Austerity

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Introduction

Austerity

- What is it?

- Measures to satisfy budget constraint?

- Notion of "excessiveness"

- What is its function, optimal size?

This paper

- Definition of austerity

- Model of austerity

Definition of austerity in sovereign debt context

- Reduction of borrower's *consumption below second best level* supported by debt capacity

- "Excessive" limits on deficit, debt

- Borrower would have been willing to obtain and able to re-pay larger loan

Model of austerity

- Standard sovereign debt model plus *incomplete information* about borrower type

- Adverse selection implies "excessively" low debt limit, con-sumption

Model of austerity—the story

- Type specific cost of default, private information

- Incentive compatibility implies austerity for high type
  In pooling equilibrium, due to cross subsidization
  In separating equilibrium, to prevent mimicking (debt cap)

- Even harsher austerity with structural reforms/investment, *negative* relation between fresh funds and austerity

Model of austerity—some implications

- Austerity is optimal

- With reforms, more fresh funds go hand in hand with *lower* consumption …

- … and harsher austerity with *higher* growth and welfare

Model of austerity—spending multiplier extension

- Basic message robust

- Multiplier may ease separation of types

- Non-central "demand" effects on growth, ability to repay

Related Literature

Eaton and Gersovitz (1981), Obstfeld and Rogoff (1996, ch. 6)

Cole, Dow and English (1995)

Stiglitz and Weiss (1981), Bester (1985), Meza and Webb (1987), Brennan and Kraus (1987), Milde and Riley (1988)

Green and Porter (1984)

Backus and Driffill (1985), Canzoneri (1985), Vickers (1986)

Basic Model

Standard sovereign debt setup

- Non-contingent debt b_{t+1}, price q_t, repayment rate r_{t+1}

- Competitive, risk neutral lenders, discount factor β

- Sovereign, no commitment, discount factor $\delta < \beta$

- Exogenous output y_t, default triggers output loss $\lambda^i y_t$

Adverse selection

- Type specific default costs, $\lambda^h > \lambda^l$, private information

- Share of high types θ

Timing, $t = 1, 2$

- Choice of r_1 on b_1, observed by lenders

  Output loss $\lambda^i y_1$ if $r_1 < 1$

  Contract $\mathcal{F}_1 = (b_2, q_1)$, reflecting posterior of lenders

  Consumption c_1

- Choice of r_2 on b_2

  Output loss $\lambda^i y_2$ if $r_2 < 1$

  Consumption c_2

Equilibrium

$$r_2^i(\mathcal{F}_1) = \begin{cases} 1 \text{ if } \lambda^i y_2 \geq b_2 \\ 0 \text{ if } \lambda^i y_2 < b_2 \end{cases}, i = h, l$$

$$U_1^i(r_1^i, \mathcal{F}_1(r_1^i)) \geq U_1^i(r_1, \mathcal{F}_1(r_1)), \forall r_1 \in \mathcal{R}, i = h, l$$

$$\theta_1(r_1) = \text{prob}(i = h | r_1, \mathcal{F}_1(\cdot))$$

$$q_1(r_1) = \begin{cases} \beta & \text{if } b_2(r_1) \leq \lambda^l y_2 \\ \beta \theta_1(r_1) & \text{if } \lambda^l y_2 < b_2(r_1) \leq \lambda^h y_2 \\ 0 & \text{otherwise} \end{cases}$$

Simplify for presentation

- Extreme types, $\lambda^h = \infty, \lambda^l = 0$
  Repayment, selection constraint high type never binds

- Equilibrium selection: optimal arrangement for high type

Pooling equilibrium

- Both types repay in first period

- Posterior implies $q_1(1) = \beta\theta$ for any $b_2 > 0$

- Only high type repays in second period

$\Rightarrow$ High type cross-subsidizes low type, suffers austerity

Separating equilibrium

- Only high type repays in first period

- Posterior implies $q_1(1) = \beta$, $q_1(0) = 0$

- Only high type repays in second period

- Self-selection constraint low type (no mimicking)

$$y_1 - y_1 0 - b_1 0 + 0 \geq y_1 - b_1 + \beta b_2$$

(continuation values unaffected by first-period action)

$\Rightarrow$ High type subject to debt cap, suffers austerity

$$\beta b_2 \leq b_1 \text{ (current account surplus high type)}$$

Separating dominates pooling equilibrium if θ sufficiently small

Costly Signalling

To render $r_1 = 1$ costly for high type, now assume $\lambda^h < b_1/y_1$

Separating equilibrium

- Self-selection constraint low type unchanged, $\beta b_2 \leq b_1$

- Repayment, self-selection constraints high type

$$b_2 \leq y_2 \lambda^h$$
$$u(y_1 - b_1 + \beta b_2) + \delta u(y_2 - b_2) \geq u(y_1(1 - \lambda^h)) + \delta u(y_2)$$

$\Rightarrow$ Lower in addition to upper bound on b_2

- High type still suffers austerity

Contractible Investment

Contractible investment, *reforms*, as alternative costly signal

- Assume $\lambda^h = \infty$ again

- Debt contract specifies (b_2, q_1, I_1)

- I_1 generates output $f(I_1)$

- Welfare high type
$$u(y_1 - b_1 + \beta b_2 - I_1) + \delta u(y_2 - b_2 + f(I_1))$$

- Abstract for now from collateral contributing role of I_1 (default cost unchanged, not affected by I_1)

Conditional over-investment as deterrence

- Conditional on $r_1 = 1$, equilibrium contract stipulates I_1 higher than optimal conditional on b_2

- In fact, over-investment *more than exhausts* additional funds

  This lowers/raises high type's first-/second-period consumption

- Second-order cost for high type

- First-order cost for mimicking low type who values investment less, due to default in $t = 2$

$\Rightarrow$ Over-investment helps deter mimicking

Indifference curves high type, selection constraint low type in $(b_2(1), I_1(1))$-space
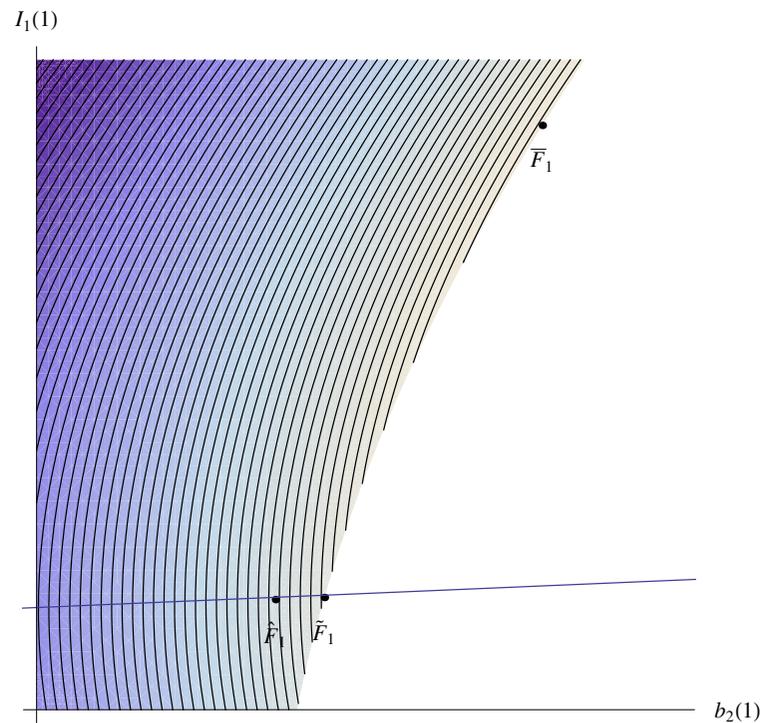
Implications

- Even without collateral contributing role, over-investment conditional on b_2

- Availability of investment margin renders austerity *harsher*

- At margin, austerity *increases* with loan size, $\mathrm{d}c_1/\mathrm{d}b_2 < 0$

- Additional funding cum reforms implies *harsher* austerity, but causes *higher* growth and welfare

Contractible investment *with* collateral contributing role

- Investment allows to sustain higher borrowing

- Over-investment, austerity-growth-welfare relation robust

  Central mechanism unchanged: High type trades off b_2 vs. I_1 differently than mimicking low type

Spending Multipliers

Spending multipliers may affect ability, willingness to repay

Introduce multiplier on net public funding, $m \geq 1$

Separating equilibrium

- Self-selection constraint low type (no mimicking)
$$y_1 - 1y_10 - m(b_10 - 0) \geq y_1 - m(b_1 - \beta b_2)$$

$\Rightarrow$ No effect on self-selection constraint, equilibrium b_2

$\Rightarrow$ With $\lambda^l > 0$, higher multiplier relaxes self-selection constraint low type, reduces austerity high type

$\Rightarrow$ But if multiplier also applies w.r.t. default costs, no effect

Conclusion

Austerity: consumption below second best

Model merges sovereign debt, adverse selection setups

Austerity due to cross-subsidization or deterrence of mimicking

Additional funding cum reforms implies *harsher* austerity, but causes *higher* growth and welfare

Multiplier may, may not relax no-mimicking constraint

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