Is Sino-Pakistan Collusion a Chimera?
A Game Theory Perspective

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Myriad complexities underlie the India–China–Pakistan triangle, with narratives varying from competition to collaboration. Recent developments in Galwan, renewed ceasefire agreement with Pakistan and a resurgent Quad, all amidst Covid diplomacy, necessitate a relook at traditional approaches and narratives on Sino-Pakistan collusion. Is it only a common anti-India sentiment that is driving it or is the pentagram of the United States, Russia, China, India and Pakistan, with their dyadic interplay, manifesting itself? From a game theory perspective, the probability of such a collusion is explored to argue that leveraging of diplomacy, information, military and economic (DIME) instruments of national power, combined with astute statecraft and foresight, is the way forward for India.

Keywords: *Sino-Pak Collusion, Game Theory, International Relations, Foreign Policy, China-Pak-India Triangle, USA-Russia-India-China-Pak Pentagram*

We worked out our methods to say how collusive [action] could happen and not happen, how much and how far one Nation can go against another. How they would support, we have worked out

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our contingencies, but yes, some kind of collusive [action] should be anticipated.

– **General Bipin Rawat**, *Chief of Defence Staff (CDS)*[1]

INTRODUCTION

There are many intricacies in the inter se relations of China, Pakistan and India while correlating the behavioural patterns of these nation states with the various schools or thoughts of international relations theory.[2] Shared history, traditional baggage of differences, differing perceptions on various issues and the prism of competition–collaboration add on to the complexities. Relative national power of these countries and the role of other players, like the United States (US), Russia and even the recently activated Quad, create a complex interconnected theatre. An often-repeated threat scenario within this paradigm is that of Sino-Pakistan collusion, wherein either of the two launches an offensive against India which is followed by the other, or both launch an overt, synchronised war, either in a geographically proximal battlefield like Gilgit-Baltistan or on two different fronts, to create a joint effect.[3] Is such a collusion a chimera, propped up by warmongers, or a plausible reality which could threaten Indian national interests and security paradigm?

Merriam-Webster Dictionary defines 'chimera' as an 'imaginary monster compounded of incongruous parts', an illusion or fabrication of the mind. Similarly, the word 'collusion' is defined as 'a secret agreement or cooperation especially for an illegal or deceitful purpose'. Sino-Pak collusion would imply the congruence of interests between China and Pakistan, even as both individually have their own ambitions and varying internal priorities. How much are the collective interests of the two on a collision course with India or is there a common path for all to tread?

If it becomes a two-front war, what will be the theatre of decision: will it be the traditional plains of Punjab or the glaciated unfriendly environs of Gilgit-Baltistan? Increased presence of People's Liberation Army (PLA) troops in Gilgit-Baltistan (not-so-recent newspaper reports), recent announcement on funding for the long-pending Diamer-Bhasha Dam and the provisional provincial status accorded by Pakistan to Gilgit-Baltistan are certain indications of renewed interest in the area; and increased participation by China in trilateral groupings of Pakistan–Afghanistan–China and engaging the Taliban,[4] even if for own energy security, have to be seen in the backdrop of such developments.

In the realm of strategic management and geopolitics, it is easier to analyse bilateral relations or dyads. In the case of India and China:

> Both are attached to a range of multilateral mechanisms and bodies at regional, cross-continental and global levels, which helps them to establish new layers of engagement and power politics. The emerging layers of power politics do take the scope of their relationship far beyond the purview of bilateralism.[5]

When the focus is on India's neighbourhood, China, Pakistan, the US and Russia fall into a closer group of influencing actors.

Recent Chinese actions in Galwan and reaffirmation of the ceasefire agreement between India and Pakistan, followed by increased proclivity from Pakistan for peace,[6] necessitate the need to deeply understand the triad of China, Pakistan and India. When viewed as a triangle or an intersecting mix of Indo-Pakistan dyad and Sino-Pakistan dyad, it can be seen that Indo-Pakistan dyad is based on a mix of shared ancestry and mistrust, whereas that of Sino-Pakistan is bolstered by the needs of both countries to achieve strategic aims, with China as the dominant partner. For China, it is a window of opportunity to expand into Central Asia as well as have a two-ocean presence through Gwadar Port, while simultaneously encircling India. The recent developments in Quadrilateral Security Dialogue (Quad) and the Chinese response 'about forming small cliques' are some indicators of China's concerns.[7]

On the other hand, Pakistan sees in China a long-term ally, often termed as 'high as mountains, deep as the ocean' friendship which has seen various ups and downs in terms of covert and overt support. Pakistan's nuclear programme is a testimony of this dyad and its effectiveness, but China's reluctance to engage during Pakistan's 1971 debacle and the 1999 Kargil War, due to extraneous factors, are past indicators of the extent to which China is willing to go. However, China of 1971 and 1999 is not the China of 2021, and the relative national power and inter se security threat perspectives have changed ever since.

China supports Pakistan with a view of sustaining the strategic pull it exerts on India's security calculus. The various platforms over which this generally one-sided friendship has manifested include transfer of technology, joint development of war machinery, nuclear enrichment ideas and infrastructure projects. In fact, the development of the nuclear option created a new set of warfare options at the sub-

conventional level wherein the threshold had to be maintained below a nuclear trigger and at the same time, brought in strategic advantages to a comparatively weaker side, that is, Pakistan, in a one-on-one with India.

Within the triangle or triad of these three nations, India's nuclear policy, Act East Policy and increased maritime domination, including participation in regional forums like the Quad, impacts China's strategic interests. The Sino-Indian dyad therefore is influenced by the US–China dyad, and similarly the US–India dyad's strength depends on the collaborative/competitive spectrum of the US–China relations. To term this multilateral series of actors as a pentagram or pentagon would be oversimplification, but for ease of understanding and restricting the scope, the focus of this article will remain on the China–Pakistan–India triangle, with emphasis on the game theoretic possibility of a collusion.

Game Theory Perspective

Under conditions of risk and uncertainty, especially when choices are to be made, an interesting perspective emerges when game theory is used or applied. In traditional Indo-Pak relations, experts speak of the Nash equilibrium[8] of continuing with the status quo or 'no war–no peace' (NWNP),[9] instead of a mutually beneficial Pareto-optimal solution of opting for peaceful resolution of the conflict.[10] What makes the whole subject interesting, and at the same time intriguing, are the recent developments in Sino-Indian and Indo-Pakistan relations, like the Galwan standoff and the renewed ceasefire agreement.

Prior to diving straight into a three-player game theory setting, let us first understand the dyadic relations between India and Pakistan. Within the prism of game theory, the payoffs for each when they play a 'simultaneous move game'[11] are represented in the matrix given in Table 1. For example, if India adopts 'negotiate' and Pakistan opts for 'not negotiate',[12] India gets 0 and Pakistan 3; and if both opt for 'not

Table 1 Indo-Pak Payoffs

		Pakistan	
		Negotiate	*Not Negotiate*
India	*Negotiate*	2,2	0,3
	Not Negotiate	3,0	1,1

Source: Gupta and Azad, 'India–Pakistan Game-Theoretic Interplay', IDSA Comment, 20 April 2011.

negotiate', the payoffs are similar, that is, 1. The options, as described in the matrix, can be understood as 'peace' versus 'no peace' and within the option of 'no peace', the countries have a gradated range of options varying from 'posturing' to 'NWNP' to 'all-out war'.

The value or payoffs could vary as per existent situations and interpretations of subject matter experts. In the model given in Table 1, both India and Pakistan get a better payoff of 2 each if they opt for peace or 'negotiate' for a peaceful settlement. If one opts for peace and the other adopts 'not negotiate', the former gets a lower dividend of 0, while the latter gets a higher dividend of 3. Despite having a Pareto-optimal solution of higher payoffs if both opt for peace (both get 2 each), it is seen that the strategy adopted is the Nash equilibrium state of 'not negotiate' or 'no peace', wherein the players (India and Pakistan) get a payoff of only 1 each.

Why does this Happen?

In game theory terms, when payoff available to each of the player irrespective of the other's stance is analysed, the following observations emerge:

1. If India opts for peace, Pakistan has an option between peace and 'not negotiate' with payoffs of 2 and 3. Pakistan will prefer 'not negotiate'.
2. If India opts for 'not negotiate', Pakistan has an option between peace and 'not negotiate' with payoffs of 0 and 1. Pakistan opts for 'not negotiate'.
3. So, irrespective of Indian options, Pakistan will prefer to adopt the 'not negotiate' (despite a payoff of 2 if both opted for peace), and similar is the case for India too. The Nash equilibrium is when both opt for 'not negotiate' as the players avoid opting for the dominated strategies where the other player stands to gain. This predicted outcome also satisfies the iterated elimination of dominated strategies as they are for India and Pakistan.

India–China–Pakistan Triangle

In case of a three-player setting, the scenarios could be:

1. India and Pakistan at war; China as quiescent onlooker.
2. India at war with Pakistan; China covertly supports Pakistan (collusion).

3. India at war with China; and Pakistan joins to exploit.
4. India at war with China and Pakistan simultaneously, or a combined offensive by China and Pakistan against India (collaboration).[13]

Irrespective of the scenarios, Chinese support of or collusion with Pakistan can be at these levels:

1. Support in international forums—diplomatic manoeuvres.
2. Economic and technological support.
3. Military equipment supply/support.
4. Overt military action in case of a two-front war.

Three-Player Game—Payoffs

Payoffs in a three-person game can thereon be worked out for each of the scenarios with varying outputs for each player. It is obvious that with China as the additional player, the payoffs will alter and make it more lucrative for Pakistan to continue with the 'not negotiate' option. Similarly, in a two-player game between India and China, actions by Pakistan will make the payoffs favourable for China. However, a point to ponder is the comparative payoff for China to change its present stance of covert support in the domains of economy, technology and equipment transfer to an overt military action.

Such a matrix is given in Table 2, with various payoffs. Effectively, it is a two-player matrix with an additional player (China) having an option of 'not collude' or 'collude'.

Table 2 Three-player Payoffs

		China			
		Not Collude		Collude	
		Pakistan		Pakistan	
		Negotiate	*Not Negotiate*	*Negotiate*	*Not Negotiate*
India	*Negotiate*	8,8,8	4,6,6	6,8,6	0,10,10
	Not Negotiate	10,0,4	4,4,4	6,4,6	2,6,7

Source: Prepared by author based on his understanding of a 3-player Game Theory.

The matrix in Table 2 is slightly different from the dyadic matrix given in Table 1, as the payoffs vary once the third player enters the game

or influences outcomes. The payoffs have been worked out by the author based on existent factors. A more detailed explanation of the logic behind each payoff is given in the Annexure.

The following are the observations:

1. If India opts for 'negotiate' or peace and China adopts 'not collude', Pakistan has an option between 'negotiate' and 'not negotiate', with payoffs of 8 and 6. So, Pakistan opts for 'negotiate'.

2. If India opts for 'not negotiate' and China opts for 'collude', Pakistan has an option between 'negotiate' and 'not negotiate', with payoffs of 4 and 6. So, Pakistan opts for 'not negotiate'.

3. In view of the multiple challenges that Pakistan faces, varying from economy to internal struggles, and the existential arrangements with China as a permanent ally, it is highly likely that Pakistan continues with the 'not negotiate' or the 'NWNP' option and pursues the strategy of sponsoring terrorism and keeping Kashmir issue alive. Essentially, Pakistan will prefer to 'negotiate' if the collusive support from China is not available.

4. When a similar analysis is done for China, the preferred choice would be 'collude' (as Pakistan will prefer 'not negotiate' and so, India will choose to 'not negotiate' no matter what China does)!
   (i) If India and Pakistan continue with 'negotiate', China has payoff of 8 for 'not collude' and 6 for 'collude'. So, China will prefer 'not collude'.
   (ii) If India and Pakistan opt for 'not negotiate', China has payoffs of 4 for 'not collude' and 7 for 'collude', so China will prefer 'collude'.

Once the preferred strategies of each player are mapped (refer Annexure), the Nash equilibrium emerges as 'not negotiate, not negotiate, collude' for the three players of the India–Pakistan–China triangle. In a similar manner as the two-player matrix, despite having better payoffs if they opt for peaceful negotiations, the players continue with status quo, unless there is a motivation to change strategies and quit the existential Nash equilibrium.

ANOTHER PERSPECTIVE: STAG HUNT

When it came to tracking down a deer, everyone realized that he should remain dependably at his post, but if a hare happened to

pass within reach of one of them, he undoubtedly would not have hesitated to run off after it and after catching his prey, he would have troubled himself little about causing his companions to lose theirs. (Rousseau, *Discourse on the Origin of Inequality*, 1755)[14]

Having seen the three-person game theory outcomes, it will be worthwhile to get another game theoretic perspective of Pakistan–China dyad with India as the third player or factor against which they can collude. In this extended dyad (Table 3), the game resembles Rousseau's 'Stag Hunt', wherein two pure strategy Nash equilibrium options are obtained: one with higher payoffs (stag, stag) and one with higher risks (hare, hare). Players can hunt for a stag together (cooperate) with a greater payoff, or separate and hunt for a hare individually (defect) with varying and lesser payoffs for each. Focus in this game is on cooperation and mutual trust between the players, which in this case is Pakistan and China.

Table 3 China–Pakistan Payoffs

		Player 2	
		Stag	*Hare*
Player 1	*Stag*	4,4	3,1
	Hare	1,3	2,2

Source: An adaptation of Stag Hunt model given in Page 3 of Ch'ng Kean Siang, 'Risk Aversion and Coordination in a Simple Stag Hunt Game: Agent Based Modelling' (10 June 2010). Available at https://ssrn.com/abstract=1623063

Unlike the Indo-Pak dyad which resembles a prisoner's dilemma, wherein option for player 2 was the same irrespective of the options played by player 1 and Nash Equilibrium was for 'Not Negotiate', in Stag Hunt, pure strategy Nash equilibrium is there for two options, that is, both going for stag or both for hare, the only difference being that the quantum of payoff is less if both players do not cooperate and go hunting a hare (4 versus 2).

In the China–Pakistan–India triangle, if a comparison can be drawn with the matrix in Table 3, greater payoffs are there for both China and Pakistan if they collude against India (stag) rather than both going for different targets, like China going for Taiwan (hare) and Pakistan pursuing its own agenda, maybe in Afghanistan. Colluding with each other gives higher payoffs to both, thereby making it a better choice. The extent of collusion and its expansion onto the collaborative domain will depend on the risk propensity and external strategic orientation of the players.

The US

An analysis of the triangle will be incomplete without seeing the other players of the pentagram, namely, the US and Russia. Even as the US adopts a hedging strategy with India against China, within the Sino-Indian dyad, the concept of intergovernmentalism (refers to arrangements 'whereby nation states, in situations and conditions they can control, cooperate with one another on matters of common interest') seems to be the dominant strategy. Economics and pragmatism seem to be driving relations between the players in the US–China–India triangle, even as some argue about Thucydides trap becoming a reality and predict a future war between an aspiring power and an existent power.[15] As Brahma Chellaney posited in the context of nuclear overhang in 2002, 'China is driving New Delhi closer to the United States by seeking preeminence through balance-of-power politics.'[16] It would be in Chinese interests to engage constructively with India even as it props up Pakistan to prevent a state collapse, and consequent challenges to its ongoing projects, and to avoid terror in the backyard in terms of support for Uighurs, etc.[17]

Russia

The pentagram of US, China, Russia, India and Pakistan is influenced by the dyads of US–China, US–Russia and Russia–India. India does not, and cannot, view China–Russia dyad as a zero-sum game and has sought to engage both China and Russia bilaterally, as well as through a raft of organisations, such as the Russia–India–China (RIC) grouping, the Shanghai Cooperation Organisation (SCO) and the Brazil, Russia, India, China and South Africa (BRICS) grouping.[18] Within the Russia–China dyad, China buys 14 per cent of Russia's exports and supplies Russia with 22 per cent of its imports, whereas India gets a mere 1.7 per cent of Russian exports and supplies 1.6 per cent of its exports to Russia.[19] India's plans of cutting import dependence and increasing self-sustenance has seen a considerable drop in traditional imports from Russia, though 49 per cent of India's defence imports are from Russia.[20] There is also concern in the US about India's plans to acquire the Russian S-400 missile system, to the extent of even inviting sanctions under Countering America's Adversaries Through Sanctions Act (CAATSA).[21] The interests of the players in the Indo-Pacific, the Indo-Russian strategic partnership of yesteryears, Russian concerns about Quad and the need of Russia to adopt a hedging strategy with India against

China are certain competing and contradicting factors which merit consideration.[22]

Essentially, the security dilemma and inter se power equations between the various members of the pentagram, combined with the preferred strategies as derived from game theory, give indications of a 'status quo' even as various players jostle for strategic space and regional alliances. The greater returns in balancing the national power instruments of economy and diplomacy seems to be influencing the strategic behaviour of all players. The game will get more interesting if a three-player setting is explored for India–US–China or US–Russia–China, which is beyond the scope of this article. However, as is evident from various historic developments in this pentagram and assuming that all players will adopt their strategies rationally, it is fair to state that the existent payoffs for collusion cannot entirely motivate China to transcend into the realms of overt military support, with damaging consequences in the realms of diplomacy and economy.

Maybe, the differing strategic culture of the Chinese *vis-à-vis* that of Clausewitzian concepts of war is clouding the perceptions of those predicting a likely strategy. Sun Tzu propounded that 'the supreme art of war is to subdue the enemy without fighting', while Clausewitz spoke of Napoleonic mass army clashes and war as a continuation of politics by other means. In the immediate future, pursuing a policy of true collusion (covert collusion) is a better strategy for China as the payoffs are better and the strategy is in sync with the teachings of masters like Sun Tzu. Maybe, in game theory terms, China will hunt the hare (Taiwan) now and cooperate with Pakistan to hunt the stag (India) later?

Way Ahead for India

The chimera of collusivity exists, but has it grown or transformed into a fire-breathing dragon is the point of concern from Indian perspective. The strategies of 'not negotiate, not negotiate, collude', as the Nash equilibrium for the three players, makes peace a distant dream. As seen earlier, if China has lesser payoffs in 'collude' and adopts 'not collude', chances of Pakistan being ready 'to negotiate' increase. To achieve such a strategic shift, India will have to adopt a multipronged strategy. The role played by other players of the pentagram, and those beyond, will also have to be influenced. What needs to be seen by strategists and policy planners is about swinging the payoffs in India's favour.

As Chellaney mentions, China and India can go down one of four paths: a downward spiral towards armed confrontation; armed coexistence; coexistence with cooperation and rivalry; and partnership.[23] In the Sino-Indian dyad, armed coexistence seems more probable for the near future. What can be done in the interim is to prepare for the worst outcome, following the age-old dictum of 'forewarned is forearmed'. The diplomacy, information, military and economic (DIME) instruments of national power have to be further leveraged with astute statecraft to ensure that the principles of coexistence and pragmatism combine with an attitude of cooperation rather than competition.

In the military domain, there is a need to change the traditional orientation of offensive/strike formations from the plains and deserts to that of high altitude, with more predominance of technology like swarm drones. Our doctrine, training and equipment need to be more joint and adapted to cater for multiple-domain operations, including air, maritime and even the cognitive domains. This can be combined with force restructuring, alongside other steps being adopted towards theatrisation. Developments in the domain of space and cyber, and creation of new organisations like the Strategic Support Force,[24] need to be factored in own calculus.

At no point should deterrence be sacrificed at the altars of those who profess the futility of force. Capability and will, two essential components of deterrence, need to be demonstrated, even as our diplomatic manoeuvre reduces the probability of a physical manifestation of Sino-Pakistan collusion in the military realm.

Notes

1. The CDS, General Bipin Rawat, in an interview given to *The Hindu*, available at https://www.indiatoday.in/magazine/interview/story/20201228-there-will-be-no-compromise-1750669-2020-12-18, accessed on 27 April 2021.

2. Byron Chong, 'Understanding Sino-Indian Relations—A Theoretical Perspective', Centre for International Maritime Studies, 28 April 2016, available at https://cimsec.org/understanding-sino-indian-relations-theoretical-perspective/, accessed on 15 March 2021.

3. Monish Tourangbam, 'The China–India–Pakistan Triangle: Origins, Contemporary Perceptions, and Future', 25 June 2020, available at https://www.stimson.org/2020/the-china-india-pakistan-triangle-origins-contemporary-perceptions-and-future/, accessed on 17 March 2021.

4. Happymon Jacob, 'China, India, Pakistan and a Stable Regional Order', European Council on Foreign Relations, October 2020, available at https://

ecfr.eu/special/what_does_india_think//analysis/china_india_pakistan_and_a_stable_regional_order, accessed on 14 March 2021.

5. Jagannath Panda in Review Essay, *Strategic Analysis*, 2014, quoted in General V.P. Malik, 'A Comprehensive Response Strategy to a Collusive and Collaborative Threat from China and Pakistan', 30th USI National Security Lecture, 2014, available at https://indianarmy.nic.in/WriteReadData/Documents/national%20Security%20Lecture%202014.pdf, accessed on 1 May 2021.

6. Zainab Akhter, 'India–Pakistan LoC Ceasefire Decision: A Thaw in Sight?', IDSA Comment, 12 March 2021, available at https://idsa.in/idsacomments/india-pakistan-loc-ceasefire-decision-zakhter-120321, accessed on 1 April 2021.

7. 'Quad Summit—Small Cliques will Destroy International Order, Says China', *The Hindu*, 16 March 2021, available at https://www.thehindu.com/news/international/quad-summit-small-cliques-will-destroy-international-order-says-china/article34076342.ece, accessed on 17 March 2021.

8. Nash equilibrium represents an action profile for all players in a game and is used to predict the outcome of their decision-making interaction. It models a steady state (i.e., a combination of strategies of all players) in which no player can benefit by unilaterally changing its strategy. If a unique Nash equilibrium exists for the game, then all players are expected to converge to the state represented by the equilibrium if they are all rational, that is, each player aims to choose the strategy that maximises its utility function.

9. The NWNP model, as explained in various publications, implies a situation characterised by continued insecurity, low-level violence, inter-group hostility and persistence of the factors that sparked and sustained the conflict. See Tommy Andersson and Conan Mukherjee, 'Seeking No War, Achieving No Peace: The Conflict over the Siachen Glacier', *Defence and Peace Economics*, Vol. 32, No. 3, 2021, pp. 253–70, doi: 10.1080/10242694.2019.1660839, accessed on 28 April 2021.

10. Arvind Gupta and Sarita Azad, 'India–Pakistan Game-Theoretic Interplay', IDSA Comment, 20 April 2011, available at https://idsa.in/idsacomments/IndiaPakistanGameTheoreticInterplay_sazad_200411, accessed on 1 January 2021.

11. In such a game, the strategy of the other player is not known to the player while executing his game. The alternative is 'sequential game', wherein the player is already aware of the other player's strategy.

12. A similar analysis with payoffs and clarifications for 'negotiate' and 'not negotiate' on Nash equilibrium and Pareto-optimal options can be found in the article by Gupta and Azad, 'India–Pakistan Game-Theoretic Interplay', n. 10.

13. 'Collusive threat' from China and Pakistan to India implies both countries acting in secret to achieve a 'fraudulent, illegal, or deceitful goal' or being engaged in secret or hidden avowed goals *vis-à-vis* India. 'Collaborative threat' implies a joint threat by working together. Basically, that would cover overt as well as covert threats to India from the China–Pakistan nexus.

    See Malik, 'A Comprehensive Response Strategy to a Collusive and Collaborative Threat from China and Pakistan', n. 5.

14. Quoted in Christina Fang, Steven Orla Kimbrough, Stefano Pace, Annapurna Valluri and Zhiqiang Zheng, 'On Adaptive Emergence of Trust Behavior in the Game of Stag Hunt', *Group Decision and Negotiation*, Vol. 11, No. 6, 2002, pp. 449–467, available at https://personal.utdallas.edu/~ericz/GDN02.pdf; emphasis in original, accessed on 12 May 2021.

15. Richard Hanania, 'There is No Thucydides Trap between the U.S. and China', 8 June 2020, available at https://www.realcleardefense.com/articles/2020/06/08/there_is_no_thucydides_trap_between_the_us_and_china_115359.html; and Kevin Brown, 'For the US and China, Thucydides' Trap is Closing', *The Diplomat*, 11 June 2020, available at https://thediplomat.com/2020/06/for-the-us-and-china-thucydides-trap-is-closing/, accessed on 16 March 2021.

16. Brahma Chellaney, 'The India–Pakistan–China Strategic Triangle and the Role of Nuclear Weapons', The Proliferation Papers, IFRI, Winter 2002, available at https://inis.iaea.org/collection/NCLCollectionStore/_Public/37/066/37066507.pdf, accessed on 20 February 2021.

17. Rhea Sinha, 'BRI in the "Af-Pak" Region: Security Challenges and China's Response', Observer Research Foundation, 12 October 2020, available at https://www.orfonline.org/expert-speak/bri-af-pak-region-security-challenges-china-response/, accessed on 1 March 2021; and Michael Kugelman, 'Imran Khan's Silence on Uighurs Undercuts his Defense of Muslims Worldwide', *Foreign Policy*, 29 January 2021, available at https://foreignpolicy.com/2021/01/29/imran-khan-uighurs-muslims-china/, accessed on 3 February 2021.

18. Manoj Joshi, 'India's Strategy in the China–Russia–USA Triangle', Observer Research Foundation, 20 December 2019, available at https://www.orfonline.org/research/indias-strategy-in-the-china-russia-usa-triangle-59417/, accessed on 14 March 2021.

19. Anita Inder Singh, 'A US–Russia–China Tightrope: In a Complex, Changing World, Countering China is a Multifaceted Problem for India', *The Times of India*, 10 January 2021, available at https://timesofindia.indiatimes.com/blogs/toi-edit-page/a-us-russia-china-tightrope-in-a-

complex-changing-world-countering-china-is-a-multifaceted-problem-for-india/, accessed on 2 April 2021.

20. *Hindustan Times*, 15 March 2021, available at https://www.hindustantimes.com/india-news/indias-arms-imports-down-by-33-says-sipri-report-101615806230302.html, accessed on 16 March 2021.

21. 'India, U.S. Resolve to Deepen Strategic Cooperation', *The Hindu*, 20 March 2021, available at https://www.thehindu.com/news/national/rajnath-singh-holds-talks-with-us-def-secretary-austin/article34115821.ece, accessed on 24 March 2021.

22. A Chinese perspective of Indo-Russian relations is outlined in an article by Qian Feng, 'India Embraces the US at Cost of Russia Ties', *Global Times*, 24 December 2020, available at https://www.globaltimes.cn/page/202012/1210947.shtml, accessed on 27 March 2021.

23. Brahma Chellaney, 'The Road from Galwan: The Future of India–China Relations', 10 March 2021, available at https://carnegieindia.org/2021/03/10/road-from-galwan-future-of-india-china-relations-pub-84019, accessed on 28 April 2021.

24. John Costello and Joe McReynolds, 'China's Strategic Support Force: A Force for a New Era', China Strategic Perspectives No. 13, October 2018, available at https://ndupress.ndu.edu/Portals/68/Documents/stratperspective/china/china-perspectives_13.pdf, accessed on 2 May 2021.

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The matrix for three-player game has been worked out in the following manner for three players, namely, India, Pakistan and China. Both India and Pakistan have an option between 'negotiate' and 'not negotiate', whereas the option available to China is 'collude' or 'not collude'. The assumptions are that all players will act rationally and that the Chinese options vary between 'not collude' to 'more overt military action in support of Pakistan'. Effectively, it is a two-player matrix with an additional player (China) having an option of 'not collude' or 'collude'. When both India and Pakistan are opting for a strategy like 'negotiate', and if China is opting for 'not collude', it is assumed that China will not undertake any actions with offensive or detrimental interests.

Table AI Three Player Playoffs (Copy of Table 2) for easy reference

		China			
		Not Collude/Peace		*Collude*	
		Pakistan		*Pakistan*	
		Negotiate	*Not Negotiate*	*Negotiate*	*Not Negotiate*
India	*Negotiate*	8, **8**, 8	4, 6, 6	6, 8, 6	0, 10, 10
	Not Negotiate	**10**, 0, 4	4, 4, 4	6, 4, 6	**2, 6**, 7

If both India and Pakistan opt to 'negotiate', all long-standing disputes will be resolved and there will be overall progress in terms of collaborative peace; so, both get a payoff of 8. In such a scenario, if China opts for 'not collude' and show peaceful overtures, the payoff is 8 and if option is 'collude', with negative, conflict-oriented tendencies, the payoff is 6, as the assumption is that Chinese actions will be to not let peace prevail. In such a scenario, the Indian payoff will drop to 6 too.

If both India and Pakistan opt for 'not negotiate', the payoff is 4 without Chinese collusion. If China colludes in such a scenario, the Indian payoffs drop and gets reduced to 2. Pakistan, with Chinese collusion, gets a larger payoff of 6 (slightly greater than a scenario without China). From Chinese perspective, an option of 'not collude' when both India and Pakistan opt for 'not negotiate' earns 4 (lesser than 'negotiate'); and the alternative of 'collude' will earn 7 (higher than payoff of collusion when both were opting for 'negotiate', but lesser than opting for 'not collude' or peace when both were opting for 'negotiate').

The Nash equilibrium—when each player's strategy is analysed against the other two—works out to be 'not negotiate, not negotiate, collude', with a payoff matrix of 2, 6, 7.

Calculation for Nash Equilibrium

In summation, the strategies that emerge are shown in Table A2:

Table A2 Dominant Strategies

Strategies of Two Players	Strategy of the Third Player
India–negotiate; Pakistan—negotiate	China—not collude
India—not negotiate; Pakistan—not negotiate	China—collude
Pakistan—negotiate; China—not collude	India—not negotiate
Pakistan—not negotiate; China—collude	India—not negotiate
India—negotiate; China—not collude	Pakistan—negotiate
India—not negotiate; China—collude	Pakistan—not negotiate

Based on the given matrix, when the strategies are superimposed on the three-player matrix, an idea of Nash equilibrium can be obtained. The payoffs underlined and in bold highlight the preferred strategies extrapolated from Table A2. The cell having the preferred strategies of all players in the same indicate Nash equilibrium. In this case, it is India and Pakistan for 'not negotiate', with China opting to 'collude'.

Table A3 Nash Equilibrium

		China			
		Not Collude/Peace		*Collude*	
		Pakistan		*Pakistan*	
		Negotiate	*Not Negotiate*	*Negotiate*	*Not Negotiate*
India	*Negotiate*	8, **8**, **8**	4, 6, 6	6, 8, 6	0, 10, 10
	Not Negotiate	**10**, 0, 4	4, 4, 4	6, 4, 6	**2**, **6**, 7