‘Optimal Policy with Occasionally Binding Credit Constraints’

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- 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 :

$$\text{Max} \quad \{\ln c_1^T + \ln c_1^N - h_1\} + \ln c_2^T$$

$$\text{s.t.} \quad c_1^T + (1-\tau)\, p_1 c_1^N + b_2 = y_1^T + p_1 h_1 - T_1$$

$$c_2^T = b_2 + y_2^T$$

$$b_2 \geq -\kappa (y_1^T + p_1 h_1)$$

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

τ : 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

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

- **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

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

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

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

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

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 κ 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.