

Export competition, currency choice and the political economy of exchange rate policies

George L. C. Yin, Ph.D student (Department of Government), Harvard University

Overview

This paper presents a game theoretic model that explicates how export competition and how currencies exporters use to price their products (currency choice) affect exchange rate level preference. The model suggests that the exchange rate level of an export competitor will affect a country's ideal exchange rate level, conditional upon the degree of export profile similarity between the two countries and the proportion of exporters that adopt Local Currency Pricing (LCP). The model also illustrates that the degree to which a government cares about general societal welfare provides no clear indication of whether or not a government will manipulate its exchange rate level.

Research question

What determines a country's exchange rate level preference? And why do countries manipulate exchange rates?

Some answers from the literature

1. The distribution of sectoral interests matter (Frieden 1991). Tradeables producers prefer a more depreciated exchange rate.

Question(s): How does currency choice complicate the picture? Can we connect the sectoral interests story more explicitly to the dynamics of export competition?

2. Electoral cycles matter, and often lead to overvalued exchange rates since devaluation signals government incompetence (Stein, Streb and Ghezzi 2005).

Question(s): How do you explain currency manipulation in East Asia, where governments intervene to depreciate currencies (e.g. China)?

3. According to Walter (2008), an actor's exchange rate level preference is determined by her vulnerability to changes in real prices and her balance sheet vulnerability to both depreciation and interest rate increases.

Question(s): Again, how do currency choice and export competition complicate the story? Moreover, how relevant is the theory for the major currency manipulators today (e.g. China, Japan, and Taiwan), who do not really borrow abroad?

Conclusion: The current literature provides at best an incomplete answer to the research question! Current theories often encounter problem when explaining episodes of currency intervention in East Asia (e.g. Taiwan in March 2010).

Setting up the model

I adapt the Grossman-Helpman model of lobbying (1994) and the Bertrand model of oligopolistic price wars to explain exchange rate level preference.

- **Actors:** Two countries i and j compete to export to country k . In country i , the export sector lobbies the government to intervene in the currency market to attain its preferred exchange rate level.

- **Three key assumptions:** a) only export and non-export sectors; b) little division within the export sector; c) exogenous and symmetric currency choice.

- **The indirect utility function of the export sector.**

$$V_{E_i} \equiv I_{E_i} + \pi_{E_i}(a, b, c, \alpha_i, \mathbf{p}_e) + \phi_i s(\mathbf{p}_D, \mathbf{p}_I, \sigma_i, \kappa_i) - C_{E_i} \quad (1)$$

In English: The export sector's total welfare consists of sectoral income from labour (I_{E_i}), sectoral producer surplus ($\pi_{E_i}(\cdot)$), and sectoral consumer surplus $s'(\cdot)$ minus sectoral political contribution (C_{E_i}).

- **Modelling producer surplus**

$$\pi_{LCP_i} = \underbrace{(a - p_{LCP_i} + b p_{LCP_j})}_{\text{quantity sold}} \underbrace{(p_{LCP_i} - c \sigma_i)}_{\text{profit margin}} \quad (2)$$

and

$$\pi_{PCP_i} = \underbrace{(a - p_{PCP_i} \sigma_i + b p_{PCP_j} \sigma_j)}_{\text{quantity sold}} \underbrace{(p_{PCP_i} \sigma_i - c \sigma_i)}_{\text{profit margin}} \quad (3)$$

English in a 2 by 2 table:

	Depreciation	Appreciation
LCP firms	increases profit margin	decreases profit margin
PCP firms	increases market share but decreases profit margin	decreases market share but increases profit margin

- **The objective function of the government.**

$$G_i(\sigma_i) = \sum_{p=1}^m c(\sigma_i) + \omega(\mathbf{z}) W_i(\sigma_i) \quad (4)$$

In English: Government cares about political contributions ($\sum_{p=1}^m c(\sigma_i)$) and to some degree gross societal welfare ($W_i(\sigma_i)$). $\omega(\mathbf{z})$ is a parameter that captures how much the government cares about the people.

Equilibrium and Comparative Statics

The following expression implicitly characterizes country i 's ideal exchange rate level:

$$\underbrace{[1 + \omega_i(\mathbf{z})] \cdot \pi'_{E_i}(\cdot)}_{\text{producer surplus}} + \underbrace{[\omega_i(\mathbf{z}) + \phi_i] \cdot s'_i(\sigma_i)}_{\text{consumer surplus}} = 0 \quad (5)$$

Proposition 1: Appreciation reduces producer surplus for LCP firms, but increases producer surplus for PCP firms.

Which follows from:

$$\pi'_{LCP_i} = \underbrace{c(-a - 2p_{PCP_i} \sigma_i + b p_{PCP_j} \sigma_j)}_{-} \quad (6)$$

and

$$\pi'_{PCP_i} = \underbrace{(p_{PCP_i} - c)(a - 2p_{PCP_i} \sigma_i + b p_{PCP_j} \sigma_j)}_{+} \quad (7)$$

Proposition 2: An appreciation always increases a country's consumer surplus. A depreciation always reduces a country's consumer surplus.

Which follows from:

$$-\kappa \mathbf{p}_I \sigma_i^{-2} \left[\underbrace{\frac{\partial}{\partial d} u(d_I(\mathbf{p}_I \sigma_i^{-1})) \cdot d'_I(\mathbf{p}_I \sigma_i^{-1})}_{+} - \underbrace{d_I(\mathbf{p}_I \sigma_i^{-1})}_{-} - \underbrace{\mathbf{p}_I \sigma_i^{-1} d'_I(\mathbf{p}_I \sigma_i^{-1})}_{-} \right] \quad (8)$$

Three pathways for exchange rate movement to affect consumer surplus. Inflation and currency manipulation.

Proposition 3: Country i 's ideal exchange rate level is decreasing in α_i and c , while it is increasing in σ_j , κ_i , \mathbf{p}_I , and ϕ_i . The effect of an increase in b is ambiguous and depends on α_i , the proportion of exporters that adopt LCP. The effect of an increase in $\omega(\mathbf{z})$ is ambiguous and depends on the relative sizes of $\pi'_e(\cdot)$ and $s'(\sigma_i)$.

Extensions, case studies and statistical testing

Extensions: oligopolistic competition among exporters; two country case
Case studies: China, Taiwan, South Korea, Japan
Statistical testing: the counter-factual problem of measuring currency manipulation (last round exchange rate, NDF etc.); Kim Jong Il as an instrument