Discussion of
“A Theory of Optimal Capital Controls”

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Capital Controls

• Huge policy importance
  — widespread use
  — effectiveness (?)

• No theoretical framework
  — Magud, Reinhart and Rogoff (2011)

• Great complexity of the question
  — portfolio choice (incomplete markets)
  — frictions

• This paper: lays out a basic frictionless framework
  — endowment economy
  — no uncertainty: one international real bond
  — trade across periods (and across goods)
Results

• Optimal tariff argument for intertemporal trade
  — tax net exports to affect intertemporal terms of trade
  — tax net exports to affect intratemporal terms of trade
    (if there is home bias)
  — reduce intertemporal (and intratemporal) trade in periods of

• very intuitive (almost)

• Obstfeld and Rogoff Chapter 2, generalized and solved analytically. very nicely done.
1. is this the right framework?

- This model: capital controls $\equiv$ trade protection
  - Capital controls equivalent to a tariff (Jeanne, 2011)
  - Pareto inferior (prisoner’s dilemma)
  - Why no WTO for capital controls?

- Reasons for capital controls:
  what makes intertemporal trade different?
  1. Enforcement frictions: require borrowing limits
     - Alvarez and Jermann (2000); Aoki, Kiyotaki, Benigno (2009)
  2. ‘Hot Money’; Information frictions
  3. ‘Trilemma’ and monetary policy
     - Obstfeld, Shambaugh and Taylor (2010)
  4. Real exchange rate management
     - Jeanne (2011)
     - Currency unions and pegs: China, Euro zone

- Fundamental results: general mechanism
2. net exports vs. net foreign assets?

- Conjecture: desire to manipulate terms-of-trade should depend not on net exports $nx_t = y_t - c_t$, but on net foreign assets $b_{t+1} = b_0 \frac{R_0, t+1}{R_0, t+1} + \sum_{\tau=0}^{t} \frac{y_{\tau} - c_{\tau}}{R_0, t+1}$

or

$$q_t b_{t+1} = b_t + y_t - c_t$$

- This paper says: no! Manipulate terms of trade only based on $nx_t$, not $b_{t+1}$

- Why? Consider $y_{\tau} = y$ for all $\tau \geq t$ (and $Y_t \equiv Y$). Then

$$c_{\tau} = y + (1 - \beta) b_t \quad \forall \tau \geq t$$
2. net exports vs. net foreign assets?

cont’d

• Is no policy at all optimal when $y_t \equiv y$? Not if $b_0 \neq 0$.

• How come?! we just proved for any $b_t$

$$c_\tau = y + (1 - \beta)b_t \quad \forall \tau \geq t$$

• Turns out this applies only for $t > 0$. Conclusion must be modified for $t = 0$, if $b_0 \neq 0$
2. net exports vs. net foreign assets?

cont’d

• Unilateral (planning) problem of a country

\[
\max_{\{c_t\}} \sum_{t=0}^{\infty} \beta^t u(c_t) \\
\text{s.t. } b_0 + \sum_{t=0}^{\infty} \beta^t \frac{u'(c_t^*)}{u'(c_0^*)} (y_t - c_t) = 0, \quad c_t + c_t^* \equiv Y.
\]

• Rewrite constraint as

\[
u'(Y - c_0)[b_0 + y_0 - c_0] + \sum_{t=1}^{\infty} \beta^t u'(Y - c_t)[y_t - c_t] = 0.
\]

Note the asymmetry of \( t = 0 \)
2. net exports vs. net foreign assets?

cont’d

• Assume \( y_t \equiv y \) and \( b_0 > 0 \)

• Optimality

\[
u'(c_0) = \mu u'(Y - c_0) \left[ 1 + \frac{u''(Y - c_0)}{u'(Y - c_0)} (b_0 + y - c_0) \right],
\]

\[
u'(c_t) = \mu u'(Y - c_t) \left[ 1 + \frac{u''(Y - c_t)}{u'(Y - c_t)} (y - c_t) \right], \quad t \geq 1.
\]

\[\Rightarrow \ c_t = c_1 \text{ for all } t \geq 1 \text{ and } c_0 \neq c_1\]

• Budget constraint

\[
u'(Y - c_0)(b_0 + y - c_0) + \frac{\beta}{1 - \beta} u'(Y - c_1)(y - c_1) = 0.
\]

• Result:
  - \( c_0 > c_1 \) and \( b_0 + y - c_0 > y - c_1 \)
  - translates into: \( \tau_0 < \tau_1 = 0 \) or \( \theta_0 > 0 = \theta_1 \)
2. net exports vs. net foreign assets?

cont’d

- Optimal policy:
  - \( \tau_0 < 0 \) and \( \theta_0 > 0 \) for \( b_0 \)
  - \( \tau_t = 0, \theta_t = 0 \) and \( b_t = b_1 \in (0, b_0) \) for all \( t \geq 1 \)

- \( \tau_0 = \tau_t \) cannot be optimal!

- \( \theta_t \) is not a function of \( b_t \): time inconsistency

- time consistent solution: \( \theta(b) \) with \( \theta'(\cdot) > 0 \) and \( \theta(0) = 0 \)

- why time inconsistency?
  - similar to Ramsey taxation with capital?
  - desire for decreasing \( |\tau_t| \) over time (constant \( |\tau_t| > 0 \) won’t do)
  - step in \( \tau_t \) is optimal, but not time consistent
  - smooth path for \( \tau_t \) is time consistent
3. additional questions

- Nothing different from trade distortions? Quantity vs price?
- Wars: prisoner’s dilemma? what’s the difference from static trade case?
- Generalizes to uncertainty?
- Absolute or relative growth? (how important $Y = \text{const}$)
- Theory of optimal RER management
- Non-linear distortion rather than counter-/pro-cyclical distortion
  - denote by $\tau$ both import tariff and export subsidy;
    by $\theta$ tax on both inflows and outflows
- Generalizes to demand shocks
Time-consistent solution

- Time-consistent program

\[ V(b) = \max_{(c,b')} \left\{ u(c) + \beta V(b') \right\} \]

s.t. \[ c + qb \leq y + b' \]

where \[ q = \frac{\beta u'(Y - c(b'))}{u'(Y - c)} \]

- Equilibrium requirement

\[ c(b) = \arg \max_{(c,b')} \left\{ u(c) + \beta V(b') \right\} \]

- Result: \( c(b) \) such that \( c'(\cdot) < 0 \) and \( c(0) = y \)