



The political economy of exchange rates: The case of the Japanese yen[☆]

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ABSTRACT

This paper sets out a political economy model of strategic exchange rates, focusing on the importance of external pressures. In our approach, an exchange rate depreciation is shown to be analytically equivalent to an export subsidy and an import tax. Thus lobbying for exchange rate policy is akin to lobbying for trade policies. Applying our model to the recent history of the Japanese yen, we show that pressures from the US government can theoretically contribute to an appreciation of the Japanese yen. In addition, the yen will still appreciate even if we assume that the Japanese international firms are Aoki-type *J*-firms.

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1. Introduction

With the recent interests in the Chinese yuan as a possible form of exchange rate mercantilism, many researchers and policy-makers are increasingly interested in the potential role of the exchange rates in trade disputes. 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. However, 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*.

In the face of rising bilateral trade imbalances, Japan since the 1970s to the late 1990s was under constant pressure to provide market access to the US exporters as well as to restrain its exports to the United States. Lobbied by its trading partners, Japanese policymakers (including the Bank of Japan) acted to raise the value of the yen, with the hope that this will defuse trade tensions. US–Japan trade conflicts thus came hand in hand with a rise of the exchange rate.

An early exposition of the role of the exchange rate in US–Japan trade conflicts was given by McKinnon (2001) and McKinnon and Ohno (1997, 2001). In their work, they argue that pressures from the US government led to an appreciation of the yen, although no formal model was developed to support it. They further argue that the yen appreciation led to a drop in import rises and to increased stress on Japanese banks.

Another important work that is very close to our thinking here is the interesting paper by Gawande et al. (2006), who show both theoretically and empirically that contributions by registered foreign interests did influence US trade policy. Our paper follows the earlier literature and uses a Grossman and Helpman (1994) style political economy model to analyze lobbying on international policies. Like the work by McKinnon (2001) and by Gawande et al. (2006), we highlight the importance of foreign influences. What is somewhat new in our paper is instead of focusing on tariffs or import quotas, we link the external pressures to an international *financial* policy—a strategic exchange rate policy.

In the process of developing our model, we also show that an exchange rate depreciation is indeed equivalent to an export subsidy and an import tax. Thus lobbying on trade policies is analytically similar to lobbying on exchange rate policy.¹ While

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¹ As pointed out by a referee, exchange rate policy affects the relative prices of all imports and all exports. Trade policies like tariffs only affect prices of specific sectors.

this current paper focuses on the Japanese yen, we believe that similar approaches can be applied to the yuan in the context of the US–China trade conflicts.² In the next section, we develop a basic political economy model of the yen–US dollar exchange rate. We explicitly show the link between exchange rates and trade in our model. In Section 3, we show that our basic results are robust when we assume that the Japanese lobbying firms are Aoki-type J firms. In Section 4, we conclude.

2. A basic political economy model of the yen/US dollar exchange rate

We consider an open economy (Japan) with two sectors: one formal sector and one informal sector. The formal sector consists of two firms: the export-competing Japanese firm produces good x for the US market and the import-competing firm produces good y for the Japanese market. The informal sector produces the numeraire good n with a mobile factor only. The technology for the numeraire good is constant return 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 Japanese 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 behavior of firms in the formal sector is simple Nash quantity duopoly (similar to those in Brander and 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, US firm, which produces x^* in the US market.

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

$$\begin{aligned} \pi^x(x, x^*; e) &= xe p^x(x + x^*) - c(x) \\ \pi^{x^*}(x, x^*) &= x^* p^x(x + x^*) - c^*(x^*) \end{aligned} \tag{1}$$

where c and c^* are the costs of the exporting Japanese firm and the foreign US firm, each producing x and x^* , respectively.

After some simple algebra, we can show that a higher e (a yen depreciation) will raise π^x . That is, a yen depreciation will raise Japanese exporting firm’s profits.

The import-competing firm in Japan produces good y and competes with the US exporting firm. The import-competing Japanese firm maximizes profit π^y and the US firm maximizes profit π^{y^*} :

$$\begin{aligned} \pi^y(y, y^*) &= y p^y(y + y^*) - c^y(y) \\ \pi^{y^*}(y, y^*; e) &= \frac{1}{e} p^y(y + y^*; e) y^* - c^{y^*}(y^*) \end{aligned} \tag{2}$$

where c^y and c^{y^*} are the costs of the Japanese firm and the US firm producing y and y^* respectively. c^y is in yen while c^{y^*} is in US dollars, p^y is the yen price of y while $(1/e)p^y$ is the dollar price of the

US export good to Japan. Some algebra will show that $d\pi^y/de > 0$, i.e. a yen depreciation will raise the Japanese import-competing firm’s profits. In sum, a yen depreciation will act like an export subsidy plus an import tax to raise Japan’s yen profits for its exporting and import-competing firms. Conversely, a yen appreciation will be equivalent to an export tax plus an import subsidy lowering the yen profits of both the Japanese exporter and the Japanese import-competing firm.³

Result 1. With our oligopolistic structure of the tradable sector, a yen depreciation is equivalent to a strategic export subsidy and a strategic import tax. Conversely, a yen appreciation is equivalent to a strategic export tax and an import subsidy.

Result 1 can be seen by noting that both the profits of the Japanese exporting firms and the Japanese import-competing firms rise with a lowering of the yen exchange rate.

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

$$U^i(n, Y^c) = n^i + u(Y^{ci}) \tag{3}$$

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; $Y^{ci} = y^{ci} + y^{*ci}$ 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:

$$I^i \geq n^i + p^y Y^{ci} \tag{4}$$

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

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

$$V^i = I^i + u(Y^{ci}) - p^y Y^{ci} = I^i + CS(p^y)$$

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 $V^x = (\pi^x/\alpha^x) + CS$; $V^y = (\pi^y/\alpha^y) + CS$; $V^m = (\pi^m/\alpha^m) + CS$, where π^x and π^y are described in Eqs. (1) and (2); and π^m is the total fixed return to the mobile factor. Taking the yen–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 yen–dollar exchange rate, the gainers and the losers from an intervention in the foreign exchange market can be identified, which further gives rise to the lobbying motives of various groups in Japan. With no lobbying, we assume that the Japanese policymakers can choose an appropriate level of the exchange rate to maximize social welfare. With no lobbying, the government’s objective function is given by:

$$\text{Max}_e W = \alpha^x V^x + \alpha^y V^y + \alpha^m V^m$$

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 $e^w = \arg \max W$. A more complicated theory of exchange rate determination can be obtained by setting one portion of the exchange rate to be determined by the market, while a fraction of the spot rate is

³ We are grateful for a referee for suggesting that we highlight this result more explicitly in the paper.

² For a discussion of the US–China bilateral trade balance, see Fung et al. (2006).

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