Discussion of

Constrained Efficient Capital Reallocation

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Outline

1. Constraints and Asset Prices
2. Constrained Efficiency

A Static Model

- Endowment $w \sim \pi(w)$
- Invest k to get:
  - μk units of Navy Blue capital (nontradeable)
  - $(1-\mu)k$ units of Orange capital (tradeable)
- Buy x units of Orange capital ($x < 0$ means sell). Price q
- Output: $f(k+x)$
- Borrowing constraint:

$$k + qx \leq w + \theta q \underbrace{[(1-\mu)k + x]}_{\text{value of Orange capital}}$$

- First best: $f'(k+x) = 1$ for all w

Equilibrium

- Firm's problem:

$$\max_{k,x} f(k+x) - qx - k$$

$$s.t. \quad k + qx \leq w + \theta q[(1-\mu)k + x] \qquad (\lambda)$$

$$-x \leq (1-\mu)k \qquad (\eta)$$

- FOC:
  - For k:

$$\underbrace{f'(\cdot)}_{\text{MPK}} - \underbrace{1}_{\text{cost}} - \lambda \underbrace{[1-\theta q(1-\mu)]}_{\text{borrowing constraint}} + \eta \underbrace{(1-\mu)}_{\text{selling constraint}} = 0$$

  - For x:

$$f'(\cdot) - q(1+\lambda(1-\theta)) + \eta = 0$$

- Low w firm:
  - $\lambda > 0$, $\eta = 0$. Buy Orange capital, don't build, borrow up to constraint
  - $f'(\cdot) = q(1+\lambda(1-\theta)) > 1$
- High w firm:
  - $\lambda = 0$, $\eta > 0$. Build, sell all Orange capital
  - $f'(\cdot) < 1$

Rethinking Asset Prices and Constraints

- Rearrange constraint:

$$k \leq \frac{w - qx(1-\theta)}{1 - \underbrace{\theta q(1-\mu)}_{\text{downpayment}}}$$

- For *builder-and-seller* $(x \leq 0)$
  - $\uparrow q$ loosens constraint
  - Allows higher investment
  - $\sim$ Kiyotaki & Moore (1997)

- For *buyer* $(k = 0,\ x > 0)$
  - constraint is just $x = \frac{w}{q(1-\theta)}$
  - $\uparrow q$ tightens constraint

Applications

High Asset Prices Loosen Constrains	**High Asset Prices Tighten Constraints**
Borrow against property plant and equipment to finance payroll	Buy used farm equipment or airplanes (Edgerton, 2011)
Borrow against house to pay for consumption	First time home buyers

Efficiency

- Planner

$$V(k(w),x(w),q) = \int [f(k(w)+x(w)) - qx(w) - k(w)]\, d\pi(w)$$

$$\begin{aligned} s.t. \quad & k(w)+qx(w) \leq w + \theta q[(1-\mu)k(w)+x(w)] && (\lambda(w)) \\ & -x(w) \leq (1-\mu)k(w) && (\eta(w)) \end{aligned}$$

- Marginal value of increasing q:

$$\frac{dV}{dq} = \underbrace{\int x(w)\, d\pi(w)}_{=0 \text{by market clearing}} + \int \underbrace{[-x(w)(1-\theta)+\theta(1-\mu)k(w)]\lambda(w)}_{\text{buyers } x>0 \text{ are constrained } \lambda>0} d\pi(w) < 0$$

- Lower asset prices reduce misallocation

Constrained Planner Problems

- "Constrained efficiency" (Geanakoplos & Polemarchakis, 1986, Lorenzoni, 2008)
  - Planner controls some decisions but not others
  - Let's you ask "is investment (or consumption, labor supply, etc.) efficient"?
- Here: planner chooses *both* prices and decisions
  - Set
    $$q = \frac{w}{(1-\theta)\,k^{FB}}$$
    so poorest firm can afford first-best quantity of Orange capital
  - Tell unconstrained firms to invest enough to clear the market
- Prices have no allocative role
- Must only respect borrowing constraints
- What question is this planning problem the answer to?