

# **‘Optimal Policy with Occasionally Binding Credit Constraints’**

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Discussant :

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Bank of Italy conference, Rome, June 30-July 1 2009

- Enjoyed reading this paper
- Innovative paper on important subject
- Very topical
- Fills important gap in literature
- Technically a big achievement

Paper analyzes OPTIMAL Ramsey policy in small open economy that faces external borrowing constraint

$$NFA_{t+1} \geq -\kappa \cdot GDP_t$$

Policy instrument: subsidy on consumption, allows to raise employment and thus GDP, to alleviate borrowing constraint

**MODEL IS STANDARD (Mendoza, 2002). THE CONTRIBUTION:  
ANALYSIS OF OPTIMAL POLICY.**

## Main results:

- policy maker intervenes aggressively to stimulate output when constraint binds
- when constraint does not bind, then it is optimal not to intervene

In this sense, policy does not have a 'precautionary motive'

But: interventions when constraint binds affect behavior in other states:

in those states consumption and hours worked increases

Optimal policy has non-negligible welfare effect

**The model :**

**Mendoza's (2002) RBC model of small open economy that faces occasionally binding borrowing constraint**

$$b_{t+1} \geq -\kappa \cdot GDP_t, \quad b_{t+1} : \text{NFA (end of } t)$$

Country receives exogenous **random traded good** endowment (only source of uncertainty),  $y_t^T$

Produces **non-traded good**,  $y_t^N$  (price:  $p_t$ )

Only traded asset : one period traded-good bond

- When there is negative shock to traded good endowment, borrowing constraint starts to bind (if beginning-of-period asset holdings sufficiently low).

- Binding borrowing constraint magnifies:

fall in traded good consumption, and in relative price of non-traded good.

- **THE KEY MECHANISM:** Households are price takers, and do not internalize effect of their consumption/labor supply decisions on

price of non-traded good, and thus on external borrowing constraint.

Because of this pecuniary externality, price falls too much in recession, which worsens borrowing constraint.

- **Optimal policy:** subsidizes non-traded good consumption to raise production and relative price; this alleviates borrowing constraint

## The model in a nutshell :

2 periods, zero world interest rate, no discounting,  
non-traded good produced in t=1 only, linear technology

### Decision problem of household :

$$\begin{aligned} \text{Max} \quad & \{ \ln c_1^T + \ln c_1^N - h_1 \} + \ln c_2^T \\ \text{s.t.} \quad & c_1^T + (1 - \tau) p_1 c_1^N + b_2 = y_1^T + p_1 h_1 - T_1 \\ & c_2^T = b_2 + y_2^T \\ & b_2 \geq -\kappa (y_1^T + p_1 h_1) \end{aligned}$$

$h_1$  : hours worked;  $c_1^N = h_1$

$\tau$  : subsidy on non-traded good, financed by lump-sum tax:  $T_1 = \tau p_1 c_1^T$

From intra-temporal FOCs:

First-period employment and consumption are

$$h_1 = c_1^N = \frac{1}{1-\tau}, \quad c_1^T = p_1$$

• **When borrowing constraint NOT binding:**

$$c_1^T = c_2^T = \frac{1}{2}(y_1^T + y_2^T),$$

i.e. traded good consumption does NOT depend on subsidy

Subsidy distorts consumption/leisure choice, and does not affect relative price or intertemporal allocation

Thus: set subsidy at  $\tau = 0$  **when borrowing constraint NOT binding**

- **When borrowing constraint binds**

**Impossible to smooth consumption:  $c_1^T < c_2^T$**

**First-period consumption of tradable is affected by first-period GDP (because of binding borrowing constraint), and thus**

**relative price of no-traded good is affected by subsidy**

$$b_2 = -\kappa \left( y_1^T + p_1 \frac{1}{1-\tau} \right)$$

$$p_1 - \kappa \left( y_1^T + p_1 \frac{1}{1-\tau} \right) = y_1^T$$

$$\Rightarrow p_1 = \frac{1 + \kappa}{1 - \kappa / (1 - \tau)} = c_1^T$$

**Setting  $\tau > 0$  raises price of non-traded good, and first-period consumption.**

**Intuition why  $\tau > 0$  is optimal when borrowing constraint binds:**

■  $\tau > 0$  distorts within-period allocation, but welfare cost of this is second-order (as allocation is undistorted when  $\tau = 0$ ).

■ But  $\tau > 0$  helps to smooth consumption more;

As  $c_1^T < c_2^T$ , this generates first-order welfare gain

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## Numerical example:

a) **Benchmark economy:**  $y_1^T = y_2^T = 5$

$$p_1=5, c_1^T=c_2^T=5, c_1^N=1, b_2=0$$

b) **Alternative situation:**  $y_1^T=1; y_2^T=5$

b.1) **Without borrowing constraint:**

$$p_1=3, c_1^T=c_2^T=3, c_1^N=1, b_2=-2$$

b.2) **With borrowing constraint ( $\kappa = 0.1$ )**

**NO SUBSIDY:**  $p_1=1.25, c_1^T=1.25, c_2^T=4.75, c_1^N=1, b_2=-0.25$

**OPTIMAL SUBSIDY:**  $\tau = 0.093$

$$p_1=1.26, c_1^T=1.26, c_2^T=4.74, c_1^N=1.10, b_2=-0.26$$

**Thus optimal subsidy only has small effect on decisions**

### **Other comments**

- **paper provides illustration of a general idea that is likely to hold in more general economies**
- **but: specific policy recommendation (subsidize non-tradables) is very model specific, and thus has to be taken with caution**

**In model with tradables production most likely would subsidize tradables as well**

## **Useful model extensions:**

- **Occasionally binding borrowing constraint makes model solution VERY difficult.**

**In this world, face constant world interest rate, until constraint binds; at that point, the borrowing rate jumps up and becomes prohibitive.**

**More tractable and more plausible: assume that country faces upward sloping loan supply schedule (constraint that binds all the time).**

- **More reasonable to specify borrowing constraint as function of tradables output (debt will have to be redeemed by future net exports)**
- **More realistic to assume that subsidy has to be financed by distorting tax**

- **Allow for shocks to borrowing constraint that are unrelated to real activity. Make  $\kappa$  stochastic:  $b_{t+1} \geq -\kappa \cdot GDP_t$**

**Important for thinking about current crisis.**

**IN SUMMARY: THIS PAPER IS IMPORTANT CONTRIBUTION.**

**MUCH SCOPE FOR STUDYING OTHER MODEL VARIANTS.**

**LOOK FORWARD TO READING FUTURE PAPERS BY THESE AUTHORS.**