

Comparison Analysis Between Inner Mongolia College Admissions Mechanism and Unified National Graduate Entrance Examination Mechanism

Yuhe Wang

*Center for China Fiscal Development, Central University of Finance and Economics, Beijing, China
2023310002@email.cufe.edu.cn*

Abstract. Against the backdrop of China's education admission matching systems, the Inner Mongolia college admissions mechanism and the Unified National Graduate Entrance Examination mechanism both limit candidates to one final choice but differ drastically in operation and outcomes. This paper compares their core rules, analyzes candidates' strategic differences, and explores why the theoretically superior Inner Mongolia mechanism was abolished in 2025 while the graduate exam mechanism remains in use. The results of this paper shows that the former is a complete-information dynamic game with high stability, strategy-proofness and Pareto efficiency but suffers from seat occupation, rigid sliding risks and high-score low-placement issues; the latter is an incomplete-information static game with efficiency losses yet fits postgraduate elite selection and is buffered by the adjustment round. This study clarifies the trade-off between theoretical optimality and practical feasibility in mechanism design, providing a reference for improving fairness and efficiency in high-stakes education admission systems.

Keywords: Efficiency, Fairness, Admission System.

1. Introduction

According to the definition of Gale and Shapley, college admission and postgraduate admission are two typical two-sided matching markets in China's education system [1]. Both their mechanism designs directly decide the fairness, efficiency, and stability of the matching. However, Inner Mongolia college admissions mechanism (Mongolia mechanism) used in Inner Mongolia from 2008 to 2024 and Unified National Graduate Entrance Examination mechanism (UNGEE mechanism) both restrict candidates to apply for one final choice, but produce totally different application strategies, matching outcomes, and policy lifespans. One question is: Both mechanisms require candidates to apply to only one college. Why do they have such differences? The Mongolia mechanism allows candidates making flexible adjustments, but it was replaced since 2025. While the UNGEE mechanism has severe information asymmetry and prominent misallocation of resources but is still used until now. Exploring these questions is essential to understanding the balance between theoretical optimality and practical feasibility in matching mechanism design, and provides a scientific basis for improving the fairness and efficiency of education admission systems.

In recent years, scholars only focused on the efficiency issues of individual mechanisms. Fu and Cai state that although Mongolia system protected the rights and interests of both candidates and colleges, it may cause malicious seat hoarding problems, meanwhile the sliding punishment cannot be ignored [2]. Gao verified that although the adjustment round could decrease the risk of sliding, it cannot resolve fundamental information asymmetry [3]. Feng, Deng, Bao and Luo argue that UNGEE mechanism has severe efficiency problems [4]. Despite rich research on separate mechanisms, few studies have directly compared the Inner Mongolia dynamic mechanism and the UNGEE static mechanism under a unified framework, leaving the causes of their divergent policy outcomes insufficiently explained.

This contrast raises critical theoretical and practical questions: why do mechanisms with the same single-choice constraint lead to fundamentally different strategic behaviors? Why was the Inner Mongolia mechanism—with stronger theoretical optimality—abolished in 2025, while the information-opaque and less efficient UNGEE mechanism remains in long-term use? Exploring these questions is essential to understanding the trade-offs between theoretical optimality and practical feasibility in matching mechanism design, and provides a scientific basis for improving the fairness and efficiency of high-stakes education admission systems.

2. The core rules of the two admission systems

The matching efficiency of education resources is highly correlated with the rule of admission mechanisms. Although Mongolia mechanism and UNGEE mechanism have the common feature that allowing candidates to apply for only one college in the end, they are essentially different in core rules and form two completely different resource matching models.

2.1. Mongolia mechanism

In Mongolia mechanism, candidates would know their score and ranking before admission. Then they are divided into different score ranges such as [701,750] and [651, 700]. The admission starts from the highest to the lowest score range, each score range could start the admission only after the previous score range ends. Every college has fixed quota. Colleges only prefer candidates with higher scores.

Every score range has an hour to choose a college in the system, and candidates can change it within this hour. After choosing a college, candidates would know how many candidates are also choosing this college and the ranking of their scores among these candidates. After the selection of each score range ends, the system will immediately count the selection situation. If the number of candidates for a college is less than the college's quota, all the candidates would be accepted. Otherwise, candidates whose ranking exceeds the quota will be rejected and classified as sliding. Sliding means that candidates can only reselect after all the candidates in all score ranges have selected once, which almost represents that there is no college for them to apply.

2.2. UNGEE mechanism

In UNGEE mechanism, candidates fill their application before the examination. Every candidate could only sign up for one major in one college, and if they are not admitted, they will be classified as sliding. Every college only consider those who sign up for them and select candidates with high scores to fill the quota.

However, for those candidates who are sliding, there is a second chance called adjustment round. Some colleges will reserve some positions in the first round for those sliding candidates and candidates can submit three parallel major choices. Then the system would follow the rules of serial dictatorship mechanism proposed by Atila Abdulkadiroğlu and Tayfun Sönmez, the preference of candidates with higher scores will be given priority until all the colleges have filled their quotas [5].

For candidates, they are admitted to another college although it is not their first preference, at least they don't have to repeat again. For colleges, they are able to recruit those candidates who are outstanding enough but just a bit unlucky and were refused by first preference.

3. Comparison of the two mechanisms from the perspective of market design

A high-quality resource matching mechanism should meet core standards such as stability, strategy-proof and Pareto efficiency, while taking into account information transparency and the rationality of matching strategies. The paper compares Mongolia mechanism with UNGEE mechanism, the two show significant differences in six core dimensions, as shown in Table 1.

Table 1. Comparison of two mechanisms

	Inner Mongolia	Postgraduate
Stability	High	Low
Strategy-proof	High	Low
Pareto efficiency	High	Low
transparency	Complete information	Incomplete information
Filling strategy	Strictly follow the true preference and when finding that this preference cannot be realized, switch to the next.	Risk to a top school & choose one that match their levels & guarantee a lower school
Current situation	Replaced since 2025	Still using

In terms of stability, Mongolia mechanism ensures that candidates could always find colleges that meet their preferences and their scores are also sufficient, so there won't be many blocking pairs. However, due to information opacity, UNGEE mechanism makes candidates misjudge the situation, resulting in low stability of matching results.

In terms of strategy-proof, under the complete information environment of Mongolia mechanism, candidates do not need to achieve admission by hiding their true preferences. While in UNGEE mechanism, to avoid sliding, candidates often deliberately lower their application goals or sprint for colleges far beyond their own level through speculative applications, resulting in weak strategy-proofness.

In terms of Pareto efficiency, Mongolia mechanism let candidates able to be admitted to the most preferred college within their score range, without much Pareto improvement space. Nevertheless, due to blind application before the examination, UNGEE mechanism causes a large number of candidates to miss their preferred colleges due to information errors, resulting in obvious efficiency losses in resource matching and low Pareto efficiency.

4. Analysis of the causes of strategic differences from the perspective of game theory

The research on candidate application recommendation models has become a hot topic of cross-integration in the fields of education and information technology. On the field of college admission, Qin proposed a recommendation algorithm based on the combination of collaborative filtering and

content analysis. By integrating students' interests, academic performance and career planning, this research emphasized the importance of personalized recommendation in college admission application [6]. Ye employed machine learning techniques to conduct a comprehensive evaluation according to students' multi-dimensional information, thus generating more accurate recommendation results [7]. However, these models fail to fully account for the complexity of the college entrance examination and voluntary application system in Inner Mongolia. On the field of postgraduate admission, Du, Liu and Shi concluded that the number of universities, institutional reputation and interview modes all affect the benefits of recruitment adjustment with the Spokes model, three-stage dynamic game and numerical simulation [8]. Nevertheless, the core issue of information asymmetry in postgraduate adjustment is not considered. Based on these, this paper analyzes the strategies from the perspective of Game Theory. The differences between two mechanisms are essentially due to the different types of games under them, leading to fundamental differences in candidates' decision-making logic and behavioral choices.

4.1. Mongolia mechanism: complete information dynamic game with reversible decisions

Game environment with complete information: All information in the enrollment process is public, which means each candidate can grasp the decision-making status of other candidates and the enrollment status of colleges, without information asymmetry.

Dynamic game decision-making process: College application is not a one-time static choice, but a continuous dynamic adjustment process. Candidates can adjust their decisions in real time according to changes in the game, and late movers can make optimal responses based on the decisions of early movers.

Reversible decisions: There is no sunk cost for candidates' decisions. If they find that the current choice is not feasible, they can immediately switch to the next preferred choice.

Under this game framework, the optimal strategy for candidates is to make choices in accordance with their own true preferences: if the preferred college is oversubscribed, they will promptly switch to the next preferred choice until they find a college that matches their scores. Eventually, the decision-making behaviors of all candidates interact to form a balance where popular colleges are not overcrowded and less popular colleges are not left out, realizing a stable matching between candidates and colleges.

4.2. UNGEE mechanism: incomplete information static game with irreversible decisions

Game environment with incomplete information: When filling in applications, candidates cannot know the application choices of other candidates. Information asymmetry can give rise to strategic information use and opportunistic behavior [9]. According to John C. Harsanyi, such asymmetry leads to irrational behavior since candidates' decisions can only be based on historical data and their own subjective judgments [10].

Static game decision-making process: Application filling is a one-time static choice. All candidates make decisions at the same times.

Irreversible decisions: The application information cannot be modified after confirmation. Once a candidate makes a choice, no matter what competitive situation is found later, the game strategy cannot be changed.

Risk buffer of the adjustment round: Although the adjustment round after sliding cannot allow candidates to be admitted to their originally preferred colleges, it provides them with a second chance for further education, significantly reducing the punishment cost of sliding.

Under this game framework, the optimal strategy for candidates is no longer simply following their true preferences, but making differentiated choices based on their own risk preferences: risk-seeking candidates are willing to bear the risk of sliding, choose to sprint for top colleges far beyond their own level, while risk-averse candidates are unsatisfied about the college in adjustment round, and will lower their application goals and choose colleges matching their own strength to avoid falling into sliding. This strategic differentiation is essentially a rational choice made by candidates to cope with incomplete information and irreversible decisions, and is also a specific embodiment of the game equilibrium under the postgraduate entrance examination mechanism.

5. Analysis of the current situation differences

From the theoretical perspectives of market design and game theory, Mongolia mechanism has significant theoretical advantages such as high stability, high efficiency and strong strategy-proofness, while UNGEE mechanism has obvious problems of efficiency loss and strategic manipulation. However, in reality, the former was abolished in 2025 and the latter is still in use. The core reason is that the theoretically optimal mechanism exposes the practical contradiction between fairness and efficiency in practice and has three major practical problems, while UNGEE mechanism, although having theoretical defects, is compatible with the practical needs of postgraduate enrollment, and its defects can be effectively alleviated through the adjustment round.

Lack of fairness caused by group occupation: The rules of complete information and dynamic adjustment give high-score candidates the chance for temporary occupation of positions. Some high-score candidates first occupy the quotas of popular colleges and majors to prevent low-score candidates from applying, and then switch to better choices at the last moment of application filling, resulting in low-score candidates who originally had the opportunity to apply for the college missing the chance, while the finally admitted candidates are not the originally intended group. This occupation behavior breaks the fair principle of higher scores first and causes substantive unfairness in admission results.

Rigid risk of sliding punishment: Although the mechanism designs dynamic adjustment rules, in the final stage of application filling, some candidates may fail to switch their applications in a timely manner due to operation delays, information judgment errors and other reasons, leading to sliding. However, this mechanism lacks a supplementary admission link similar to the postgraduate entrance examination adjustment, and sliding candidates face the serious consequence of having no college to attend. In particular, the sliding of high-score candidates will arouse social doubts about the rationality of the mechanism, violating the bottom-line principle of education admission.

Resource misallocation due to high score and low efficiency: Slight differences in score segments will lead to significant differentiation in candidates' decision-making behaviors, forming a phenomenon of "high score and low efficiency". For example, a candidate with 601 points, as the lowest score in the segment, may be afraid to choose colleges that are almost fully applied, while a candidate with 600 points, being in a lower score segment, dares to choose the same level of colleges without worrying about competitive pressure. Eventually, some high-score candidates choose colleges below their score level due to excessive conservatism, while some low-score candidates are admitted to higher-level colleges, resulting in a misallocation between scores and admission results, which violates the original intention of Pareto efficiency.

However, although UNGEE mechanism has theoretical defects, its rule design is highly compatible with the talent selection needs and applicant group characteristics of postgraduate enrollment, and the adjustment round effectively alleviates its core defects, making it rational for continuous use.

Postgraduate education is a professional elite education. Colleges have much higher requirements for candidates' major matching and research capabilities than the college admission, requiring candidates to clarify their research directions and supervisor choices before applying. This mechanism forces candidates to understand the professional characteristics and supervisor research directions of the target college before applying, which is in line with the personalized selection demand of postgraduate enrollment. In contrast, the college admission is for general education, which emphasizes the matching between scores and college levels, and has relatively low requirements for professional precision.

To design stable and efficient education admission mechanisms, fairness and efficiency must be equally emphasized. Mechanism design should balance complete information disclosure and dynamic adjustability with antimanipulation rules to prevent position occupation and unfair exclusion. Practical matching mechanisms need robustness and risk buffers beyond theoretical efficiency [11].

6. Conclusion

This paper compares the Inner Mongolia college admissions mechanism and the Unified National Graduate Entrance Examination mechanism from the perspectives of game theory and market design. Although both restrict candidates to one final choice, they differ sharply in information structure, decision dynamics and matching performance. The Inner Mongolia mechanism is a complete information dynamic game with high stability, strategyproofness and Pareto efficiency, while the postgraduate mechanism is an incomplete information static game with efficiency loss and strategic manipulation. The theoretically superior Inner Mongolia mechanism was abolished in 2025 due to unfair occupation, rigid sliding risks and highscore lowplacement problems, whereas the postgraduate mechanism remains in use because it fits elite education selection and is buffered by the adjustment round.

This paper only conducts theoretical analysis and lacks empirical tests and data simulations. Future research can use admission data to quantify efficiency and fairness, expand the scope of mechanisms, and further explore the balance between theoretical optimality and practical feasibility in highstakes education matching systems.

References

- [1] Gale, D., & Shapley, L. S. (1962). College admissions and the stability of marriage. *The American Mathematical Monthly*, (1), 9-15.
- [2] Fu, D. Y., & Cai, F. (2025). Research on the development of the college entrance examination admission model in Inner Mongolia Autonomous Region. In *Seminar of Education Examination and Evaluation* (pp. 90-99). Shanghai Municipal Educational Examinations Authority.
- [3] Gao, W. (2025). Break and restructuring: Choice dilemmas and breakthrough in interdisciplinary postgraduate transfer admissions. In *Career development* (pp. 153-156). Shanghai Education Press Group.
- [4] Feng, D. S., Deng, Z. M., Bao, L., & Luo, X. Y. (2003). An exploration of the reform in postgraduates' examination and admission system. *Journal of Guangdong University of Technology (Social Sciences Edition)*, (3), 42-44.
- [5] Abdulkadiroğlu, A., & Sönmez, T. (1998). Random serial dictatorship and the core from random endowments in house allocation problems. *Econometrica*, (3), 689-701.
- [6] Qin, X. F. (2024). Research on personalized recommendation of college application (Master's thesis). Guizhou Minzu University.
- [7] Ye, M. C. (2024). Design of college entrance examination volunteer recommendation system based on machine learning. *Technology Innovation and Application*, (9), 118-121.
- [8] Du, B., Liu, H. M., & Shi, Y. F. (2022). Governance of postgraduate admission transfer in institutions of higher education: Competition, modes and strategies. *Higher Education Exploration*, (2), 40-45.

- [9] Zhou, X. G. (2003). Ten lectures on the sociology of organizations. Social Sciences Academic Press.
- [10] Harsanyi, J. C. (2004). Games with incomplete information played by "Bayesian" players, I-III. *Management Science*, (12), 1804-1817.
- [11] Roth, A. E. (2008). What have we learned from market design? *The Economic Journal*, 118, 285-310.