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Great Power Rivalry in the 21st Century: China vs the United States
A Game-Theoretic Analysis of the Thucydides Trap

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Abstract

This paper is analysing the likelihood of a 'Thucydides Trap', i. e. a military conflict between a rising and an established superpower, for the case of China and the United States. Inspired by the work of Allison (2017) as well as Yin and Hamiliton (2018), the analysis takes place in the framework of non-cooperative game theory that reflects the interdependency of the actions of both players within a given payoff matrix.

The research is divided in two domains: the economic and the military relations. For the former we are using the repeated prisoner's dilemma game, whereas the latter is analysed in the framework of the sequential chicken game. Both domains and hence the respective games are closely linked: A potential military conflicts became only relevant if the outcome of the first game indicates an economic war and vice versa.

In a first step it can be shown that indeed an all-out trade and tech war is already under way between the US and China with non-cooperative solutions of both sides, especially with regards to general purpose technologies like semiconductors and AI. This paves the way for the possibility of a military conflict as well.

In analysing a military conflict in the second step, we distinct two scenarios: An open and a latent conflict. As a result, it turns out that an ongoing latent conflict is much more likely than an open one. In principle this means that the likelihood of a 'Thucydides Trap' between the US and China is low although not excluded for the given environment. The conclusion is justified by the high economic and political stakes involved for both parties in the case of an open military conflict. Regardless, it is highly likely that the latent conflict as well as the trade and tech war will continue at least for the time being.

1 Introduction

The rapid rise of China's economy since the start of the reform and opening up policy under Deng Xiaoping in 1978 to the second largest economy of the world as well as its technological progress in recent years, has led to the perception that the country is on its way to become the second superpower next to the United States (US). This judgement changed the China-policy of the US. According to Kevin Rudd (2019: 49-62), the former prime minister of Australia, 'the period of US-China strategic engagement' was displaced by 'a new period of strategic competition' at latest during the first presidency of Donald Trump between 2017 and 2021.

The change of the US-policy was accompanied by a paradigm shift in China's foreign policy as well. In the last 15 years the country moved away from Deng's dictum 'hide your capacities, bide your time' towards a leading role in world affairs that is entitled by the rise to great power status, questioning the unrivalled dominance of the US (Yan 2021). This shift is inter alia demonstrated by groundbreaking initiatives in the United Nations like the Global Security, the Global Development, the Global Civilisation Initiative (Economy 2024), but also by territorial claims in the South China Sea and the comprehensive Belt-and-Road Initiative that comprises large part of Asia and Africa (Economy, 2021; Shirk 2023:14-22).

The tensions between China and the USA was accelerated by the Russian invasion of the Ukraine in February 2022, which paved the way back into bloc-building and East-West system competition as it was already the case in the cold war era until the breakdown of the Soviet Union at the beginning of the 1990s. Since then, a club-based international system emerged with the US, the EU and its allies in one camp and the BRICS countries among others that did not follow the Western sanctions against Russia in the other. [1] 'Friend-shoring' and regionalisation instead of globalisation is now dominating international trade and investment flows (Löchel, Jablonski 2025: chap. 6).

The centre of the conflict is the 'great power rivalry' between the US and China. It was even interpreted as a new 'Thucydides' trap' in a well-known book by Graham Allison (2017) [2]. The term is based on the writings of the Greek historian Thucydides, who described the potential for conflict as he chronicled the Peloponnesian War between Sparta and Athens in the late 5th century BC. According to his writing, the conflict made a war inevitable, as the established power of Sparta was threatened in its position by the second most influential city-state of Athens.

Allison studied sixteen cases of superpower transition in history. He found that a power transition between a rising and an established power was only resolved peacefully in just four cases. However, despite this finding, Allison emphasised that there is no historical determinism for China and the US to fall into the Thucydides' trap, a conclusion that is shared by Chinese authors as well (Zhang, Pu 2019, Yan 2020). One reason is the still continued and deep economic interdependency between the two countries, which is historically unique for the

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[1] BRICS members are Brazil, Russia, India, China, and South Africa. At the beginning of 2023 Egypt, Ethiopia, Iran, and the United Arab Emirates jointed the bloc as new members; Malaysia and Thailand announced its interest to join the organisation.

[2] Westad (2024) compares the current US-China rivalry with the relationship between Britain and Germany in the years before the outbreak of World War I in 1914. He argues that Germany as the rising power had the fear that Britain intends to contain the economic and strategic rise of the country, whereas Britain conversely suspected to lose its position as a global hegemon at that time. See also Clark (2013) for the similarities between Germany's situation between 1871 and 1914 and China's between 1978 and today: both belated nations, both realising a fast economic rise, both with international ambitions but contained by the hegemonial powers.

relationship between the rising and the established power. However, the flipside of this argument is that the ongoing decoupling increases the likelihood of a Thucydides' trap between China and the US.

Kevin Rudd (2019) argues that the Thucydides' trap is an active concern, because the US perceives China's rise as a threat given its propensity for nationalism and mercantilism and its ideological revival under President Xi Jinping, while China sees the USA as seeking to contain its rise. The real tensions retroact on the academic discussion in mutual accusations that China likes to 'displace the American order' – the title of a book by Rush Doshi (2021) – and conversely that the United States is 'thwarting China's rising power' to preserve US hegemony (Wu 2023:121-146). A recent book edited by Evan S. Medeiros (2023) collected the different views. Whereas American authors blame China for challenging the 'rule-based international order' (Economy 2023:66-89), Chinese authors identify the 'strategic pressure of the United States' (Wang 2023) as the main reason for the tensions.

The following paper aims to analyse the great power rivalry between China and the USA in the framework of the game theory to judge the risk of a military conflict. Game theory is indeed an appropriate method for this question. The analytical framework acknowledges that both powers are not operating in isolation but are engaged in a constant and intricate relation of 'co-dependency' (Roach 2022: 35-54). In other words, the strategic decisions made by both countries are inherently influenced by the interplay of interests and the ripple effects of each other's actions and responses. By recognising that, game theory captures the intricacies of their mutual reliance, competition, and cooperation. Given the approach's ability to model the various strategies, payoff structures, and potential equilibria in the geopolitical contest, it enables a nuanced understanding of the motivations, incentives, and possible outcomes, thereby shedding light on the complex geopolitical competition between these two great powers.

In the following we will first review the US-China relations over time. This is followed by an analysis of the US-China rivalry today in the framework of non-cooperative game theory. For the economic competition we use the repeated prisoner's dilemma game continued by the sequential chicken game for the military tensions. We sum up the results of our analysis in the conclusion.

2 The Economic Relationship between China and the USA Over Time
The most important milestones in the economic relations between the US and China in the last 50 years are listed in the following table 1. It starts with the visit of US-President Richard Nixon in China in 1972 after a long period of non-diplomatic relations between the two countries in the aftermath of the Korean War between 1950 and 1953 (Bergsten 2022:31-44). The move was supported by the joined interest of both sides to position themselves better in the rivalry with the Soviet Union as pointed out by Chinese diplomat Ying Fu (2021) as well as Henry Kissinger (Kissinger 2011). From then on, the cooperation improved further on and in 1979 China and the US officially normalisation its diplomatic relationship. Simultaneously, the China launched the reform and opening up policy under Deng Xiaoping (Siripurapu and Berman, 2022).

Later in the 1990s, US-President Bill Clinton was a strong supporter of China's WTO entry after the country submitted its application for joining the General Agreement on Tariffs - the predecessor of WTO - in 1986. After long negotiations and enormous concessions of China to liberalise its trade and domestic economy, the entry was concluded in late 2001 (Tan 2021), which kicked off the period of so-called 'hyper-globalisation' that lasted until the outbreak of the global financial crisis in 2008 (Subramanian, Kessler 2013; Kirchner 2022).

Table 1 Milestones of US–China Economic Relations 1979 – 2023

Year	Event
1972	Richard Nixon visits China; 'Shanghai Communique' signed
1979	The United States and China normalise diplomatic and trade relations.
1986	China applies to rejoin the General Agreement on Tariffs and Trade (GATT).
1999	The United States and China reach an agreement on the terms of China's WTO accession
2001	China joins the WTO.
2004	The United States bring their first WTO case against China.
2009	US President Barack Obama and Hu launch the US–China Strategic and Economic Dialogue (S&ED). China becomes the world's largest exporter.
2011	The WTO Appellate Body sides with China in a dispute over whether China's state-owned enterprises violate WTO rules on government subsidies.
2015	The Obama administration concludes negotiations for the Trans-Pacific Partnership (TPP).
2017	US President Donald Trump withdraws the United States from the TPP. Trump and Chinese President Xi Jinping launch the US–China Comprehensive Economic Dialogue.
2018	Trump imposes a sweeping set of tariffs on Chinese goods, leading to several rounds of tit-for-tat retaliation until US tariffs cover nearly all Chinese imports.
2020	Washington and Beijing reach a 'Phase One' trade agreement.
2022	US President Joe Biden institutes stringent export controls on computer chips in an effort to restrict China's advanced manufacturing sector.
2023	Biden signs an executive order restricting some US investment in Chinese high-tech industries.
2024	The Biden-administration strongly increases tariffs on Chinese imports of renewable energy products like EV, solar panels and batteries

Source: Löchel, Jablonski 2025: chap. 6

At that time, the general attitude of the US towards China was positive. It supports the countries integration into the international trade system combined with the hope that increasing economic exchange would help to stabilise the balance of power, facilitate a peaceful world order, and bring about changes within China itself that moves the country and its economic and political system closer to the Western standards (Clinton, 2000; Rudd, 2019; Kirchner, 2022). Despite differences and tensions between the US and China from time to time in the following years, most of the issues could be resolved through negotiations, even when it comes to sensitive issues like the Clinton administration allowing Lee Teng-hui - the then Taiwanese leader - to visit the US in 1995, the US bombing of the Chinese embassy in Yugoslavia in 1999, and the Hainan Island Incident in 2001 (Fu, 2021).

China's WTO entry confronted the US what is called today as 'China shock' that describes the massive loss of manufacturing employment in the US due to fast increasing cheap imports from China (Kroeber 2023). To counter this development, US-President George W. Bush introduced tariffs on imports from China already in the early 2000s. However, the US-China relations keeps mostly friendly, which lasted until the Global Financial Crisis in 2008. Since then globalisation is on retreat.

One example is the launch of the Trans-Pacific Partnership (TPP) by the Obama administration in 2016 that comprised twelve countries and approximately one-third of the world GDP but excluded China (Siripurapu, Berman, 2022).[3] The agreement was negotiated for ten years but was never ratified due to the political opposition in the US. This allowed President Trump to quickly withdraw from it early in his presidency, which in turn opens the way for China to establish the Regional Comprehensive Economic Partnership (RCEP) in 2020. Today, the RCEP is the largest free trade zone of the world with a total of 15 countries from which six – Australia, New Zealand, Korea, Japan, Indonesia, Malaysia – had originally also joined the TPP.

Parallel to withdrawal from TTP, President Trump started a trade war with China already in 2018 by raising tariffs from 10 to 25 percent on a total of more than 800 imported goods from China, including cars, aircraft parts and steel, with the goal of reducing the existing 200 billion USD trade deficit with China (Dollar 2022). China reacts with a tit-for-tat strategy by imposing similar 25 percent tariffs on US imports, mostly on agricultural products, cars and aquatic products. The consecutive trade negotiations continued until the beginning of 2020, when the Phase One Economic and Trade Agreement was eventually signed, in which China agreed to increase its imports from the US and undertake certain domestic reforms.

When President Biden began his presidency in 2021, his administration essentially continued Trump's trade policy but intensified it with a massive increase in tariffs on certain imports from China at the beginning of 2024. This included renewable energy products like EV, solar panels and batteries, for which tariffs of 100, 50 and 25 percent, respectively, were imposed. Overall, the Biden administration followed a much more comprehensive and systematic approach vis-a-vis China than the Trump administration. For example, China was explicitly labelled a 'strategic competitor' in sharp contrast to the 'partnership' with allies in fields such as technology, cybersecurity, and trade (White House 2022).

One core element of this approach is the ongoing tech war that restricts China's access to top-level US technologies (China Briefing 2024). Most important are the landmark export controls on semiconductors and chip-making equipment from the US to China in October 2022. However, the tech war is not only related to high-tech exports from the US to China. It also includes heavy restrictions for Chinese outbound investments to the US to acquire advanced technologies. The most prominent case in this regard is the 5G communication technology of Huawei (Ryan, Burman 2023). Since 2021, the company has no longer been allowed to sell any of its products to companies in the US.

For his new Presidency starting in January 2025, Donald Trump already announced to raise tariffs on all Chinese imports further on among others actions (Hou et al 2024). It is therefore likely that the ongoing de-coupling of the US from the Chinese economy will continue or even accelerate in the years to come.

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[3] Another example is the extension to categorise China as a 'non-market economy' by the US and the EU in 2018, although the WTO-contract includes the possibility that this status could expire after 15 years in 2016 (Hosman 2021).

3 Using Game Theoretical Model to Explain Conflicts Between the US and China

In 2005, Thomas Schelling was awarded the Nobel Prize "for having enhanced our understanding of conflict and cooperation through game-theory analysis" (NobelPrize.org, 2016). His work focused on strategic interactions and the role of commitment in crisis situations, highlighting how states' behaviour could be influenced by the perceived actions of other actors (Schelling, 1960).

Schelling also used the game of chicken to analyse the strategic competition between superpowers with regard to their possession of nuclear weapons. In his book The strategy of conflict, Schelling argued that the nature of the competition transformed from a zero-sum game into "a mixed-motive or interdependent game in which 'conflict is mixed with mutual dependence,' creating a 'precarious partnership'" (Allison, 2018).

Drawing on this insight, Allison (2017) also used the game of chicken in his mentioned book about the 'Thucydides trap' to depict how the competition between China and the US can play out and even escalate to a war in five different imaginary scenarios. The first scenario is about a collision accident at sea, the second is a conflict over Taiwan, the third scenario involves a conflict between China and the US caused by a third party, followed by a scenario induced by the regime collapse in North Korea, and finally a trade war scenario. Following Allison's argumentation, all these possible scenarios can turn into a hot war between China and the US.

Others have also used game theory to extensively discuss trade and other macroeconomic issues between the US and China like Kwan (2018), Mao et al. (2019), Ru (2020), Kovács (2022) among others. Yin and Hamilton (2018) conducted an analysis of a trade war between the US and China by applying a combination of a repeated prisoner's dilemma and a sequential chicken game. Asghari et al. (2021) concluded that a trade war is very likely, along with increased tension "in other areas, including military, cyber and culture" when the two countries do not restrain from "a competitive strategy in the economic area".

3.1 Our Contribution

The focus of previous research is mainly limited to using game theoretical models to explain trade conflicts between China and the US, which only shows the tip of the iceberg – namely, offering a simplistic view of a multifaceted conflict. To the best of our knowledge, there is no existing academic research paper that applied game theory to explain the rising tension between the two nations on multiple levels, answering the key question of whether or not the game theory can offer a solution to resolve a potential large-scale confrontation.

Therefore, the paper makes a novel contribution to the existing literature by adopting game theory to analysing the economic and military aspects of the US-China competition as well as the interplay between these two dimensions. On top of that, the paper synthesises theories and opinions from both sides in an attempt to provide a nuanced and balanced overview of the issue.

3.2 The Basic Model

The primary objective of this paper is to explain the "Thucydides' trap" in the context of Sino-U.S. relationship. Central to this endeavour is a comprehensive examination of the power dynamics between the two nations and their strategic decision-making. In light of this, game theory emerges as a well-suited analytical instrument, adept at probing and dissecting the intricacies of strategic interactions and interdependencies between the involved parties.

There are mainly three reasons why game theory is an appropriate model to be applied in this context. Firstly, superpowers such as China and the US are players that often engage in strategic decision-making, where their decisions are influenced not only by their own preferences but also by the actions and signalling's of other powerful actors. Therefore, game theory provides a systematic framework to analyse the real-world interdependence between nations and predict the likely outcomes of their decisions. Secondly, game theory allows for assessment of different scenarios taking into account varying levels of information, interdependence among actors, and the structure of potential outcomes. This evaluative process assumes particular importance in the context of decision-making under uncertainty, which is often the case when it comes to geopolitical competition. Lastly, it can be helpful for conflict resolution. As the structure of game theory must define the preferences and predict the actions of each player, it becomes possible to identify potential areas of compromise and build strategies for achieving mutually beneficial outcomes.

With reference to the model specification used in Yin and Hamilton (2018), a modified repeated prisoner's dilemma game combined with a sequential chicken game is used as the main framework to analyse the interaction between China and the US on the economic and military dimensions in this paper.

In the paper of Yin and Hamilton (2018), this modified model is principally applied to illustrate the trade relationship between China and the US. As they only focus on trade, the repeated prisoner's dilemma game is used to model different trade strategies between the two countries, and the sequential chicken game is used to analyse a trade war scenario. In our paper, this same model established by Yin and Hamilton (2018) is applied, but it will be upgraded to the military level. That is, we use this model to examine two aspects of the competition between China and the US – the economic aspect is examine through the repeated prisoner's dilemma game and the sequential chicken game is employed to understand the intricacies of the military dimension. The economic aspect in our paper will not only consists of simple trade relationship but also technological competition as it has profound economic implications.

The prisoner's dilemma game is a classic single-round game in game theory, which consists of two players and each of them has two strategies – to cooperate or to defect (Fudenberg and Tirole, 1991). When the game is played once, defection is a dominant strategy for both players, as it guarantees a higher payoff irrespective of the opponent's move (Fudenberg and Tirole, 1991). Yet, the limitation of this game is that the continuous strategic interactions between players cannot be explained by a single-round game.[4]

The repeated prisoner's dilemma game is the same two-player game but over multiple rounds, so that cooperation can emerge as a viable strategy since the players can use strategies such as "tit-for-tat" (Axelrod, 1984). In other words, the prospect of future interactions allows players to retaliate against defections and reward cooperation, creating incentives for sustained cooperative behaviour (Fudenberg and Tirole, 1991). This repeated or infinite nature of this game indicates that the game is a non-zero-sum game, meaning that both China and the US have to adopt a long-term perspective on their relationship, which is a good simulation of the reality. In this model, both countries participate in an endless game and must interact with one another for as long as they continue to exist. Hence, the choice of the repeated version of the prisoner's dilemma game is optimal compared with the one-shot version.

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[4] Moreover, the preferred solution is not Pareto optimal. If both players cooperate that would make both better off compared to the outcome of mutual defection.

As shown in Table 2, the repeated prisoner's dilemma game is employed to analyse the economic aspect of the competition between China and the US. Given that a trade war between China and the US is already under way since 2018, the focus of this model will be put on the technology war between the two states, i. e. the tough competition in the semiconductor and AI-technology, for instance. Both are frontiers technologies with great importance for the economic but also military developments.

Both players involved in this game, namely China and the US, possess two strategies. The first option is to adopt a cooperative stance, engaging in trade activities with minimal protectionist measures, allowing technology exchange, and maintaining a peaceful economic relationship. Alternatively, they can opt for a defection strategy, implementing economic and technological decoupling measures. This would involve restricting knowledge exchange on technology, setting up regulatory and technical barriers on both technological and non-technological trade.

Table 2 Repeated Prisoner's Dilemma Game with A Sequential Chicken Subgame

(Economic Level) China / United States	Cooperate	Defect		
Cooperate	5 5	-6.8 6		
Defect	-6.8 6	**(Military Level) China / United States**	**Turn**	**Stay**
		Turn	0 0	1 -1
		Stay	-1 1	-10 -10

There are totally four outcomes given each player's decision:

1. **Both players cooperate**: the economic relationship on technology is relatively peaceful which is advantageous to both in the long run.
2. **The US defects while China cooperates**: the US imposes protectionist measures on trade relating to technology and starts respectively de-coupling from China, i.e., reducing its dependency on China. In the meantime, China remains cooperative without any decoupling measures.
3. **China defects while the US cooperates**: China imposes protectionist measures, while the US follows the free trade principle.
4. **Both players defect**: the two countries are in a technological war and are decoupled from each other economically.

Each outcome will lead to certain payoffs which represent the consequences of their strategies. The first outcome gives a relatively high payoff to both players, because more innovative ideas and technologies can stem from an environment where knowledge and technology exchange is unrestrained (Koyama and Rubin, 2022). The second and third outcomes demonstrate when one player is defecting and the other is cooperating, the defecting player enjoys a better payoff by exploiting the resources and knowledge of the cooperating player (Yin and Hamilton, 2018). The last outcome is the case when an open technological war is happening between the two states, which may also increase the risk of military conflict. The reason is that when two countries have an interdependent economic relationship, the loss of having an open military conflict is greater, especially when today's economic interdependence is much greater among states than it was before World War I (Cooper, 2014). It is worth noticing that the economic interdependence in this paper does not only refer to the trade relationship but also other economic aspects such as interdependence on the financial market. By extending the scope to include other economic aspects, the hypothesis of economic interdependence as a mitigating factor in reducing the likelihood of open military conflicts gains further strength (Gartzke et al., 2001).

So, if China and the US are decoupled from each other both economically and technologically, there is less incentive for them to not engage in military conflicts since the economic cost is lower. According to the capitalist peace theory, economic interdependency can be a pacifying force in cases of disputes or conflicts (Schneider, 2022). Consequently, the game will shift into a chicken game which is usually used to model crisis situations (Stone, 2001). Also, the repeated structure of the Prisoner's Dilemma game may hinder cooperation as certain strategies, such as "tit-for-tat" (Yin and Hamilton, 2018), can lead to a cycle of defection. Hence, transitioning to the chicken game can provide a more accurate representation of the dilemma concerning how a technological war, wherein both players defect, can elevate the risk of military conflicts.

The chicken game, also known as the hawk–dove game, is a finite game that entails two players faced with the decision of either backing down or engaging in a mutually destructive conflict (Fudenberg and Tirole, 1991). Each player can choose to either **Stay (drive straight)** or **Turn (swerve)** in a hypothetical situation where two cars are driving towards each other on a collision course (Yin and Hamilton, 2018). In the context of our study, the strategy denoted as "Stay" signifies a player's decision to opt for a military confrontation, whereas the strategy referred to as "Turn" indicates the player's inclination to avoid a military confrontation by implementing de-escalation policies.

The key to winning this game is to predict what the other player will do and make a decision accordingly. If one state can convince the other state that they are willing to take the risk and continue driving straight through signalling and leverage, the other state may choose to swerve away and lose the game (Yin and Hamilton, 2018).

In a regular chicken game, both players make their decision simultaneously, without knowing what the other player will do (Stone, 2001). In a sequential chicken game, on the other hand, the players make their decisions in a specific order, one after the other, with each player knowing the other player's previous move (Stone, 2001). In other words, the second player's move is dependent on the first player's move. Hence, the sequential chicken game is a better model to depict a real-world scenario, because the players can anticipate the other player's move and adjust their own move accordingly, leading to more complex and interesting strategies compared to a regular chicken game. After all, politicians and statesmen often make important strategic decisions with the help of historical experience and signalling's from the other side (Inboden, 2014).

In the sequential chicken game, each player has two strategies, which will lead to four outcomes:

1. One player plays the strategy **Turn**, the other player responds with the strategy **Turn**: When both players choose to turn, they will exit the sequential chicken game and enter the repeated prisoner's dilemma game again, in which they will continue to interact with each other. In this setting, both states demonstrate their reluctance to engage in a military confrontation, leading them to return to the negotiation table for further discussions.
2. One player plays the strategy **Turn**, the other player responds with the strategy **Stay**: When the first-mover state chooses diplomatic negotiations, the other state wins the game.
3. One player **Stays**, then the other player T**urns**: When the first-mover state signals the intent to persist with an arms race and military escalation or using leverage to force the other state to compromise, the other state complies.
4. One player **Stays**, the other player also chooses to S**tay**: When both states are determined to continue with an arms race and military escalation. In other words, we will end up with two blocs and a bilateral world structure if both China and the US choose to play Stay and escalate the conflict on a military level.

Thus, if both states choose **Turn**, i.e., they both signal de-escalation, the world can then go back to the globalised order. If they choose **Stay**, it signals that both of them are determined to head towards a polarised world where there will be minimal or no interaction between them.

There are two pure strategy Nash equilibria in the sequential chicken game – (Stay, Turn) and (Turn, Stay). A pure strategy Nash equilibrium occurs when each player's chosen action is the best response to the actions of all other players, and no player has an incentive to unilaterally deviate from their strategy (Yin and Hamilton, 2018). When a pure strategy Nash equilibrium is chosen or if both players choose to turn, the game is resolved and the players will return to the repeated prisoner's dilemma game (Yin and Hamilton, 2018).

Consistent with Yin and Hamilton (2018), we exclude the consideration of mixed strategy Nash equilibrium solutions. In a mixed strategy Nash equilibrium, each player randomly selects a strategy with a certain probability distribution, resulting in the situation where no player has an incentive to switch to another strategy given the mixed strategies of the other players (Fudenberg, Tirole, 1991). Given that it is very unlikely such important decisions will be chosen randomly by any state, it is reasonable that we disregard this situation.

We also acknowledge that a military conflict may occur irrespective of a technological war on the economic level. In that case, China and the US will find themselves directly in a situation of a sequential chicken game. It is also reasonable to assume that a full-scale military

confrontation is the worst case scenario, where a full scale decoupling on the economic and technological fronts between the two states will soon follow if not already initiated concurrently with the outbreak of the conflict. Speaking in the terminology of game theory, if both players find themselves in the state of (Stay, Stay) in the sequential chicken game, it naturally entails that they are in the state of (Defection, Defection) in the repeated prisoner's dilemma game.

Through the incorporation of the sequential chicken game as a subgame within the broader context of the repeated prisoner's dilemma game, the strategic decisions of both players become interdependent across military and economic domains. As a result, they must consider the ramifications of their choices holistically, wherein decisions made at the military level will invariably affect the economic level, and vice versa.

3.3 Theoretical Rationality of the Basic Model

In the following, we provide a proper theoretical explanation of the rationale for the payoffs, e. g. how should the payoffs be constructed according to the rules of game theory. We are starting with the Repeated Prisoner's Dilemma followed by Sequential Chicken Game.

A game is considered as a repeated prisoner's dilemma game if it satisfies the following conditions:

1. $T > R > P > S$;
2. $R > (T+S) / 2$;

where T stands for the payoff of "Temptation to Defect", R stands for the payoff of "Reward for Mutual Cooperation", P stands for the payoff of "Punishment for Defecting", and S stands for "Sucker's Payoff", as shown in Table 3 (Geng et al., 2017; Nordstrom, 2023).

If we recall the arbitrary numbers assigned as payoffs for the repeated prisoner's dilemma game, all these numerical representations satisfied the conditions required:

$T = 6 > R = 5 > P > S = -6.8$;
$R > (T+S) / 2 = 5 > (6 – 6.8) / 2$.

According to our reference paper written by Yin and Hamilton (2018), "alterations to payoffs can be made through affine transformation, as long as they do not violate the initial preference order".

The payoffs in a sequential chicken game should have the following ordinal preferences: ST > TT > TS > SS (Yin and Hamilton, 2018).

The numerical representations in our model, as shown in Table 2, satisfied this condition: (1,0) > (0,0) > (0,1) > (-10, -10). In addition, these numerical representations also signify the assumed consequences of each outcome. In the case of (Stay, Stay), the welfare loss is the greatest for both players, whilst there should not be any changes in the status quo when both states choose to turn. Also, the beneficiary of ST or TS outcomes will have a slight gain in the payoff, and the gain of 1 is symmetric for both players for now. The numerical values may change in the analysis section if more empirical evidence suggests otherwise.

Table 3 Repeated Prisoner's Dilemma Game

(Economic Level) China United States	Cooperate	Defect
Cooperate	R R	T S
Defect	S T	P P

Table 4 Sequential Chicken Game

(Military Level) China United States	Turn	Stay
Turn	T T	S T
Stay	T S	S S

4 Analysis & Discussion

In the following section, empirical evidence will be integrated into the model in order to explain the competition on economic and military levels.

4.1 Economic Competition

Already in 2017, the Trump administration had signalled the intent to alter the trade relationship with China (Siripurapu and Berman, 2022). That is, the US launched an investigation into China under the provisions of Section 301 of the Trade Act of 1974, to assess whether China's trade practices and policies concerning technology transfer, intellectual property, and innovation are discriminatory against the US (Office of the United States Trade Representatives, 2017).

However, China believed that the Section 301 investigation was detrimental to the existing international trade order (Wang, 2017). "It is understood that WTO rules expressly prohibit the unilateral implementation of trade sanctions. Section 301 is a unilateral measure imposed by the US based on its own judgement of unfair trade practices, and as such, it is highly likely to violate WTO rules." (Wang, 2017). Clearly, the launch of this investigation was perceived as a defection strategy by the Chinese side.

As China dismissed the legitimacy of this investigation, the Chinese spokesperson Chunying Hua also emphasised that "the Chinese government has consistently placed great importance on the protection of intellectual property rights, and the achievements in this regard are evident. Any trade measures adopted by WTO members must adhere to WTO rules" (Wang, 2017). If we find us in a one-shot prisoner's dilemma game, one could argue that the only dominant strategy for China would be defect as a response to the American defection strategy, at least when it comes to trade. That is, knowing that the US is playing defect, China should respond with the defection strategy in a non-iterative setting despite the strategy is not Pareto-efficient, according to the theory of prisoner's dilemma. Yet, China was well aware of the need to adopt a long-term perspective when evaluating such matters (Fu, 2021). This could elucidate China's rationale for invoking the WTO rules and urging the US to demonstrate compliance with the established regulations as a preliminary step, instead of resorting to an escalation of tensions through assertive rhetoric or threats of retaliation at once. Nonetheless, the trade war commenced in 2018 when the US implemented the defection strategy by imposing tariffs on imported goods from China, prompting China to respond with retaliatory tariffs (Buchholz, 2020; Mullen 2022).

As evident from Figure 1, both countries engaged in a repetitive pattern of "tit-for-tat" strategies, with both consistently adopting the defection strategy. Up until September 24, 2018, the payoff for the defection-defection outcome remained symmetrical for both nations (Buchholz, 2020). An illustrative example can be found in Table 5. As depicted in Figure 2, China's optimal strategy in this scenario, given the US strategy, was defection, i.e., retaliation, which was indeed employed by China.

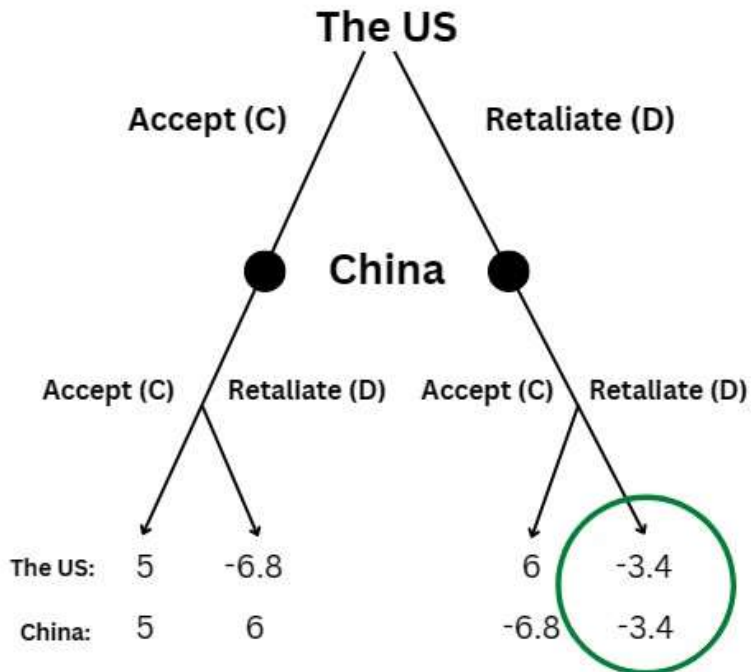**Figure 1 The Timeline of US-China Trade War, 2018-2020**
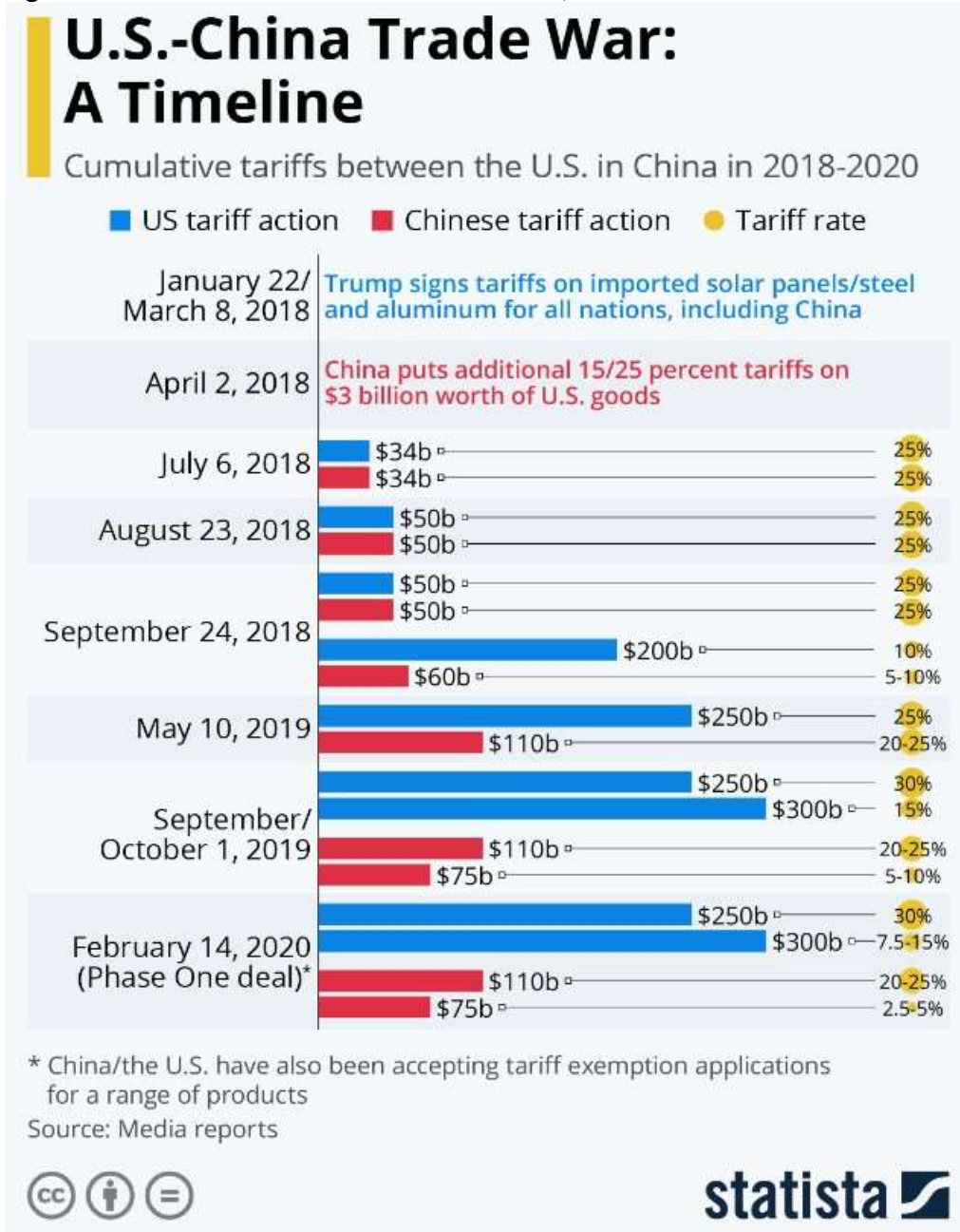
(Source: Buchholz, 2020)

Table 5 Repeated Prisoner's Dilemma Game with Payoff Alteration, Jul 6, 2018

(Economic Level) China United States	Cooperate	Defect
Cooperate	5 5	6 -6.8
Defect	-6.8 6	-3.4 -3.4

Figure 2 China's Strategy, Jul 6, 2018

However, the payoff structure ceased to be symmetrical starting from September 24, 2018, as evidenced by Table 6. One important reason for the changes in the payoff structure may be that the total value of the US imports from China was comparably higher than China's import from the US (Vietor and Sheldahl-Thomason, 2020; Bown, 2022). According to the theory,

defection is not the optimal strategy for China anymore given the US strategy, instead they should choose the cooperation strategy, as shown in Figure 3. In reality, a truce was reached between both countries at the G20 summit in December 2018, following China's commitment to making a large purchase of American goods (Mullen 2022).

Table 6 Repeated Prisoner's Dilemma Game with Payoff Alteration, Sep 24, 2018

(Economic Level) China / United States	Cooperate	Defect
Cooperate	5 / 5	-6.8 / 6
Defect	6 / -6.8	-6 / -20

Figure 3 China's Strategy, Sep 24, 2018

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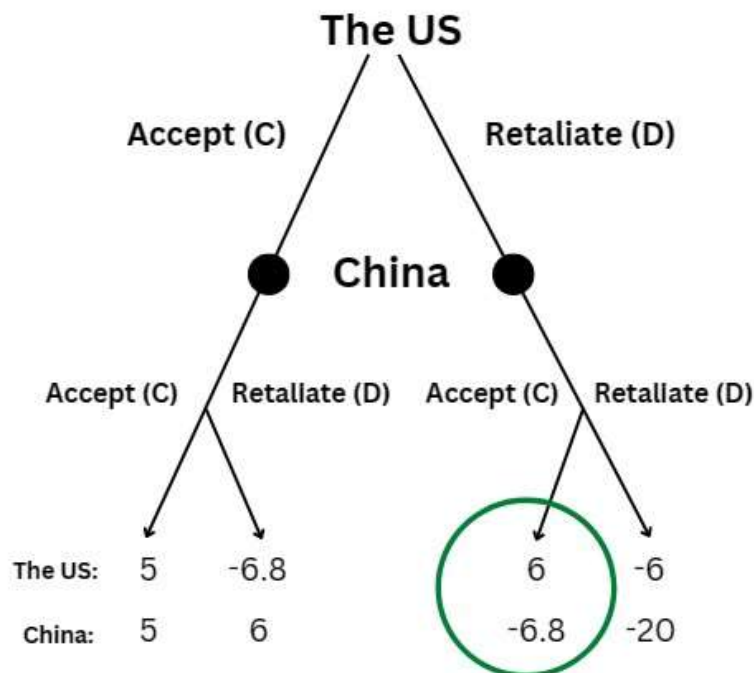
Yet, the truce in 2018 did not last long; the trade war resumed after the unsuccessful negotiations between China and the US (Mullen, 2022). Despite the signing of the phase-one deal in 2020, which entailed China's commitment to augment purchases of American products and undertake specific structural adjustments concerning intellectual property practices in exchange for the US tariff reductions on certain Chinese imports, the trade war did not come to a complete halt (Staff, 2020; Mullen, 2022; Bown, 2022). According to Chad P. Bown (2022), a senior fellow at the Peterson Institute for International Economics, both China and the US are "determined to reduce the two countries' economic interdependence". This statement seems to be valid when it comes to the technology sector.

In 2019, the Chinese telecommunications giant Huawei was put on the "entity list" by the American government, which made it significantly difficult for Huawei to procure components from American companies (Mullen, 2022). In 2021, President Biden implemented the Secure Equipment Act, which aimed to hinder Chinese tech companies, such as Huawei and ZTE, from obtaining new equipment licences in the US due to security concerns (Shepardson, 2021). In 2022, both the CHIPS and Science Act and Inflation Reduction Act were passed to "promote scientific research and domestic production of high-tech goods" in the US (Siripurapu and Berman, 2022). On October 7 of the same year, the US government further strengthened its export controls on advanced technology and products associated with artificial intelligence (AI) and semiconductors to China, intending to limit China's progress in these high-tech sectors (Gill and Lee, 2023; Allen, 2023). Later in 2022, the US also took measures to prohibit the sale of communications equipment manufactured by Chinese firms Huawei and ZTE as well as the use of certain video surveillance systems originating from China (The Associated Press, 2022).

All these policies and legal acts clearly demonstrated that the US has chosen to defect on technological competition, which is one of the focus areas of this paper. Exports controls under the Trump administration already targeted the technology sector, but President Biden strengthened the technological chokehold on China (Gill and Lee, 2023). The Biden administration's semiconductor policy focused on four chokepoints, i.e., vital technologies or areas for a nation's future growth:

> "to (1) strangle the Chinese AI industry by choking off access to high-end AI chips; (2) block China from designing AI chips domestically by choking off China's access to U.S.-made chip design software; (3) block China from manufacturing advanced chips by choking off access to U.S.-built semiconductor manufacturing equipment; and (4) block China from domestically producing semiconductor manufacturing equipment by choking off access to U.S.-built components" (Allen, 2023).

Since the US has a competitive advantage over China when it comes to technology, it is reasonable to assume that China has a higher incentive to cooperate compared to the US. To illustrate this asymmetrical payoff in Table 7, we will assume that China's payoff of a cooperative solution is twice as much as that of the US.

Table 7 Repeated Prisoner's Dilemma Game, Technological Competition

(Economic Level) China / United States	Cooperate	Defect
Cooperate	10 / 5	6 / -10
Defect	-10 / 6	-3 / -3

There are mainly two reasons to motivate this choice. Firstly, the protectionist measures imposed by the US on China will harm the economic growth of China (Allison et al., 2022; Allen, 2023). Also, economic decoupling between China and the US in general, including technological decoupling, will cause many problems, such as supply chain shortages, for not only both countries but the entire global economy (Bown, 2022; Allison et al., 2022; Allen, 2023; Nye Jr., 2023).

To increase the loss for China, the US could mobilise its allies to augment the impact of its defection strategy. Indeed, "Japan and the Netherlands agreed to join the United States in adopting new export controls on advanced semiconductor technology and equipment" to China in January 2023 (Gill and Lee, 2023). However, China can also exploit its dominance in some of the most critical industries to increase the effect of its retaliation. As global warming becomes an immediate issue for most countries, the demand for green energy technologies is rising rapidly. Currently, the US cannot ignore its dependence on China when it comes to this field, as China accounts for "80% of the world's solar panels, 40% of the world's wind turbines, and 90% of the refined rare earths that are essential for the batteries that power EVs" (Allison et al., 2022). Nevertheless, China may still be the one that will suffer the most from a technological war given the US technological superiority as well as the importance of technology for China's economic growth. Therefore, the asymmetrical payoff structure of (10, 5) for China and the US in a cooperative state is set in such a way that China obtains a higher payoff value.

Secondly, the technological race is not only about economic cost and benefit analysis but also public attitudes within the country. Technological leadership is also closely tied to national pride for both countries. In 2013, President Xi articulated the vision of the Chinese Dream by outlining the principles of the "New Normal" (Vietor and Sheldahl-Thomason, 2020). This approach entailed transitioning from quantitative to qualitative growth by leveraging technological leadership, fostering innovation, promoting domestic consumption, and prioritising sustainability (Vietor and Sheldahl-Thomason, 2020). In addition, a recurring narrative in China is that China is rising while the US-led international order is declining

(Roach, 2022; Rachman; 2022). So, acquiring technological leadership would serve as a significant testament to that narrative and further bolster the public's confidence in the CCP.

From the US perspective, retaining as a technological leader is also critical for political reasons. There are many social problems such as large wealth inequality in American society. The utilisation of China as an evil antagonist to absorb anger from American workers has been a political expediency employed by US politicians from both Republicans and Democrats (Roach, 2022). After China replaced the US as the largest manufacturer in the world, the narrative of China being "an existential threat to the cherished American Dream and US global leadership" has gained popularity (Roach, 2022). Considering that the US has long been a hotbed for innovation and technology, it would be emotionally unacceptable for Americans to accept that China is taking the crown. Also, the COVID-19 pandemic exacerbated the income inequality issues (Delavega, 2021). Fighting for technological leadership with China can then be a new narrative to gain political support for US politicians and divert attention from tricky problems such as government budget deficits and domestic saving problems. In other words, both China and the US need this race for internal stability, which motivates the symmetrical payoff structure (-3, -3) when both players play defect. Furthermore, political reasons entail that the loss of playing cooperation is greater when the other player is defecting, signified by the numerical value of -10.

Given how the payoff structure is stipulated, according to motivations mentioned above, the US will be playing the defection strategy. Consequently, while China hopes for a cooperative solution, it is likely that the country will respond with defection given the US defection strategy, as shown in Figure 4. Indeed, Huning Wang, a top Chinese politician and a member of the Politburo Standing Committee, acknowledged the importance of technology leadership: "If you want to overwhelm the Americans, you must do one thing: surpass them in science and technology" (Che, 2022).

Figure 4 China's Strategy, Technological Competition
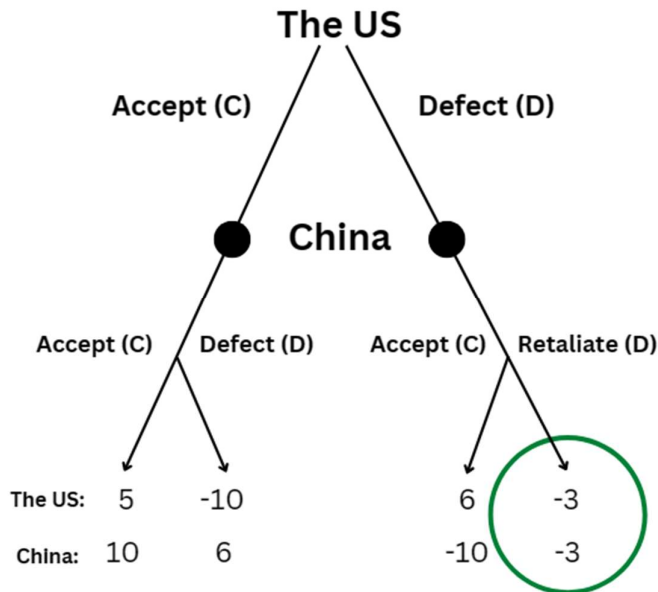
Hence, in response to the protectionist measures implemented by the US, China retaliated by imposing export controls on rare earths, a critical resource for semiconductor production (Gill and Lee, 2023). Moreover, China engaged in a number of other retaliation efforts, such as impeding all "corporate mergers involving a US semiconductor company that operates in

Chinese markets", banning Chinese companies in the critical infrastructure industry from purchasing chips from the US producer Micron, and tightening export controls on "gallium and germanium, two minerals that are important raw inputs for electronics manufacturing" (Allen, 2023).

In addition to retaliation efforts, China is developing its own advanced technology capabilities to achieve self-reliance through its "Made in China 2025" strategy announced in 2015 followed by the Innovation-driven Development Strategy (IDDS) in 2016 (Löchel, Jablonski 2025). According to Chinese economists, the best way to avoid technological chokeholds is to become self-reliant by replacing foreign products with domestic products (Jin et al., 2022). It should be noted that the Chinese self-reliance approach was prior to the start of the trade war of Trump as well as the tech war by Biden (Allen, 2023).

In summary, China and the US are at a trade war and a technological war on the economic level. In most cases when the US played the defection strategy, China has responded with the same strategy, which can lead to a worrying bipolar economic order. As Keyu Jin, a Chinese scholar at the London School of Economics, warned that the world may be "divided into two, with one half using Chinese information systems and infrastructure, and the other half using American information systems and infrastructure" (BBC News, 2019).

However, both countries are in a repeated prisoner's dilemma game, which means that they are playing the game infinitely. Therefore, it does not mean that the two countries cannot break free from the "tit-for-tat" trap in the future, especially when universal issues such as global warming require a high degree of cooperation, and the payoff structure may change in such a way that the best strategy for both countries will be cooperation. Besides, the competition between China and the US are deemed to have spillover effects in the world, so it is essential to acknowledge the importance of other players in the global economy. It would be interesting for future studies to investigate how COVID-19 and post-pandemic economic outlook can change the payoff structure for both countries, or how to alter the payoff structure when other players such as the EU are included in the game.

4.2 Military Competition

According to the set-up of our model, the game will be shifted to a sequential chicken game when they both play defection strategy in the repeated prisoner's dilemma game. The underlying assumption is that economic and technological decoupling can increase the risk for military conflicts and/or a polarised world order where China and the US will have minimal interaction with one another. Yet, some people believe that technological decoupling may decrease the possibility of military escalations, because China will not be able to access "military relevant technologies" to achieve its military potential (Gill and Lee, 2023; Allen 2023). While acknowledging that this claim may have some merits, it is essential to recognize the potential pitfall that technological competition might not necessarily reduce the likelihood of military confrontations but rather defer it to a later juncture.

Furthermore, there are two types of military conflicts: a latent and an open military conflict. An example of the former can be arms race or any other type of confrontations that can increase the division between two or more countries but will not escalate to a direct military conflict or a declaration of war. On the other hand, open military conflicts involve active military engagements and direct confrontations between opposing forces. Economic and technological decoupling might delay the onset of an open military conflict, but it is improbable to postpone a latent one, as observed from historical lessons drawn from the US-Soviet relationship. Given our comprehensive consideration of both types of military conflicts in this paper, adhering to our underlying assumption appears justified.

For each type of military conflicts, it requires a tremendous amount of empirical data as well as specific military knowledge to pinpoint a good payoff structure. Therefore, we will only be discussing different payoff scenarios of these two types of military conflicts with the support of certain empirical evidence due to data limitations and our restrained military knowledge.

4.2.1 An Open Conflict Scenario

Following Russia's invasion of Ukraine in 2022, there is a growing concern regarding the possibility of a direct military confrontation between the US and China over Taiwan (Rachman, 2022). This concern is evident not only through numerous articles published in Western media but also through statements made by President Biden as well as President Xi on different occasions (Hille and Sevastopulo, 2022; Mao, 2022).

From the US perspective, the Taiwan issue has garnered renewed attention and concern primarily due primary objective of the People's Republic of China (PRC) to reunify the country with Taiwan – officially: Republic of China - and the notable occurrence of PRC's bomber flights in proximity to Taiwan shortly after President Biden's inauguration followed by different military manoeuvre in the Taiwan street later (Hille and Sevastopulo, 2022; Zhou, 2023). Notably, China's unwavering "One China Policy", asserting Taiwan as an integral part of its territory, remains unchanged, which suggests that the cause of heightened American apprehension could be attributed to the bomber flights (Hille and Sevastopulo, 2022; Mao, 2022). In the setting of the sequential chicken game, the US may interpret those bomber flights as China's signal of playing the stay strategy. However, China may hold a different perspective. Despite the US's recognition of the "One China Policy", it has continued to supply arms to Taiwan and maintains a close relationship with the island (Mao, 2022). From China's standpoint, deploying bomber flights could be a response to the US's increased sales of advanced military equipment to Taiwan (Vietor and Sheldahl-Thomason, 2020).

Dai Xu (2020), a professor at the PLA National Defence University, expounds in his book that the US has consistently pursued a strategic encirclement of China since the Korean War in the 1950s. Major General Yinan Jin of China (2017) shares the belief that inciting regional conflicts is a recurring strategy employed by the US to further its interests and gain regional dominance. As per the Major General's view, the US previously extended military support to the Philippines under the pretext of assisting them in combating terrorism during the sensitive period of the territorial dispute between China and the Philippines. However, it was actually a political demonstration of support to the Philippines against China (Jin, 2017). The general cites this Philippines example, along with the American's covert military aid to Taiwan, as evidence that the US has persistently pursued a strategy of containment against China.[5]

Additionally, the principle that the US will not support Taiwan's independence has been a fundamental cornerstone of the US-China relationship since the Shanghai Communique signed by President Nixon and Premier Zhou Enlai in February 1972 in Beijing (Kissinger, 2011: 267-273; Sacks, 2022). While subsequent presidents maintained this policy, President Biden was the first to explicitly state, "Taiwan makes their own judgments about their independence…that's their decision", marking a notable departure from his predecessors (Mao, 2022; Sacks, 2022). As Sacks (2022) pointed out:

> "Some will argue that President Biden merely misspoke – indeed, after the president's interview, the White House clarified that U.S. policy had not changed. But officials in Beijing will see this as further evidence that the United States is walking away from its

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[5] Another example is the so-called AUKUS pact between Australia, the United Kingdom and the US, concluded in September 2021, that provides Australia with atom submarines in the Pacific. The pact its mostly interpreted as an action to contain China's influence in the region.

one-China policy. They will view this statement alongside Speaker Nancy Pelosi's remark that it is 'up to Taiwan to decide' whether to declare independence and conclude that there is a coordinated effort underway to shift U.S. policy. They will also note former secretary of state Mike Pompeo's call for the United States to recognize Taiwan as an independent country and former secretary of defence Mark Esper's recommendation to ditch the one-China policy and see such changes as enjoying bipartisan support."

As a result, there exists a divergence in perspectives: the US perceives China as the initiator of aggressive signalling, while China may view the US as the party that initially provoked China with malicious intent. These distinct interpretations of signals and of the sequence of signalling can significantly influence the players' strategic choices.

Nonetheless, both countries are cognizant of the grave ramifications of an open military conflict, given the impact of nuclear weapons, potential economic damages, and the potential repercussions to their respective international reputation. Consequently, both players will exercise extreme caution in adopting the Stay strategy, and they will remain hesitant to do so until one of them believes that the other player will persist with the Stay strategy. Only when such belief is established, they may opt to switch to the Turn strategy to prevent a direct military conflict.

In the first scenario, where the payoff structure is symmetrical, the outcome is significantly influenced by the player who can make credible threats first or possesses more leverage over the other. If the US holds superior capabilities in making credible threats, China will be compelled to reluctantly adopt the Turn strategy, as depicted in Figure 5. Conversely, if China is the first to employ credible threats, the US will become the loser of the game, as illustrated in Figure 6.

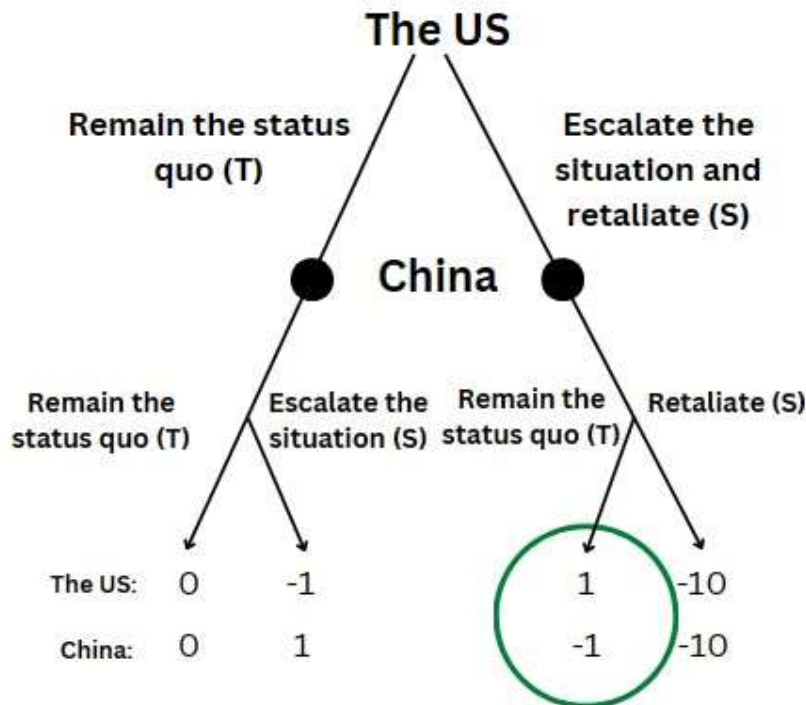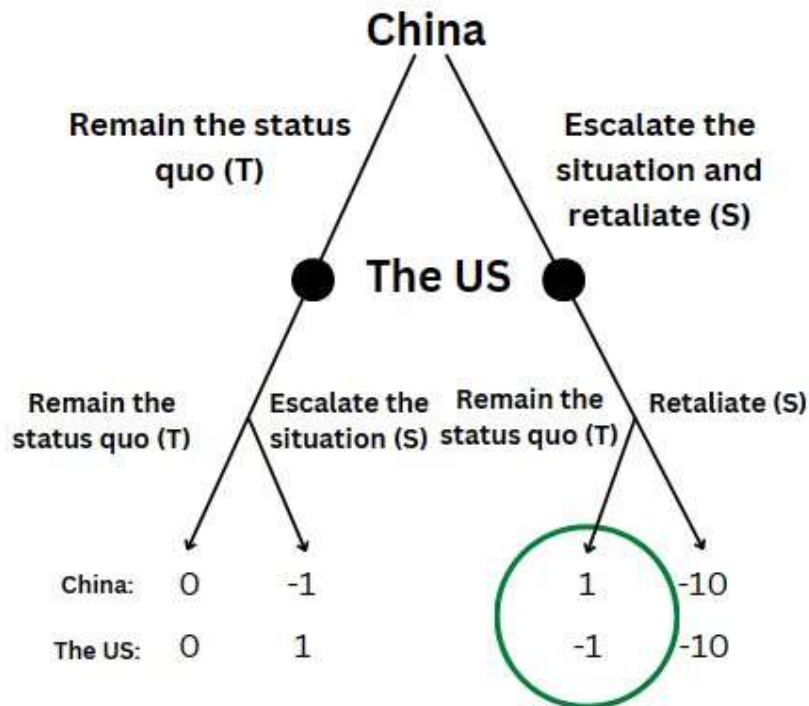**Figure 5 First Scenario with the US As the First Player, Symmetrical Payoff Structure**

Figure 6 First Scenario with China As the First Player, Symmetrical Payoff Structure

However, there are more factors involved in a military conflict beyond mere economic costs, as with technological competition. For instance, a declaration of independence by Taiwan and/or recognition of its independence by the US could potentially lead to significant social instability within mainland China, thereby potentially emboldening separatist movements in other regions. In this second scenario, China may face greater losses with the Turn strategy if the US adopts the Stay strategy (i.e., the US acknowledging the independence of Taiwan). As depicted in Figure 7, if the payoff for China is equal to or greater than -10 when the US plays Stay, China will respond with the Stay strategy.

In other words, China is very likely to persist with the Stay strategy if the US violates the "One China Policy". As for the nuclear deterrence, both Dai (2020) as well as General Jin (2017) highlighted that it is only meaningful when nuclear weapons are possessed by just one side, because they are nothing more than psychological weapons when possessed by both sides.

Figure 7 Second Scenario with Payoff Alteration, China's Strategy
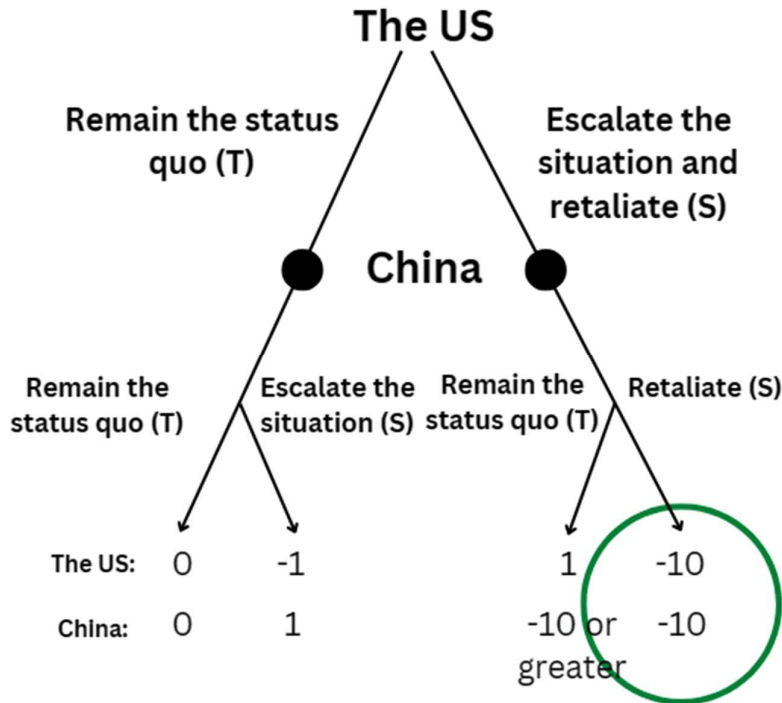
In the second scenario, we considered the US as the first player in the event of violating the "One China policy". Nevertheless, we must acknowledge the possibility of China taking the first move. As a result, we introduce the third scenario, depicted in Figure 8, where T denotes no military actions against Taiwan, and S represents the use of military forces against Taiwan. In this instance, the payoff structure is altered, resulting in negative payoffs for China if it opts for the Stay strategy. Even if the US chooses the Turn strategy, it would not be a prudent decision for China to select the Stay strategy.

There are several reasons behind this alteration. Firstly, conducting a military action against Taiwan may severely tarnish China's international image, posing strong negative reputational and economic consequences in the relationship with the EU but probably also with ASEAN[6] and part of the BRICS countries (Wong, 2023). Secondly, it is highly likely that huge parts of the citizen of the PRC will not support a military conflict with Taiwan, given that Taiwanese are also regarded as Chinese. Additionally, China must contemplate the potential consequences of an US involvement in a military conflict and the likelihood of an escalation into a global, full-scale war with the involvement of other nations. Moreover, the protracted duration of the Russia-Ukraine war demonstrated President Putin's miscalculation of the joint reaction of the West in supporting the Ukraine, which will probably the case for Taiwan as well if a military conflict happens.

Finally, even if China were to achieve reunification with Taiwan through the use of force, the process of governance might encounter significant opposition and challenges. Therefore, despite the fact that "90 percent of advanced chips for military defence and corporate

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[6] ASEAN consists of ten member states: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

computing services come from Taiwan" (Hufbauer and Hogan, 2022), the disadvantages of employing military forces against Taiwan would currently outweigh the advantages.

Considering these factors, it is plausible that China would refrain from initiating military actions in the third scenario, leaving the US to play the Stay strategy by, for instance, strengthening ties with Taiwan or providing increased military support to the island.

Figure 8 Third Scenario with Payoff Alteration
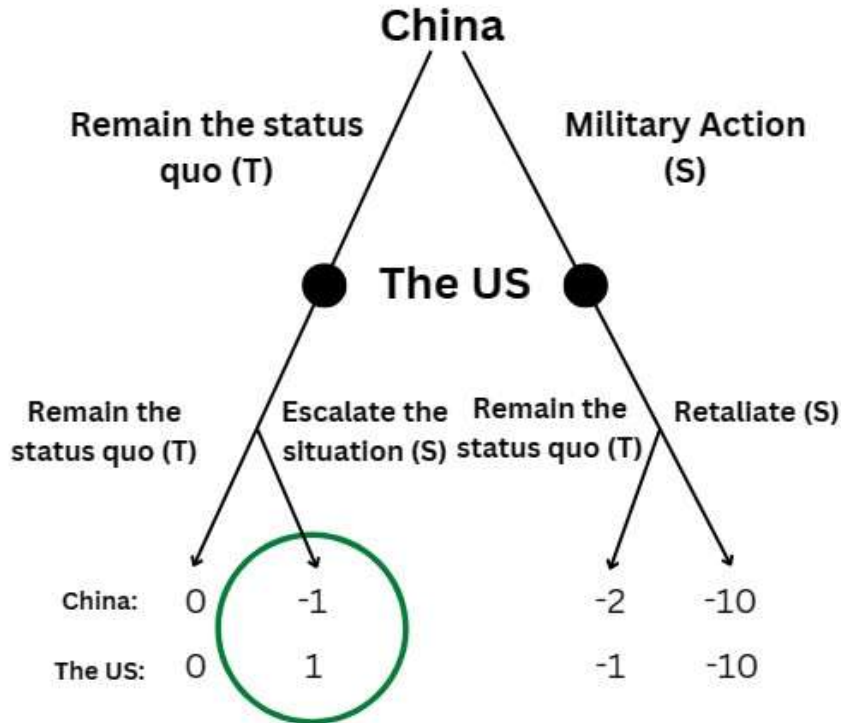
However, the Stay strategy of the US can evolve other actions such as military exercises to escalate the situation and send a strong signal but must not violate the "One China Policy", to avoid entering the second scenario, i.e. a Stay-Stay scenario where a full-blown military confrontation can be expected. But an argument can be made that there is little incentive for the US to further escalate the situation if China opts for the peaceful strategy. Provoking China under the pretext of China playing Turn first may lead to an increased likelihood of China choosing Stay in the subsequent round, as they are not confined to a one-shot game. In other words, once the sequential chicken game is resolved, the players will return to the repeated prisoner's dilemma game, affording them another opportunity to engage in the sequential chicken game again.

With that in mind, it becomes more plausible that the situation in reality will unfold similar to the fourth scenario (Figure 9), where the optimal strategy for the US is Turn, assuming China chose the Turn strategy first.

Figure 9 Fourth Scenario with Payoff Alteration
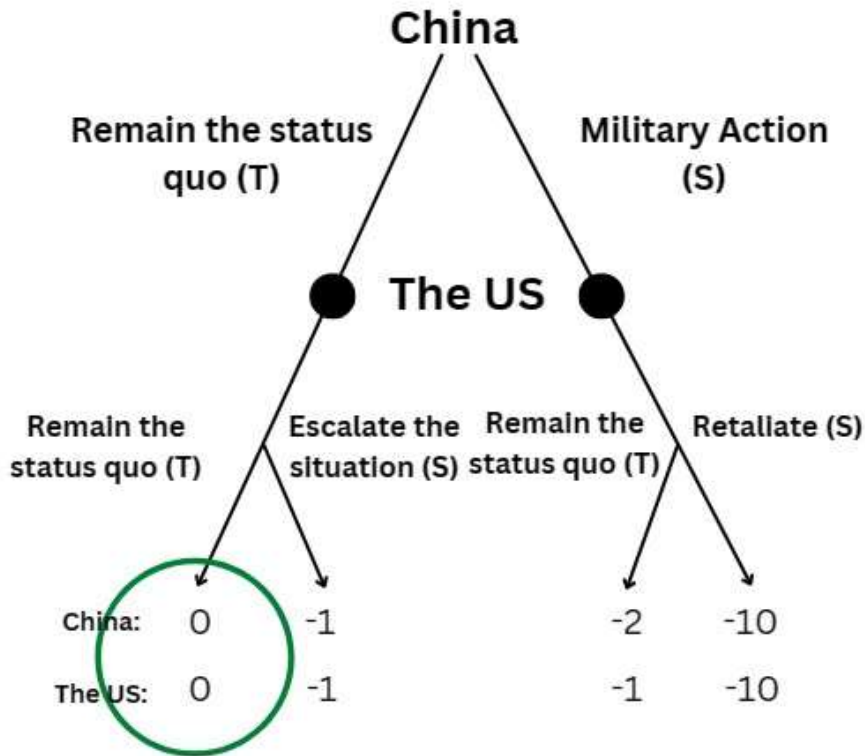

4.2.2 A Latent Conflict Scenario

Although the likelihood of an open military conflict is small, one cannot rule out the possibility of a latent conflict situation. As noted by Zhou (2023), the Chinese government adopts a "tit-for-tat" strategy in its foreign policy, likely aiming to align with the narrative of "China is rising and the US is declining":

> "When the U.S. imposed significant chip export restrictions, China responded by banning the export of rare metals. Due to the repeated visits of official US delegations to Taiwan, China conducted frequent large-scale military exercises in the waters surrounding the island. After the United States shot down a Chinese spy balloon that has passed over the continental US, China chose to completely sever high-level military communication channels."

Likewise, it would be overly optimistic to anticipate the US being the first to make concessions in this competition unless it escalates into a direct military struggle. That is, the US would not accept the narrative of "a declining US" and hand over the crown to China easily. Considering the mutually destructive potential of nuclear weapons and the belief that a nuclear war is more likely to be psychological in nature, the plausibility of a latent conflict scenario becomes more compelling.

As previously mentioned, in the context of US-China rivalry, a nuclear contest is in fact a psychological war. In other words, we may end up in a state of a "balance of terror", i.e., when both sides have enough nuclear weapons to ensure the destruction of the other in the event of a nuclear war, neither side would have an incentive to initiate such a conflict, which depicts the state during the Cold War period. Accordingly, the payoff structure should be modified to reflect this, as illustrated in Figure 10.

Figure 10 Latent Conflict Scenario with Payoff Alteration
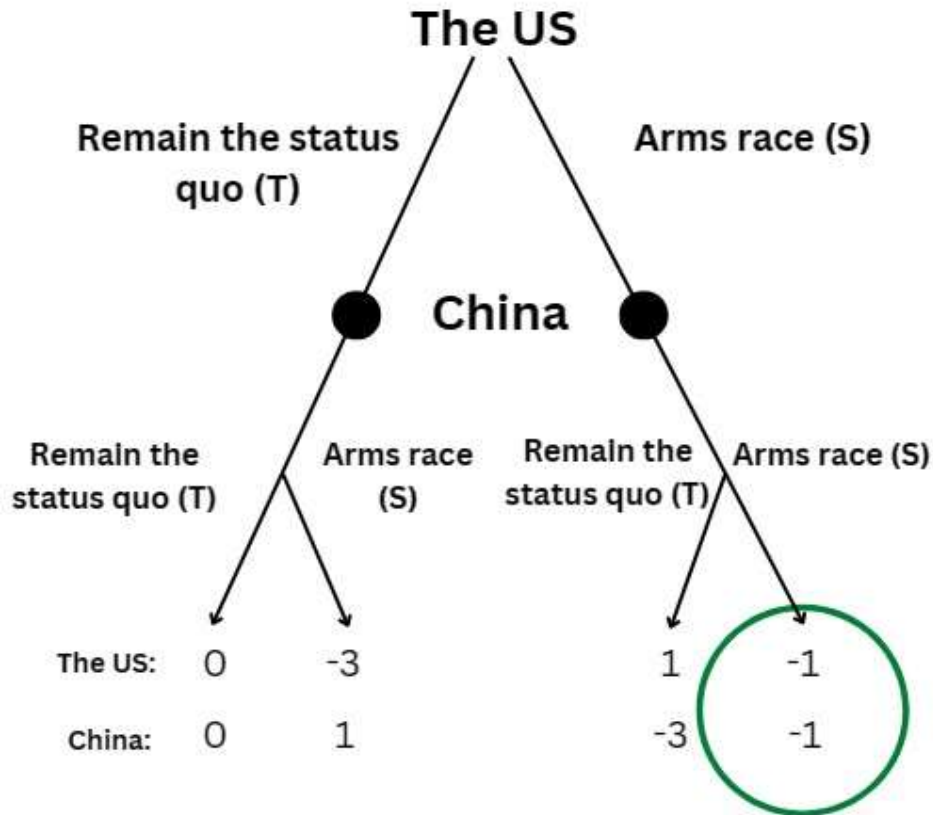
The arms race, while not as catastrophic as an open war, leads to a revised payoff of (-1, -1) when both countries are involved in such competition. Given the nature of the arms race, it is highly probable that when one country increases its military capabilities, the other will follow suit, leading to an equilibrium where both nations engage in this military buildup. Indeed, China has notably increased its military expenses (Vietor and Sheldahl-Thomason, 2020), although Major General Jin (2017) stressed that military spending per capita offers a more objective basis for comparisons with other countries. Hence, the payoff structure is designed to reflect these real-world dynamics.

Under this scenario, it becomes evident that the most plausible outcome is that both countries will participate in the arms race, which may gradually evolve into a bipolar world order. Apart from arms race, leveraging one's military power to influence the counterparty can also be seen as a type of latent conflicts. According to Joseph S. Nye Jr. (2023), a more viable strategy for the US is not engaging in open military conflict with China but to "attract allies" and influence China "by strengthening America's own alliances and international institutions". He also points out that certain countries support the US in strengthening military deterrence against China, which aligns with our assumption that a latent military competition is more likely to happen.

In summary, the likelihood of a latent conflict emerging between China and the US appears higher than that of an open war. Nonetheless, it is essential to acknowledge that this conclusion, as well as the various military competition scenarios, is subject to potential revisions as we consider additional factors, such as the media's role, and obtain more precise data. For instance, with more accurate and comprehensive data on the military capabilities of both nations, the payoff structure can be refined to better reflect the reality, leading to a more precise conclusion.

5 Conclusion

Following the approach of Allison (2017) as well as Yin and Hamiliton (2018), this paper explores the strategic rivalry between the US and China on economic as well as on military domains in the framework of the non-cooperative game theory. It is investigating the likelihood whether a 'Thucydides' Trap' between the US as established and China as the rising superpower, can be avoided. For the analysis of the economic competition, we are using the repeated prisoner's dilemma game, while adding a sequential chicken game as a subgame to analyse the military component of the rivalry. Both games fit best with the respective empirical evidences.

Based on the result of the first model and empirical evidence mapped in the payoff matrix, we conclude that in economic dimension an all-out trade and tech war is already underway between the US and China. A pivotal role plays the competition on technological leadership in general purpose technologies like chips and AI. Whereas the US follows a non-cooperative strategy by excluding China from the access to advanced technologies, China pursues a strategy of technological self-reliance to reduce the economic dependency from the US and the West in general.

The assessment opens the possibility of a military conflict between the two superpowers. We divided this part into two categories: an open conflict scenario and a latent conflict scenario. According to our analysis, the probability of a latent conflict between China and the US is much higher than that of an open one. The main reason is that an open conflict would inflict significant economic and reputational damage on both parties, and internal opposition is expected to be strong, which could challenge the position of the government in both China and the US. However, it should be noted that for that conclusion it is assumed that the principle of the 'One China Policy' will be not be challenged and the possibility of a forced reunification is excluded.

Our conclusion remains open to further refinement. Given that the payoff structure is essential to the players' choice of strategy, additional factors, such as more accurate and comprehensive data on military capabilities, may be helpful to confirm it. Furthermore, the influence of other ongoing military conflicts like the Russia-Ukraine and the Hamas-Israel war should be taken into account as well. The risk of triggering a domino effect with a military conflict between China and the US may compel them to work more diligently on developing cooperative solutions rather than resorting to defection strategy.

A change in politicians plays a role as well. For instance, it is not excluded that the political and military tensions between the US and China are easing after the re-election of Donald Trump as the next President of the United States. Although Trump will probably intensify the trade and tech war with China, it seems that he in contrast to the Biden-administration is not much interested in 'system rivalry' but more on 'deals' that ensures economic advantages for the US.

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