

Comparison and Prospect of Chinese College Admission System and UCAS by Market Design Theory

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Abstract. This essay provides a depth analysis of the evolution of college admission mechanisms in China, focusing on the transition from the traditional 'non-parallel' system to the contemporary 'parallel' approach. It examines the characteristics and implications of both the old Sequential Mechanism and the new parallel mechanism, shedding light on their respective impacts on students and institutions. Furthermore, the essay explores the UCAS (Universities and Colleges Admissions Service) system, offering a comparative analysis between the Chinese admission system and UCAS. By highlighting similarities, differences, advantages, and challenges, it aims to claim the diverse methodologies employed in university admissions worldwide. The essay also emphasizes the importance of adopting a multifaceted approach to enhance the efficacy and fairness of both the Chinese admission system and UCAS. It advocates for the incorporation of more comprehensive methods, increased transparency, and targeted support for disadvantaged students to promote equity and inclusive in college admissions. Moreover, its emphasis the significance of global collaboration and exchange of best practices in shaping a more inclusive and effective higher education landscape.

Keywords: Chinese College admission system, Market design, Pareto efficiency, Strategy-proof.

1. Introduction

Since 1979, the Chinese College Entrance Examination has been held every 43 years. In 2019, the total number of participants rose to almost 10 million [1]. The evolution of college admission mechanisms in China over the past two decades reflects a profound shift from the traditional 'non-parallel' system to the more contemporary 'parallel' method. Initially dominated by the Sequential Mechanism, commonly known as the Immediate Acceptance Mechanism (IA), Chinese college admissions underwent a significant transformation towards a parallel mechanism, revolutionizing the landscape of student's admission. This essay delves into the contrast between the old and new mechanisms within the Chinese admission system, highlighting their features, impacts, and implications respectively for students and colleges.

In addition, this essay explores the UCAS (Universities and Colleges Admissions Service) system, offering a comparative analysis between the Chinese admission system and UCAS. While the former focus on Chinese students, the latter holds a broader international appeal, consider about students from various regions worldwide. By examining both systems, this research aims to explore similarities, differences, advantages, and challenges inherent in their respective approaches to university admissions.

2. Old vs. New Mechanism in the Chinese Admission System

Within the last two decades, many Chinese provinces have transitioned from the 'non-parallel' to the 'parallel' college admissions mechanisms. The Sequential Mechanism is also known as the Immediate Acceptance Mechanism commonly referred to as the Boston mechanism. According to Chen and Sönmez, Yan, the IA mechanism was the prevalent college admissions mechanism in China in the 1980s and 1990s [2, 3].

The previous non-parallel mechanism, or Boston or immediate acceptance (IA) mechanism, had been the only mechanism used in Chinese student assignments at both the high school and university levels.

As for the current Chinese university admission system, students would first fill in a few university preferences, the number of the preferences would differ according to the policies in different regions in China. According to the order of the results of the general online candidates from high to low, the computer will search the 3 parallel college preferences (for example A, B, C) that each student fills in in turn. First, the candidate file is proposed to the candidate's A school, if the score does not reach the school's control line, then voted to school B, and so on. The file is waiting to be proposed to the universities that are in the preferences until the application is accepted by a university. The file would be proposed to the universities in the candidate's file process, and the universities would decide whether to accept the application. If no institution meets the application conditions after searching, the candidate's application process has also been completed.

It is worth noting that in this matching mechanism, the universities are not allowed to set any student as unacceptable. The main difference between this PA algorithm and the DA algorithm is that in this mechanism there isn't any preference list on the universities' side because the only standard for recruiting students is the college admission examination score. In addition, the preference list from the student is also not their true preference but just a proposed order. Both the candidate's file progress and the universities' accepting progress are directly determined by the examination score ranking.

The similarity between these two mechanisms is score and ranking are the basis of admission, which means that the higher the score students get, they may be more competitive in the admission system. There are several differences between these two mechanisms. For one thing, the old system is a non-parallel mechanism, but the new system is a parallel mechanism, which significantly solves the problems of students missing out on the better school due to the afraid to cannot entering the school. For another, the old system is college-proposing, but the new system gives students more rights and changes to student-proposing. This change made the system more friendly to the students.

And the new mechanism improves the acceptance rate of candidates. If a student is not assigned to a first-choice school. In the first round, the IA mechanism could be more costly than a parallel mechanism such as the Shanghai mechanism, which offers a "second chance." For universities, the quality of students is more balanced, and it also solves the problem that some colleges and universities are full of students and other parts were seriously disconnected in the past, which is conducive to the smooth completion of the admission work. According to the simulation prediction, the acceptance rate of parallel volunteers can reach more than 90%.

3. The UCAS System: A Global Perspective

Since the UCAS system is one of the most well-known university admission systems in the world, this research will explore this mechanism and analyze the similarities and differences between the Chinese admission system and UCAS.

The number of applications from both countries rises to an ultrahigh digit in terms of the applied range. 10.78 million applications for college admission exams were submitted nationwide, which is 70,000 more than the year before [4]. According to the most recent application season data made available on the UCAS website, as of June 30th, 2021, 682010 individuals from all over the world had applied through the UCAS system for British undergraduate courses. This represents a 4% increase from 2020. According to statistics, 28490 mainland Chinese students applied for admission, out of a total of 28400 candidates from all EU member states (except from the UK) [5]. Moreover, nearly everyone who plans to study for an undergraduate degree in the UK from Europe, Asian, the America, must apply through UCAS. Chinese mechanism may assign quotas to different provinces or regions, but students need to apply to the UK's college in the same system wherever they are from [6]. Different from the Chinese admission system, applicants can only apply to a maximum of 5

colleges and are not asked to rank their choices. And it is a pre-results application system, students apply to universities before they know their final grades. In addition, universities may send offers to students on different dates but will not set a fixed date [7].

Both two mechanisms are student-proposing, and they are not Pareto efficient. For Chinese, because people limited number of volunteers, to make sure that guarantee admission, they tend to apply to schools with lower scores. For UCAS, the inaccuracy of 'predicted grades' is the most important reason, the gap between predicted grades and real grades causes some students to miss out on the offer that they deserve. The trade-offs and complexities in student selection, geographical location, economic status, and educational background also should be considered.

There are still some differences between these two mechanisms. Firstly, except for some military schools' Chinese universities do not have the right to set a student as unacceptable [8]. By contrast, the university in the UK has the right to reject students even though they got enough grades. Secondly, it must be mentioned that they have different preference rank. Chinese admission only focuses on the score in the examination, but UK admission focuses on A-level grades, PS, recommendation letters, high school transcript, and so on.

For Chinese it is strategy-proof because it is the parallel mechanism and student-optimal so students are bold enough to follow their original preferences. Because no artificial operations are used during any of the matching processes, the enrollment official website system will handle everything, making the mechanism extremely stable. The student's file will be automatically rejected by the other universities as soon as it is approved by one. It forbids candidates and universities from exchanging private signs on both sides. It is important to confirm that the parallel volunteer system is strategy-proof since, when completing the admission form, candidates should firmly adhere to their initial preference. Everyone is forced to "tell the truth". On their form by the admittance mechanism, achieving the strategy-proof objective [9].

But for UCAS system is not strategy-proof, because the result may be compromised by factors such as personal statements, some students likely fake it to get more opportunities and inaccuracy predicted grades also violate the concept of 'telling the truth'. On the other hand, to get more exceptional applicants, colleges advertise a higher qualification on the UCAS system, which goes against the strategy-proof premise that truth-telling is a weakly dominating strategy from "market design."

From the perspective of stability. For the Chinese admission system, because no artificial operations are used during any of the matching processes, the application process on the official website system can handle everything, making the mechanism highly stable. The student's file will be automatically rejected by the other universities as soon as it is approved by one. It prevents candidates and universities from exchanging private signs on both sides [10]. For UCAS, even though colleges have developed a ranking system for their admissions process, the current system lacks a method that can efficiently reveal coordinated offers. Universities extend offers to candidates without having any idea what those offers might entail. Students just need to keep two of the five conditional offers, which is the explanation. Before their last evaluation, the other three had been prepared to give up. As a result, it is like speculating or a gambling game where the outcome depends on an unknown interplay between the five offers given by colleges and the decisions made by each student. Because a person or pair of individuals could profitably diverge from some prior matching, the mechanism is therefore not reliable enough in the table 1 [9].

Table 1. Comparison of admission system

	Chinese admission system	UCAS
Applied area	Mostly in China	All over the world
Determine factor	Examination score	A-level grades, PS, recommendation letters, high school transcript, and so on.
Pareto efficient	No	No
Strategy-proof	Yes	No
Stability	Yes	No

4. Advantages and Challenges of Chinese admission system and UCAS

The Chinese admission system offers several distinct advantages. Firstly, its standardized nature ensures fairness and equality in assessing students' academic abilities across diverse social, and economic backgrounds and geographic regions. Secondly, the Chinese admission system's emphasis on meritocracy incentivizes students to strive for academic excellence, fostering a competitive educational environment. However, the Chinese admission system is not without its drawbacks. The intense competition and high stakes associated with this examination often lead to excessive pressure and stress among students, significantly impacting their mental health and well-being. Furthermore, the Chinese admission focus primarily on academic performance may neglect other important aspects of students' abilities and qualities, such as extracurricular activities and personalities.

On the other hand, UCAS offers a different approach to university admissions, characterized by its holistic evaluation process. By considering various factors such as academic achievements, personal statements, recommendation letters, and extracurricular activities, UCAS provides a more comprehensive assessment of students' abilities and potential. Additionally, UCAS's flexibility allows students to apply to multiple universities and courses, empowering them to explore different options and tailor their choices to their interests and strengths. Nevertheless, UCAS also faces challenges. The subjective nature of its holistic evaluation process introduces the possibility of inconsistencies and biases in admissions decisions across different universities. Moreover, students from disadvantaged backgrounds may face barriers in accessing resources and support to prepare competitive applications, exacerbating existing inequalities in higher education.

Also, there is a growing recognition of the need to focus on the Chinese college admission system. While maintaining its objectivity and fairness, efforts are underway to incorporate a more holistic evaluation that considers a broader range of factors beyond academic performance. Such reforms aim to alleviate the pressure on students and provide a more comprehensive assessment of their abilities, ultimately enhancing the overall quality and fairness of university admissions in China. Also, there is a need to address the issues of subjectivity and inequality in the UCAS system. Efforts should be to enhance transparency and consistency in admissions decisions while ensuring equitable access to resources and support for all students. Furthermore, initiatives aimed at widening participation and diversifying the student body are being prioritized, aiming to create a more inclusive and representative higher education sector in the UK.

5. Suggestion

To enhance the efficacy and fairness of both the Chinese college admission system and UCAS, a multi-faceted approach is necessary. For the Chinese system, adopting a more holistic evaluation method that extends beyond mere academic scores to include extracurricular activities and personal achievements could alleviate the immense pressure on students and acknowledge a wider array of talents. Increasing transparency in the allocation of quotas and expanding student rights in the application process would further empower applicants, making the system more equitable and student friendly. On the other hand, UCAS reduces the use of standardizing the evaluation of predicted grades to decrease discrepancies and implementing targeted support for students from disadvantaged backgrounds, ensuring all applicants have equal opportunities to succeed.

Both systems could also learn from each other through the exchange of best practices, with the Chinese system's rigorous academic focus and UCAS's comprehensive approach providing valuable insights. Encouraging global collaboration in higher education admissions and adopting adaptive reforms in response to societal and technological changes are crucial steps toward creating a more inclusive and effective educational landscape. Regular stakeholder engagement will ensure that reforms are well-rounded and address the evolving needs of students, educators, and policymakers, ultimately leading to a fairer and more accessible higher education system worldwide.

6. Conclusion

In conclusion, the contrasting approaches of the Chinese admission system and UCAS emphasize the diverse methodologies used in selecting prospective university students. While the Chinese system emphasizes standardized testing and a meritocratic approach, UCAS adopts a more holistic admission process, considering multiple facets of students' abilities and backgrounds. Despite their distinctiveness, both systems face challenges such as fairness, transparency, and inclusivity.

Additionally, the government or the Department of Education should pay efforts to enhance the efficacy and fairness of both systems. For the Chinese system, incorporating holistic evaluation methods and increasing transparency in admissions processes could ease pressure on students and promote equity. Similarly, UCAS could benefit from reducing reliance on predictions and implementing targeted support for disadvantaged students to ensure equal opportunities for all applicants.

Moreover, fostering collaboration and exchange of advantages between the two systems can enrich their respective approaches and contribute to a more inclusive and effective global higher education landscape. By prioritizing stakeholder engagement and adaptive reforms, both the Chinese admission system and UCAS can strive towards creating fairer, more accessible pathways to higher education for students worldwide.

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