the best and brightest to public service.

3. THE ORGANIZATION OF MODERN-DAY ALL INDIA SERVICES

Today, the All India Services comprises of i) the Indian Administrative Service (~ 5000 officers in total; ~ 180 recruited per year), ii) the Indian Police Service (~ 4000 officers in total; ~ 150 recruited per year), and the iii) Indian Forest Service (3000 officers in total; 100 recruited per year).

The Prime Minister's Office consists of the Department of Space, the Department of Atomic Energy, and the Ministry of Personnel, Public Grievances, and Pensions. As such, the Prime Minister is the minister-in-charge of these ministries and the deputy minister remains the Minister of State. Having the apex position in these ministries gives the Prime Minister nearly unilateral power in instituting change across these three ministries (basically, by executive privilege, without any Parliamentary approval or other checks and balances between the executive and legislative branches of government).

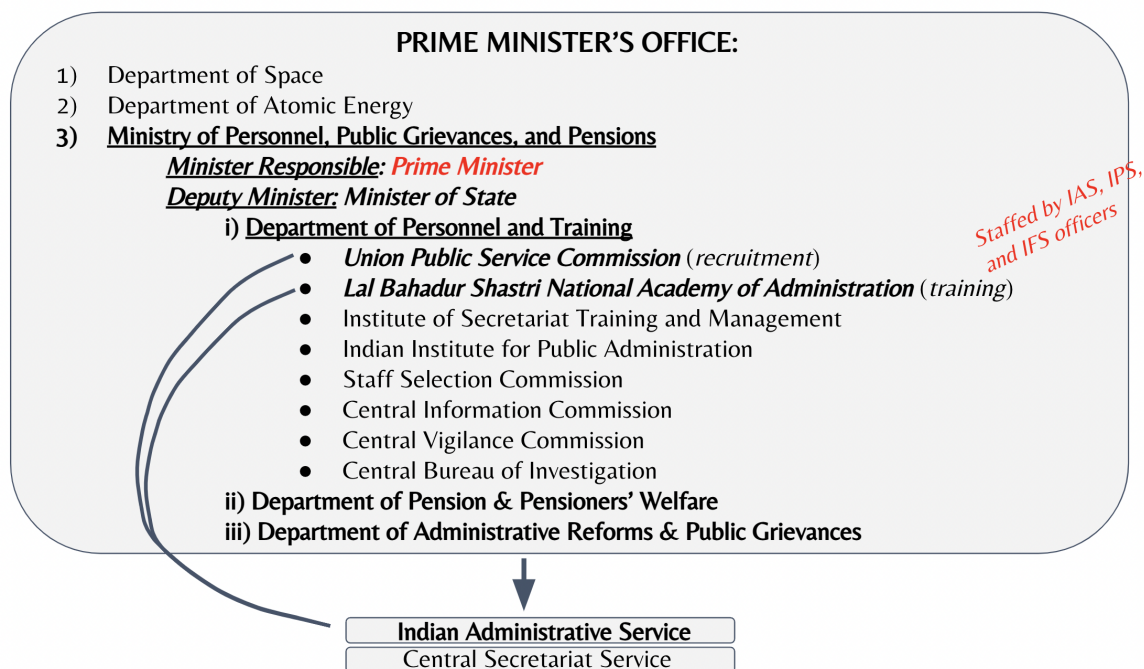
Importantly, the Union Public Service Commission (UPSC) which deals with all civil service recruitment, the Department of Personnel and Training (DoPT) which deals with appointment, transfers, and promotions of civil servants, and the Lal Bahadur Shastri Academy of Administration (LBSNAA) which deals with training, all fall under the purview of the Ministry of Personnel, Public Grievances, and Pensions. Hence, as illustrated in Figures 1, the Prime Minister has unilateral control over when, how, and why to reform the cadre allocation procedures of the All India Services. The Indian Administrative Service falls under the Prime Minister's Office, while the Indian Police Service under the Ministry of Home Affairs and the Indian Forest Service under the Ministry of Environment, Forest, and Climate Change. Nevertheless, all personnel decisions related to recruitment and posting assignments for all three services fall under the Prime Minister's jurisdiction.

While the Ministers of Parliament are the political heads of these and all other ministries in the central government, the non-apex post staffing of all of these ministries consists of All-India Service officers. As such, the effective functioning of government requires the support and cooperation of the civil service. Hence, even the Prime Minister must ensure that the civil service—particularly, the most elite ones: the All India Services—remain motivated and favorable to their cause, and cooperate with them to formulate and implement all public policy and effectively manage public administration.

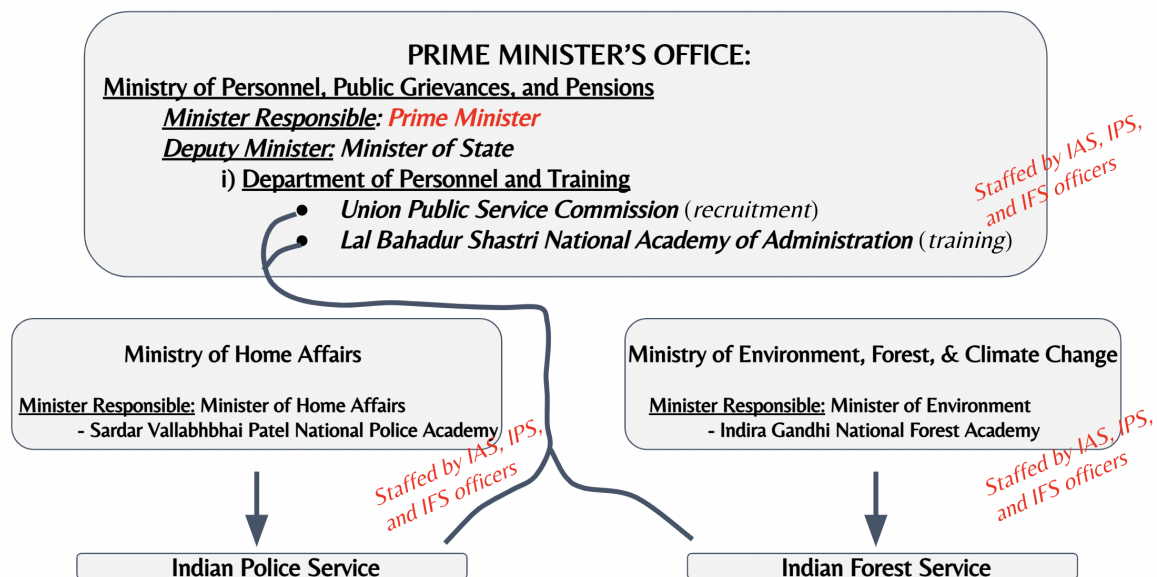
4. THE MODEL

There are two sets of institutional players who seek to change the design of the institution: the Prime Minister (executive) and the All-India Service Officers (bureaucrats). The All India Services comprises of the Indian Administrative, Police, and Forest Services.

Figure 1. The Prime Minister's Office.



(a) Ministry oversight of Indian Administrative Service.



(b) Ministry oversight of Indian Police and Forest Services.

These players have endogenous incentives to alter/keep the cadre allocation procedures in their favor to address i) who is assigned where and ii) how the allocation procedures should be designed.

The fundamental tension of objectives exists because:

- (1) ensuring national integration and balance of bureaucratic quality across the country (a property of the allocation),
- (2) maintaining bureaucratic morale, motivation, and satisfaction (a property of the preferences of bureaucrats)

The All India Services were chartered within the Constitution to ensure this national integration purpose by having central officers commissioned to states to specialize and report back to the center. Moreover, an equitable balance of bureaucratic quality across the country is necessary to ensure well-balanced growth and development across the country. On the other hand, bureaucrats' morale and satisfaction affect how content and motivated they are, whether they will exit the civil service, and whether the service will attract top talent going forward.

Thakur (2021) established the Preference-vs-Performance trade-off that highlights this tension. Bureaucrats want to stay close to home and want to avoid underdeveloped areas. Such correlation in preferences leads to:

- Distributional imbalance of bureaucratic quality and increased regionalism if you give too much weight to bureaucrats' preferences
- Lowered bureaucratic morale if you don't incorporate preferences as i) high scorers are not rewarded, assignments may be inefficient, and iii) coalitions might want to collectively deviate and change the system (Thakur, 2022)
- Increased strategic reporting of preferences in a non-strategyproof mechanism

I assume that the Prime Minister cares more about 1) national integration and bureaucratic quality balance, but might also put some weight on 2) bureaucratic morale. On the other hand, the bureaucrats care more about 2) bureaucratic morale, motivation, and satisfaction, but might also put some weight on 1) national integration and quality balance.

Therein lies the struggle between the executive and the bureaucracy. Although the decision to reform versus uphold the allocation procedure lies with the executive, the bureaucracy also has its own agenda and pressures the executive to reform the institution of assignment procedures in their own favor. Hence, the question arises: when is institutional reform politically feasible and in which way does the institutional pendulum swing?

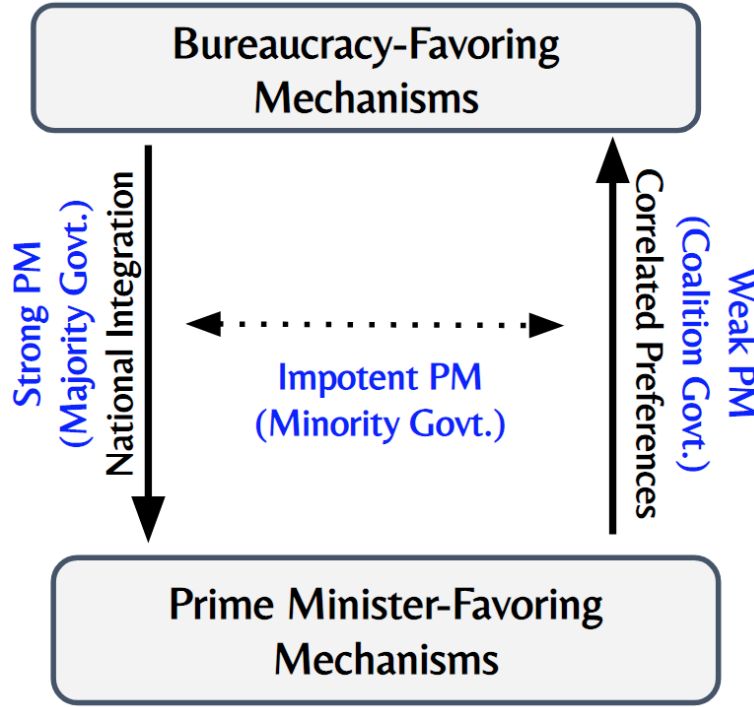
I argue that a strong Prime Minister who is national-minded and insistent would push towards institutional reform to increase 1) National Integration and Quality Balance, which often acts against a lot of the bureaucrats' favor. Hence, such a strong Prime Minister should have the political will, management prowess, and social capital to act against the bureaucracy.

On the other hand, a weak Prime Minister would allow the bureaucracy to impose its will (akin to regulatory capture). This would involve incorporating preferences of where

bureaucrats would like to be placed. A weak Prime Minister would not be able to resist the bureaucracy's pressure to make favorable reforms that benefit them.

The model's implied dynamics are summarized in Figure 2.

Figure 2. Dynamics of Institutional Reform.



5. EMPIRICAL MEASURES

5.1. Measuring bureaucrats' preferences.

The bureaucracy is not a single agent, however, but rather a collection of many individuals who each have their own preferences over where they would like to be assigned. I assume that the bureaucracy acts by majoritarian norms. Namely, the bureaucracy's will to reform versus remain with the status quo, can be proxied by how many of the bureaucrats prefer the assignment from the reformed allocation procedure to the assignment they get from the status quo allocation procedure. If a majority of bureaucrats would each individually benefit from the reform, then I assume the overall bureaucracy pressure is to reform to a bureaucracy-favoring mechanism. On the other hand, if a majority of the bureaucrats seek to retain the status quo assignment procedure, then I assume the overall bureaucracy pressure is for making no changes to the system.¹

¹Cadre allocation are lifelong assignments, hence a reform to the cadre allocation procedures only affects the incoming and new batches of civil servants and keeps existing civil servants' allocations unchanged. However, based on my interactions with several civil servants and my reading of the system, the civil service

I have rank order preference data from the Indian Police Service 2008 batch and Indian Forest Service batches 2009 to 2021, which I will use for running counterfactual mechanisms and finding the sizes of the coalitions in favor versus for institutional reform of the allocation procedures. I will also use this preference data and combine it with my knowledge of the underlying matching mechanisms to illustrate how agents are gaming non-strategyproof mechanisms like the 2017 procedure and explain on what basis civil servants rank their preferences using discrete choice analysis.

5.2. Measuring Prime Minister's strength.

Empirically, the strength of a Prime Minister in the Parliamentary System will be proxied by the type of government formation:

- A Prime Minister heading a majority government is considered to be a strong Prime Minister.
- A Prime Minister heading a coalition government is considered to be a weak Prime Minister.
- A Prime Minister heading a minority government is considered to be impotent or unable to institute institutional change.

Intuitively, Prime Ministers who head majority governments have enough political and public support to resist the bureaucracy and impose their will. They can afford to be less reliant on the bureaucracy and hence the bargaining power of the bureaucracy is weaker. On the other hand, Prime Ministers with an unwieldy coalition government consisting of a large number of parties are considered weak. Such Prime Ministers have enough trouble maintaining cohesion and discipline amongst their own political rank and file and thus are more reliant on the bureaucracy's effectiveness to get things done for them (something that is important for their political future *a la* Mayhew (1974)). Therefore, the bureaucracy has a lot of bargaining power and can leverage this to get bureaucracy-favoring reforms. Lastly, minority governments are extremely unstable and usually very short-lived. Prime Ministers who head minority governments lack enough political capital to make any institutional reform.

As illustrated in Figure 2, taken together, the model and the empirical measures predict that strong Prime Ministers with majority governments change to and uphold systems that are Prime Minister favoring by promoting national integration. This captures an executive disciplining the bureaucracy. On the other hand, weak Prime Ministers with coalition governments change to and uphold systems promoting bureaucratic preferences. This is a form

is a tightly-knit collective of overlapping generations that looks after its collective interests. Hence, even quite senior All India Service officers are passionate about the current cadre allocation policy and potential reforms.

of regulatory capture where a large coalition of bureaucrats can exert influence on the executive to change to or maintain favorable institutions. Lastly, impotent Prime Ministers with minority governments will simply retain the status quo due to a lack of political capacity.

6. ALL INDIA SERVICE CADRE ALLOCATION PROCEDURES (1965-PRESENT)

In this section, I describe each of the five matching mechanisms used for cadre allocation of the All India Service officers. Readers interested in understanding the mechanism in more detail should read through Section 6. Those less interested in the exact details of the mechanisms can skip to the key design features and properties that are summarized in Figure 1).

6.1. Roster System (1966-1977).

In 1966, the second Prime Minister, Lal Bahadur Shastri, who headed the Indian National Congress party-led majority government, first established a cadre allocation procedure for All India Services by implementing the Roster System. This mechanism was upheld by Prime Minister Indira Gandhi during both her majority government from 1966 to 1975 and her government under the state of emergency from 1975 to 1977.

The 1966 Roster system operated as follows:

- (1) The mechanism did not elicit preferences from bureaucrats.
- (2) State cadres were arranged in an alphabetical roster. Each year the order of the roster was changed so that the most prioritized group in one year would be the least prioritized group in the next year. This would create an ordered list of the state cadres which would create a cycle. If a state had 2 vacancies, that state would appear in cycles 1 and 2, whereas a state that had 7 vacancies would appear in cycles 1 through 7.
- (3) Candidates were then ordered based on their exam rank and assigned in that order to this roster.

The 1966 Roster System favored the Prime Minister as it ignored any preferences of the bureaucrats and ensured balance of bureaucratic quality across the country and minimal regionalism due to the rotating roster filtering through the ordered list of bureaucrats ranked by exam performance.

6.2. Limited Zonal Preference System (1978-1983).

After the Emergency Period (1975 to 1977) in India came to an end, in 1978, Prime Minister Morarji Desai who headed the Janata party-led coalition government² replaced the 1966 Roster System and instead implemented the Limited Zonal Preference System which remained

²This coalition government was an amalgamation of political parties opposed to the Emergency: Bharatiya Lok Dal, Bharatiya Kranti Dal, Swatantra Party, Socialist Party, Praja Socialist Party, Samyukta Socialist Party, Utkal Congress, Bharatiya Jana Sangh, Congress (O), Congress for Democracy, Congress (R) Rebels

Table 1. Key features and properties of cadre allocation procedures.

Roster System (1966-1977)	
1. Alphabetically rotating roster of state cadres. 2. No preference elicited from civil servants 3. Candidates are ordered by exam rank and assigned to roster	* <i>Favors Prime Minister</i> * <i>No bureaucrats' preferences</i> * <i>Balanced bureaucratic quality</i> * <i>Minimal regionalism</i>
Limited Zonal Preference System (1978-1983)	
1. State cadres are divided into 5 Zones. 2. Candidates rank 5 Zones and rank their top 1-2 choices in each zone. 3. Preferences are assumed to be lexicographic by Zone and cadres in each zones (after which assumed to be indifferent by Zone rank) 4. Serial Dictatorship by exam rank (with insider vs. outsider cadre vacancies)	* <i>Favors Bureaucracy</i> * <i>Some bureaucrats' preferences</i> * <i>Imbalanced bureaucratic quality</i> * <i>Admits some regionalism</i>
Appended Roster System (1984-2007)	
1. Priority given to insiders in order of exam rank. 2. Only preference of civil servants is whether or not they want insider position 3. Outsiders allocated by a complicated roster-like formula, but unpredictable, as-if-random from officers' perspective. 4. Prioritizing certain states over others across years and by prioritizing states which failed to get many high-ranking Insiders, for being assigned high-ranking Outsiders.	* <i>Favors Prime Minister</i> * <i>Minimal preferences of bureaucrats</i> * <i>Balanced bureaucratic quality</i> * <i>Minimal regionalism</i>
Serial Dictatorship System (2008-2016)	
1. Priority is given to insiders in order of exam rank. 2. Full preference rank order of civil servants over all cadres. 3. Outsiders allocated by a serial dictatorship in the order of exam rank.	* <i>Favors Bureaucracy</i> * <i>Full preferences of bureaucrats considered</i> * <i>Imbalanced bureaucratic quality</i> * <i>Lots of regionalism</i>
Zonal Preference Serial Dictatorship (2017-Present)	
1. State cadres are divided into 5 zones. 2. Candidates rank 5 Zones and rank each cadre in each zone in order of preference. 3. Candidates' preferences are ordered by top preferences in order of Zones, then second best in order of Zones, etc. 4. Priority given to insiders in the order of exam rank 5. Outsiders are allocated by a serial dictatorship in the order of exam rank.	* <i>Favors Bureaucracy</i> * <i>Constrained bureaucrats' preferences</i> * <i>Balanced bureaucratic quality</i> * <i>Admits some regionalism</i>

in place from 1978 to 1983. This mechanism was upheld by Prime Minister Charan Singh (minority govt., 1979-1980).

The 1978 Limited Zonal Preference System operated as follows:

- (1) The state cadres were partitioned into five geographically partitioned zones.
- (2) Candidates were asked to rank the five zones in order of preference. Moreover, the candidates were asked to rank their top one or two state cadres within each zone. The preferences of the candidates were then assumed to be lexicographic by zone and cadres within each zone; after which, the candidates were assumed to be indifferent over remaining cadres which were ranked according to their zone rank.
- (3) Given these somewhat limited and constrained sets of preferences, the mechanism for allocation was a serial dictatorship in order of exam rank where cadre vacancies were delineated based on insider versus outsider vacancies within each state cadre.

The Limited Zonal Preference System favored the bureaucracy as their preference rank orders were taken into account, although they only had a limited scope to rank their preferences (across zones and for only a subset of cadres within each zone). However, because bureaucrats' preferences were correlated (wanting to stay close to home and waiting to avoid the underdeveloped regions and conflict areas), the Limited Zonal Preference System led to increased regionalism and an imbalance in bureaucratic quality across the country.

6.3. Appended Roster System (1984-2007).

In 1984, Prime Minister Indira Gandhi, who headed an Indian National Congress party-led majority government, replaced the 1978 Limited Zonal Preference with the Appended Roster System which remained in place from 1984 to 2007.³ This mechanism was upheld by Prime Ministers i) Rajiv Gandhi (majority govt., 1984-89), ii) Vishwanath Pratap Singh (minority govt., 1989-90), iii) Chandra Shekhar (minority govt., 1990-91), iv) Narasimha Rao (minority govt., 1991-1996), v) Atal Bihari Vajpayee (minority govt., 1996-96), vi) H. D. Deve Gowda (minority govt., 1996-97), vii) Inder Kumar Gujral (minority govt., 1997-98), and viii) Atal Bihari Vajpayee (National Democratic Alliance coalition govt., 1998-04).

The 1984 Appended Roster System operated as follows:

- (1) The 24 cadres are split into 4 alphabetically ordered groups:
 - Group I: Andra Pradesh, Assam-Meghalaya, Bihar, Chhattisgarh, Gujarat
 - Group II: Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh
 - Group III: Maharashtra, Manipur-Tripura, Nagaland, Orissa, Punjab, Rajasthan, Sikkim

like Chandra Shekhar, Krishan Kant, Ram Dhan, Mohan Dharia, Chandrajit Yadav, Lakshmi Kanthamma, etc.

³See <http://persmin.gov.in/AIS1/Docs/OldCadreAllocProcedure.pdf> for the official mechanism details.

- Group IV: Tamil Nadu, AGMUT, Uttarakhand, Uttar Pradesh, West Bengal
- (2) Each year, the order of the 4 groups is rotated by moving the first group to be the last. This forms a permutation of the 24 states. The algorithm goes through this ordered list again and again in a cyclical fashion as I explain below, hence I call this a “1:24 cycle.” For example, the 2007 rotation was 1) Group IV, 2) Group I, 3) Group II, and 4) Group III. Hence, Bihar which is the 3rd state in Group I becomes the 8th state in the 1:24 cycle in this rotation.
 - (3) Each cadre creates a list of vacancies across 6 groups: insider and outsider vacancies separated by the 3 quota categories (General, OBC, SC/ST).
 - (4) Candidates are arranged by exam score and each candidate is asked whether or not he would like to be considered for an insider position.⁴
 - (5) First, in order of exam rank, all those who answered “Yes” to being an insider, are allotted to their state if there is a corresponding vacancy in their quota category.
 - (6) Next, if there are insider vacancies with no matching candidates who are willing to be insiders, check for swaps (in order of exam rank):
 - If there is no General insider candidate to fill a General insider vacancy, first check if there is an SC/ST insider candidate, SC/ST insider vacancy, and SC/ST outsider vacancy which can be exchanged: SC/ST insider vacancy is deleted, an SC/ST outsider vacancy switches to General outsider vacancy, and the candidate is allotted to the cadre. If no SC/ST insider candidate or no SC/ST outsider vacancy, attempt for similar swap with OBC category. Similarly, if no OBC insider vacancy is filled, check for swaps first with SC/ST category and then with General category. And then, if no SC/ST insider vacancy is filled, check for swaps first with OBC category and then with General category.
 - (7) If an insider vacancy remains even after swaps, convert it to an outsider vacancy.
 - (8) Insiders in each state are allocated into subsequent 1:24 cycles. Then in the remaining subsequent cycles, introduce any existing outsider vacancies by each state. For example, if Maharashtra gets 4 insiders, they are allotted to cycles 1, 2, 3, and 4 respectively, and Maharashtra’s remaining vacancies for outsiders will be allotted to cycles 5, 6,...
 - (9) Arrange all remaining candidates in order of exam rank and go through the 1:24 cycles to fill remaining outsider vacancies by order of exam rank. However, rotate groups every cycle when allotting insiders (i.e., group 1 of this year’s rotation is first in 1st cycle, group 2 is first in 2nd cycle, etc).

⁴In practice, almost everyone answered “Yes” to this question, as this mechanism otherwise allotted a seemingly random cadre from the candidate’s perspective.

The 1984 Appended Roster System favored the Prime Minister as bureaucrats' preferences were not considered (other than whether they sought an insider position or not). Moreover, there was a careful balancing of bureaucratic quality across the country and minimal regionalism, because (i) the rotating roster meant that states that received high-quality insiders were prioritized for lower-quality outsiders and (ii) the states that were prioritized higher in the roster this year would have lowest priority next year. So a balance of bureaucratic quality across the country was achieved both within a batch and also across batches.

6.4. Serial Dictatorship System (2008-2016).

In 2008, Prime Minister Manmohan Singh, who headed a Indian National Congress Party-led coalition government, replaced the 1984 Appended Roster System and instead implemented a Serial Dictatorship System which remained in place from 2008 to 2016.⁵

The 2008 Serial Dictatorship System operated as follows:

- (1) Each candidate is asked to report their strict preferences over cadres.⁶ Those who rank their home state as their top choice are considered for insider positions.
- (2) Each cadre creates a list of vacancies across 8 groups: insider and outsider vacancies separated by the 4 quota categories (General, OBC, SC, and ST).
- (3) First, go through candidates by exam rank and allot those who want to be insiders to cadres if a matching vacancy in their category exists.
- (4) Next, if insiders do not have matching vacancy in their quota category, check for swaps:
 - When no candidate is available against an insider SC Vacancy, check for swaps by exam rank first with ST insider candidate, then OBC insider, and then General insider by shifting the SC vacancy to the cadre which the incoming officer would have otherwise been allocated to as an outsider (if this does not work, swap with the next cadre in alphabetical order in which outsider vacancy is available). Similarly, insider ST Vacancy checked for swaps by exam rank first with SC, OBC, and then General insiders. Insider OBC vacancy checked for swaps by exam rank first with ST, SC, and then General insiders. Insider General vacancy checked for swaps by exam rank first with SC, ST, and then OBC insiders.
- (5) Convert all remaining vacancies to outsider vacancies.
- (6) In order of exam rank, run through each candidate's preference order and allocate if vacancy exists.

⁵See <http://persmin.gov.in/AIS1/Docs/NewCadreAllocPolicy.pdf> for official mechanism details.

⁶Caveat for truncated preferences: "If a candidate does not give any preference for any of the cadres, presume he has no preference. Accordingly, if he is not allotted to any one of the cadres for which he has indicated preference, he shall be allotted along with other such candidates in the order of rank to any of the remaining cadres, arranged in alphabetical order, in which there are vacancies in his category after allocation of all the candidates who can be allotted to cadres in accordance with their preference." Hence, there are no unacceptable cadres by the rules.

The Serial Dictatorship System favored the bureaucracy as their full preference rank orders were now considered. The mechanism was strategyproof for all preferences, other than the home state cadre (which is required to be ranked 1st for consideration for insider positions). However, because bureaucrats' preferences were correlated (wanting to stay close to home and wanting to avoid underdeveloped regions and conflict areas), the Serial Dictatorship System led to increased regionalism and an imbalance in bureaucratic quality across the country (Thakur (2021)).

6.5. Zonal Preference Serial Dictatorship (2017-Present).

In 2017, Prime Minister Narendra Modi, who headed the Bharatiya Janata Party's majority government, replaced the 2008 Serial Dictatorship and implemented the Zonal Preference Serial Dictatorship which mandated restrictions over how candidates are allowed to express their preferences over state cadres. The 2017 Zonal Preference Serial Dictatorship is the 2008 Serial Dictatorship System, with an added preference order restriction for the civil servants when ranking the cadres.

The 2017 Zonal Preference Serial Dictatorship operated as follows:

The mechanism groups the cadres into 5 zones by region:

- (1) Zone I: AGMUT, Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Punjab, Rajasthan and Haryana
- (2) Zone II: Uttar Pradesh, Bihar, Jharkhand and Odisha
- (3) Zone III: Gujarat, Maharashtra, Madhya Pradesh and Chhattisgarh
- (4) Zone IV: West Bengal, Sikkim, Assam-Meghalaya, Manipur, Tripura and Nagaland
- (5) Zone V: Telangana. Andhra Pradesh, Karnataka, Tamil Nadu and Kerala

Each candidate must first rank the 5 zones in order of preference 1:5, and then, rank their preference amongst cadres within each zone separately. Then, the final preference order for the candidate rotates across the 5 zones in order of within-zone preference: i.e.,

- (1) 1st preferred cadre in 1st preferred Zone
- (2) 1st preferred cadre in 2nd preferred Zone
- (3) 1st preferred cadre in 3rd preferred Zone
- (4) 1st preferred cadre in 4th preferred Zone
- (5) 1st preferred cadre in 5th preferred Zone
- (6) 2nd preferred cadre in 1st preferred Zone
- (7) 2nd preferred cadre in 2nd preferred Zone
- (8) ...

There are two other important caveats. First, to qualify for an insider vacancy, the candidate must rank the Zone containing his home cadre as his 1st choice, and must rank

his home cadre as his 1st choice within that Zone. Second, not ranking cadres or zones is treated as being indifferent amongst the unranked cadres or zones.

The 2017 Zonal Preference Serial Dictatorship favors the Prime Minister as bureaucrats' preferences are constrained in an attempt to prevent regionalism. However, these preference restrictions render the mechanism non-strategyproof, even amongst the subset of non-home state cadres. Because of admitting strategic manipulation (see Thakur (2021) and Section 8), despite its purpose and intentions, this mechanism only goes so far in alleviating regionalism and addressing the imbalance in bureaucratic quality across the country.

Figure 3. History of Indian cadre allocation procedure.

<u>Years</u>	<u>Govt</u>	<u>PM Strength</u>	<u>Type of Govt</u>	<u>Mechanism Policies</u>	<u>Mechanism benefits</u>	<u>Days of Govt</u>
1965-1966	Lal Bahadur Shastri	Strong	Majority	Roster System	Prime Minister	581 days (death)
1966-1977	Indira Gandhi	Strong	Majority	Upheld PM favoring Roster System	Prime Minister	3438 days
1975-1977	Indira Gandhi Emergency	Strong	Emergency	Upheld PM favoring Roster System	Prime Minister	635 days
1977-1979	Morarji Desai	Weak	Coalition	Limited Zonal Preference System	Bureaucracy	856 days
1979-1980	Charan Singh- Janata Bharatiya Secular with Congress (O)	Impotent	Minority	Upheld Bureaucracy favoring Limited Zonal Preference System	Bureaucracy	170 days
1980-1984	Indira Gandhi	Strong	Majority	Appended Roster System	Prime Minister	1752 days (assn)
1984-1989	Rajiv Gandhi	Strong	Majority	Upheld PM favoring App Roster System	Prime Minister	1858 days (assn)
1989-1990	Vishwanath Pratap Singh- Janata Dal	Impotent	Minority Coalition with outside support	Upheld PM favoring App Roster System	Prime Minister	343 days
1990-1991	Chandra Shekhar- Samajwadi Janata Party- Rashtriya	Impotent	Minority Coalition with outside support	Upheld PM favoring App Roster System	Prime Minister	223 days
1991-1996	Narasimha Rao- Indian National Congress	Impotent	Minority Coalition with outside support	Upheld PM favoring App Roster System	Prime Minister	1791 days
1996-1996	Atal Bihari Vajpayee	Impotent	Minority	Upheld PM favoring App Roster System	Prime Minister	16 days
1996-1997	H.D. Deve Gowda- United Front	Impotent	Minority Coalition with outside support	Upheld PM favoring App Roster System	Prime Minister	324 days
1997-1998	Inder Kumar Gujral- United Front	Impotent	Minority Coalition with outside support	Upheld PM favoring App Roster System	Prime Minister	332 days
1998-2004	Atal Bihari Vajpayee- Nat Dem Alliance	Weak	Coalition	Upheld PM favoring App Roster System	Prime Minister	2256 days
2004-2014	Manmohan Singh- United Progressive Alliance (13 party coalition)	Weak	Coalition	Preference Serial Dictatorship	Bureaucracy	3656 days
2014-	Narendra Modi	Strong	Majority	Zonal Preference Serial Dictatorship	Prime Minister	2213 days...

7. ENDOGENOUS INSTITUTIONAL REFORM: EMPIRICAL EVIDENCE

We want to micro-found and endogenize the evolution of allocation procedures used to assign the All India Service officers to states from 1966 to today. Figure 3 provides the history of the mechanisms: when they were reformed versus upheld, by which Prime Ministers, etc.

First, we will illustrate the “Preference-versus-Performance Trade-off,” as Thakur (2021) refers to it, that leads to this political economy tussle between the executive and the bureaucracy. Namely, there is a fundamental conflict of interest between the Prime Minister wanting an equitable balance of bureaucratic quality across the country and the bureaucracy wanting their preferences to be reflected in the allocations. As seen from Figure 4a, the average preference rank achieved by the PM-favoring mechanisms is higher than the Bureaucracy-favoring mechanisms. On the other hand, as seen from Figure 4b, the inequity across states in terms of bureaucratic quality is higher in Bureaucracy-favoring mechanisms compared to PM-favoring mechanisms. Herein lies the tussle between the Prime Minister and the civil service.

We argued in Section 4 that it is the strength of the Prime Minister as proxied by whether they lead a majority versus a coalition government, that determines whether they change to or uphold PM-favoring mechanisms (strong PM with majority government) or change to or uphold Bureaucracy-favoring mechanisms (weak PM with coalition government). Moreover, a PM with a minority government is considered impotent and cannot make any changes. Table 2 finds that the likelihood of a PM-favoring mechanism change is 60% with a strong PM, a weak PM is 66.7% likely to change to a Bureaucracy-favoring mechanism, and the impotent PM has a null effect on changing the mechanisms.

Table 2. Change in Mechanism by Strength of Prime Minister.

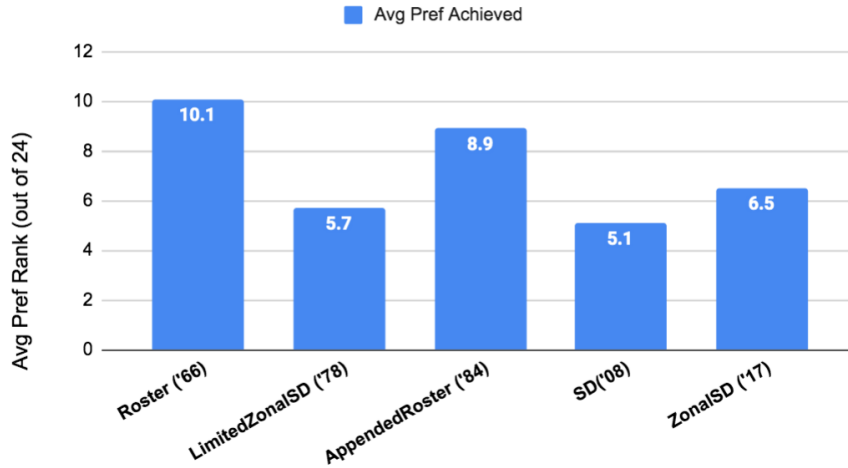
	(1)
	PM-Favoring Mechanism Change
Strong PM	0.600** (0.243)
Weak PM	-0.667** (0.302)
Constant	-2.78e-17 (1.86e-09)
Observations	16
R^2	0.622

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

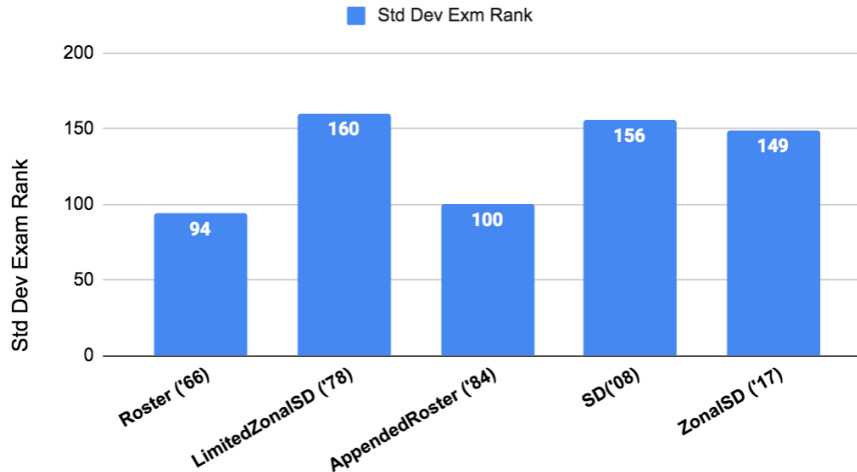
Figure 4. The Preference-versus-Performance Trade-off: Bureaucrats' Preference vs. Bureaucratic Quality Balance.

Average Bureaucrats' Preference Rank Attained (IPS 08 data)



(a) Average preference rank assigned by cadre allocation procedure.

Standard Deviation of Statewise Avg Exam Rank (IPS 08 data)



(b) Standard deviation across states of average exam rank by cadre allocation procedure.

8. STRATEGIC MANIPULATION UNDERMINES THE PRIME MINISTER'S GOALS.

Compared to the other institutional changes to/from Bureaucracy-favoring mechanisms to Prime Minister-favoring mechanisms, why did the 2017 Zonal Serial Dictatorship seem to have made less of a change from the 2008 Serial Dictatorship System (Figure 4)? It turns out that the 2017 Zonal Serial Dictatorship is non-strategyproof.

The 2017 Zonal Serial Dictatorship can be gamed by bureaucrats who could strategically manipulate their reported preferences to get more preferred state cadres. Since bureaucrats' correlated preferences are at odds with the Prime Minister's national integration purpose, making a mechanism non-strategyproof and allowing bureaucrats to game the system directly undermines the Prime Minister's goals.

With the simple numerical example below from Thakur (2021), I illustrate two points:

- (1) The 2017 Zonal Serial Dictatorship is not strategyproof for cadre preference within a zone (I call "intra-zonal strategyproofness")
- (2) The 2017 Zonal Serial Dictatorship is not strategyproof for zonal preferences across zones (I call "inter-zonal strategyproofness")

Consider the 2017 Mechanism for 4 cadres $\{a, b, c, d\}$ divided into two zones $\{Z_1, Z_2\}$ with $\{a, b\} \in Z_1$ and $\{c, d\} \in Z_2$. The true utility value for cadre i is denoted v_i . I consider $v_a > v_b > v_c > v_d$. Let p_i denote the probability of getting into cadre i . *Inter-zonal strategyproofness* would imply $Z_1 \succ Z_2$, since each cadre in Z_1 dominates each cadre in Z_2 . Moreover, *intra-zonal strategyproofness* implies $a \succ b$ in Z_1 and $c \succ d$ in Z_2 .

I show that there exist probabilities p_i and valuations v_i such that the optimal rankings are $Z_2 \succ Z_1$ (violating inter-zonal strategyproofness), and $c \succ d$ in Z_2 and $b \succ a$ in Z_1 (violating intra-zonal strategyproofness). Consider the following example:

- c is the home cadre for this candidate
- $v_a = 1.9, v_b = 1.8, v_c = 1.7$, and $v_d = 1$
- $p_a = .3, p_b = .5, p_d = .7, p_c = \begin{cases} .9 & \text{if ranked 1st in } Z_2 \text{ and } Z_2 \text{ ranked first,} \\ 0 & \text{otherwise} \end{cases}$

The logic of the numerical example is that Zone 1 is preferred to Zone 2 by dominance, however, the candidate's home cadre c for which he has insider priority (hence high p_c) is in Zone 2. Although the candidate prefers both cadres a and b to his home cadre c , he optimally ranks c first overall due to the insider priority. Namely, if c is not ranked 1st in its zone Z_2 and if Z_2 is not ranked as the most preferred zone, the candidate cannot get his home cadre. Hence, he ranks $Z_2 \succ Z_1$, violating inter-zonal strategyproofness. Moreover, although $v_a > v_b$, since $p_b > p_a$, to avoid failure and get the worst cadre ($v_d \ll v_b$) with a high probability of 0.7 (since it is the worst cadre, no one wants it, so the candidate will get it with high probability if he ranks it), the candidate would rather get b with higher probability and avoid getting d , instead of getting a with smaller probability with greater risk of getting the bad outcome d . This violates intra-zonal strategyproofness as the stated preference is $b \succ a$ in Z_1 .

Non-strategyproofness is usually a more abstract notion with unclear consequences in practice: due to complicated ways in which strategic and naive types know different information and are differently communicating and sharing information to respond to the

system's incentives. However, in the All India Service cadre allocation case, due to the inherently adversarial motives of the bureaucracy and Prime Minister, successful strategizing by the bureaucrats undoes the purpose of the 2017 Zonal Serial Dictatorship which was to help balance bureaucratic quality and fight the sharp in regionalism from the 2008 Serial Dictatorship System.

Figure 5 illustrates this point. I exploit the fact that the 2008 Serial Dictatorship System is strategyproof outside of the home cadre preference. Hence, with the strategyproof preferences from 2015 (Figure 5a) and 2016 (Figure 5b), I first order all the state cadres in the first column by the average preference rank in the second column. By running the 2017 Zonal Serial Dictatorship's zonal preference restriction on 2015 preferences assuming truthful reporting, I show in columns 3 and 4 the intended effect of the changed mechanism. The cadres which were consistently being ranked low by everyone on average were supposed to get a higher preference rank as a result of the zonal ranking restriction (the t-stat in green indicates a statistically significant increase in preference rank). On the other hand, the cadres which were being ranked highly by everyone were to be penalized with the zonal ranking restriction (the t-stat in red indicates a statistically significant decrease in preference rank). However, this intended change does not reflect in the actual change in preference ranks arising from as shown in columns 4 and 5 for 2017 reported preferences and columns 6 and 7 for 2018 reported preferences under the 2017 Zonal Serial Dictatorship's zonal preference restriction. In fact, there seem to be either null effects (i.e., no change in imbalance relative to the 2015 and 2016 truthful preferences) or in several cases, exactly the opposite, statistically significant effect of further lowering preference rank of laggards, like Manipur, and further improve preference rank of winners, like Rajasthan.

It is clear from the stark contrast between the intended change versus the lack of or opposite change in practice, that strategizing by the bureaucracy undoes the Prime Minister's intended effect of improving national integration by alleviating regionalism and promoting more balanced bureaucratic quality across the country.

9. CONCLUSIONS.

In this paper, I have developed and empirically tested a model of how institutional rules (cadre allocation procedures) change endogenously based on the political economy struggle between the executive (Prime Minister) and the bureaucracy (All India Service officers).

In India's case, the power to reform/uphold the cadre allocation procedures, used to assign All India Service officers to state cadres for lifelong appointments, lies under the Prime Minister's Office. As such, Prime Ministers can unilaterally change the system. However, I find a deeply rooted conflict of interest between the Prime Minister and the civil service. The civil service wants their preferences over postings to be taken into account by the allocation

procedures, while the Prime Minister wants a more equitable balance of bureaucratic quality across the country. These aspirations are at odds with one another because civil servants' preferences are correlated. Hence, increasing the weight on bureaucrats' preferences leads to heightened regionalism and an imbalance of bureaucratic quality across the country.

I find that the strength of the Prime Minister, as proxied by the type of parliamentary government they head, impacts whether mechanisms are reformed/upheld between bureaucracy-favoring (increasing weight over civil servants' preferences at the cost of bureaucratic quality imbalance) to/from Prime Minister favoring (balanced bureaucratic quality at the expense of decreased weight on bureaucrats' preferences).

I empirically validate this theory using detailed knowledge of the history of matching mechanisms used over time and the rank order preferences of civil servants over state cadres. I can thus exploit strategyproof preferences and run clean counterfactuals delineating what assignments would come out had the alternative mechanisms used across time been implemented instead. This can give me micro-founded evidence of the sizes of the coalitions that would lobby for/against change in the cadre allocation procedures. Lastly, I also bring to light how the implementation of non-strategyproof mechanisms and the successful strategizing by the civil service can undermine the purpose and intent of reform, undermining the Prime Minister's goals.

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Figure 5. Strategic Undoing of 2017 Zonal Serial Dictatorship.

In comparison with strategyproof 2015 (a) and 2016 (b) preference data: i) cadre average rank, ii) change in cadre average rank and t-statistic with 2017 Zonal Serial Dictatorship using truthful 2015 preferences, iii) cadre average rank with 2017 Zonal Serial Dictatorship using truthful 2017 preferences, iv) change in cadre average rank and t-statistic with 2017 Zonal Serial Dictatorship using truthful 2018 preferences.

		Intended Change		2015-2017 Actual Change		2015-2018 Actual Change	
		Average Rank assuming 2017 zonal preference restriction on truthful 2015 preferences		Change in Cadre Average Rank with 2017 preferences		Change in Cadre Average Rank with 2018 preferences	
Cadre	Cadre Average Rank 2015	preferences	t-stat_1	preferences	t_stat_2	preferences	t_stat_3
Nagaland	24.19	-1.29	-2.88	0.81	1.24	1.34	2.07
Manipur	23.14	-2.55	-4.84	1.81	2.76	1.58	2.42
Tripura	22.70	-2.59	-4.77	0.10	0.15	-1.44	-1.91
Jammu Kashmir	21.32	3.78	7.60	-1.14	-1.69	-0.41	-0.60
Assam-Meghalaya	18.72	-6.93	-9.97	0.19	0.22	-1.93	-2.56
Sikkim	18.25	-6.45	-8.39	2.72	3.18	-0.76	-0.94
West Bengal	17.35	-7.41	-9.84	2.21	2.41	0.77	0.89
Bihar	14.90	-2.61	-3.28	1.27	1.54	1.69	2.10
Jharkhand	14.82	-3.21	-4.30	-1.66	-2.14	-1.56	-2.01
Orissa	14.29	-2.91	-3.88	-1.57	-1.92	-3.58	-4.65
Chhattisgarh	14.12	0.47	0.65	-0.86	-1.17	-1.98	-2.57
Kerala	12.99	2.39	2.79	-0.72	-0.81	-1.00	-0.99
Punjab	12.90	6.10	7.85	0.65	0.88	1.04	1.20
Tamil Naidu	12.42	3.59	4.13	-0.34	-0.40	0.97	1.10
Haryana	12.11	4.76	4.99	0.51	0.58	2.08	2.39
Uttar Pradesh	11.82	-3.94	-4.72	1.93	2.18	3.74	4.01
Telangana	11.59	-1.02	-1.24	1.65	2.20	2.71	3.53
AGMUT	11.25	4.65	4.64	0.73	0.80	0.60	0.61
Andhra Pradesh	10.14	-4.17	-5.98	-0.57	-0.80	-0.77	-1.11
Himchal Pradesh	8.80	4.98	6.77	-1.25	-1.61	-0.06	-0.07
Gujarat	8.42	1.67	2.93	0.62	0.86	2.32	2.97
Uttarakhand	7.80	3.65	4.60	-3.28	-4.25	-1.04	-1.11
Rajasthan	7.71	1.79	1.98	-2.00	-2.35	-2.16	-2.38
Karnataka	7.55	6.74	8.57	-1.07	-1.26	-2.10	-2.37
Maharashtra	6.39	0.61	1.15	0.02	0.02	0.68	0.84
Madhya Pradesh	5.33	-0.10	-0.17	-0.78	-1.10	-0.71	-0.96

(a) 2015 strategyproof preferences as a baseline.

		Intended Change		2016-2017 Actual Change		2016-2018 Actual Change	
		Average Rank assuming 2017 zonal preference restriction on truthful 2016 preferences		Change in Cadre Average Rank with 2017 reported preferences		Change in Cadre Average Rank with 2018 reported preferences	
Cadre	Cadre Average Rank 2016	preferences	t-stat_1	preferences	t_stat_2	preferences	t_stat_3
Nagaland	24.48	-0.73	-2.07	-0.05	-0.08	0.49	0.83
Manipur	23.21	-2.13	-4.48	1.31	2.20	1.08	1.82
Tripura	22.66	-2.67	-5.39	0.22	0.36	-1.32	-1.88
Jammu Kashmir	22.37	2.82	5.61	-1.23	-2.00	-0.50	-0.80
Assam-Meghalaya	18.65	-7.05	-11.36	0.37	0.46	-1.74	-2.48
Sikkim	17.33	-6.31	-8.61	3.50	4.32	0.03	0.04
West Bengal	17.17	-7.55	-11.26	2.52	2.87	1.08	1.31
Bihar	15.60	-3.02	-3.98	0.98	1.25	1.40	1.85
Jharkhand	14.88	-3.44	-4.99	-1.50	-2.06	-1.40	-1.92
Orissa	14.58	-3.86	-5.23	-0.90	-1.17	-2.92	-4.04
AGMUT	13.37	4.10	4.34	-0.85	-0.98	-0.98	-1.05
Tamil Naidu	13.31	2.46	2.69	-0.10	-0.13	1.20	1.44
Chhattisgarh	13.23	1.55	2.26	-1.05	-1.54	-2.18	-3.01
Punjab	12.93	6.01	8.17	0.72	1.04	1.10	1.34
Kerala	12.87	3.50	4.18	-1.71	-2.04	-1.99	-2.05
Haryana	12.45	5.35	6.03	-0.41	-0.48	1.16	1.41
Telangana	11.21	0.37	0.47	0.64	0.92	1.70	2.37
Uttar Pradesh	11.09	-2.96	-3.40	1.69	2.00	3.49	3.92
Andhra Pradesh	10.53	-4.80	-6.76	-0.34	-0.51	-0.54	-0.83
Himchal Pradesh	9.23	4.42	5.85	-1.11	-1.53	0.08	0.10
Uttarakhand	7.62	2.41	3.09	-1.86	-2.58	0.38	0.42
Rajasthan	7.33	1.85	2.20	-1.67	-2.08	-1.84	-2.11
Karnataka	7.10	6.04	7.93	0.08	0.10	-0.95	-1.12
Gujarat	7.06	2.35	4.63	1.29	1.94	2.99	4.08
Maharashtra	6.15	1.13	2.02	-0.26	-0.37	0.40	0.52
Madhya Pradesh	4.58	0.15	0.30	-0.29	-0.44	-0.22	-0.32

(b) 2016 strategyproof preferences as baseline.

APPENDIX A. PREFERENCES OF IPS BATCH 2008

In this appendix, I borrow from analysis from Thakur (2021) to describe the 2008 batch IPS data used in this paper:

First, we see in Table 3 how the distressed regions of the country are consistently ranked low on the preferences of most officers. Underdeveloped regions and conflict zones with China from the Northeast bloc (e.g., Nagaland, Manipur, Tripura, Sikkim, Nagaland) and conflict zone with Pakistan (e.g., Jammu & Kashmir) are consistently ranked low.

Next, Thakur (2021) illustrates how the preferences of civil servants are correlated. As Tables 4 and 5 highlight, civil servants primarily care about three dimensions when ranking preferences: i) distance from home, ii) how rich the state is, and iii) how developed the state is. Distance from home is of primary importance because of linguistic and cultural distances in India. Figure 6 illustrates such preference ranking behavior for IPS officers coming from Uttar Pradesh Cadre from the 2008 IPS batch.

Lastly, Figure 5 from Thakur (2021) illustrates how susceptible the 2017 Zonal Serial Dictatorship Mechanism is to strategic manipulation. Assuming truthful reporting of preferences by everyone else, the plot indicates how many people can be strategic and highlights how many more preferred cadres they can get from this strategizing.

Table 3. From Thakur (2021): Preferences of 122 IPS officers admitted from the 2008 Civil Service Examination.

Cadre	Average	Cadre	Std Dev
Rajasthan	5.8	Nagaland	1.5
Maharashtra	6.0	Manipur-Tripura	2.0
Gujarat	6.8	Rajasthan	3.1
Haryana	6.8	Gujarat	3.4
Punjab	7.3	Maharashtra	3.4
Madhya Pradesh	7.3	Sikkim	3.5
Karnataka	7.7	Punjab	3.6
Uttar Pradesh	8.5	Assam Meghalaya	3.7
Uttarakhand	9.8	Orissa	3.9
Andhra Pradesh	9.9	Madhya Pradesh	4.1
Tamil Nadu	10.2	West Bengal	4.2
AGMUT	10.4	Haryana	4.3
Himachal Pradesh	10.6	Uttarakhand	4.3
Bihar	12.7	Himachal Pradesh	4.4
Kerala	12.9	Jammu & Kashmir	4.4
Orissa	14.7	Chhattisgarh	4.5
Jharkhand	15.3	Jharkhand	4.9
West Bengal	15.4	Karnataka	5.1
Chhattisgarh	15.6	Andhra Pradesh	5.7
Sikkim	18.8	Uttar Pradesh	6.0
Assam Meghalaya	19.1	Kerala	6.2
Jammu & Kashmir	20.9	Bihar	6.3
Manipur-Tripura	21.9	AGMUT	6.6
Nagaland	22.9	Tamil Nadu	6.6

Notes: The left column shows the average rank (out of 24 cadres) IPS officers assigned to each cadre, while the right column shows the standard deviation of rank assigned to each cadre. Notice the bad cadres (*bolded*) are consistently ranked at the bottom of IPS officers' rank order preferences. 93% of IPS officers gave complete preferences (with some indifference). 121 out of 122 indicated wanting to be an insider (i.e.,

1st choice was home cadre). *Data from*

http://mha.nic.in/hindi/sites/upload_files/mhahindi/files/pdf/CardAllokts2008.pdf

Table 4. From Thakur (2021): Discrete Choice Analysis of Cadre Preferences.

	(1) Cond logit	(2) Cond logit	(3) Rnk-ordered logit	(4) Rnk-ordered logit	(5) Lin reg
	Top5	Bottom5	PrefRank	PrefRank	PrefRank
DistancefromHome (<i>thou.</i>)	-4.09*** (0.354)	1.94*** (0.246)	-1.31*** (0.125)	-0.673** (0.270)	-6.49*** (0.313)
GSDPpercapita04-05 (<i>mil.</i>)	32.0*** (12.2)	-5.26 (7.05)	10.8*** (3.70)	10.7*** (3.67)	53.3*** (19.4)
HealthIndex08	1.316 (0.922)	-2.331*** (0.813)	1.359*** (0.339)	1.543*** (0.355)	7.188*** (1.841)
%ageRurRoadsSurfaced	1.771*** (0.376)	-3.128*** (0.253)	1.555*** (0.105)	1.537*** (0.106)	9.425*** (0.598)
DistancefromHome ² (<i>mil.</i>)				-0.447** (0.179)	
Constant					4.897*** (0.961)
Observations	2783	2622	2806	2806	2806
R^2					0.277
LL	-799.50	-982.087	-6020.5567	-6018.765	
LL (intercept only)	-1105.08	-1182.97			

Notes: *Columns (1), (2)* report conditional logits where the dependent variable is indicator variable for cadre being ranked amongst the top 5, bottom 5 ranks respectively. *Columns (3) and (4)* report rank-ordered logits (or exploded logits) for the cadre preferences. *Column (5)* uses linear regression specification similar to rank-ordered logit from column (3). Data: i) Distance from Home State is the distance in miles between capital cities of the home cadre and ranked cadre. ii) GSDP

Per Capita 04-5 is the gross state domestic product per capita from year 2004-2005. iii) Health Index 08 is the health index for 2008 computed in forming the Human Development Index from the India Human Development Report 2011. iv) %age Rural Roads Surfaced is the percentage of rural roads which are surfaced

from data.gov.in. See Table ?? for the summary statistics of these variables.

Standard errors in parentheses are clustered at an individual level

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

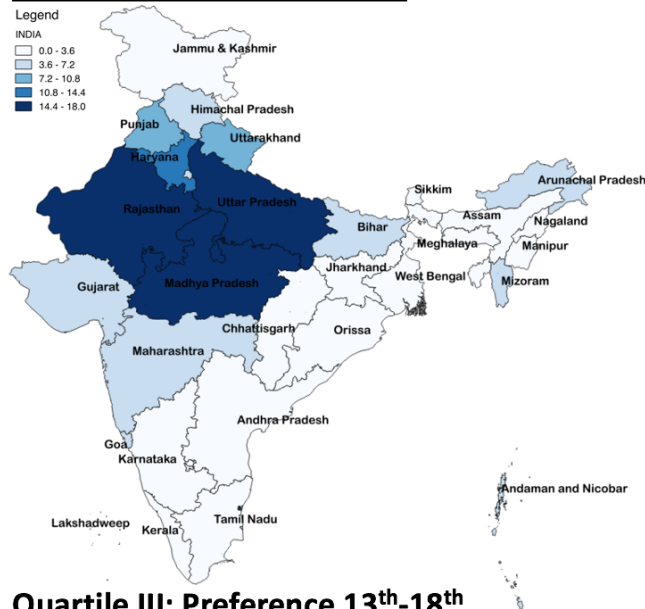
Table 5. From Thakur (2021): Relative Effect Sizes in Cadre Preference Discrete Choice Model in terms of Distance from Home State in Miles.

	(1)	(2)	(3)
	Conditional logit PrefRank Top5	Conditional logit PrefRank Bottom5	Rnk-ordered logit PrefRank
DistancefromHome	381	381	381
GSDPpercapita04-05	76	26	80
HealthIndex08	32	120	103
%ageRurRoadsSurfaced	94	350	257

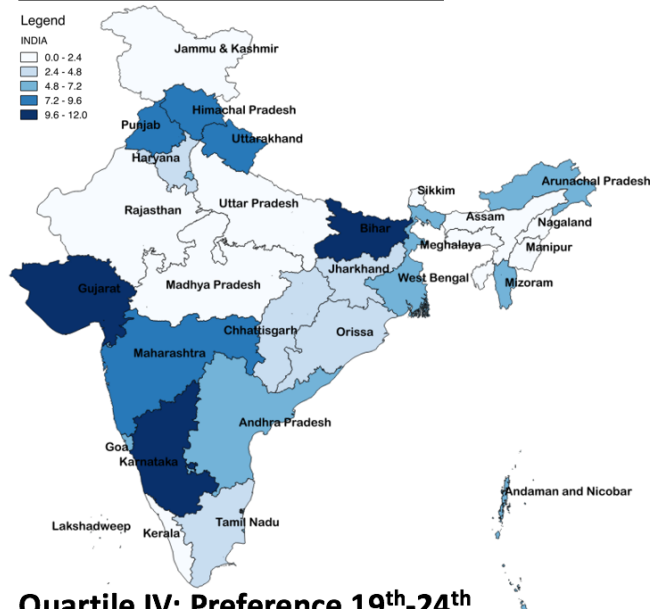
Notes: This table calculates the 1 standard deviation effect of i) Distance from Home State in miles, ii) GSDP per capita 04-05, iii) health index 2008, and iv) percentage of rural roads surfaced, in terms of distance from home state in miles.

Figure 6. From Thakur (2021): Distribution of cadre preferences of Candidates from UP.

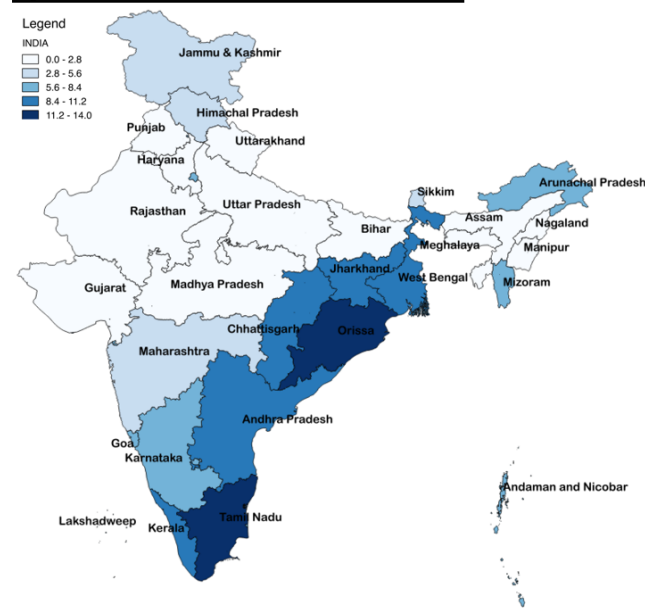
Quartile I: Preference 1st-6th



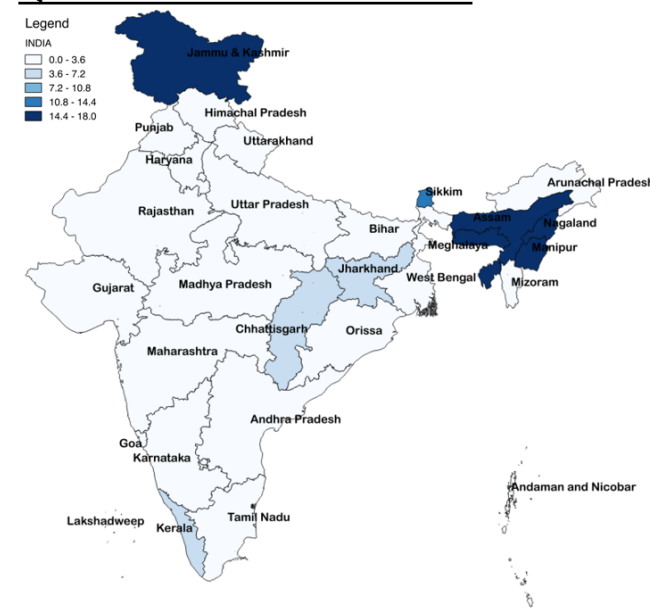
Quartile II: Preference 7th-12th



Quartile III: Preference 13th-18th

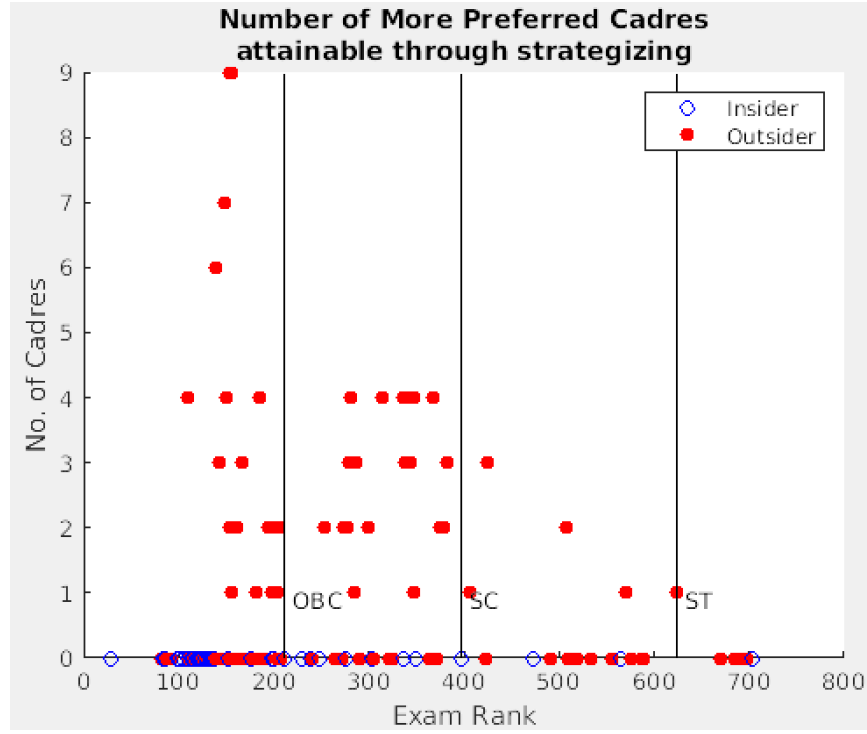


Quartile IV: Preference 19th-24th



Notes: Maps show the distribution of cadre preferences across 4 quartiles for all 18 IPS officers from Uttar Pradesh in 2008.

Figure 7. From Thakur (2021): Susceptibility of the 2017 Mechanism to Strategic Behavior.



Notes: Assuming all agents $-i$ report their preferences truthfully, this figure shows, for each individual i , how many cadres there are which i can get via strategic reporting and which he strictly prefers to the cadre he achieves via truthful reporting. Notice those who are assigned insider positions (blue) cannot improve, whereas amongst those assigned outsider positions (red), relatively lower ranked individuals within each quota category can improve via strategic reporting. And those with lower exam rank can only achieve fewer possible improvements due to competition arising from correlated preferences. Data used for simulation is from IPS 2008 batch.

APPENDIX B. Measuring Correlation Across Individuals' Preferences (Thakur, 2021).

This appendix is from Thakur (2021) and shows the measure of correlation across civil servants' preferences I use in this paper.

I define a novel measure of correlation across preference rank orders, which is a generalization of the Spearman rank correlation coefficient to N rank-ordered lists. When considering the ranking of $n = 1, \dots, N$ candidates over $c = 1, \dots, C$ cadres, I suggest the following correlation measure

$$(1) \quad \rho = 1 - \frac{\sum_{c=1}^C \left(\frac{1}{N-1} \sum_{n=1}^N (r_{nc} - \bar{r}_c)^2 \right)}{C \left(\frac{(C-1+1)^2 - 1}{12} \right)}$$

Measuring how much variance there is in ranking for each alternative across candidates relative to its average ranking, and summing these measures across all of the ranked alternatives, gives us a measure of how much variation there is in the candidates' ranking of the alternatives (i.e., numerator). This quantity is then bench-marked against the variance of a discrete random distribution (i.e., denominator).

This general measure has some nice properties:

- If all candidates rank their rank order preferences identically, the numerator of the second term is 0, and hence $\rho = 1$ (i.e., perfect positive correlation).
- If all candidates randomize their rank order preferences, the parenthesis term in the numerator of the second term becomes the variance of a discrete uniform distribution for integers $\{1, \dots, C\}$, which approaches $\frac{(C-1+1)^2 - 1}{12}$ for large N , hence the second term goes to 1 and thus $\rho \rightarrow 0$ (i.e., no correlation).
- This measure is an equally weighted average of Spearman rank correlation coefficients for all distinct pairs of individuals.

Proof: Starting from average of Spearman rank correlation coefficients for all N choose 2 pairs $i \neq j$ of candidates, I show that this coincides with my measure

$$\begin{aligned} \frac{1}{\frac{N!}{2!(N-2)!}} \sum_{i \neq j \in N} \left(1 - \frac{6 \sum_{c=1}^C (r_{ic} - r_{jc})^2}{C(C^2 - 1)} \right) &= 1 - \frac{1}{N} \sum_{i=1}^N \sum_{j=1}^N \left(\frac{\frac{1}{N-1} \sum_{c=1}^C (r_{ic} - r_{jc})^2}{\left(\frac{C(C^2 - 1)}{12} \right)} \right) \\ &= 1 - \left(\frac{\sum_{c=1}^C \frac{1}{N-1} \sum_{i=1}^N (r_{ic} - \frac{1}{N} \sum_{j=1}^N r_{jc})^2}{\left(\frac{C(C^2 - 1)}{12} \right)} \right) \\ &= 1 - \frac{\sum_{c=1}^C \left(\frac{1}{N-1} \sum_{i=1}^N (r_{ic} - \bar{r}_c)^2 \right)}{C \left(\frac{(C-1+1)^2 - 1}{12} \right)} = \rho \end{aligned}$$

Table 6. Correlation across individuals' rank order preferences for IPS 2008, IFS 2015, and IFS 2016.

	IPS 2008	IFS 2015	IFS 2016
Number of Civil Servants	122	110	110
Number of Cadres	24	26	26
Correlation in Pref	.5261	.4845	.5211
Correlation in Pref (only complete pref)	.5704	.4845	.5211