

Cross-border Regulatory Arbitrage and Judicial Conflicts: A Dynamic Game Study Based on the Land-Hong Kong Connect Mechanism

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Abstract. With the development of global financial market interconnectivity, differences in securities regulatory regimes in different jurisdictions trigger cross-border securities regulatory arbitrage. Enterprises take advantage of the regulatory rule gap to circumvent strict regulation by listing or trading in different places. Although such behavior helps firms reduce compliance costs, it may bring problems such as regulatory competition and cross-border risk transmission. This paper takes the regulatory game between mainland China and Hong Kong as an example, constructs a dynamic game model including mainland regulators, Hong Kong regulators, and cross-border arbitrageurs, and analyzes the interaction of the strategies of each party and the equilibrium results. It is found that the regulatory differences and the conflict of enforcement authority cause the game equilibrium to deviate from Pareto optimality. When the regulators of the two places act separately, the arbitrageurs choose to violate arbitrage as the equilibrium strategy, the mainland regulators bear the risk of regulatory failure, and the cooperative regulation can make all three parties gain positively and maintain market stability. However, due to the high cost of cooperation and insufficient incentives, the optimal social outcome is difficult to realize autonomously. For this reason, policy intervention is needed to coordinate regulatory conflicts of interest, bridge legal differences, and lower the threshold of collaboration in order to achieve effective harmonization of cross-border securities regulation.

Keywords: Cross-border securities regulatory arbitrage; regulatory disparity, game modeling, blockchain technology, regulatory collaboration mechanism.

1. Introduction

In recent years, the issue of cross-border securities regulatory arbitrage has gradually attracted attention as global capital market connectivity deepens. Differences in securities regulatory regimes in different jurisdictions enable companies to take advantage of the regulatory divide to reduce compliance costs. This regulatory divide is specifically reflected in the inconsistency of information disclosure standards, differences in regulatory enforcement efforts, and inconsistencies in legal systems and enforcement efficiency, etc. Enterprises often realize regulatory arbitrage by choosing to list or trade in regions with relatively lax regulation. Although such behavior can enhance corporate earnings in the short term, it may trigger regulatory competition and cross-border spillover of risks in the long term, posing a potential threat to the stability of the financial market, especially typical of the regulatory interactions between the Mainland and Hong Kong [1, 2].

Current research perspectives mainly focus on three aspects: institutional differences, technology application, and game analysis. In terms of institutional differences, Hu Yanping systematically compares the regulatory regimes of the Mainland and Hong Kong securities markets and finds that the Mainland market has higher regulatory costs and a more complex system, which provides objective conditions for regulatory arbitrage [3]. Gan Yunfeng further pointed out that the conflict of laws and the imperfection of the cross-border regulatory coordination mechanism are the fundamental reasons for the continuation of arbitrage behavior, and there is an urgent need to strengthen institutional collaboration [4]. In terms of technology application, blockchain and other financial technology means are widely recognized as being able to effectively reduce the information asymmetry of cross-border regulation. Liu Jianing pointed out that real-time information sharing and regulatory collaboration through blockchain can significantly compress the space for cross-border

arbitrage [5]. However, the application of technology is accompanied by high costs and legal barriers, and it is difficult to cure the arbitrage problem by solely relying on technology. Huang Hui further emphasized through the analysis of the Hong Kong Securities Market Tribunal case, technical means must be complementary with the legal system, purely technology-driven can not completely solve the fundamental problem of regulatory arbitrage [6]. From the perspective of the research path of game analysis, the existing literature mostly uses complete information game theory to analyze the cross-border regulatory collaboration dilemma. For example, Cui Xiaohe used the complete information game model to explore the regulatory interaction between China and the United States, pointing out that the regulatory autonomy preference leads to the lack of cooperation motivation of regulators, and ultimately falls into a suboptimal equilibrium [2].

Although existing studies have explored the issue of regulatory arbitrage from multiple perspectives, there is still a lack of in-depth analysis of the role of dynamic game mechanisms in cross-border regulatory collaboration under conditions of incomplete information. In practice, regulatory bodies and market participants often face information asymmetry problems, and strategic interactions present significant dynamics and complexity. Therefore, this paper focuses on the practice of securities regulation between the Mainland and Hong Kong, constructs a three-party dynamic game model with incomplete information that includes regulators and arbitrage firms in the two places, and systematically examines the strategic choices and equilibrium states of each party, aiming to provide more realistic policy recommendations for cross-border securities regulatory collaboration.

2. Game Model Analysis

This paper constructed a dynamic game model with the participation of the mainland regulator (C), the Hong Kong regulator (H), and the cross-border arbitrageurs (F). The game process is sequentially as follows: first, the mainland regulator (C) chooses to implement a strong or weak regulatory strategy. Second, the Hong Kong regulator (H) decides to collaborate with the mainland regulator (cooperation) or insist on autonomous regulation (non-cooperation). Finally, arbitrageurs (F) choose to operate in compliance or cross-border arbitrage based on the regulatory status of the two places.

First, enter the parameter setting of the Mainland regulator (C). The cost of regulation is set at 8, mainly because of the large size of the Mainland securities market, the large number of listed firms, the wide range of regulatory targets and the complex structure, thus strong regulation requires the investment of a large amount of administrative resources, manpower costs, and cross-departmental coordination costs. In addition, the Mainland has not yet established a mechanism similar to that of specialized judicial bodies such as the Securities Misconduct Tribunal in Hong Kong, which makes the enforcement process less efficient and more costly [4, 6]. While such high-intensity regulation helps to enhance market order, it may also face difficulties in sustaining enforcement in the long run due to high costs, which in turn affects the stability and consistency of regulation. The cost of weak regulation is 3, reflecting the resource savings from the simplified regulatory process. The additional cost of collaboration is 10 units, reflecting the resource investment in legal coordination, information communication, and joint enforcement in cross-border cooperation. The benefit of investigation and prosecution is 20 units, a benefit that includes not only the amount of forfeiture but also covers the recovery of investor losses, the restoration of market confidence, and the long-term social benefits brought about by the deterrence of violations. The negative utility of unsuccessful detection of violations is -15 units, reflecting the negative impact of regulatory failure, including reputational damage to the regulator, erosion of market confidence, and an increase in potential risks to financial stability. The high cost of regulatory failure reflects the need for effective enforcement by regulators. The cost of blockchain technology is 6 units, representing the relatively high initial investment in implementing advanced technology regulation in the Mainland.

The Hong Kong regulator (H) parameter is set with a strong regulatory cost of 6 units, which is lower relative to the Mainland because of Hong Kong's streamlined regulatory system, small market

size, more mature regulatory mechanism, lower marginal costs of regulatory costs and technology application, and the Market Misconduct Tribunal system that improves regulatory efficiency [6]. Weak regulation, i.e., an autonomy cost of 2 units, represents the minimum regulatory maintenance cost. This suggests that H will incur some burden if it chooses to regulate more strictly than usual while maintaining low costs by maintaining autonomous inaction. Collaboration costs are set to 8 units, reflecting the costs incurred by cross-border information sharing and collaborative enforcement. The arbitrage benefit is set at 15 units, reflecting the benefits of maintaining Hong Kong's reputation in the global capital markets and the efficiency of enforcement. The autonomy dividend is 12 units, reflecting the gains in market attractiveness and international competitiveness from Hong Kong's maintenance of regulatory autonomy. The cost of blockchain technology is 4 units, lower than the Mainland's 6 units, and there is a realistic basis for this difference. The Mainland has invested more in regulatory technology, on the one hand, due to the initial construction and R&D costs due to the larger technological infrastructure required for the market size; on the other hand, the Mainland's regulatory technology is still in the pilot testing stage, and the integration of new technology into the existing system needs to overcome legal and institutional barriers [5, 6].

Arbitrage agency (F) parameters. Setting the gain from compliance at 30 units and the gain from arbitrage at 100 units shows the huge profit incentive of cross-border regulatory arbitrage. This setting is close to reality: firms have relatively limited profits from compliance, while arbitrage by exploiting regulatory discrepancies often yields returns several times that of normal business, which is precisely the reason why arbitrage behavior is so persistent. However, the model also gives a huge penalty effect of -150 for non-compliance and considers the expected return of the arbitrageur in conjunction with the probability of detection and punishment, portraying regulatory deterrence from a game perspective. According to the classic theory of criminal economics, a rational subject will choose to take a risk only when the expected gain from the violation exceeds the expected penalized cost. In the model, if the Mainland and Hong Kong work separately and do not synergize their technologies, the probability of violation of the law being investigated and punished is about 30%. In this case, the arbitrageur's expected penalty is $-150 \times 30\% = -45$, and the expected net gain from violating the law is still about $100 - 45 = 55$, which is higher than the gain from complying with the law by 30, thus the arbitrage strategy is superior, which is in line with the motivational structure of "Gain from violating the law > Expected penalty". However, if the probability of detection is raised to 60% by the collaboration between the two regions and the use of blockchain monitoring, the expected penalty of arbitrage becomes $-150 \times 60\% = -90$, leaving a net gain of about 10, much lower than the gain from compliance of 30. At this point, the arbitrageur's optimal choice would be to comply with the law, as the expected utility of non-compliance has been reversed to a disadvantage. The information research cost of 5 units represents the cost invested by the firm in analyzing the uncertainty of the regulatory situation in both places. Technology confrontation cost of 10 units, the cost of technology invested to circumvent regulation under the condition that the regulator adopts blockchain technology.

Technical rule. Violation detection probability, 60% if C and H collaborate and blockchain is enabled. 30% in all other cases (no technology enablement by default). The blockchain enablement condition is triggered only if C and H both choose strong regulation and collaborate.

The above parameterization is intended to be realistic, with arbitrage gains much higher than compliance gains, suggesting that firms have strong incentives to seek regulatory arbitrage; however, the penalties for getting caught are also sufficiently severe to reflect regulatory deterrence. On the regulator's side, the high additional cost of cooperation and the significant attraction of autonomy for Hong Kong under fragmentation reflect the current incentive imbalance in cross-border regulatory collaboration. In the following, the strategy combinations of the game are calculated based on these parameters and the equilibrium results are analyzed.

Table 1. Tri-party cross-border regulatory arbitrage strategy portfolio

		Arbitrage institutions (F)			
		compliance		arbitrage	
		Hong Kong Regulator (H)			
		provide assistance	autonomy	provide assistance	autonomy
Mainland regulators (C)	intensive supervision	(8, 5, 25)	(12, 10, 25)	(-2, -5, -55)	(-2, 10, 40)
	weak regulation	(-22, 5, 25)	(-18, 10, 25)	(-22, -5, -55)	(-18, 10, 55)

Table 2. Tripartite cross-border regulatory arbitrage benefits matrix

serial number	C's regulatory strategy	Regulatory strategy for H	Behavioral Strategies for F	Gain on C	Gain on H	Gain on F	Total tripartite benefits	Scene Description
1	intensive supervision	coordination	compliance	20-8-10+6=+8	15-6-8+4=+5	30-5=+25	+38	Blockchain enabled, ideal collaboration scenario
2	intensive supervision	coordination	arbitrage	(20 x 60%) -8 -10 +6 = -2	(15 x 60%) -6 -8 +4 = -5	(100 x 40%) - (150 x 60%) -5 -10 = -55	-62	Separate equilibrium empowered by technology
3	intensive supervision	autonomy	compliance	20-8-0 = +12	12 -2 = +10	30 -5 = +25	+47	C unilateral strong regulation, H
4	intensive supervision	autonomy	arbitrage	(20 x 30%) -8 = -2	12-2= +10	(100 x 70%) - (150 x 30%) -5 -10 = +40	+48	C regulatory isolation, F arbitrage using time differences
5	weak regulation	coordination	compliance	-15 -3 -10 +6 = -22	15 -6 -8 +4 = +5	30 -5 = +25	+8	C weakly regulated but H collaboratively contradictory
6	weak regulation	coordination	arbitrage	(-15 x 60%) -3 -10 +6 = -22	(15 x 60%) -6 -8 +4 = -5	(100 x 40%) - (150 x 60%) -5 = -55	-72	C Dereliction of duty and failure of H collaboration
7	weak regulation	autonomy	compliance	-15-3 = -18	12 -2 = +10	30 -5 = +25	+17	C is completely absent and H remains autonomous
8	weak regulation	autonomy	arbitrage	-15-3 = -18	12 -2 = +10	(100 x 70%) - (150 x 30%) -5 = +55	+47	market failure

As derived from Table 1, there are a total of eight strategy combinations for the three parties. The returns of the Mainland regulator (C), the Hong Kong regulator (H) and the arbitrageur (F) under each combination, as well as the total tripartite returns, are given in the table above.

Observing Table 2, Strategy 1 (C strong regulation + H collaboration + F compliance) is a Pareto-optimal strategy combination in terms of Pareto efficiency. In this scenario, the Mainland and Hong

Kong regulators work together to strictly enforce the law, arbitrageurs comply with regulations, and all parties have positive returns and no risk spillover from market stability. Of course, Strategy 4 and Strategy 8 have slightly higher total returns, but they are not sustainable due to the losses incurred by the regulators. Although Strategy 1 achieves a win-win situation for all three parties, it may not be an equilibrium spontaneously chosen by the game participants. To examine the stability of each party's strategy, further determine the Nash equilibrium in the strategy portfolio. A Nash equilibrium requires that no participant has an incentive to unilaterally deviate from the current strategy given the other parties' strategies.

First, examine Strategy 1. Assuming no change in the counterparty, if Hong Kong regulator H changes from collaboration to autonomy, its return increases from +5 to +10 (moving to Strategy 3); if H does not collaborate, arbitrageur F is likely to take advantage of the change from compliance to arbitrage, moving the situation to Strategy 4, where H's return is still +10. Therefore, there is an incentive for H to deviate, and Strategy 1 is not a Nash equilibrium. Mainland regulator C or arbitrageur F may also have an incentive to deviate under strategy 1, but H's deviation alone is sufficient to disrupt the equilibrium.

Next, Strategy 4 (C strong regulation + H autonomous + F arbitrage) is tested, and one-sided deviations are tested under this combination. For C, if it is changed to weak regulation, the scenario changes to strategy 8, and the C return falls from -2 to -18, which clearly does not select for deviation. For H, if it is changed to Collaboration with C, the scenario changes to Strategy 2, and H returns drop from +10 to -5, with no incentive to deviate. For F, if it is changed to compliance, it becomes strategy 3, and the F return drops from +40 to +25, also with no incentive to deviate. None of the three parties has a unilateral willingness to deviate, so Strategy 4 satisfies the Nash equilibrium condition and is the only pure strategy Nash equilibrium in this game.

Finally, test strategy 8 (C weak regulation + H autonomous + F arbitrage). c can rise to strategy 4 to raise its own return from -18 to -2 if it is changed to strong regulation, so c has incentive to deviate; therefore strategy 8 does not constitute an equilibrium.

Other combinations can be analyzed similarly: strategy 3 (C is strong, H is autonomous, F is compliant) seems to be favorable to C and H, but F will tend to deviate to arbitrage (transfer to strategy 4), so it is difficult to stabilize; strategy 7 (C is weak, H is autonomous, F is compliant), then C has an incentive to strengthen the regulation in order to improve the return, and so on. To sum up, Strategy 4 is a stable equilibrium of the three-party game, while Strategy 1 is Pareto-advantaged but difficult to achieve self-stabilization due to incompatible incentives of all parties.

The above results reveal the contradictions in the current cross-border securities regulatory game: ideally, a win-win-win situation can be achieved by regulators' coordination and market players' compliance, but this situation cannot be achieved through free play due to the respective interests of each party.

What often happens in reality is a situation similar to strategy 4, where the mainland regulators try to tighten controls, Hong Kong prefers to maintain institutional autonomy, and firms take advantage of regulatory gaps to engage in arbitrage. In this equilibrium, Hong Kong maintains the attractiveness of its financial market in the short run and arbitrageurs reap high benefits, but Mainland regulators bear the costs of regulatory failure and risk accumulation. In the dynamic long run, this uncooperative equilibrium will increase the overall systemic risk, and all parties may suffer in the event of a risk outbreak. Therefore, how to reverse the incentives for gaming to make cooperation possible is a key challenge for regulatory authorities.

3. Conclusion

This study systematically analyzes the game relationship between cross-border securities regulation in the Mainland and Hong Kong by constructing a dynamic game model. It is found that the current regulatory equilibrium deviates from the optimal state due to institutional differences and the absence of collaboration mechanisms, leading to the persistence of regulatory arbitrage space.

Although cooperation between the two jurisdictions can enhance regulatory effectiveness, incentive mismatch and high collaboration costs impede substantive cooperation, allowing firms to exploit regulatory loopholes for profit and undermining market stability.

Based on the findings of the study, this paper puts forward multi-level policy recommendations: first, to establish a regular collaboration mechanism to improve information sharing and joint enforcement; second, to promote the harmonization of regulatory rules in key areas; third, to optimize the incentives for cooperation by applying economic leverage; and fourth, to explore a regional collaboration model with the Guangdong-Hong Kong-Macao Greater Bay Area as a pilot. It is also recommended to promote the construction of a multilateral regulatory platform to accumulate experience for global regulatory collaboration.

It should be noted that there are two limitations in the research: first, cross-border cooperation is subject to the legal and political differences among countries; second, the theoretical model needs to be verified with practice. Future research should focus on three directions: exploring the application of blockchain and other technologies, strengthening empirical case studies, and deepening international comparative analysis in order to build a better cross-border regulatory system. These studies will provide important support for maintaining financial market stability.

References

- [1] Liu Fengyuan, Qiu Ni. On the risk regulation of cross-border regulatory arbitrage. *Journal of Central South University (Social Science Edition)*, 2022, 28 (04): 42-52.
- [2] Cui, Xiaohe. Comparison of cross-border securities regulatory collaboration mechanisms between China and the United States. *Shanghai Finance*, 2019 (1): 74-80.
- [3] Hu Yanping. A comparative study of government regulation in mainland and Hong Kong securities markets. *SAR Economy*, 2006, (07): 47-49.
- [4] Gan Yunfeng. Research on the reform and improvement of China's cross-border securities regulatory collaboration mechanism. *Modern Economic Discussion*, 2016, (7): 85-90.
- [5] Liu Jianing. Experiences and practical paths of cross-border financial regulatory cooperation in Guangdong, Hong Kong and Macao Bay Area. *New Finance*, 2023, (4): 48-55.
- [6] Huang Hui. Hong Kong securities market misconduct tribunal system and its inspiration. *Investor*, 2018, (01): 184-202.