

Market Design for Social Justice: A Case Study on a Constitutional Crisis in India

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Commissioned vs. Aspired Market Design

- **Commissioned** market design is fundamentally different than **aspired** market design by an outsider.
- **Commissioned market design**
 1. The need for a change is already established (i.e., no need to develop a persuasion strategy for reform).
 2. Commissioned design economist is chosen mostly based on past success. She is given a lot of **leeway** on various details.
 3. Custom-made theory is not expected. A compelling case can be made through experimental, empirical or computational methods.
- **Aspired market design**
 1. The need for a change is not established. There will be a lot of resistance for a reform. Motives will be questioned.
 2. A compelling **persuasion strategy** is essential for a reform.
 - Past success or research that merely provides intuition are unlikely to compel decision makers who have **vested interests** in status quo.
 3. **Custom-made theory** which captures the **true goals** of the stakeholders may be an important part of the persuasion stage.

Minimalist Market Design and its Three Main Tasks ▶ PDF

- **Minimalist market design** (Sönmez, 2023) is a design paradigm which embeds a persuasion strategy.

- Especially valuable for an **aspiring** design economist who is an **outsider**.

There are three main tasks under this paradigm.

1. Identify the **mission** of the institution: What are the primary objectives of policymakers, system operators and other stakeholders?
 - The **history** of the institution may be instructive.
2. Determine whether the existing institution satisfies these objectives.
 - If it doesn't, then there is potential for policy impact.
 - To materialize this potential into a successful redesign, identify the **root causes** of the failures.
3. Address these failures by interfering **only** with the flawed aspects of the deficient institution.
 - Akin to a surgeon performing a **"minimally invasive"** procedure.

Minimalist Market Design and its Three Main Tasks

- In some applications, primary objectives may be collectively infeasible.
 - Need to formulate compelling compromises.

E.g. The incompatibility between **Pareto efficiency** and **no justified envy** in school choice.
- In some applications, a potential discord between the mission of the institution and its practical implementation can be eliminated by a unique minimalist intervention.
 - Straightforward resolution via the three main tasks under minimalist market design.

E.g. US Army's Branching Process (Greenberg, Pathak & Sönmez, 2021)

E.g. Joint Implementation of Vertical and Horizontal Reservations in India (Sönmez & Yenmez 2022)

A Supplemental Task under Minimalist Market Design

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Ideally, in these settings, there is one additional task.
- 4. If there are multiple “minimally invasive” designs through tasks 1-3, present a comprehensive analysis of these competing institutions.
 - May be especially valuable in applications “in which issues of social, racial and distributive justice are particularly salient” (Hitzig, 2020).
 - Depending on policy objectives, **axiomatic characterizations** may be one way to pursue such analyses.
- The role of the fourth task is to maintain **informed neutrality** between reasonable normative principles in design proposals.
 - Li (2017) coins the term “informed neutrality” for ethical principles.

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 - Depending on policy objectives, **axiomatic characterizations** may be one way to pursue such analyses.
- The role of the fourth task is to maintain **informed neutrality** between reasonable normative principles in design proposals.
 - Li (2017) coins the term “informed neutrality” for ethical principles.
- This fourth task takes center place in my presentation.

Vertical Reservations

- **Vertical reservations** (VR protections), is the strongest affirmative action (AA) policy in India.
 - Formulated in the Supreme Court judgment *Indra Sawhney (1992)*.
 - Originally, designed as a **reparatory and compensatory** instrument that corresponds to the protective provisions described in the Article 16(4) of the 1950 Constitution of India.
 - Sets aside a percentage of government positions and seats at public universities for each of a number of protected groups.
- Until 2019, these provisions were exclusively granted to **Socially and Educationally Backward Classes (SEBCs)** who historically faced caste-based oppression and discrimination.
 - 15% to **Scheduled Castes (SC)**
 - 7.5% to **Scheduled Tribes (ST)**
 - 27% to **Other Backward Classes (OBC)**
 - In total 49.5% to SEBCs

103rd Constitutional Amendment

- **January 2019:** In a highly controversial Constitutional Amendment, VR protections were granted for members of a new category called **Economically Weaker Sections (EWS)**.
 - Reserves 10% of positions, reducing the percentage of open positions from 50.5% to 40.5%.
 - For the first-time VR protections are awarded to a group based on an **individual-based transient** characteristic.
 - Beneficiaries of earlier VR protections, i.e., members of SEBCs, are **excluded** from the scope of EWS.
 - More than 95% of the individuals from general category (i.e., those who do not belong to an SEBC) qualify for EWS, de facto making it a **forward caste** reservation.

Supreme Court Challenge: Timeline

- **January 2019:** Amendment was immediately challenged in court.
- **August 2020:** Case elevated to a five-judge Constitution Bench of the Supreme Court.
- **September 2022:** In the first day of hearings and together with two others, the Bench announced the following main issue to examine whether the Amendment violates the Constitution:

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Are EWS reservations invalid for excluding SEBCs?

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Are EWS reservations invalid for excluding SEBCs?

- **A Minimalist Compromise:** In the last day of hearings, Prof. Dr. Mohan Gopal, a renowned Constitutional Scholar, suggested a compromise that does not involve striking down the amendment:
Remove the exclusion clause on SEBCs from the scope of EWS.
- Our formal analysis is about the implications and implementation of this compromise policy.

A Controversial Verdict

- **November 2022:** In a landmark judgment *Janhit Abhiyan (2022)*, the Constitution Bench upheld the 103rd Constitutional Amendment.
 - Decision reached in a 3-2 **split** verdict.



Excluding SC/ST/OBC from EWS reservation is fresh injustice: Justice Bhat

The CJI and Justice Bhat dissented from the decision upholding EWS as constitutionally valid

- **Sticking Point:** Constitutionality of the controversial exclusion

A Controversial Verdict

- The extent of the disagreement can be vividly seen in the opening paragraph of the **Dissenting Opinion** by Justice S. Ravindra Bhat:

"I regret my inability to concur with the views expressed by the majority opinion on the validity of the 103rd Amendment on Question No. 3, since I feel - for reasons set out elaborately in the following opinion - that this court has for the first time, in the seven decades of the republic, sanctioned an avowedly exclusionary and discriminatory principle. Our Constitution does not speak the language of exclusion. In my considered opinion, the Amendment, by the language of exclusion, undermines the fabric of social justice, and thereby, the basic structure."

Reactions to Verdict

- While the verdict was declared as a major victory for the central government led by Prime Minister Narendra Modi, according to many, it also created an uproar in India by undermining social justice.

“It is constitutionally perverse that the compelling need for measures to address social backwardness has become a justification for the exclusion of backward classes from measures to address economic deprivation.

[...] India’s most marginalised sections that comprise a significant proportion of India’s poor stand excluded from reservation meant for the poor, and second, it is now far easier to provide reservation for this narrowly constructed EWS than it is to do the same for India’s most marginalised sections.”

Anup Surendranath, Professor of Law



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Why 10% quota for 'economically weak' in India has caused uproar

Controversial 10 percent quota in jobs and education for so-called 'Economically Weaker Sections' category of people angers politicians and caste activists.

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DMK Files Review Petition Against EWS Quota Verdict, Says it 'Legitimises Discrimination'

The Tamil Nadu ruling party sought an open court hearing on its review plea, stating that there is an "error" in the judgment as it overrules earlier larger nine-judge bench verdict delivered in the 1992 'Indira Swahney' case.

Supreme Court's EWS verdict may have opened a can of worms

The Supreme Court's split 3:2 verdict on the validity of the 10 percent reservation for EWS raises several questions, leaves the door open for states to make their own interpretations, and potentially attempt to raise quotas to well beyond the 50 percent ceiling

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EWS judgement undermines Constitutional code of equality: Legal experts, Bahujan leaders

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'Setback in century-long struggle': Opposition tears up SC's verdict on EWS

Justification of Exclusion in the Majority Opinion

- The majority justices were not unsympathetic to this perspective, but they were of the opinion that exclusion is inevitable.

"[...] Rather, according to the petitioners, the classes covered by Articles 15(4), 15(5) and 16(4) are comprising of the poorest of the poor and hence, keeping them out of the benefit of EWS reservation is an exercise conceptionally at conflict with the constitutional norms and principles.

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At the first blush, the arguments made in this regard appear to be having some substance because it cannot be denied that the classes covered by Articles 15(4), 15(5) and 16(4) would also be comprising of poor persons within. However, a little pause and a closer look makes it clear that the grievance of the petitioners because of this exclusion remains entirely untenable and the challenge to the Amendment in question remains wholly unsustainable. As noticed infra, there is a definite logic in this exclusion; rather, this exclusion is inevitable for the true operation and effect of the scheme of EWS reservation."

Sometimes Justices Make Poor Design Economists

- The majority justices offer the following **technical** justification for their alleged necessity of the exclusion:

“The moment there is a vertical reservation, exclusion is the vital requisite to provide benefit to the target group. In fact, the affirmative action of reservation for a particular target group, to achieve its desired results, has to be carved out by exclusion of others.”

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[...] But for this exclusion, the purported affirmative action for a particular class or group would be congenitally deformative and shall fail at its inception. Therefore, the claim of any particular class or section against its exclusion from the affirmative action of reservation in favour of EWS has to be rejected.

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[...] But for this exclusion, the purported affirmative action for a particular class or group would be congenitally deformative and shall fail at its inception. Therefore, the claim of any particular class or section against its exclusion from the affirmative action of reservation in favour of EWS has to be rejected.

[...] It could easily be seen that but for this exclusion, the entire balance of the general principles of equality and compensatory discrimination would be disturbed, with extra or excessive advantage being given to the classes already availing the benefit under Articles 15(4), 15(5) and 16(4).”

Sometimes Justices Make Poor Design Economists

- **Summary:** The entire justification of the majority justices for their support of the exclusion is based on two related technical arguments made in paragraphs 79-82 of the Majority Opinion.
- According to them, exclusion of SEBCs from a new provision is **absolutely necessary** to deliver any meaningful benefit to groups ineligible for earlier provisions.
- They also claim that, inclusion of SEBCs to the scope of EWS would necessarily result in **excessive advantage** to members of these classes.

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SC/ST/OBC Exclusion From EWS Quota Logical, Necessary To Avoid Double Benefits: Supreme Court

Padmakshi Sharma

8 Nov 2022 1:45 AM

Fallacy of the Technical Claims in the Majority Opinion

- I next argue that, these claims are outright wrong.
- More precisely, while they are accurate under non-overlapping VR protections, they are false under overlapping VR protections.
 - Since the constitutionality of the exclusion is examined by the Supreme Court, so is the non-overlapping structure of the VR protections.
- As such, the justification for the controversial exclusion is due to an oversight on the implications of changing the structure of VR protections, a technical phenomenon justices are not familiar with.

Basics

- q^Σ # of identical positions
 - The most basic and a common version of the problem in India, especially for allocating public positions
- \mathcal{I} set of individuals
 - each individual is in need of one position
 - each individual $i \in \mathcal{I}$ is endowed with a distinct merit score $\sigma_i \in \mathbb{R}_+$
- **Baseline Policy w/o AA:** Individuals with higher merit scores have higher claims
- **Primary AA Policy: Vertical Reservations (VR).**
 - Managed through category memberships

Vertical Reservations

- \mathcal{R} set of VR-protected categories (e.g., {SC,ST,OBC,EWS})
- $e \in \mathcal{R}$ EWS
- g a general category for those ineligible for VR protections
 - Old general category Individuals who don't belong an SEBC
- $\rho_i \subset \mathcal{R}$ set of VR-protected categories individual $i \in \mathcal{I}$ belongs
 - $\rho_i = \emptyset$ i belongs to the general category g
 - $\rho = (\rho_i)_{i \in \mathcal{I}}$ profile of category memberships
- Non-Overlapping VR protections: $|\rho_i| \leq 1$ for each $i \in \mathcal{I}$
- Overlapping VR protections: $|\rho_i| > 1$ for some $i \in \mathcal{I}$

Vertical Reservations

- q^c # of **category- c** positions set aside for members of $c \in \mathcal{R}$
- $q^o = q^\Sigma - \sum_{c \in \mathcal{R}} q^c$ # of **open category (category- o)** positions
- $\mathcal{V} = \mathcal{R} \cup \{o\}$ set of **vertical categories for positions**
- $\mathcal{E}^v(\rho) \subseteq \mathcal{I}$ Individuals who are **eligible** for category- v positions
 - $\mathcal{E}^o = \mathcal{E}^o(\rho) = \mathcal{I}$
 - $\mathcal{E}^c(\rho) = \{i \in \mathcal{I} : c \in \rho_i\}$ for any $c \in \mathcal{R}$

Solution Concept: Choice Rule

- For any given set of applicants, a **choice rule** specifies who receives a position and from which categories they do.
- A **choice rule** is a function $C(\rho; \cdot) = (C^\nu(\rho; \cdot))_{\nu \in \mathcal{V}} : 2^{\mathcal{I}} \rightarrow (2^{\mathcal{I}})^{|\mathcal{V}|}$ such that, for any $I \subseteq \mathcal{I}$,

- for any category $\nu \in \mathcal{V}$,

$$C^\nu(\rho; I) \subseteq I \cap \mathcal{E}^\nu(\rho) \quad \text{and} \quad |C^\nu(\rho; I)| \leq q^\nu,$$

- for any two distinct categories $\nu, \nu' \in \mathcal{V}$,

$$C^\nu(\rho; I) \cap C^{\nu'}(\rho; I) = \emptyset.$$

- Given a choice rule $C(\rho; \cdot)$, the resulting **aggregate choice rule** $\widehat{C}(\rho; \cdot) : 2^{\mathcal{I}} \rightarrow 2^{\mathcal{I}}$ specifies who receives a position:

$$\widehat{C}(\rho; I) = \bigcup_{\nu \in \mathcal{V}} C^\nu(\rho; I) \quad \text{for any } I \subseteq \mathcal{I}.$$

Mandates under *Indra Sawhney (1992)*

- **Non-wastefulness:** A position cannot remain idle for as long as there is at least one eligible individual.
 - A choice rule $C(\rho; \cdot)$ is **non-wasteful** if, for every $I \subseteq \mathcal{I}$, $v \in \mathcal{V}$, and $j \in I$,

$$j \notin \widehat{C}(\rho; I) \text{ and } |C^v(\rho; I)| < q^v \implies j \notin \mathcal{E}^v(\rho).$$

- **No justified envy:** Subject to eligibility, the higher is the merit score of an individual, the higher her claim is for a position.
 - A choice rule $C(\rho; \cdot)$ satisfies **no justified envy** if, for every $I \subseteq \mathcal{I}$, $v \in \mathcal{V}$, $i \in C^v(\rho; I)$, and $j \in (I \cap \mathcal{E}^v(\rho)) \setminus \widehat{C}(\rho; I)$,

$$\sigma_i > \sigma_j.$$

Mandates under *Indra Sawhney (1992)*

- **Compliance with VR protections:** VR-protected positions cannot be used up for individuals who deserve an open position based on merit.
 - A choice rule $C(\rho; \cdot)$ **complies with VR protections** if, for each $I \subseteq \mathcal{I}$, $i \in I$ and $c \in \mathcal{R}$,

$$i \in C^c(\rho; I) \implies \begin{cases} |C^o(\rho; I)| = q^o, \text{ and} \\ \sigma_j > \sigma_i \text{ for any } j \in C^o(\rho; I). \end{cases}$$

- **Highest-level AA provision:** Assures that VR-protected positions are awarded to individuals who are “truly in need of” AA.

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- **Highest-level AA provision:** Assures that VR-protected positions are awarded to individuals who are “truly in need of” AA.
- A choice rule **complies with Indra Sawhney** if and only if it satisfies all three axioms.

Implementation of Non-Overlapping VR Protections

- VR protections have always been non-overlapping in India.
 - **Until 2019:** Due to caste system
 - **Since 2019:** Due to caste system and the controversial exclusion
- The following choice rule by Dur et al. (2018) plays a key role in our analysis.

Over-and-Above (O&A) Choice Rule $C_{OA}(\rho; \cdot)$

Step 1. Allocate open positions to highest merit individuals.

Step 2. For each VR-protected category, allocate the reserved positions to its highest merit members who remain unassigned.

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Proposition (Sönmez & Yenmez, 2022)

Assuming non-overlapping VR protections, O&A choice rule uniquely complies with Indra Sawhney.

Overlapping VR Protections: Open Positions

- If the exclusion is removed from EWS, an individual can be a member of both EWS and a SEBC.
 - Special case of **overlapping VR protections**.

Overlapping VR Protections: Open Positions

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 - Special case of **overlapping VR protections**.
- Under Indra Sawhney, whether VR protections are overlapping or not is immaterial for allocation of open positions.
 - Allocation of open positions can still be carried out through Step 1 of the O&A choice rule.

Lemma

For any choice rule that complies with Indra Sawhney, recipients of open positions are same as those who receive them under the O&A choice rule.

Overlapping VR Protections: Reserved Positions

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- **Preliminary Answer:** For starters, Step 2 of O&A choice rule is no longer uniquely defined!

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Step 2. For each VR-protected category, allocate the reserved positions to its highest merit members who remain unassigned.

- **A Practical Resolution:** What about processing VR-protected categories sequentially?

Sequential Choice Rules

- Fix a processing sequence \triangleright (an **order of precedence**) for vertical categories.
 - Δ^o Open-First orders of precedence
 - Δ_e^o Open-First and EWS-Last orders of precedence
 - $\Delta^{o,e}$ Open-First and EWS-Second orders of precedence

Sequential Choice Rule $C_S(\triangleright, \rho; \cdot)$

Following the order of precedence, sequentially choose the highest merit-score eligible individuals for each category.

- **Remark:** For any $\triangleright \in \Delta^o$, the resulting sequential choice rule $C_S(\triangleright, \rho; \cdot)$ generalizes the O&A choice rule.
 - **EWS-Last O&A** $C_S(\underline{\triangleright}, \rho; \cdot)$ with $\underline{\triangleright} \in \Delta_e^o$.
 - **EWS-First O&A** $C_S(\overline{\triangleright}, \rho; \cdot)$ with $\overline{\triangleright} \in \Delta^{o,e}$.

Sequential Choice Rules

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- **Bottomline:** The main challenge under overlapping VR protections is not the difficulty of abiding by Indra Sawhney, but rather the multiplicity of the choice rules which do.
- **Question:** Why would that be a challenge?

Initial Observations on EWS-Last and EWS-First O&A

- **Assumption 1:** Everyone is eligible for EWS in the absence of the SEBC exclusion.
 - With current EWS eligibility restrictions on income in India, the estimated fraction is 98% (Deshpande & Ramachandran, 2019).
- **Assumption 2:** There is excess demand from forward castes (i.e., **old general category** before the introduction of EWS).
- **Assumption 3:** For any category $c \in \mathcal{R} \setminus \{e\}$,

$$\frac{\# \text{ of category-}c \text{ positions}}{\# \text{ of category-}c \text{ applicants}} \geq \frac{\# \text{ of EWS positions}}{\# \text{ of old general category applicants}}$$

- **Assumption 4:** Merit score distribution for forward castes is either the same as or first order stochastically dominates merit score distribution for each SEBC.

Initial Observations on EWS-Last and EWS-First O&A

Proposition

1. *Under Assumptions 1-4, the outcome of the EWS-Last O&A choice rule is same as the outcome of the O&A choice rule with EWS exclusion, i.e., **the outcome of the current policy.***
2. *Under Assumption 1, the outcome of the EWS-First O&A choice rule is same as the outcome of the O&A choice rule without EWS reservation, i.e., **the outcome of the policy prior to the controversial Amendment.***

Preliminary Observations on Sequential Choice Rules

- The first part of this proposition on EWS-Last O&A refutes the technical claims of the Majority justices in *Janhit Abhiyan (2022)*.
 - Individuals ineligible for earlier VR protections for SEBCs, i.e., members of the old general category, are still the primary beneficiaries of EWS.
 - Under EWS-Last O&A the removal of the exclusion does not generate excessive benefits to SEBCs.

It merely assures that SEBCs are not hurt by AA!
- Removal of the exclusion w/o additional details is not a good option either, because it creates a major loophole.

Violation of Right to Equality under the Amendment

- The Amendment allows for a “poor” member of a forward caste to receive a position, while it denies the same position for a potentially poorer member of an SEBC even if she has a higher merit score!
- Cannot be justified by either meritocracy or AA

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Article 16(1)

EWS verdict shows merit matters only when it's 'their' children, not 'our' kids

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“[...] the ‘othering’ of socially and educationally disadvantaged classes – including SCs/ STs/OBCs by excluding them from this new reservation on the ground that they enjoy pre-existing benefits, is to heap fresh injustice based on past disability. [...] The net effect of the entire exclusionary principle is Orwellian, (so to say) which is that all the poorest are entitled to be considered, regardless of their caste or class, yet only those who belong to forward classes or castes, would be considered, and those from socially disadvantaged classes for SC/STs would be ineligible.”

Justice S. Ravindra Bhat, Dissenting Opinion in Janhit Abhiyan (2022)

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25% less cut-off marks for EWS candidates sparks controversy in Tamil Nadu

Hindustan Times, Chennai | By MC Rajan

Open in India - Meeting along with cut-offs for EWS candidates being lower than SC...

India

Nothing wrong with cut-offs for EWS candidates being lower than SC, ST & OBC, says UPSC

UPSC says cut-offs for civil services exam for EWS candidates doesn't impact the chances under other categories. Also notes that it depends on the number of people availing the quota.

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UPSC cut-off for EWS lower than for OBCs again

UPSC STORIES

To Be in EWS Or Not To Be

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Highlights

With EWS category students getting into the coveted Civil Services scoring lesser marks than the OBC one, quota debate is raging in the country.

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NEWS / Why Don't the Guardians of Merit Protest Lower EWS Cutoff?

THIS STORY IS FROM AUGUST 3, 2021

Why don't the guardians of merit protest lower EWS cutoffs?

Low EWS Cut-Off (Less Than Half Of SC, General) In SBI Clerk Exam Raises Eyebrows

SBI Clerk Cut Off 2019: SBI has set 28.5 per cent marks as the cut-off for the EWS candidates while cut-off for Scheduled Caste (SC), General and Other Backward Communities (OBC) is 61.25 per cent.

ANALYSIS CASTE

SBI Exam Leaves OBCs, SCs, STs Struggling To Figure Out EWS Quota Trick

In Tamil Nadu, the cut-off marks was the lowest for the economically weaker sections of the upper caste. This led to significant outpouring of anger from SCs, STs and OBCs.

Three Potential Resolutions

- **Question:** How to avoid the violation of Right to Equality without creating a loophole?
 - Answering this question requires making a normative judgment.
- We consider three normative positions:
 1. **Majority Perspective** (once the technical flaws are corrected)
 - Assures that the outcome differs minimally from the current outcome subject to eliminating violation of the Right to Equality.
 2. **Dissenting Perspective**
 - Assures that the higher-level provision aspect of reparatory and compensatory VR protections to SEBCs is maintained.
 3. **Technocratic Perspective**
 - Treats all VR protected categories neutrally.

What it Takes to Revoke a Constitutional Amendment?

- In India, the Supreme Court can revoke a Constitutional Amendment **only if** it breaches the **basic structure** of the Constitution.

"It is hardly a matter of debate that the challenge herein is not to any executive order or even to an ordinary legislation. The challenge is to a constitutional amendment. [...] The challenge is founded on, and in fact could only be founded on, the premise that the amendment in question violates the basic structure of the Constitution in the manner that it destroys its identity."

Majority Opinion, Janhit Abhiyan (2022)

- The two dissents assert that the exclusion breaches the basic structure by violating the **Right to Equality** covered in Articles 14-18 of the Constitution.
 - The technical arguments in Majority Opinion which dismisses this assertion are flawed.

Minimal Interference due to Separation of Powers

- We next formulate a policy that removes the violation of Right to Equality from the Amendment through **minimal interference**.
 - Valuable due to **separation of powers**.

*“The reason for **minimal interference** by this Court in the constitutional amendments is not far to seek. [...] The interplay of amending powers of the Parliament and judicial review by the Constitutional Court over such exercise of amending powers may appear a little bit complex but ultimately leads towards strengthening the constitutional value of **separation of powers**.”*

Majority Opinion, Janhit Abhiyan (2022)

Who are Affected from the Violation of Right to Equality?

- ρ Current profile of non-overlapping category memberships
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- **Question:** Which individuals in \mathcal{J} (if any) lose a position due to this violation?
- **Tentative Answer:** An individual $j \in \mathcal{J}$ who remains unmatched under $\hat{\rho}$, even though she would have been matched if she were granted with a membership of EWS instead of her actual VR-protected category.
 - Eligibility for **reparatory and compensatory** SEBC reservation **hurts** such individuals, not only negating, but also reversing the intended effect!

Who are Affected from the Violation of Right to Equality?

- Given an individual $j \in \mathcal{J}$, let $\tilde{\rho}_j = \{e\}$.
- For the next series of definitions, fix a profile of category memberships ρ , a choice rule $C(\rho; \cdot)$, and a set of applicants $I \subseteq \mathcal{I}$.

Definition

A set of individuals $J \subseteq (I \cap \mathcal{J})$ is **vulnerable to a violation of the Equality Code** if, for each $j \in J$,

$$j \notin \hat{C}(\rho; I) \quad \text{and} \quad j \in \hat{C}((\rho_{-J}, \tilde{\rho}_J); I).$$

- We will say **no applicant is materially affected by the violation of the Equality Code**, if no subset of applicants $J \subseteq (I \cap \mathcal{J})$ is vulnerable to a violation of the Equality Code.

Who are Affected from the Violation of Right to Equality?

Definition

The set of individuals $J \subseteq (I \cap \mathcal{J}) \setminus \hat{C}(\rho; I)$ is a **maximal set of individuals who suffer from a violation of the Equality Code** if,

1. J is vulnerable to a violation of the Equality Code, and
2. for any $J' \subseteq (I \cap \mathcal{J}) \setminus \hat{C}(\rho; I)$,

$$J \cap J' \subseteq \hat{C}((\rho_{-J'}, \tilde{\rho}_{J'}); I) \quad \text{and} \quad J' \setminus J \not\subseteq \hat{C}((\rho_{-J'}, \tilde{\rho}_{J'}); I).$$

Lemma

The maximal set of individuals who suffer from a violation of the Equality Code is unique.

The Case for the EWS-Last O&A Choice Rule

- Let the category membership profile ρ^* be such that,
 1. $\rho_i^* = \rho_i \cup \{e\}$ for any $i \in \mathcal{J}$, and
 2. $\rho_i^* = \rho_i$ for any $i \in \mathcal{I} \setminus \mathcal{J}$.
 - Introduces a special form of overlapping VR protections.
 - Corresponds to the removal of the exclusion.

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Proposition

Let $\underline{\triangleright} \in \Delta_e^o$. Then, no set of individuals is vulnerable to a violation of Equality Code under the EWS-Last O&A choice rule $C_S(\underline{\triangleright}, \rho^; \cdot)$.*

The Case for the EWS-Last O&A Choice Rule

Theorem

The set of individuals who receive a position under EWS-Last O&A but not under O&A, i.e.,

$$C_S(\underline{\Delta}, \rho^*; I) \setminus C_{OA}(\hat{\rho}; I),$$

is equal to the maximal set of individuals who suffer from a violation of the Equality Code under O&A.

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Corollary

EWS-Last O&A generates the same outcome as O&A if and only if no applicant is materially affected by the violation of the Equality Code under O&A.

The Legal Concept of Migration (Mobility) in India

- Legal terminology does not differentiate between categories of individuals and categories of positions in India.
 - Somewhat benign for the case of VR-protected categories such as SC, because SC positions are exclusive to members of SC.
- As a result the **general** category and the **open** category are used synonymously.
 - Legal documents speak of **open category individuals** or **general category positions**.
 - Not so benign, since open category positions are **not** exclusive to individuals from general category.
- The legal concept of **migration** (aka **mobility**) is a consequence of this misleading convention.
 - When a member of a VR-protected category (eg. SC) receives an open position, she is said to have **migrated** to general/open category.

The Role of Migration/Mobility in VR Policy

- What makes the VR policy a higher level AA policy is, it provides members of VR-protected categories (eg. SC, ST, OBC) with the **benefit of mobility** from their category to general category.
 - In our formal framework, this benefit is regulated through the axiom of **compliance with VR policy**.

The Loss of Mobility under the Exclusion

- In his Dissenting Opinion, Justice S. Ravindra Bhat describe his strong objection to the exclusion as follows:

“The exclusionary clause operates in an utterly arbitrary manner. Firstly, it ‘others’ those subjected to socially questionable, and outlawed practices – though they are amongst the poorest sections of society. Secondly, for the purpose of the new reservations, the exclusion operates against the socially disadvantaged classes and castes, absolutely, by confining them within their allocated reservation quotas (15% for SCs, 7.5% for STs, etc.). Thirdly, it denies the chance of mobility from the reserved quota (based on past discrimination) to a reservation benefit based only on economic deprivation.”

- In addition to the removal of the exclusion, the Dissenting Justices are also in favor of establishing mobility from SC/ST/OBC to EWS.
 - Assures that reparatory and compensatory VR protections for SEBCs maintain their status as the highest level AA protection.

Granting Mobility from Reparatory Categories to EWS

- The role EWS plays in our next axiom is parallel to the role open category plays for compliance with VR protections.
- **Mobility from reparatory categories to EWS:** No VR-protected position for SEBCs can be used up for an EWS-eligible individual who deserves an EWS position based on merit.
 - A choice rule $C(\rho; \cdot)$ **grants mobility from reparatory categories to EWS** if, for any $I \subseteq \mathcal{I}$, $c \in \mathcal{R} \setminus \{e\}$, and $i \in \mathcal{E}^e(\rho)$,

$$i \in C^c(\rho; I) \implies \begin{cases} |C^e(\rho; I)| = q^e, \text{ and} \\ \sigma_j > \sigma_i \text{ for any } j \in C^e(\rho; I). \end{cases}$$

The Case for the EWS-First O&A Choice Rule

- Together with the mandates of *Indra Sawhney (1992)*, our last axiom has a sharp implication in India.

Theorem

Suppose, once EWS is removed, each individual belongs at most one VR-protected category. Let $\overline{\Delta} \in \Delta^{o,e}$. Then, a choice rule complies with Indra Sawhney and it grants mobility from reparatory categories to EWS if, and only if, it is the EWS-First O&A choice rule $C_S(\overline{\Delta}, \rho; \cdot)$.

VR-Maximality

- Sequential choice rules are not the only extensions O&A with normative appeal. Indeed, there is a more compelling alternative if the objective is maintaining neutrality between VR-protected categories.

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- Given a set of individuals $I \subseteq \mathcal{I}$, let $\beta(I)$ denote the maximum number of VR-protected positions that can be awarded to eligible individuals.
 - For the case of non-overlapping VR protections,

$$\beta(I) = \sum_{c \in \mathcal{R}} \min \left\{ |I \cap \mathcal{E}^c(\rho)|, q^c \right\}.$$

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- For any $I \subseteq \mathcal{I}$ and $j \in \mathcal{I} \setminus I$, **individual j increases the VR utilization of I if,**

$$\beta(I \cup \{j\}) = \beta(I) + 1.$$

Meritorious O&A Choice Rule $C_{\text{OA}}(\rho; \cdot)$

Given $I \subseteq \mathcal{I}$

Step 1 (Open Positions). Allocate open positions to highest merit-score individuals. Let $J = I \setminus C_{\text{OA}}^{\circ}(\rho; I)$.

Step 2 (VR-Protected Positions).

Step 2.0 (Initiation): Let $J_0 = \emptyset$.

Step 2.k ($k \in \{1, \dots, \sum_{c \in \mathcal{R}} q^c\}$): Assuming such an individual exists, choose the highest merit-score individual in $J \setminus J_{k-1}$ who increases the VR-utilization of J_{k-1} . Denote her by j_k and let $J_k = J_{k-1} \cup \{j_k\}$. If no such individual exists, then end the process.

For any individual who receives a VR-protected position in Step 2, the category of her assigned position is determined at the termination of the procedure.

Meritorious Over-and-Above Choice Rule

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- Moreover, of all such rules, it is the one that is most “meritorious.”

Definition (Gale, 1968)

Let members of two sets of individuals $I = \{i_1, \dots, i_{|I|}\}$, $J = \{j_1, \dots, j_{|J|}\}$ be each enumerated such that the higher the merit score of an individual is the lower index number she has. Then, set I **Gale dominates** set J if,

1. $|I| \geq |J|$, and
2. for each $\ell \in \{1, \dots, |J|\}$,

$$\sigma_{i_\ell} \geq \sigma_{j_\ell}.$$

Meritorious Over-and-Above Choice Rule

Theorem

Let $C(\rho; \cdot)$ be any choice rule that complies with Indra Sawhney. Then for any $I \subseteq \mathcal{I}$, the set of individuals $\widehat{C}_{(OA)}(\rho; I)$ admitted by the meritorious O&A choice rule Gale dominates the set of individuals $\widehat{C}(\rho; I)$ admitted under choice rule $C(\rho; \cdot)$.

Implementation of EWS Quota

- Key arguments by the majority justices in their defense of the exclusion of SEBCs from EWS in the controversial Supreme Court ruling *Janhit Abhiyan (2022)* are **false**.
 - Akin to a false proof of a theorem!
 - Since these arguments are technical in nature, experiences like these suggest an important **support** role for design economists.
- Subject to earlier mandates of the Supreme Court and avoiding the violation of the Equity Code,
 1. Minimal intervention \implies EWS-Last O&A
 2. Maintaining elevated status of reparatory VR Protections
 \implies EWS-First O&A
 3. Neutral VR implementation \implies Meritorious O&A

Importance of Informed Neutrality

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- As emphasized in Li (2017),
“In addition to studying cause and effect in markets, economists also have a comparative advantage in stating precisely the normatively-relevant properties of complex systems [...]”
- Taking advantage of this comparative advantage through minimalist market design, I presented how an intuitive compromise policy brought during hearings of *Janhit Abhiyan (2022)* could have
 - on the one hand, resulted in a major loophole in the system if it was adopted by the court without any additional structure,
 - but at the same time, could have been further refined to one of three policies that each serve a distinct (but reasonable) normative objective.