

Discussion of
“A Theory of Optimal Capital Controls”

ARNAUD COSTINOT, GUIDO LORENZONI AND IVÁN WERNING

OLEG ITSKHOKI
Princeton University

Cowles Summer Conference
June 2011

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 = 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
 - Calvo and Mendoza (2000), Chari and Kehoe (2003)
 - 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

$$b_{t+1} = \frac{b_0}{R_{0,t+1}} + \sum_{\tau=0}^t \frac{y_\tau - c_\tau}{R_{0,t+1}}$$

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

$$\max_{\{c_t\}} \sum_{t=0}^{\infty} \beta^t u(c_t)$$

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

- 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

$$u'(c_0) = \mu u'(Y - c_0) \left[1 + \frac{u''(Y - c_0)}{u'(Y - c_0)} (b_0 + y - c_0) \right],$$
$$u'(c_t) = \mu u'(Y - c_t) \left[1 + \frac{u''(Y - c_t)}{u'(Y - c_t)} (y - c_t) \right], \quad t \geq 1.$$

$\Rightarrow c_t = c_1$ for all $t \geq 1$ 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!
- θ_t is not a function of b_t : time inconsistency
- time consistent solution: $\theta(b)$ with $\theta'(\cdot) > 0$ and $\theta(0) = 0$
 - ▶ characterization
- 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 τ_t is optimal, but not time consistent
 - smooth path for τ_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 $Y = const$)
- Theory of optimal RER management
- Non-linear distortion rather than counter-/pro-cyclical distortion
 - denote by τ both import tariff and export subsidy;
by θ tax on both inflows and outflows
- Generalizes to demand shocks

Time-consistent solution

- Time-consistent program

$$V(b) = \max_{(c,b')} \{u(c) + \beta V(b')\}$$

$$\text{s.t.} \quad c + qb \leq y + b'$$

$$\text{where} \quad q = \frac{\beta u'(Y - c(b'))}{u'(Y - c)}$$

- equilibrium requirement

$$c(b) = \arg \max_{(c,b')} \{u(c) + \beta V(b')\}$$

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