

The Political Economy of Exchange Rates:

The Case of the Chinese Yuan

Nathalie Aminian

University of Le Havre, France

K.C.Fung

University of California, Santa Cruz

Alicia Garcia-Herrero

BBVA Hong Kong

Alan Siu

University of Hong Kong

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Abstract

This paper sets out a political economy model of exchange rates, focusing in the importance of external lobbying. Applying it to the recent history of the Chinese yuan, we show that pressure from the U.S. trade negotiators could lead to an appreciation of the Chinese yuan, as well as to a reduction in import prices and trade disequilibrium between the United States and China.

Key words: China, Yuan, political economy model, lobbying

JEL classification: F31, F59

1. Introduction

With the recent interests in the Chinese renminbi/yuan as a possible form of exchange rate mercantilism, many researchers and policymakers are increasingly interested in the potential role of the exchange rates in trade disputes¹. The central role of the Chinese yuan in international disputes is a relatively new phenomenon, a phenomenon that is clearly tied to the perceived dramatic rise of China.

China has operated its exchange rate regime as a de facto peg to the US dollar since 1998². In the wake of the Asian financial crisis, China's commitment to a fixed exchange rate to the US dollar was praised as a key anchor for the global financial system. A stable exchange rate regime has helped china as well, providing a stable macroeconomic environment and thus facilitating China's growth over the past years. However, from the middle of 2003, the issue of whether the yuan has been undervalued or whether it should be appreciated became an intensely debated question in the international scene and the academic circle. Foreign countries such as the US, Japan and some EU countries have repeatedly demanded that China should appreciate its currency. They argued that the Chinese yuan is undervalued because of China's manipulating the yuan exchange rate, making China's exports cheaper and giving its manufacturers an unfair trade advantage. This is why external political pressures came from some

¹ ¹ This argument was put forward by Phil English (*English Testifies on Chinese Currency. Currency Manipulation Negates Trade Benefits*, October 1st 2003), representing Pennsylvania, and William R. Hawkins of the US Business and Industry Council (*Slow Boat to China. Current Currency Realities*, August 27, 2003).

² For a discussion see LIN Guijun, Ronald M. SCHRAMM (2000).

politicians and lobby groups to call for the appreciation of the Chinese yuan. As a matter of fact, in July 2007, the US Senate Finance Committee³ began drafting legislation that was intended to increase pressure on China to let its currency rise in value. The proposals the committee aimed to turn into legislation also would potentially allow the US companies to seek anti-dumping duties on Chinese imports to offset what many US producers claim as an unfair price advantage that is gained by Beijing's practice of managing the yuan's value to keep its products relatively cheap in US consumer markets⁴.

It is noteworthy that arguments about the appropriate value of the exchange rates in Asia actually date back all the way to the perceived rise of another economic giant in the 1980s and the early 1990s, namely, *Japan*. The clearest exposition of the role of the Japanese yen in U.S.-Japan trade conflicts were given by McKinnon (2001) and McKinnon and Ohno (1997, 2001). Since the 1970s until recently, Japan was under constant pressure to provide market access to the U.S. exporters as well as to restrain its exports to the United States given the large bilateral trade deficit that the US was accumulating. Political economy considerations led US policymakers and trade negotiators to pressure Japan to open up its markets and to reduce its exports to the United States. At the same time, Japanese policymakers (including the Bank of Japan) acted to raise the dollar value of the yen, which should help reduce Japanese exports and increase U.S. and other foreign imports. As a result, the U.S. - Japan trade conflicts

³ The Senate Finance committee was composed by Max Baucus, a Montana Democrat, Republican Senator Charles Grassley, Democrat Senator Charles Schumer, and Republican Senator Lindsay Graham.

⁴ For issues related to the United States-China bilateral trade balances, see Fung, Lau and Xiong (2006).

came hand in hand with a secular appreciation of the yen, followed by a decade of low growth and deflation⁵.

It is interesting to make a parallel between the experience of “*Japan bashing*” of yesterday and the temptation of “*China bashing*” of today. Some argue that “*Japan bashing*” resulted in such a depressed Japanese economy by an overvalued yen that the Americans relented and announced a new “strong dollar” policy. Today “China bashing” could have the same negative results (if not worse). This is why it is instructive to analyze how the pressure being applied on China today could lead to a revaluation of the yuan, with less than desirable results, as it happened in the 1990s in Japan with similar pressure to revalue the yen.

In McKinnon’s spirit, this paper provides an external lobby *political economy* model that illustrates how pressures from a trading partner can lead to a rise of the exchange rates. Our *contribution* to the literature is to provide a theoretical foundation for the importance of external lobbying in determining exchange rates. This follows the theoretical literature on the importance of lobbying in trade disputes based on the Grossman-Helpman model (1994). In the next section, we develop a basic political economy model of the Yuan-US dollar exchange rate.

⁵ For some recent discussions of related issues with Japan, see N. Aminian, KC Fung, A. Garcia-Herrero, Ch. C. Lin, (2007), “The Political Economy of Exchange Rates: The case of the Japanese Yen”, Third annual Conference of APEA, 25-26 July, Hong Kong.

2. A Basic Political Economy Model of the Yen/US dollar exchange rate

We consider an open economy (China) with two sectors: one formal sector and one informal sector. The formal sector consists of two firms: the export-competing Chinese firm produces good x for the U.S. market and the import-competing firm produces good y for the Chinese market. The informal sector produces the numeraire good n with a mobile factor only. The technology for the numeraire good has constant returns to scale. The goods, x and y are produced with the mobile factor and a specific factor. The mobile factor is supplied inelastically to the Chinese economy. As long as the informal sector is active, the constant marginal product of the mobile factor fixes its economy-wide return to unity.

Total population in the economy is normalized to one. A fraction α^x of the population owns the specific factor used in the production of good x and has a direct stake in the export-competing firm, a fraction α^y of the population owns the specific factor used in the production of good y and has a direct stake in the import-competing firm. The remaining $1 - \alpha^x - \alpha^y$ (hence after, α^m) individuals are the owners of the mobile factor, which are used in both formal and informal sectors, and earn a fixed return normalized to one.

The owners of the mobile factor are assumed to be inactive politically. Each individual is allowed to own at most one specific factor. Owners of the specific factor organize as interest groups for political activity.

The behaviour of firms in the formal sector is simple Nash quantity duopoly (similar

to those in Brander-Spencer, 1985). This part of the model is familiar to the strategic trade policy literature, but it is useful for our expositions later in the paper. The exporting firm produces good x , and competes with the foreign, U.S. firm, which produces x^* in the U.S. market.

The exporting Chinese firm charges p^x in U.S. dollars but it cares about profits in yen. e is the yuan/\$ exchange rate. The Chinese firm maximizes profit π^x and the U.S. firm maximizes profit π^{x^*} :

$$\pi^x(x, x^*; e) = xep^x(x+x^*) - c(x) \quad (1)$$

$$\pi^{x^*}(x, x^*) = x^*p^x(x+x^*) - c^*(x^*)$$

where c and c^* are the costs of the exporting Chinese firm and the foreign U.S. firm, each producing x and x^* , respectively.

After some algebra, we can show that a higher e (a yuan depreciation) will raise π^x . That is, a yuan depreciation will raise Chinese exporting firm's profits.

The import-competing firm in China produces good y and competes with the U.S. exporting firm. The import-competing Chinese firm maximizes profit π^y and the U.S. firm maximizes profit π^{y^*} :

$$\pi^y(y, y^*) = yp^y(y+y^*) - c^y(y) \quad (2)$$

$$\pi^{y^*}(y, y^*; e) = \frac{1}{e} p^y(y+y^*; e)y^* - c^{y^*}(y^*)$$

where c^y and c^{y^*} are the costs of the Chinese firm and the U.S. firms producing y and y^* . c^y is in yuan while c^{y^*} is in U.S. dollars, p^y is the yuan price of y while $(1/e)p^y$ is the dollar price

of the U.S. export good to China. Some algebra will show that $d\pi^y/de > 0$, i.e. a yuan depreciation will raise the Chinese import-competing firm's profits. In sum, a yuan depreciation will act like an export subsidy plus an import tax to raise China's yuan profits for its exporting and import-competing firms. Conversely, a yuan appreciation will be equivalent to an export tax plus an import subsidy lowering the yuan profits of both the Chinese exporter and the Chinese import-competing firm.⁶

Turning now to the demand side, all individuals in China have the same preferences and maximize the utility function:

$$U^i(n, Y^c) = n^i + u(Y^c) \quad (3)$$

where $i = x, y$ and m represents the shareholders of the export-competing firm, the import-competing firm, and the owners of the mobile factor, respectively; n^i is the consumption of the numeraire good; $Y^c = y^{ci} + y^{*ci}$ is the total consumption of the homogeneous goods y and y^* by individual i . The function $U(\cdot)$ is differentiable, increasing and strictly concave in all arguments. Utility is maximized subject to the budget constraint:

$$I^i \geq n^i + p^y Y^c \quad (4)$$

where I^i is the net income of individual i ; p^y is the domestic yuan price of good y .

From Equation (3) and Equation (4), the indirect utility function of each individual in group i has the form:

$$\begin{aligned} V^i &= I^i + u(Y^c) - p^y Y^c \\ &= I^i + CS(p^y) \end{aligned}$$

⁶ The relationship between exchange rate changes and various trade barriers is examined in McKinnon and Fung (1993).

where $i = x, y$ and m ; CS is consumer surplus derived from consumption of the good in the import sector. We assume that the exportable good x is not consumed domestically.

The gross indirect utility functions for each individual in each group are

$$V^x = \frac{\pi^x}{\alpha^x} + CS ; \quad V^y = \frac{\pi^y}{\alpha^y} + CS ; \quad V^m = \frac{\pi^m}{\alpha^m} + CS$$

where π^x and π^y are described in Equation (1) and Equation (2); and π^m is the total fixed return to the mobile factor. Taking the yuan-dollar exchange rate as given, the indirect utility function identifies the utility level of an individual in group i when there is no lobbying.

Given the yuan-dollar exchange rate, the winners and losers from an intervention in the foreign exchange market can be identified, which points to the possibility of lobbying by various groups both in China and abroad. If no lobbying takes place, we assume that the Chinese policymakers can choose an appropriate level of the exchange rate to maximize social welfare. The government's objective function is given by:

$$Max_e W = a^x V^x + a^y V^y + a^m V^m$$

where W is the social welfare level which can be attained in the absence of any political contributions to the government. The socially optimal exchange rate is, then, given by $e^v = \arg \max W$. We will assume that the yuan is determined entirely by policymakers as far as China has operated its exchange rate regime as a *de facto* peg to US dollar since 1998.

The lobbying structure follows Grossman-Helpman (1994). They apply Bernheim and Whinston's (1986) study on menu-auctions and common agency. The two different lobbying groups, that in favour of the yuan appreciation and that against – act as bidders and offer various contribution schedules corresponding to different exchange rates to the Chinese government. Then, the government, as the auctioneer, sets the exchange rate by evaluating the weighted sum of contributions and aggregate social welfare. The equilibrium is a set of contribution schedules with the politically-determined exchange rate.

The equilibrium contribution schedules imply that the interest groups make contributions up to the point where the marginal benefit from the resulting change in the yuan exchange rate exactly equals the marginal contribution costs. In equilibrium, the contribution schedules of each interest group are given by:

$$\alpha^i V_e^i = \lambda_e^i(e) \quad (5)$$

where $i = x, y$; $\lambda^i(e)$ is the contribution schedule provided by interest group i and they are differentiable at e .

The government's objective is to maximize a weighted sum of political contributions and aggregate welfare. In Grossman-Helpman's spirit, such an objective function seems plausible for a government that is concerned about its re-election. Thanks to the lobbying groups, the government could have another resource to enhance its possibility of being re-elected, i.e. the contributions provided by the interest groups. However, this model allows other interpretations. As far as China is concerned, it is

possible to assume that aggregate welfare enters the government's objective because representatives are civil-minded, and politicians value contributions for financing the communist party's expenditures and establish their credibility as potential candidates for higher political or party office.

The government's objective function can now be written as:

$$\text{Max}_e V^G = (\beta-1) [\lambda^x(e) + \lambda^y(e)] + W \quad (6)$$

where $\beta > 1$ represents the weight that the government puts on the contributions provided by the interest groups.⁷

The first order condition of the government's optimization problem is:

$$V_e^G = \beta(\alpha^x V_e^x + \alpha^y V_e^y) + \alpha^m V_e^m = 0 \quad (7)$$

The politically determined yuan-dollar exchange rate is given as $e^p = \arg \max V^G$. This is the basic framework for a politically determined yuan-dollar rate. We now introduce the element of the foreign pressure. The source is political lobbying due to the U.S. trade negotiator. We assume that the Chinese policymakers will take into account the U.S. interest in the objective function of the government. This may come about due to the mechanism as formalized by Antras and Miquel (2008) or some other channels. But the reduced form outcome is that an index of the U.S. interest which is a function of decreasing China's trade surplus TB with the U.S is now added to the objective of the Chinese government. Thus we have:

$$V^G = (\beta - 1)(\lambda^x(e) + \lambda^y(e)) + \theta f(TB) + W \quad (8)$$

⁷ With the weight attached to the political contributions greater than 1, it is assumed that the government places a higher value on the special interests than on the general welfare of the country.

where $0 < \theta < 1$ is the weight attached by the Chinese policymakers on the U.S. special interest, i.e. the reduction of China's trade surplus with the U.S. The first order condition for this expanded objective function of the government is:

$$V_e^G = (\beta - 1)(\lambda_e^x + \lambda_e^y) + We + \theta f'(TB)TB_e = 0 \quad (9)$$

where $f' < 0$ and subscripts are partial derivatives. Assuming that the Marshall-Lerner condition holds, $\partial TB / \partial e > 0$, i.e. a yuan appreciation will reduce China's trade surplus with the United States. Totally differentiating equation (9) and using the implicit function theorem, we can determine what is the impact of the political pressure of the U.S. trade negotiator on the yuan- dollar exchange rate:

$$V_{e\theta}^G d\theta + V_{ee}^G de = 0 \quad (10)$$

$$de / d\theta = -V_{e\theta}^G / V_{ee}^G$$

In particular (10) holds for an initial value of $\theta = 0$ so that

$$de^0 / d\theta|_{\theta=0} = -f'(TBe) / V_{ee}^G < 0 \quad (11)$$

since $f' < 0$ by construction, $TBe > 0$ and $V_{ee}^G < 0$ are the sufficient second order conditions.

Eq. (11) shows that the more US lobbies focus on China, i.e., the higher θ , the more the yuan will appreciate against the dollar.⁸

Proposition 1: *Using our political economy model of the exchange rates, Chinese yuan appreciates with political pressure from U.S. trade negotiators*

⁸ Note that we are focusing on the nominal exchange rates here. Later on, we will show that the price level will also decline.

Since we are interested in the impact of external lobbying on the trade account and the Chinese economy in general, we need to determine how prices will react. This should give us an idea of the changes in the real exchange rate as a consequence of external lobbying and, thereby, in competitiveness. From the profit function of the U.S. exporter and the Chinese import-competing firms, we can obtain:

$$dy / de + dy^* / de = -\pi_{y^*e}^{y^*} (\pi_{yy^*}^{y^*} + \pi_{yy}^y) / \Delta^y < 0$$

where $\pi_{y^*e}^{y^*} = p^{y^*} + y^* p^{y^*}$, $\pi_{yy}^y = 2p^y + y p^{y'}$, $\pi_{y^*e}^{y^*} = -(p^y + y p^{y'}) / e^2$, and

$\Delta^y = \pi_{yy}^y \pi_{y^*y^*}^{y^*} - \pi_{yy^*}^y \pi_{y^*y}^{y^*}$. The impact of the U.S. influence on the yen and the import price is:

$$dp^y / d\theta = \left(\frac{de^\rho}{d\theta} \right) \left(\frac{d(y + y^*)}{de^\rho} \right) \left(\frac{dp^y}{d(y + y^*)} \right) < 0 \quad (12)$$

In particular (12) holds for an initial value of $\theta = 0$. U.S. pressure will lead to a yuan appreciation by Proposition (1). An appreciation will raise the total output of the importable sector in China, which leads to a lowering of the price level.

Proposition 2: *Using our political economy model of the exchange rates, pressure from the U.S. trade negotiators leads to an appreciation of the Chinese yuan, and a decline of the import price level.*

3. Endogenizing the impact to of U.S. Lobbying on the Yuan

After particular periods of recrimination and intense pressure in 2003 and 2004, it seems that the U.S. has eased its pressure somewhat on China to appreciate its currency. In general, how does one explain this relative decline of external pressure on the yuan to appreciate?

First, China decided to change its exchange rate policy in 2005, announcing the first step towards revaluating its currency. In a statement, the People's Bank of China said it was dropping its yuan-dollar peg in favour of pegging to a basket of currencies. The government also lifted the value of the currency by more than 2%⁹. The US welcomed China's move to a more flexible foreign products exchange although it has been considered as insufficient¹⁰.

Second, the US and China have a common interest to keep unchanged their trade and financial relationships. It seems that there is an implicit "deal" between the two countries: "you keep on buying my goods, I will keep on financing your public deficit so as to sustain the growth rate of both economies". In fact, the U.S. current account deficit mainly reflects a new round of deficit spending by the U.S. federal government and very low personal savings by American households. In this context, the role of capital

⁹ Under the new exchange rate mechanism, one dollar is valued 8.11 yuan compared to the old rate of 8.2765 yuan, effectively a 2% revaluation.

¹⁰ Democrat Senator, Charles Schumer, called China's move to a basket of currencies "a good first step albeit a baby step". "If there are not larger steps in the future, we will not have accomplished very much. But after years of inaction, this step is welcome", Schumer said.

inflows in balancing the large U.S. trade deficit very important. The US trade deficit and outflows of FDI to China lead to a huge increase of international reserves held by the People's Bank of China. The inflows of US dollars let Bank of China purchase US Treasury Bonds and invest in the US financial markets, allowing therefore the financing of the US deficits (see Figure 1). We can accommodate this phenomenon and take into account of such trade and financial interdependence in our simple framework by allowing the national interest of the United States to be increasing with a smaller bilateral trade deficit and a larger bilateral capital account surplus K . As in the case of the U.S. trade deficit, a lower U.S. dollar will encourage Chinese investors to buy more dollar denominated assets.

However, in the specific case of China, capital outflows are still strictly controlled. One can argue that the amount of U.S. Treasury bills purchased by the Chinese is actually an exogenous policy variable. The Chinese government picks a K and keeps the yuan relatively low, raising its net exports and keeping its employment and growth strong. At the same time, a larger K helps finance the “excessive” consumption of the United States. To take into account of such trade and financial interdependence between China and the United States in our model, we can make θ a function of the US capital account surplus (K) with China. Suppose now the Chinese government decides to purchase more U.S. Treasury bills. Capital inflows to the U.S. have increased relative to capital outflows from the US, θ becomes smaller. In other words,

$$V^G = (\beta - 1)(\lambda^x + \lambda^y) + W + \theta(K) f(TB)$$

$$\frac{dV^G}{dK} = \left(\frac{d\theta}{dK} \right) (\theta') > 0$$

Proposition 3: *Using our political economy model of exchange rates, if we link the exchange rate not only to the bilateral trade balance but also to the U.S. borrowing from China, our model is compatible with a moderation of yuan appreciation.*

Third, with the current housing and credit crisis, there is a looming recession facing the U.S. economy. The Chinese economy has also slowed, with the growth rate predicted to drop to below 10 percent in 2009. However, China will still fare relatively better in the global slowdown and it is expected that the size of the Chinese economy will become relatively bigger compared to the size of the U.S. economy.

How might such a relative shift of economic power change our model of the political economy of the yuan? Intuitively, we would expect that the U.S. government will increase its pressure on the Chinese to raise its exchange rate in order to stimulate growth and employment in the United States. It has also been shown more formally in Antras and Miguel (2008) that the relative sizes of economies can affect to what extent a government will pay attention to the welfare of its trading partners. In our model, we can accommodate this phenomenon by allowing the weight attached to the U.S. interest to be a function of China's relative economic size.

To take into account such changes, we make θ a function of the two countries relative incomes $Y = Y^{US}/Y^{CH}$ with Y^{CH} increasing relative to Y^{US} , makes θ larger. In other words,

$$V^{G^3} = (\beta - 1)(\lambda^x + \lambda^y) + W + \theta(Y) f(TB)$$

$$\frac{de^p}{dY} = \left(\frac{de^p}{d\theta} \right) (\theta') > 0$$

Proposition 4: *Using our political economy model of exchange rates, if we permit the weight attached to the U.S. lobbying to be a function of the expected Chinese GDP relative to that of the US, our model predicts that there will be increasing U.S. pressure on the yuan to appreciate.*

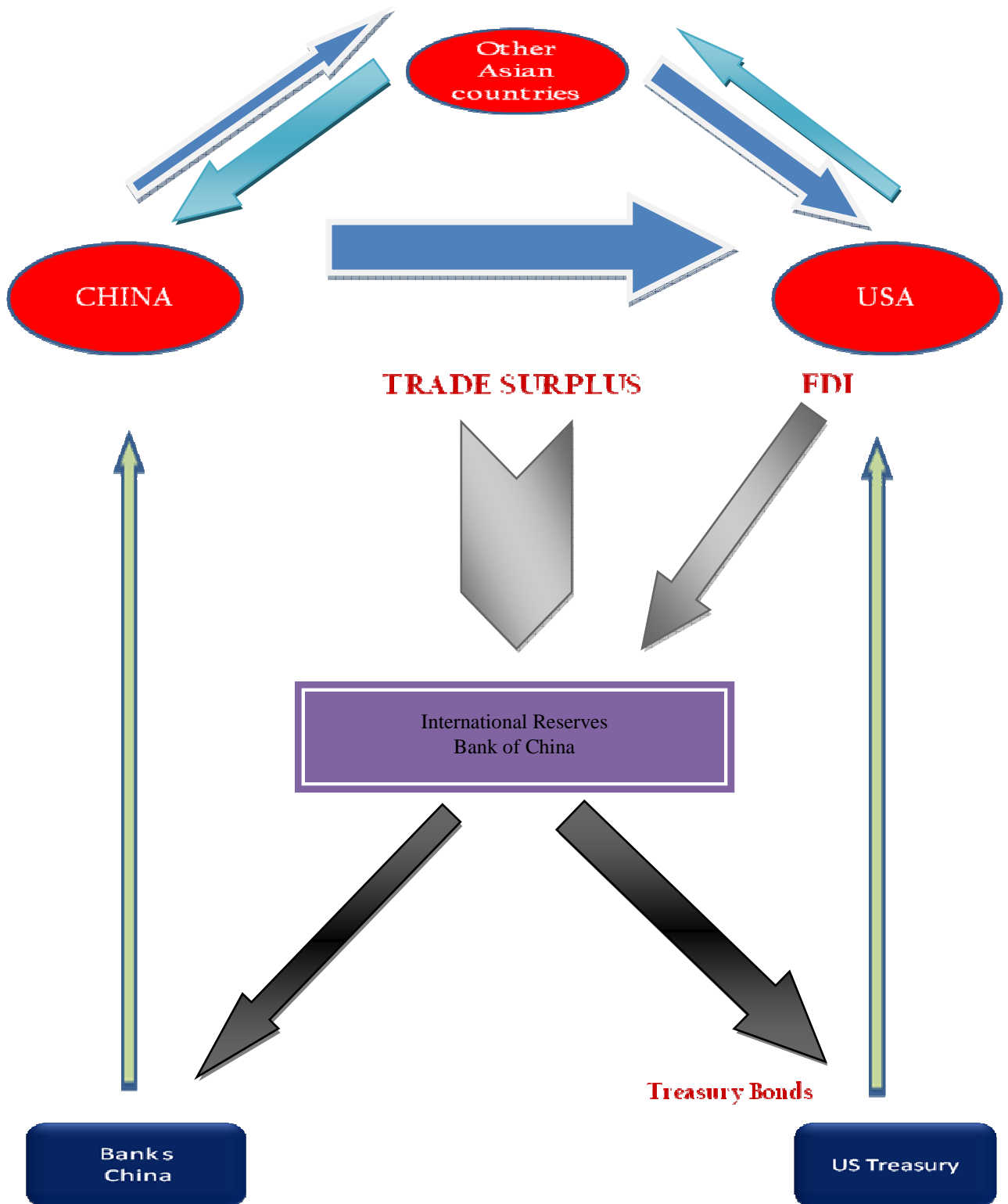
6. Conclusion

This paper provides a theoretical political economy model of exchange rates. To this end, we follow the Grossman-Helpman lobbying approach and apply it to a novel setting, namely exchange rate policy.

We apply it to the recent history of the Chinese yuan and show that pressure from the U.S. trade negotiators could contribute to an appreciation of the Chinese yuan. The politically-determined appreciation also led to a reduction in import prices. We extended our model to show that China's capacity to finance the U.S. deficits can explain the easing of the yuan to appreciate. The expected slowdown of the U.S. economy can lead to a heightening of the political pressure on further yuan appreciation. However, based on the past experience of Japan, there may well be a "*China bashing trap*" i.e. a sustained appreciation of a creditor country's currency against the world's dominant money is a recipe for a slowdown in its economic growth with no obvious decline in its trade surplus.

Our paper is among the first papers to provide a theoretical political economy model of exchange rates. Given the recent heightened political interests on how Asian governments may have manipulated their exchange rates to maintain their export competitiveness, we believe that our political economy model of exchange rates can make a contribution to both the academic and policy debates on the triangular linkages among politics, exchange rate policies and trade disputes.

Figure 1: Trade and financial relationship between the U.S. and China



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