Efficient Sovereign Default

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Sovereign Defaults in the Data

- Sovereign defaults (suspension of payments) are recurrent but infrequent events
- Associated with: Data
  - Severe output and consumption losses
  - Large fall in imports of intermediate goods
- Maturity of debt shortens as default is more likely

Conventional Approach

Incomplete market approach to sovereign debt:

- Sovereign borrower can issue only non-contingent debt
- Sovereign borrower cannot commit to fully repay its debt

Typically:

- Exogenous maturity composition of debt
- Exogenous cost of default
- Markov equilibrium

Conventional View of Debt Crises

- Pervasive inefficiencies
  - Defaults due to incomplete contracts
- Excessive reliance on short-term debt causes crises
  - Roll-over risk: Cole and Kehoe (2000), Rodrik and Velasco (1999)

My Approach

As in conventional approach:

- Sovereign borrower can issue only non-contingent debt
- Sovereign borrower cannot commit to fully repay its debt

Extend by allowing for:

- Endogenous maturity composition of debt
- Endogenous cost of default (Production economy)
- Best equilibrium

My View of Debt Crises

- Best equilibrium outcome is constrained efficient
- High reliance on short-term when default is likely part of the efficient arrangement
  - Symptom, *not* cause

Best Equilibrium Outcome is Constrained Efficient

- The best equilibrium outcome is the solution to an optimal contracting problem with two frictions:
  - Lack of commitment by sovereign borrower
  - Private information
- Non-contingent defaultable debt of multiple maturities sufficient to implement efficient outcome

Features of the Best Outcome

Recurrent but infrequent defaults associated with:

- Output and consumption losses
- Fall in imports of intermediate goods
- Maturity of debt shortens as indebtedness increases before default

Policy Implications

Defaults and associated costs (trade disruption) *not* driven by

- Market incompleteness
- The high reliance on short-term debt

But by the underlying informational and commitment frictions.

Therefore:

- Adding assets is irrelevant
- Policies that penalize short-term debt are welfare reducing

Contribution to the Literature

Incomplete market literature on sovereign default:

- Eaton and Gersovitz (1981), Aguiar and Gopinath (2006), Arellano (2008), Benjamin and Wright (2009), Chatterjee and Eyigungor (2012), Mendoza and Yue (2012), Arellano and Ramanarayanan (2012)
- Cole and Kehoe (2000), Conesa and Kehoe (2012)

Extend by allowing for:

- Endogenous maturity composition of debt
- Endogenous cost of default (Production economy)
- Best equilibrium

Develop efficiency benchmark useful for policy analysis

Contribution to the Literature, cont.

Optimal dynamic contracting literature:

- Private Information: Green (1987), Thomas and Worrall (1990), Atkeson and Lucas (1992)
- Lack of Commitment: Thomas and Worrall (1994), Kocherlakota (1996), Kehoe and Perri (2002), Alburquerque and Hopenhayn (2004), Aguiar, Amador and Gopinath (2009)
- Atkeson (1991) and Ales, Maziero, and Yared (2012)
- Clementi and Hopenhayn (2006), DeMarzo and Fishman (2007), DeMarzo and Sannikov (2006), Hopenhayn and Werning (2008)

Implementation: Relate efficient outcome to data on default, bond prices, maturity composition of debt

Outline

- Physical Environment
  - Baseline economy
  - Isomorphic taste shock formulation
- Sovereign Debt Game
  - Best Equilibrium Outcome is Efficient
- Characterization of Efficient Allocation
- Implementation
  - Default, Bond Prices, and Maturity Composition of Debt
- Relate to Evidence

PHYSICAL ENVIRONMENT

Baseline Economy

- $t = 0, 1, ..., \infty$
- 2 types of agents:
  - Foreign lenders
  - Domestic agents (government)
- 3 types of goods:
  - Intermediate good, m
  - Domestic consumption good, y (Non-Tradable)
  - Export good, y^*

Foreign Lenders

- Risk neutral, discount factor $q \in (0, 1)$
- Value consumption of the export good
- Large endowment of the intermediate good
- Technology of the foreign lenders is such that relative price between intermediate and export good is one

Domestic Agents

- Preferences over domestic consumption good

$$\mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t U(y_t)$$

with U strictly increasing and concave, and $\beta \leq q$

- Endowed with 1 unit of labor

Domestic Technology

- Domestic consumption and export good produced using
  - ℓ: domestic labor
  - m: imported intermediate good

$$y = zF(m_1, \ell_1) \qquad y^* = F(m_2, \ell_2)$$

$$m_1 + m_2 \leq m \qquad \ell_1 + \ell_2 \leq 1$$

- z is the productivity of domestic sector:

  $z \in \{z_L, z_H\}$ *iid* according to π

- F CRS, $F(0, 1) > 0$, $\lim_{m \to 0} F_m(m, \ell) = \infty$

- Let $f(m) = F(m, 1)$

Observables in the Baseline Economy

- Domestic consumption and export good produced using
  - ℓ: domestic labor
  - m: imported intermediate good

$$y = zF(m_1, \ell_1) \qquad y^* = F(m_2, \ell_2)$$

$$m_1 + m_2 \leq m \qquad \ell_1 + \ell_2 \leq 1$$

- Foreign lenders observe inputs devoted to domestic consumption, m_1, ℓ_1
- Cannot observe z or y, only y/z
- Let $c \equiv y/z$ be "consumption" of resources devoted to domestic good production

Observables in the Baseline Economy

- Domestic consumption and export good produced using
  - ℓ: domestic labor
  - m: imported intermediate good

$$y = zF(m_1, \ell_1) \qquad y^* = F(m_2, \ell_2)$$

$$m_1 + m_2 \leq m \qquad \ell_1 + \ell_2 \leq 1$$

- The technological restrictions boil down to

$$\frac{y}{z} + y^* = c + y^* \leq f(m)$$

Rewrite as a Taste Shock Economy

If $U(y) = \frac{y^{1-\gamma}}{1-\gamma}$, let $c = \frac{y}{z}$ and $\theta = z^{1-\gamma}$

With this change of variable:

- Domestic agent preferences

$$\sum_{t=0}^{\infty} \sum_{\theta^t} \beta^t \Pr(\theta^t) \theta_t U(c(\theta^t))$$

- Domestic resource constraint

$$c + y^* \leq f(m)$$

Rest of the Talk

- Present the results using the taste shock notation
- Under the assumption $\gamma > 1$:

  High taste shock corresponds to low productivity shock

  $$\theta_H = z_L^{1-\gamma} > \theta_L = z_H^{1-\gamma}$$

  With either low productivity or high taste shock, marginal utility of imported intermediates is high
- Refer to $c = y/z$ as consumption

SOVEREIGN DEBT GAME

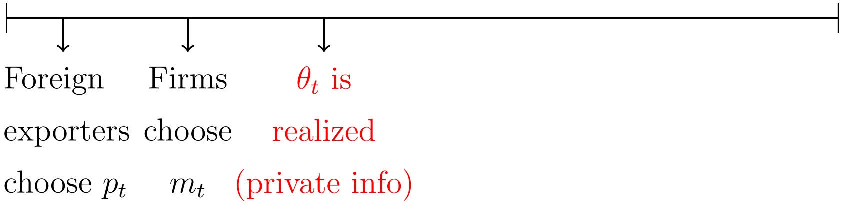
Players

- Benevolent domestic government
- Private domestic firms
- Foreign exporters
- Foreign lenders (debt-holders)

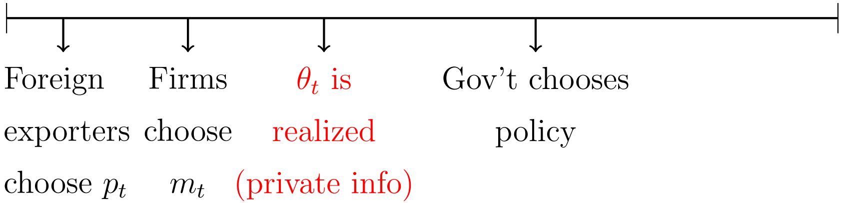
Timing

Timing

Timing


Foreign exporters choose p_t
Firms choose m_t
θ_t is realized (private info)

Timing


Foreign exporters choose p_t
Firms choose m_t
θ_t is realized (private info)
Gov't chooses policy

Timing

- Foreign exporters choose p_t
- Firms choose m_t
- θ_t is realized (private info)
- Gov't chooses policy
- Foreign lenders choose debt prices, q_t

Gov't Policies: Capital Controls and Debt Policies

- Government taxes payment by firms to foreign exporters at rate τ_t
  - Interpret as *capital controls*
  - Revenue $= \tau_t p_t m_t$

- Government issues two non-contingent defaultable bonds
  - Short-term: 1 period
    - $b_{S,t+1}$: amount issued
    - Promise to pay $b_{S,t+1}$ next period
  - Long-term: Consol
    - $b_{L,t+1}$: amount issued
    - Promise to pay $b_{L,t+1}$ in every subsequent period

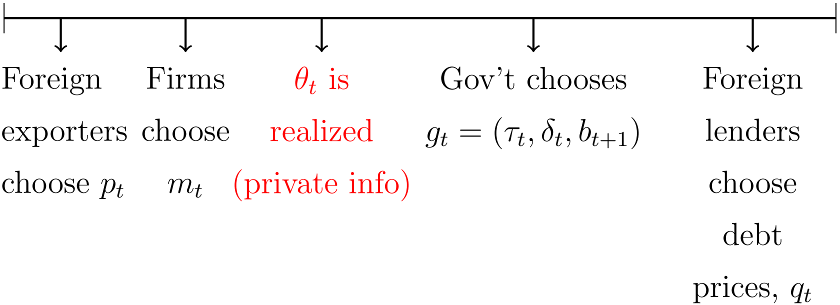
Gov't Policy: Default and Payment of Debt

Three levels of payment at t, $\delta_t \in \{1, r, 0\}$

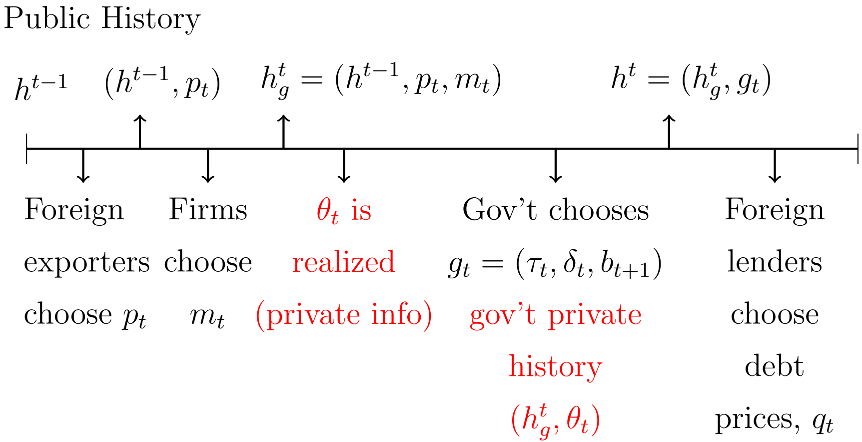
- $\delta_t = 1$: Full payment
- $\delta_t = r \in (0, 1)$: Partial payment
  - Pay r to each short-term debt holder
  - Pay $\frac{r}{1-q}$ to each long-term debt holder
- $\delta_t = 0$: Suspension of payments in current period

The government is in *default* whenever $\delta_t < 1$

Timing


Foreign exporters choose p_t
Firms choose m_t
θ_t is realized (private info)
Gov't chooses $g_t = (\tau_t, \delta_t, b_{t+1})$
Foreign lenders choose debt prices, q_t

Timing


Public History
h^{t-1}
(h^{t-1}, p_t)
$h_g^t = (h^{t-1}, p_t, m_t)$
$h^t = (h_g^t, g_t)$
Foreign exporters choose p_t
Firms choose m_t
θ_t is realized (private info)
Gov't chooses $g_t = (\tau_t, \delta_t, b_{t+1})$
gov't private history (h_g^t, θ_t)
Foreign lenders choose debt prices, q_t

Pricing Function: Short-Term Bond

Consistent with lenders' arbitrage condition

$$q_S(h^t) = q\mathbb{E}\left[\chi_S(h^{t+1})|h^t\right]$$

where

$$\chi_S(h^{t+1}) = \begin{cases} 1 & \text{if } \delta_{t+1} = 1 \\ r & \text{if } \delta_{t+1} = r \\ q\mathbb{E}\left[\chi_S(h^{t+2})|h^{t+1}\right] & \text{if } \delta_{t+1} = 0 \end{cases}$$

Pricing Function: Long-Term Bond

Consistent with lenders' arbitrage condition

$$q_L(h^t) = q\mathbb{E}\left[\chi_L(h^{t+1})|h^t\right]$$

where

$$\chi_L(h^{t+1}) = \begin{cases} 1 + q_L(h^{t+1}) & \text{if } \delta_{t+1} = 1 \\ \frac{r}{1-q} & \text{if } \delta_{t+1} = r \\ q\mathbb{E}\left[\chi_L(h^{t+2})|h^{t+1}\right] & \text{if } \delta_{t+1} = 0 \end{cases}$$

Government Budget Constraint

- If there is full payment, $\delta = 1$:

$$c + b_S + b_L \leq Y(\tau) + q_S(h_g^t, g)b_S' + q_L(h_g^t, g)(b_L' - b_L)$$

- If there is partial payment, $\delta = r$:

$$c + \left(b_S + \frac{b_L}{1-q}\right) r \leq Y(\tau) + q_S(h_g^t, g)b_S' + q_L(h_g^t, g)b_L'$$

- If there is suspension of payments, $\delta = 0$:

$$c \leq Y(\tau) \quad \text{and} \quad (b_S', b_L') = (b_S, b_L)$$

where $Y(\tau) = f(m_t) - (1-\tau)p_t m_t$

Trade: Private Agent's Optimality

- Foreign exporters no-arbitrage condition:

$$1 = \mathbb{E}\left[p_t(h^{t-1})\left(1 - \tau(h_g^t, \theta_t)\right)|h^{t-1}\right]$$

- Firms' optimality:

$$f'(m(h_m^t)) = p(h^{t-1})$$

Definition of Sustainable Equilibrium

A *sustainable equilibrium* is (σ, p, m, q) such that for all histories

- The government's strategy, σ, maximizes domestic agents utility subject to budget constraints given private strategies
- Given the government's strategy, private strategies are such that:
  - p is consistent with foreign exporters' arbitrage condition
  - m satisfies firms' optimality
  - q is consistent with foreign lenders' arbitrage condition

Worst Equilibrium

- Assumption: Lenders can deny access to foreign savings
- Autarky is the worst equilibrium for the government
- Value associated with autarky is

$$v_a = \frac{\mathbb{E}(\theta)U(f(0))}{1-\beta}$$

Sustainable Equilibrium Outcome

- Focus on outcomes:
  - What happens along the equilibrium path

- Denote outcomes as $\mathbf{y} = (\mathbf{x}, \mathbf{g}, \mathbf{p})$ where

$$\mathbf{x} = \{m(\theta^{t-1}), c(\theta^t), y^*(\theta^t)\}_{t=0}^{\infty}$$

$$\mathbf{g} = \{\tau(\theta^t), \delta(\theta^t), b_S(\theta^t), b_L(\theta^t)\}_{t=0}^{\infty}$$

$$\mathbf{p} = \{p_t(\theta^{t-1}), q_S(\theta^t), q_L(\theta^t)\}_{t=0}^{\infty}$$

and $v(\theta^t)$ = continuation value for the domestic agent

BEST SUSTAINABLE EQUILIBRIUM OUTCOME IS CONSTRAINED EFFICIENT

Incentive Compatibility and Sustainability Constraint

Any sustainable equilibrium outcome must satisfy

- Incentive Compatibility Constraint

$$\theta_t U(c(\theta^t)) + \beta v(\theta^t) \geq \theta_t U(c(\theta^{t-1}, \theta')) + \beta v(\theta^{t-1}, \theta') \quad \text{(IC)}$$

Government must have no incentive to conduct

undetectable deviations

Incentive Compatibility and Sustainability Constraint

Any sustainable equilibrium outcome must satisfy

- Sustainability Constraint

$$\theta_t U(c(\theta^t)) + \beta v(\theta^t) \geq \theta_t U(f(m(\theta^{t-1})) + \beta v_a \qquad \text{(SUST)}$$

Government must have no incentive to conduct *detectable deviations*

Best Equilibrium Outcome is Constrained Efficient

Main Proposition of the Paper

The best sustainable equilibrium outcome solves the following optimal contracting problem:

$$J(v_0) = \max_{\mathbf{x}} \sum_{t=0}^{\infty} \sum_{\theta^t} q^t \Pr(\theta^t) \left[-m(\theta^{t-1}) + f\left(m(\theta^{t-1}) \right) - c(\theta^t) \right]$$

subject to (IC), (SUST) and

$$\sum_{t=0}^{\infty} \sum_{\theta^t} \beta^t \Pr(\theta^t) \theta_t U(c(\theta^t)) \geq v_0 \tag{PC}$$

CHARACTERIZATION OF THE CONSTRAINED EFFICIENT ALLOCATION

Efficient Allocation Solves Nearly Recursive Problem

- Problem at $t = 0$

- Problem for $t \geq 1$ where
  - Efficient allocation
  - Lenders' value (total value of debt), B

  are recursive in borrower's value, v

Recursive Problem for $t \geq 1$

The efficient allocation solves

$$B(v) = \max_{m, \{c_s, v'_s\}_{s=H,L}} \sum_{s \in \{L,H\}} \pi_s \left[-m + f(m) - c_s + qB(v'_s) \right]$$

subject to

$$\theta_L U(c_L) + \beta v'_L \geq \theta_L U(c_H) + \beta v'_H \tag{IC}$$

$$\theta_H U(c_H) + \beta v'_H \geq \theta_H U(f(m)) + \beta v_a \tag{SUST}$$

$$v'_H, v'_L \geq v_a \tag{SUST'}$$

$$\pi_H \left[\theta_H U(c_H) + \beta v'_H \right] + \pi_L \left[\theta_L U(c_L) + \beta v'_L \right] = v \tag{PKC}$$

Problem at $t = 0$

The efficient allocation solves

$$J(v) = \max_{m,\{c_s,v'_s\}_{s=H,L}} \sum_{s\in\{L,H\}} \pi_s \left[-m + f(m) - c_s + qB(v'_s)\right]$$

subject to (IC), (SUST), (SUST') and

$$\pi_H \left[\theta_H U(c_H) + \beta v'_H\right] + \pi_L \left[\theta_L U(c_L) + \beta v'_L\right] \geq v \qquad \text{(PC)}$$

where J is the Pareto Frontier

Problem at $t = 0$

The efficient allocation solves

$$J(v) = \max_{m, \{c_s, v'_s\}_{s=H,L}} \sum_{s \in \{L,H\}} \pi_s \left[-m + f(m) - c_s + qB(v'_s) \right]$$

subject to (IC), (SUST), (SUST') and

$$\pi_H \left[\theta_H U(c_H) + \beta v'_H \right] + \pi_L \left[\theta_L U(c_L) + \beta v'_L \right] \geq v \tag{PC}$$

where J is the Pareto Frontier

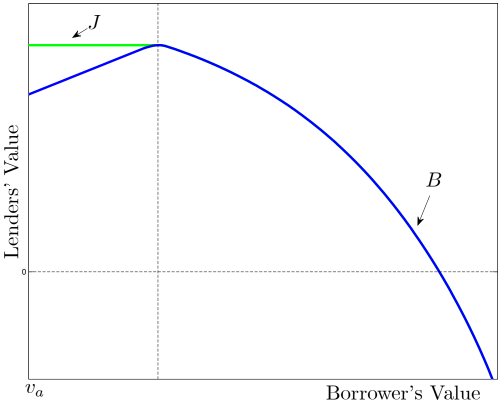
Asymmetry between $t = 0$ and $t \geq 1$ because:

- (PKC) is an equality constraint
- (PC) is an inequality constraint
- If $B(v)$ is increasing then (PC) is slack and $J(v) > B(v)$

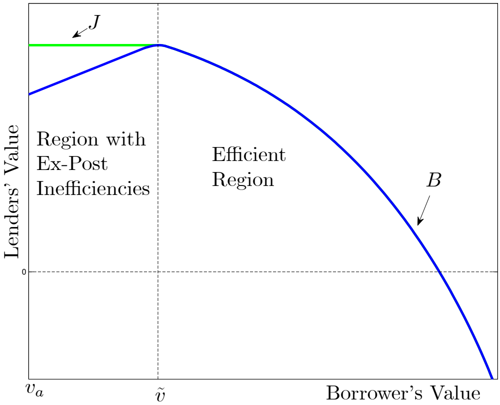
PROPERTIES

- Region with ex-post inefficiencies
  - Lack of commitment plays critical role
- Transit to the region with ex-post inefficiencies
  - Private information plays critical role
- Low borrower values are associated with low imports of intermediates and low output

Region of Ex-Post Inefficiencies



Region of Ex-Post Inefficiencies



When borrower's value is low, can make both borrower and lenders better off ex-post

$B(v)$ has the Depicted Shape

Proposition (Region with Ex-Post Inefficiencies Exists)

$\exists\ \tilde{v} > v_a$ *such that there exist*

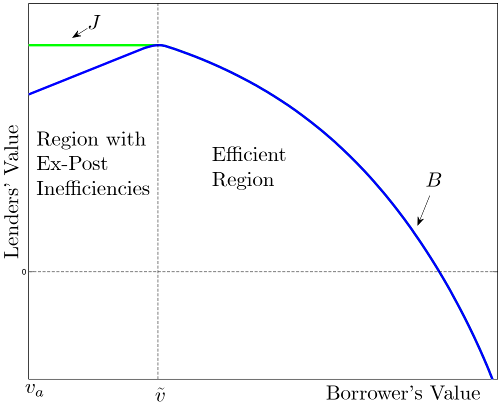
- *Region with ex-post inefficiencies:*

  B *is increasing for* $v \in [v_a, \tilde{v})$

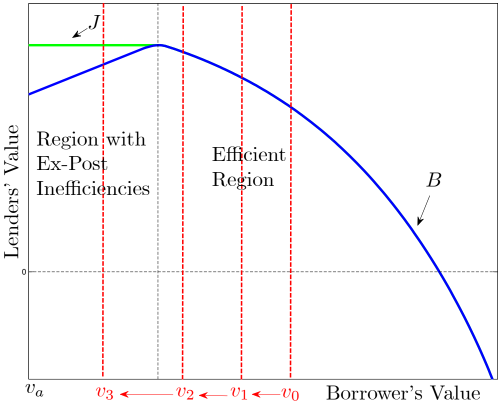
- *Efficient region*

  B *is decreasing for* $v \in [\tilde{v}, \bar{v})$

Any Efficient Allocation Starts on the Efficient Region

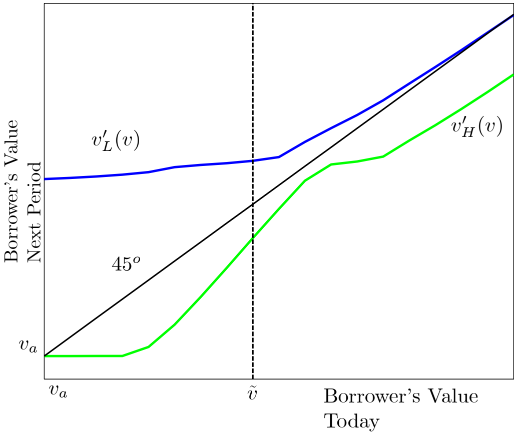


Transits to the Region with Ex-Post Inefficiencies



Starting from v_0, a sequence of high taste shocks pushes the economy to the region with ex-post inefficiencies

Borrower's Value Decreases After High Taste Shock



After the realization of a high taste shock, the continuation value is lower than the current one: $v'_H(v) < v$

Two Countervailing Forces

- Incentive force: Want to spread continuation values
  - Cheapest way to provide utility
    - Make c_H large and c_L small
    - Spread out continuation values
  - Desirable to make v'_H low
- Commitment force: Want to back-load borrower payoff
  - By back-loading, relax future sustainability constraint
  - Low production distortions in the future
  - Want high v'_H

Optimality of Ex-Post Inefficiencies

Proposition (Transit to Region with Ex-Post Inefficiencies)

If either (i) $\theta_H - \theta_L$ sufficiently high or (ii) π_H sufficiently low, then any efficient allocation transits to and out of the region with ex-post inefficiencies with strictly positive probability.

Lemma

If either (i) or (ii) then $\forall\ v \in [\tilde{v}, \bar{v}]$

$$v'_H(v) < v$$

Intuition for the Sufficient Conditions in the Lemma

(i) $\theta_H - \theta_L$ large: Incentive force large

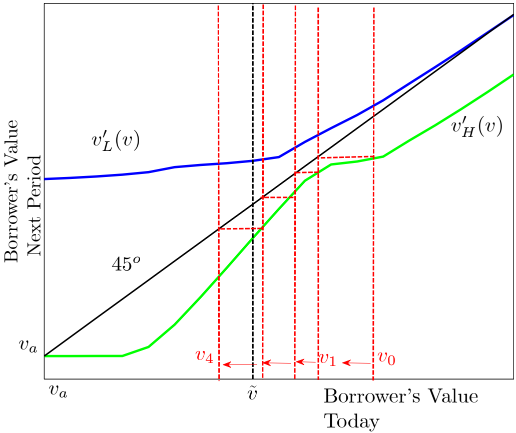
- Insurance motive is large
- Incentive compatibility makes $v'_H(v)$ lower than v

(ii) π_H low: Small cost of not back-loading

- Low probability of reaching state in which future (SUST) is tight and production is highly distorted

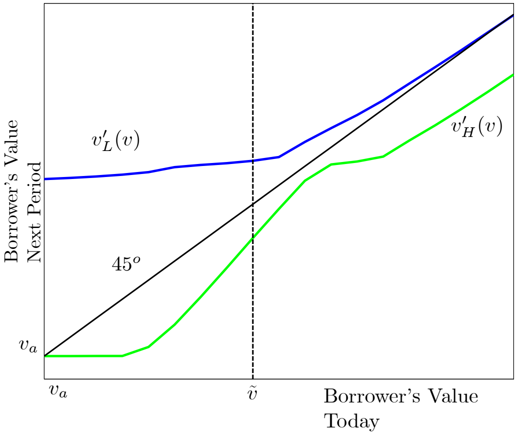
Incentive force outweighs commitment force $\Rightarrow \quad v'_H(v) < v$

Transits to the Region with Ex-Post Inefficiencies



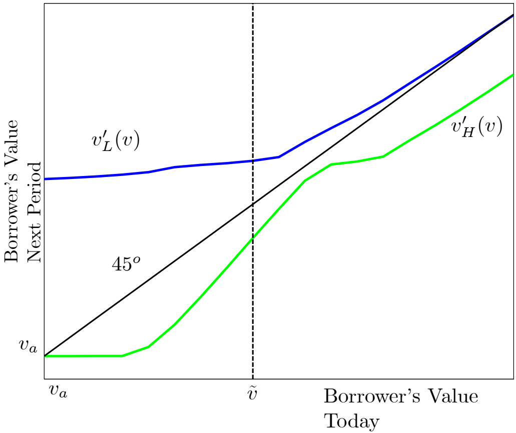
Starting from v_0, a sequence of high taste shocks pushes the economy to the region with ex-post inefficiencies

What Happens When Reach Autarky?



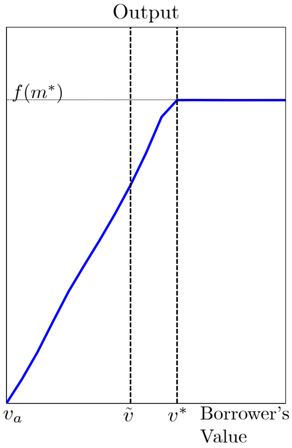
Bounce up the first time θ_L is realized

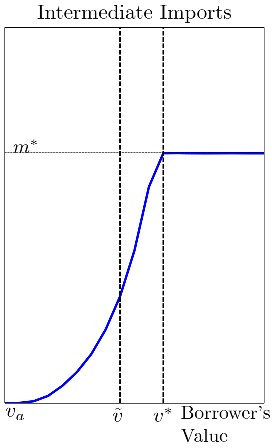
Is There a Stationary Distribution?



If $q > \beta$ there exists a non-degenerate limiting distribution

Low v Associated with Low Output and Intermediates





m^* = statically efficient amount of intermediates, $f'(m^*) = 1$

Recap

- A sequence of high taste shocks pushes the economy to the region with ex-post inefficiencies
- This path is associated with falling imports of intermediates and output
- Autarky is a reflecting point, not absorbing
- If $q > \beta$ there exists a stationary distribution

Next:

- Implementation: interpret ex-post inefficient outcomes as debt crises
- Implications for maturity composition (and interest rates)

IMPLEMENTATION:
DEFAULTS, BOND PRICES, AND MATURITY COMPOSITION

Construct Equilibrium Outcome

- Allocation and total value of debt from contracting problem
- p and τ are immediate

Next, construct:

- Payment policy, δ
- Bond prices, q_S and q_L
- Debt holdings, b_S and b_L

Using v as a state variable

Equilibrium Payment Policy

- If $v > v_a$: Full payment, $\delta = 1$
- If $v = v_a$:
  - If $\theta = \theta_H$: Suspension of payments, $\delta = 0$
  - If $\theta = \theta_L$: Partial payment, $\delta = r$

Equilibrium Bond Prices

Given the equilibrium payment policy, prices consistent with lenders' arbitrage conditions

$$
\begin{aligned}
q_S(v) &= \begin{cases} q & \text{if } v \in (v_a, \bar{v}] \\ q\bar{r} & \text{if } v = v_a \end{cases} \\
q_L(v) &= \begin{cases} q \sum_{s=L,H} \pi_j \left[1 + q_L(v_s'(v))\right] & \text{if } v \in (v_a, \bar{v}] \\ q \frac{\bar{r}}{1-q} & \text{if } v = v_a \end{cases}
\end{aligned}
$$

where $\bar{r}$ is the expected recovery rate:

$$\bar{r} = \pi_L r + \pi_H [0 + q\bar{r}] = \frac{\pi_L r}{1 - q\pi_H}$$

LT bond price strictly increasing in borrower continuation value

Equilibrium Maturity Composition of Debt

- From the contracting problem, total value of debt is:

$$b(v, \theta_s) \equiv f(m(v)) - m(v) - c_s(v) + qB(v_s'(v))$$

- When $\delta = 1$, given prices, $b_L(v)$ and $b_S(v)$ must solve

$$b(v, \theta_L) = b_S(v) + b_L(v) \left[1 + q_L \left(v_L'(v)\right)\right]$$

$$b(v, \theta_H) = b_S(v) + b_L(v) \left[1 + q_L \left(v_H'(v)\right)\right]$$

How is Insurance Provided?

When there is default (only when $v = v_a$):

- Suspension and partial payments provide insurance

When there is no default:

- After θ_H: *Debt dilution*
  - Borrower's continuation value decreases
  - Higher probability of default in the near future
  - Long-term debt price falls $\Rightarrow$ capital loss for lenders
  - Wealth transfer from lender to the borrower
- After θ_L: *Debt buyback*
  - Borrower's continuation value increases
  - Lower probability of default in the near future
  - Long-term debt price rises $\Rightarrow$ capital gain for lenders
  - Wealth transfer from the borrower to the lenders

On-Path Default and Off-Path Punishment

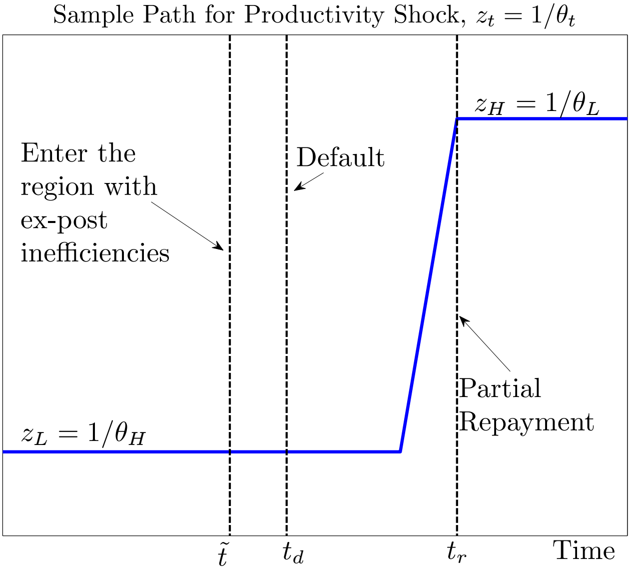
- On-path: When there is a default
  - After a partial repayment regain access to credit market
  - Do not trigger autarky
- Off-path: Autarky to deter detectable deviations
  - Can use less severe punishment to deter detectable deviations

CHARACTERIZING BEST OUTCOME

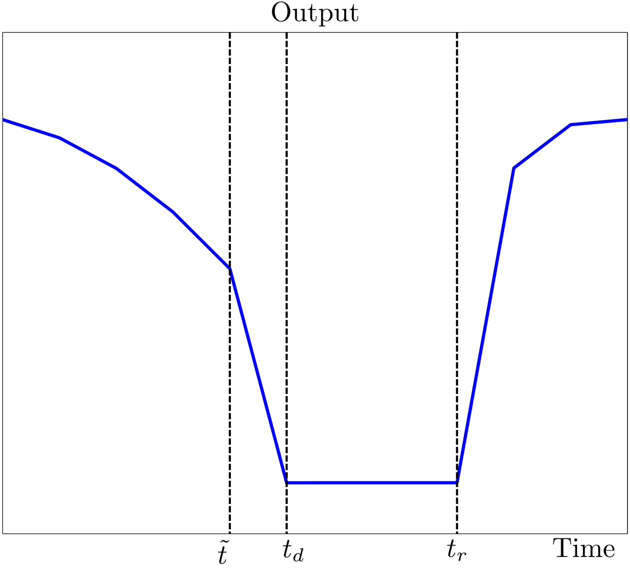
RELATION TO THE EVIDENCE:

- Sovereign debt crises are associated with:
  - Output and consumption losses
  - Fall in imports of intermediate goods
- Maturity of debt shortens as default is more likely

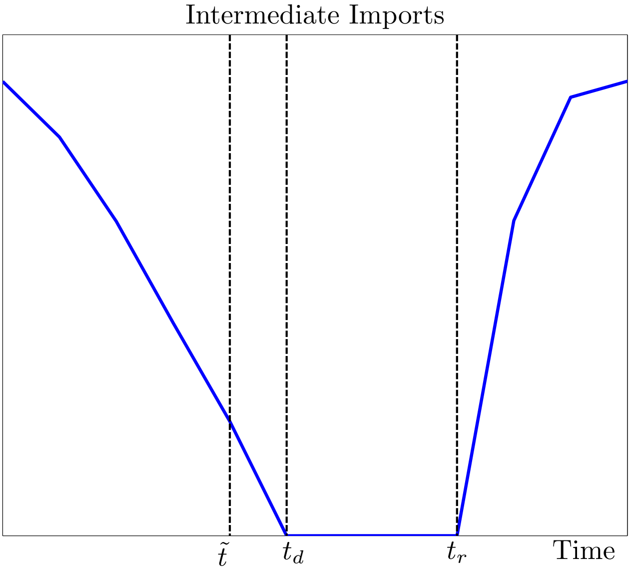
Sample Path Leading Toward Default



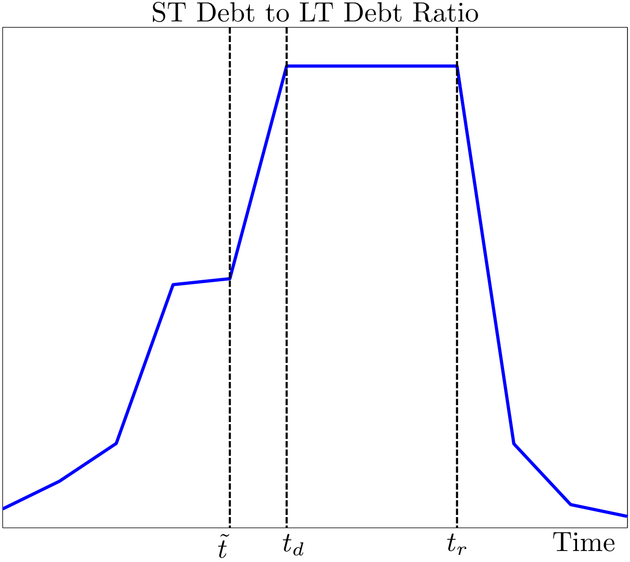
Defaults are Associated with Output Losses



Defaults are Associated with Drop in Imports



Maturity of Debt Shortens as Default is More Likely



Maturity of Debt Shortens as Default is More Likely

Recall: $b_L(v)$ and $b_S(v)$ solve

$$b(v, \theta_L) = b_S(v) + b_L(v) \left[1 + q_L \left(v'_L(v)\right)\right]$$

$$b(v, \theta_H) = b_S(v) + b_L(v) \left[1 + q_L \left(v'_H(v)\right)\right]$$

When indebtedness is high (future default is likely):

- Long-term bond prices more sensitive to shocks
- Can obtain needed insurance with small amount of long-term debt
- Overall indebtedness is high so short-term debt must be high

Recap

Recurrent but infrequent defaults associated with:

- Output and consumption losses
- Fall in imports of intermediate goods
- Shortening of maturity of debt as default approaches

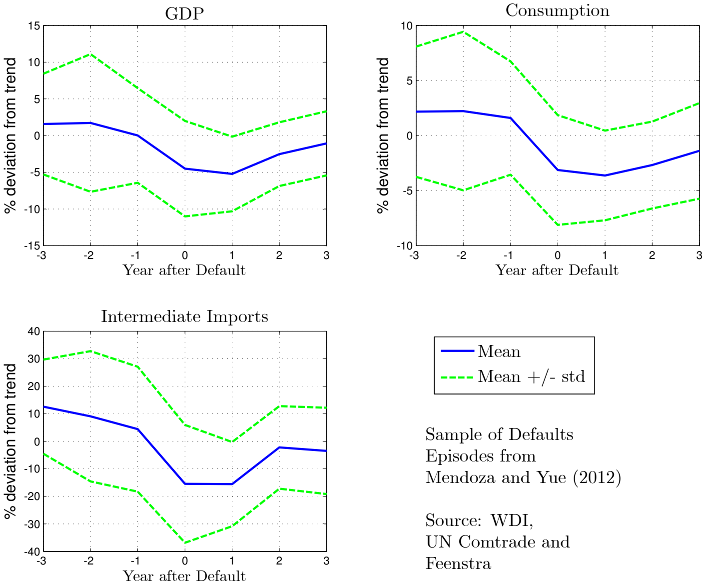
Conclusion

- Key aspects of sovereign debt and default rationalized as best outcome of a sovereign debt game
- Best outcome is constrained efficient
  - It solves optimal contracting problem with informational and commitment frictions
- Default is *not* driven by
  - Market incompleteness
  - The high reliance on short-term debt

  But by the underlying frictions
- Method to implement efficient allocation likely generalize to other contracting problems

Dynamics Around Default Episodes

Back



Sample of Defaults
Episodes from
Mendoza and Yue (2012)

Source: WDI,
UN Comtrade and
Feenstra

$$imports_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \sum_{j=0}^{3} \delta_j \mathbf{1}\{default_{i,t-j} = 1\} + \epsilon_{i,t}$$

Variable	Coefficient Estimate	Standard Error
Constant	0.007	0.960
GDP	1.810	0.145
Default at t	-0.119	0.044
Default at $t-1$	-0.108	0.044
Default at $t-2$	-0.040	0.044
Default at $t-3$	-0.005	0.043

Back

Equilibrium Capital Controls and Imports Price

- From the contracting problem, I get $m(v)$
- Construct $p(v)$ and $\tau(v)$ consistent with firms optimality and foreign exporters no-arbitrage conditions:

$$f'(m(v)) = p(v)$$

$$1 = p(v)(1 - \tau(v))$$

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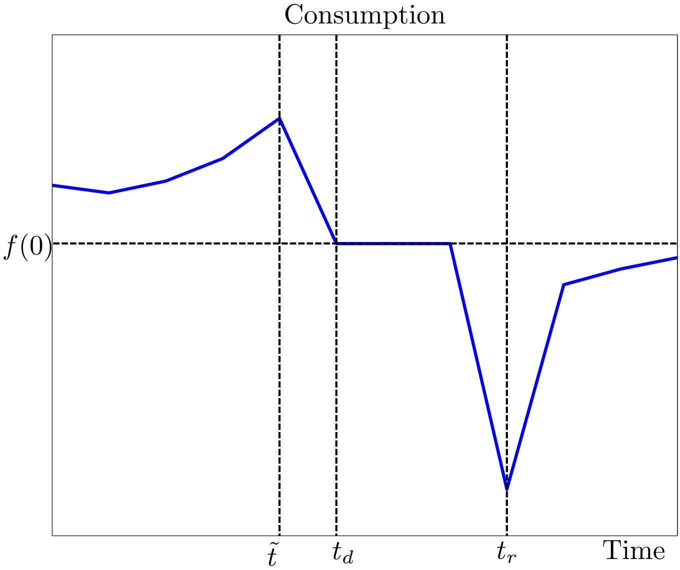
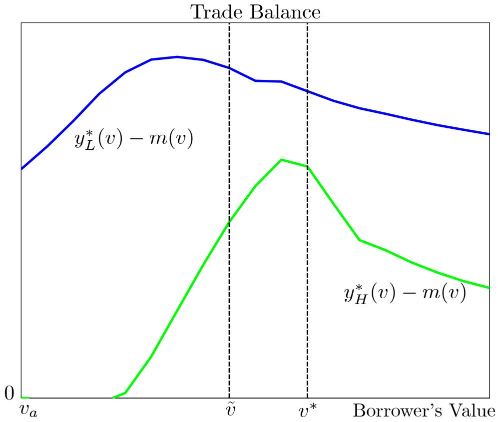
Defaults are Asssociated with Consumption Losses



Recovery Driven by Exports



From autarky, once the economy recovers, large trade surplus