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The US-China Trade Conflict:

A Game Theoretical Analysis

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Abstract

Game Theory has been gaining great importance in Economics, encouraging research in many theoretical and applied fields. This paper relies on simple game theory tools to set up a major international trade dispute. Using the backward deduction approach, the strategies of the United States and China in their recent trade conflict are analyzed.

JEL classification

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Keywords

Trade conflict; exchange rate policy; game theory

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I-Introduction:

Game theory is of great importance for analyzing imperfect competitive markets that have more than one interacted agent with different conflicting objectives and strategies. This makes game theory a suitable way to model international trade relations. International trades for many commodities are usually dominated by exports, government policies and multinational companies (Karp & McCalla, 1983). This paper attempts to show how game theory tools can be used to analyze the decision of countries under an international dispute.

One hotly contested conflict of the global economy is China's staggering rise of exports in the world market. In the wake of this experience, many industrial countries accuse China of unfairly backing up its competitiveness by dumping policies as well as by using fixed exchange rate policies that underestimate the value of the Chinese currency in order to keep its import price very low. In particular, the United States perceives itself as the major victim of China's trade policy: The United States of America have a trade merchandise deficit with China since 1984. This trade deficit has accelerated to more than 201 billion in 2005, which is ten times the deficit the United States have with other Asian countries. For example, the U.S. deficit with Malaysia is \$23.3 billion, with South Korea \$16.1 billion, and with Taiwan \$12.8 billion (Lum and Danto 2007¹). To reduce such high deficits, the U.S. parliament decided to take some protectionist actions to defend domestic interests. In May 2005, the U.S. Congress agreed to set a 27.5% tariff on Chinese exports if China would not appreciate its currency at least by 10% (Francis, 2005). According to CRS reports (Martin, 2008), the Chinese Renminbi (the Chinese currency which is also known as Yuan) appreciated about 15% nearly since January 2007.

A Game is constructed in this paper between China and United States as an attempt to understand on what basis the two countries built their decisions (United States threatening China and China adopting a gradual appreciation currency program). The analysis used in this paper exploits the setting's analogy to an entry game discussed in Rasmusen (2001, pp. 15): Rasmusen, using a decision game tree, demonstrated that the best strategy of a dry cleaners producer, who is considering to enter the market or not, depends on the threatened retaliation of the incumbent.

¹ See appendix table (1).

Following the example of Rasmusen, the following trade policy game takes all factors into consideration which affect the disputes between the two countries. The payoffs of the game are assumed to be the trade balances of the countries. To solve the game, the backward deduction method is used to determine the optimal decision for each of the two countries.

II- Trade Game:

1. Back ground for the Game:

For more than two decades, the United States has depended on unilateral agreements to expand its own exports. According to trade law section 301, it has the right to threaten the trade partner of imposing trade protectionist in case the partner country does not expand American opportunities in its domestic market. For Example, the American pressure imposed on South Korea that led South Korea dropped all health requirements it has been imposing on meat imported from the United States (Kherallah and Beghin, 1998)

United States is following the same strategy with China in order to decrease the coercion of China's export on the domestic production. American Government continuously calls China to float its exchange rate in order to decrease the damage created from the unfair trade advantage created from having a cheap Yuan. According to the CRS (Congressional Research Service) the Chinese currency needs to be appreciated by 40% in order to reflect its true value (Sanford, 2005). Due to the damage of this currency manipulation, the United States pressured China to appreciate its currency by 10% or otherwise the US will impose 27.5% tariff on imported products from China.

United States represents the largest importer of goods from China, according to CRS reports, American importers from China reached \$243.4 billion in 2005 compared to \$108.5 billion Japanese imports from China, and \$183.7 billion the European Union imports (Lum and Danto, 2007). Thus China have to carefully respond to US threats taking into consideration how serious the US will be in binding its threats.

A game is constructed in order to analyze the decision of the United States to threaten China and the respond of China to this threat. During the game, two main forces of nature (forces decided according external factors outside the game) are

considered: first, how far US is serious concerning this threat. It is true that the United States is suffering high trade deficit on one side but benefiting low cost Chinese products on the other side which definitely improved households' purchasing power. In addition, American firms (such as Boeing, Ford, General Motors, IBM and Motorola) are benefiting cheap imported inputs that expand their production as well as US job opportunities. According to the Information Technology Association of America, job opportunities created in information technology in 2003 only due to Chinese and Indian development about 90,000 new jobs (Gilboy, 2004). Moreover, the United States is considered the fifth largest source of FDI in China (Foreign Investment in China, 2006), so decreasing Chinese exports means decreasing the income of such American multinational companies and investors in China. Thus, it is not recommended to improve the country's trade balance on the expense of the American individual's income. In addition, the United States fears that putting pressure on China and taking restrictive actions against its exports would lead China to decrease its purchase of US treasury securities while China represent the second biggest country purchasing US treasury security (Morrison, 2008a)

Second, through the game, the ability of China to keep its level of trade balance in spite of the pressure of currency appreciation or tariff restriction is considered. China would take defensive actions to safeguard its returns in the balance of payments. As to imports, these actions can be putting subsidies on its agricultural goods at the home town so that the agricultural imports from the U.S. will still be more expensive for the Chinese. Regarding the manufactured exports to the U.S. China can make its goods more competitive by investing in higher quality products and innovation so that even with a higher price, Americans will still demand the Chinese manufactured goods over the U.S. local goods. This is in addition to the fact that Chinese average surplus balance of payment growth rate between the periods (2000-2005) is 23.5%² which means that the usual growth in exports from year to year could cover the effect of the appreciation in currency.

² Calculated according to the Data available from US Department of Commerce (Lum. and Danto, 2007).

2. Settings of the Game:

a. Players:

- First Player : United States
- Second Player : China

b. Strategies:

- Strategies For United States:

United States has mainly two strategies we try to analyze which is better:

- Strategy A: To threat China and call for Yuan appreciation.
- Strategy B: Not to threat China and keep the status quo.

- Strategies For China:

China has to take decision only if the United States chooses Strategy A but if the US chooses Strategy B then the Game Stops

China First has to take decision whether:

- To respond to US threat with appreciating the currency: in this case it has to choose between:
 - Appreciating with 10%
 - Appreciating with 5%
 - Appreciating with 3%
- To not respond to US threat with appreciating the currency: in this case it has to choose between other ways of responding such as:
 - Trade war: China would impose tariff on the United States' exports to China.
 - No Trade War: this means not responding at all.

c. Constructing the Game:

- The Game can be explained by four Stages:

- At Stage I:

The United States has to choose either to threaten (Strategy A) or not threaten (Strategy B)

- At Stage II:

China has to take the decision which depends on the US choice at Stage I, IF US chooses

- Strategy A: Then China has to choose whether to respond with appreciation (Strategy R) or not responding with appreciation (Strategy N)
- Strategy B: Then China has to take no actions and the status quo will remain and thus the game stops.

- At Stage III:

China still has to take decisions depending on its decision in Stage II, if China chooses:

- Strategy R: Then it has to choose whether to appreciate its currency with 10% as US called for or with a medium level 5% or low level 3%
- Strategy N: Then it has to decide whether to start a trade war or not.

- At Stage IV:

No decisions are taken but other factors that affect the decision of the game are considered, such as:

- The ability of China to keep the supply and demand on its exports and imports constant. So there is two variations in this case:
 1. Having a fixed payoff.
 2. Having a changing payoff according to forces of supply and demand.

- How serious US in imposing tariffs on China. This is not a decision taken in the game but it is decided according to the effect on individual and multinational companies' income. So it is considered whether the US is really willing to abide by its threat or not .

- In case China appreciates with less than 10% three variations are considered:

1. Imposing the whole amount of tariff 27.5%.

2. Imposing medium amount weighted by how much Chinese currency is appreciated. In case China appreciates by 5%: a middle situation where the Yuan appreciates from 8.1943 to 7.784585. In this case China has only followed 50% of The US request, thus US will impose tariffs by an amount 13.75% (= $0.5 \times 27.5\%$ which is the tariff US is threatening to impose on China if does not appreciate its currency). While In case China appreciates by 3%: low level of appreciation, the Yuan appreciates from 8.1943 to 7.948471. In this case China has only followed 30% of The US request, thus US will impose tariffs by an amount 19.25% (= $0.7 \times 27.5\%$)

3. Imposing no Tariff at all

- To reach the optimal decision for every country, a game decision tree is constructed, and backward deduction method is used.

d. The Decision Tree:

Figure (1): The Decision Tree for Trade Game:

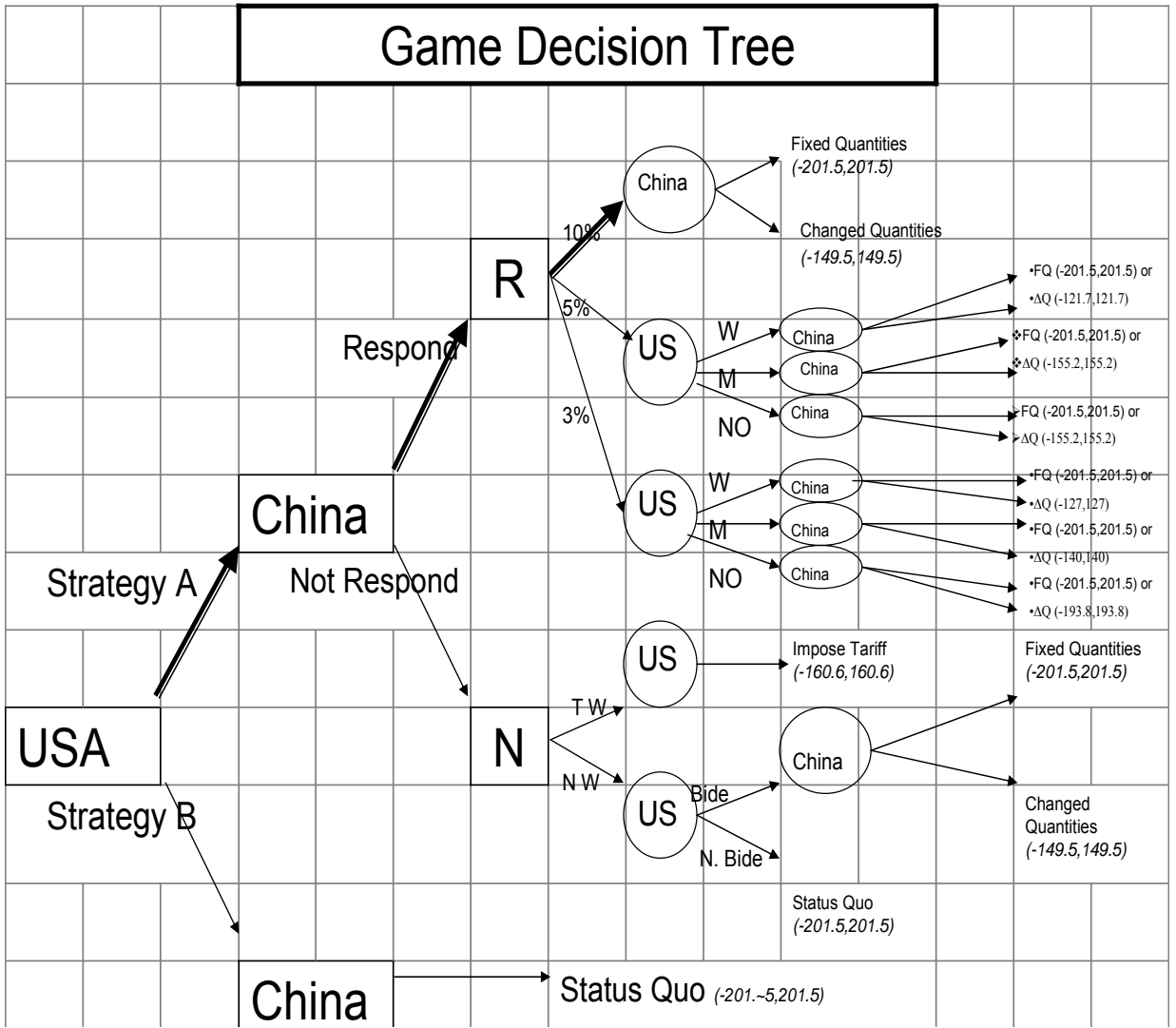


Figure Explanation:

- Decision game tree explains the Trade Game between China and United States. At every point, payoffs are calculated taking inconsideration all variations of the situation so far. Then backward deduction analysis is used to reach the optimal decision for the two players.
- Every Square represent a decision should be taken, while every circle represents forces of nature.

According to the decision game tree, the game can be explained as follows, The United States is the first player and it has to choose between threatening China (strategy A) or not (strategy B). In case, the United States chooses strategy B, the game stops as the status quo is reached. If United States chooses strategy A, then it is China's turn to take decision.

China has either to respond to American threat by appreciating the currency (strategy R) or not responding by appreciation (strategy N). If China chooses strategy R then it is facing another choice by how much to appreciate. If China chooses strategy N, then it has to choose between not responding at all or responding with other means like imposing tariff on US goods.

In case China chooses strategy R, China has to choose between three decisions taking inconsideration the forces of nature that would affect the payoff for every decision:

- i. Appreciating with 10%: then there is 100% probability that the US will not impose any tariffs but China should take inconsideration that it might keep the trade balance fixed or it might decrease due to having the price of its currency increased and thus the price of its products increased in comparison to that of United States.
- ii. Appreciating with 5%: there is probability that United States impose the whole tariff (27.5%) or medium level (13.75%) or not imposing at all. For every variation the payoffs are also affected by the ability of China to keep fixed trade balance situation.
- iii. Appreciating with 3%: there is also probability that US impose the whole tariff (27.5%) or medium level (22.25%) or not imposing at all. And again for every variation payoffs are affected by the ability of China to keep a fixed trade balance.

In case China chooses strategy N, China has to choose between two variations either:

- i. Start a trade war and thus US will definitely impose 27.5% tariff.
- ii. Not start a trade war and not respond at all. The payoffs at this point are affected by whether the United States is really intending to abide by its threat or not. In case the United States chooses not to abide by the threat, the status quo is reached. While in case it decided to abide by the threat, the payoffs are affected by the ability of China to keep fixed trade balance or not.

e. The Game Payoffs:

To calculate the payoffs, the following is considered:

- We start with the exports and imports for year 2005 data according to CRS reports (Lum and Danto, 2007) convert it in Yuan according to CRS official exchange rate reports \$1=8.1943 Yuan (CRS reports, Sandford, 2005). Then calculate the expected payoffs (trade balance) China and the United States would achieve in US \$ (dollars).

- US mainly imports manufactured and technological products from China and exports agricultural products (Francis, 2005). According to the US Agriculture Economic Research Department, the average elasticity of agricultural product over the world is -0.34^3 thus the price elasticity of imported agricultural products from the United States to China is -0.34 . While, the price elasticity of the imported products by United States from China is nearly 1 (as it is a basket of different products that average elasticity all together is 1).

- With variation in quantity, the following is considered:

- Every 1% appreciation in the Chinese products means a 0.34% increase in Chinese imports and 1% decrease in exports.
- Incase of imposing tariff on Chinese exports, 1% tariff imposed means 1% exports decrease.

- Incase China decided to start a trade war: 1% tariff imposed on American exports means 0.34 decreases in Chinese Imports. It is also assumed that China will not take other defensive actions thus there is no probability of having fixed trade balance.

- Every payoff is calculated taking in consideration the situation of currency appreciation.

f. Assigning Probabilities:

As stage IV, there are two main factors (the ability of China to keep constant quantities and the seriousness of US to impose tariff) are treated as forces of nature which means they are choices for the country but does not depend on the payoffs represented in the game. Thus probabilities are assigned for every variation as we are not sure which will occur in reality.

³ Calculated according to the *International Food Consumption Patterns* available At the US official Agriculture website; Economic Research Services.

Different Probabilities are assigned for the different variations as follows:

- i. China has achieved a growing role on the international trade basis, it was able to achieve trade surplus with most of countries (total exports for China id \$ 1,218 billion in 2007 (Morrison, 2008b)), achieve highest growth rates (reported as 11.4% in 2007 according to Morrison, 2008b), create the most preferred manufacturing plat form for companies (according to Morrison, 2008b, fifty percent of trade in China is dominated by foreign investment) and even displace the Japanese and Americans position among South East Asian countries not only as trade partners but as source of economic assistance as well (Nato, 2008). Taking in consideration such progress China has lately achieved, the probability that it will be capable to keep its trade balance constant is higher than having decrease in trade surplus. Thus the probability of having fixed trade balance is 60% .
- ii. Appreciating with 10% implies a zero probability of imposing US tariff. In contrast, appreciating by an amount of less than 10% will increase the probability that the US imposes a tariff.
- iii. The United States would prefer to keep free trade in order not to be accused by the rest of the world of being violating the open trade rules it has set, in addition to the pressure the government would face from American investors in China and decrease in US treasury bills purchased by China. Thus:
 - If China appreciates with 5% or 3%: The probability of not imposing a tariff is 0.5, the probability of imposing a medium level tariff is 0.3, while the probability of imposing the whole tariff is 0.2.
 - If China does not respond at all (Strategy N and No Trade War), the probability that the United States abide by its threat and impose 27.5% on Chinese products should increase in comparison to the situation where China

appreciates. Thus, the probability that the US abide by its threat is 0.5 and for “not abide” also 0.5.

- iv. If China started a trade war, there is 100% probability that the United States will impose the whole tariff. Also a 100% probability that there will be changes in trade balance as China will not take other defensive actions.

g. Game Outcome:

Table (1) summarizes the outcome of the game. The Payoffs represented in the table are the Payoffs for China while that of United States are just the same but in negative values.

According to the table above, for US it is better to threaten as this would increase the probability to decrease its trade deficit even with high probability that it will not bide to its threat. For China the highest payoff for China is keeping the status quo, while if US imposed tariffs the highest payoff is achieved for China when it appreciates its currency with 10%. Thus China would choose Strategy R and appreciate with 10% and US would better threaten China as this would decrease its trade deficit.

It is remarkable for China, that the difference between not responding at all and appreciating with 10% is slightly small which implies the strength of the Chinese economy towards any international disputes in spite of its highly integration in the global world.

The outcome of the game is very near to reality as United States threatened China to use protection tools if it does not appreciate its currency. As U.S. Congress agreed to set a 27.5% tariff on Chinese exports if China would not appreciate its currency at least by 10% in May 2005 (Francis, 2005). In addition, President Bush has raised the issue of Chinese currency in many international meetings and the congress has raised a number of disputes in the WTO against China (Morrison, 2008a).

Table 1: The outcome of Game I (in billion US \$):

Case					Payoff	P of changes in Q	Payoff	P of Tariff	Payoff
Strategy A	Strategy R	App. 10%	0 tariff	No change	201.5	0.6	191.22		191.22
Strategy A	Strategy R	App. 10%	0 tariff	Δ in Q ↑ in imports by 3.4% & ↓ in Exports by 10%	175.8	0.4			
Strategy A	Strategy R	App. 5%	27.5%	No Change	201.5	0.6	169.58	0.2	187
Strategy A	Strategy R	App. 5%	27.5%	↑ imports by 1.7% & ↓ in Exports by 32.5%	121.7	0.4			
Strategy A	Strategy R	App. 5%	13.75%	No Change	201.5	0.6	182.98	0.3	
Strategy A	Strategy R	App. 5%	13.75%	↑ imports by 1.7% & ↓ in Exports by 18.75%	155.2	0.4			
Strategy A	Strategy R	App. 5%	0 Tariff	No Change	201.5	0.6	196.38	0.5	
Strategy A	Strategy R	App. 5%	0 Tariff	↑ imports by 1.7% & ↓ in Exports by 5%	188.7	0.4			
Strategy A	Strategy R	App.3%	27.5%	No Change	201.5	0.6	171.7	0.2	186.2
Strategy A	Strategy R	App.3%	27.5%	↑ imports by 1.02% & ↓ in Exports by 30.5%	127	0.4			
Strategy A	Strategy R	App.3%	13.75%	No Change	201.5	0.6	176.9	0.3	
Strategy A	Strategy R	App.3%	13.75%	↑ imports by 1.02% & ↓ in Exports by 25.25%	140	0.4			
Strategy A	Strategy R	App.3%	0 Tariff	No Change	201.5	0.6	198.4	0.5	
Strategy A	Strategy R	App.3%	0 Tariff	↑ imports by 1.02% & ↓ in Exports by 3%	193.8	0.4			
Strategy A	Strategy N	Trade War China impose 40% tariff	27.5%	Chinese Imports decrease by 23.8% and exports decrease by 27.5%	160.6	-	160.6		160.6
Strategy A	Strategy N	No Trade War	27.5%	No Change	201.5	0.6	180.7	0.5	191.1
Strategy A	Strategy N	No Trade War	27.5%	↓ in Exports by 27.5%	149.5	0.4			
Strategy A	Strategy N	No Trade War	0 Tariff	Status Quo	201.5		201.5	0.5	
Strategy B	Status Quo								201.5

Source: Constructed by the authors based on the settings of the game.

Concerning China, it did not react on the spot but started a gradual currency appreciation. In July 2005, the Bank of China announced a gradual appreciation

program. From July 2005 till may 2008 it is estimate that China has appreciated its currency by about 16%. However, many members of the WTO still believe that Chinese currency real value is still higher than the official rate (Morrison, 2008a). This can be explained through the outcome of this game as the Chinese government knew that it is better to appreciate but it does not worth much so there is no need to rush but a well planned program would be the best choice.

h. Sensitivity Analysis:

The outcome of the game highly depends on the assigned probabilities. Thus in this section a sensitivity analysis is carried to show how changing the assigned probabilities would affect the outcome of the game. It is remarkable that:

- For the probability that China keeps a fixed trade balance, the higher the probability assigned the higher the payoff for China. This implies the importance that China takes defensive actions to improve its imports and exports level against the external threats.
- Regardless the probability of having fixed trade balance for China, it is always better to appreciate with 10% and the difference between the payoffs of appreciating with 10% and not responding at all is slightly small.
- If the probability that US not imposing tariff is higher than 0.5 (under Strategy N), then it is always better for China not to respond at all and the difference in comparison to appreciation with 10% is slightly small.
- Regardless the probability assigned, appreciating with 10% is better than appreciating with 5% or 3%.

It is also important to highlight the following concerning the game payoff:

- The highest payoff for China if the status quo is kept.
- China starting a trade war is not a profitable choice for China, but for the United States.
- It is always better for the United States to threat even with high probability not to abide to its threat (thus strategy B is never chosen).

III-Conclusion:

The general strategy of the United States trade policy is to expand exports and to reduce foreign trade barriers against U.S. goods and services. Actually, the U.S. trade law section 301 is one of the most important tools that the United States have used to achieve its target. According to this law, the U.S imposes pressures on other countries through threatening to impose trade barriers if the specific country refuses to open its market. The procedures of Section 301 start when a U.S. firm or industry accuses a certain country of discriminating exports, causing limitations to the U.S. commerce, or affecting the domestic market negatively. If the accusations are accepted by the U.S. government, it threatens to impose bilateral tariffs in order to support its own producers (Kherallah & Beghin, 1998). As a recent example, the U.S. have imposed pressure on China to appreciate its currency in order to give more opportunities for American producers, especially in the textile and apparel, toys and steel industry. The congress has asked the administration to make China appreciate its currency in order to decrease the tension set on domestic producers. Actually, the Yuan is cheap: According to Morrison (2008a), the real value of the Chinese currency is 40% higher than its official value in 2005.

The Chinese officials have used a crawling peg exchange rate policy, which is a managed floating policy for the official exchange rate that allows for adjustments in the value as long as these adjustments do not affect the economic policy (Martin, 2008). China feared that appreciating its currency relative the dollar and to fixed Asian countries would negatively affect the stability of its economy (Morrison, 2008a).

Using decision tree analysis which is a vital tool in game theory, we were able to resolve the pressures set on China regarding trade and analyze the best option for China – the one that will maximize its payoffs. As a main result, China should positively respond to the U.S. call of appreciating the Yuan, because this is the choice that will maximize China's payoffs. However, we also show that China still has the option resist the U.S. pressures. Though this would not be the optimal decision for China, the incurred losses will not be heavy.

Having derived these results, the reasons of this surprising strength against the U.S. and the rest of the world are analyzed. Actually, China's strength is based on the

edges in trade it has made over time. China has a significant trade surplus not only against the U.S., but also against the rest of the world. This position as a dominant export nation implies strength, however, because all actions it will take will affect the payoffs of the rest of the world. Being heavily dependent on the stream of goods made the other trading partners including the United States cautious in dealing with China.

As a general implication of this result, countries with effective “weapons” can be independent from international pressures, though we acknowledge that this will reduce global wealth. For example, developing countries can invest into the production of just a few goods, where they have at the same time a competitive advantage as well as a vast market in other countries. In a globalized world, these highly competitive goods are not only the source of revenue streams, but they can also be strong weapons for general trade strategies. If China’s exports were not competitive, the U.S. wouldn’t wait so long for China to respond. China will not even have had the option to be reluctant in applying the orders of the U.S. The Chinese exports made the U.S. unable to stop its trade with China.

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Appendix:

Table (1) United States Merchandise Trade Balance with different Asian Countries

year	China	Indonesia	S.Korea	Malaysia	Philippines	Taiwan	Thailand
1984	-377	-4,674	-4,188	-9,983	-913	-11,266	-381
1985	-373	-4,152	-4,992	-936	-959	-13,295	-804
1986	-2,135	-2,757	-7,588	-807	-805	-16,069	-1,018
1987	-3,422	-2,955	-10,326	-1,159	-898	-19,221	-904
1988	-4,237	-2,438	-10,578	-1,715	-1,069	-14,314	-1,739
1989	-7,094	-2,618	-7,115	-2,052	-1,102	-14,305	-2,343
1990	-11,488	-1,785	-4,888	-2,071	-1,151	-12,347	-2,597
1991	-14,018	-1,675	-2,224	-2,446	-1,439	-11,038	-2,693
1992	-19,943	-1,927	-2,732	-4,144	-1,870	-10,601	-3,944
1993	-24,927	-3,117	-3,003	-4,858	-1,646	-10,050	-5,214
1994	-32,076	-4,209	-2,346	-7,454	-2,137	-10,864	-5,938
1995	-36,772	-4,599	523	-9,162	-2,070	-10,863	-5,452
1996	-42,431	-4,778	3,286	-9,809	-2,372	-12,610	-4,587
1997	-53,026	-5,222	1,269	-7,695	-3,370	-13,331	-5,699
1998	-56,927	-7,042	-7,456	-10,043	-5,211	-14,960	-8,198
1999	-68,668	-7,575	-8,308	-12,349	-5,153	-16,077	-9,340
2000	-83,810	-7,839	-12,398	-14,573	-5,147	-16,134	-9,747
2001	-83,045	-7,605	-12,988	-12,956	-3,666	-15,239	-8,733
2002	-103,115	-7,062	-12,979	-13,661	-3,715	-13,805	-9,939
2003	-123,960	-6,999	-12,864	-14,517	-2,068	-14,111	-9,338
2004	-161,977	-8,142	-19,829	-17,288	-2,072	-12,866	-11,214
2005	-201,625	-8,971	-16,106	-23,252	-2,355	-12,788	-12,569

Source: U.S. Department of Commerce, International Trade Commission. (Lum & Nanto, 2007, p.45)

Table (2): US Merchandise Trade with China (1984-2005)

Year	US Exports	US Imports	US Trade Balance
1984	3,004	3,381	-377
1985	3,856	4,224	-373
1986	3,106	5,241	-2,135
1987	3,497	6,910	-3,422
1988	5,017	9,261	-4,237
1989	5,807	12,901	-7,094
1990	4,807	16,296	-11,488
1991	6,287	20,305	-14,018
1992	7,470	27,413	-19,943
1993	8,767	31,183	-24,927
1994	9,287	41,362	-32,076
1995	11,749	48,521	-36,772
1996	11,978	54,409	-42,431
1997	12,805	65,832	-53,026
1998	14,258	75,109	-56,927
1999	13,118	81,786	-68,668
2000	16,253	100,063	-83,810
2001	19,234	102,280	-83,045
2002	22,053	125,167	-103,115
2003	26,806	151,620	-123,960
2004	34,721	196,699	-161,977
2005	41,836	243,462	-201,625

Sources: U.S. data from U.S. Department of Commerce. (Lum & Nanto, 2007,p.41)

Table (3): The effect on Payoff setting different probabilities:

Table (3a): Changing the probability that China ability to keep fixed trade balance:

Case					Payoff	P of changes in Q	Payoff	P of Tariff	Payoff
Strategy A	Strategy R	App. 10%	0 tariff	No change	201.5	0.8	196.63		196.63
Strategy A	Strategy R	App. 10%	0 tariff	Δ in Q ↑ in imports by 3.4% & ↓ in Exports by 10%	175.8	0.2			
Strategy A	Strategy R	App. 5%	27.5%	No Change	201.5	0.8	185.54	0.2	194.25
Strategy A	Strategy R	App. 5%	27.5%	↑ imports by 1.7% & ↓ in Exports by 32.5%	121.7	0.2			
Strategy A	Strategy R	App. 5%	13.75%	No Change	201.5	0.8	192.24	0.3	
Strategy A	Strategy R	App. 5%	13.75%	↑ imports by 1.7% & ↓ in Exports by 18.75%	155.2	0.2			
Strategy A	Strategy R	App. 5%	0 Tariff	No Change	201.5	0.8	198.94	0.5	
Strategy A	Strategy R	App. 5%	0 Tariff	↑ imports by 1.7% & ↓ in Exports by 5%	188.7	0.2			
Strategy A	Strategy R	App.3%	27.5%	No Change	201.5	0.8	186.6	0.2	194.06
Strategy A	Strategy R	App.3%	27.5%	↑ imports by 1.02% & ↓ in Exports by 30.5%	127	0.2			
Strategy A	Strategy R	App.3%	13.75%	No Change	201.5	0.8	189.2	0.3	
Strategy A	Strategy R	App.3%	13.75%	↑ imports by 1.02% & ↓ in Exports by 25.25%	140	0.2			
Strategy A	Strategy R	App.3%	0 Tariff	No Change	201.5	0.8	199.96	0.5	
Strategy A	Strategy R	App.3%	0 Tariff	↑ imports by 1.02% & ↓ in Exports by 3%	193.8	0.2			
Strategy A	Strategy N	Trade War China impose 40% tariff	27.5%	Chinese Imports decrease by 23.8% and exports decrease by 27.5%	160.6	-	160.6		160.6
Strategy A	Strategy N	No Trade War	27.5%	No Change	201.5	0.8	191.1	0.5	196.3
Strategy A	Strategy N	No Trade War	27.5%	↓ in Exports by 27.5%	149.5	0.2			
Strategy A	Strategy N	No Trade War	0 Tariff	Status Quo	201.5		201.5	0.5	
Strategy B	Status Quo								201.5

Table (3b): Changing the Probability of US imposing Tariff:

Case					Payoff	P of changes in Q	Payoff	P of Tariff	Payoff
Strategy A	Strategy R	App. 10%	0 tariff	No change	201.5	0.6	191.22		191.22
Strategy A	Strategy R	App. 10%	0 tariff	Δ in Q ↑ in imports by 3.4% & ↓ in Exports by 10%	175.8	0.4			
Strategy A	Strategy R	App. 5%	27.5%	No Change	201.5	0.6	169.58	0.2	187
Strategy A	Strategy R	App. 5%	27.5%	↑ imports by 1.7% & ↓ in Exports by 32.5%	121.7	0.4			
Strategy A	Strategy R	App. 5%	13.75%	No Change	201.5	0.6	182.98	0.3	
Strategy A	Strategy R	App. 5%	13.75%	↑ imports by 1.7% & ↓ in Exports by 18.75%	155.2	0.4			
Strategy A	Strategy R	App. 5%	0 Tariff	No Change	201.5	0.6	196.38	0.5	
Strategy A	Strategy R	App. 5%	0 Tariff	↑ imports by 1.7% & ↓ in Exports by 5%	188.7	0.4			
Strategy A	Strategy R	App.3%	27.5%	No Change	201.5	0.6	171.7	0.2	186.2
Strategy A	Strategy R	App.3%	27.5%	↑ imports by 1.02% & ↓ in Exports by 30.5%	127	0.4			
Strategy A	Strategy R	App.3%	13.75%	No Change	201.5	0.6	176.9	0.3	
Strategy A	Strategy R	App.3%	13.75%	↑ imports by 1.02% & ↓ in Exports by 25.25%	140	0.4			
Strategy A	Strategy R	App.3%	0 Tariff	No Change	201.5	0.6	198.4	0.5	
Strategy A	Strategy R	App.3%	0 Tariff	↑ imports by 1.02% & ↓ in Exports by 3%	193.8	0.4			
Strategy A	Strategy N	Trade War China impose 40% tariff	27.5%	Chinese Imports decrease by 23.8% and exports decrease by 27.5%	160.6	-	160.6		160.6
Strategy A	Strategy N	No Trade War	27.5%	No Change	201.5	0.6	180.7	0.4	193.18
Strategy A	Strategy N	No Trade War	27.5%	↓ in Exports by 27.5%	149.5	0.4			
Strategy A	Strategy N	No Trade War	0 Tariff	Status Quo	201.5		201.5	0.6	
Strategy B	Status Quo								201.5