Conventional and Unconventional Monetary Policy with Endogenous Collateral Constraints

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- What are the uses of this additional dimension of policy?

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  - all agents can purchase all assets at same prices
  - endogenous determination of risk premia
- Private borrowing must be collateralized
  - collateral requirements endogenized as in Geanakoplos (1997), Geanakoplos-Zame (2013)
  - CB (government) liabilities subject to no such constraint

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  - Real value of nominal quantities is endogenously determined, affected by both aspects of monetary policy

  — are asset purchases useful as a way of preventing unwanted deflation, when interest-rate policy is constrained by the ZLB?

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- But even when collateral constraints bind, and CB purchases affect asset prices, asset purchases need not have effects that are equivalent to (or even similar to) those of an interest-rate cut

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- For large enough CB purchases, second case applies

The Model

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  — interest in effect on aggregate demand in period 0

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- Two goods, non-durable and durable, at each date

  — durable good the only form of collateral for private borrowing

The Model

- Assets:
  - durable good (yields one unit of services at each date and in each possible state; can be rented)
  - money (liability of CB, pays riskless nominal rate i)
  - riskless gov't debt (defined by nominal value at maturity)
  - privately issued financial claims: promise fixed nominal amount at date 1, backed by durable as collateral (multiple types, with different degrees of collateralization, may coexist)

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  - purchases d^{CB} units of public debt and x_3^{CB} units of durable in period 0, at period 0 market prices
  - issues reserves in quantity

$$M \equiv q_{pub} d_3^{CB} + (p_3 - p_2) x_3^{CB}$$

to finance purchases

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- CB also determines value of money in terminal period: p_{s1} an independent choice for each possible state s
  - in an infinite-horizon model, could simply have interest-rate policy each period (and each state)
  - here instead: CB assumed to redeem the money for non-durable goods at date 1, at specified parity

Fiscal Policy

- Net tax collections at date 1 in aggregate amount

$$\mu - p_{s3} x_3^{CB}$$

to retire public debt (net of contribution to public finance of CB seignorage revenues)

— where μ is aggregate public supply of riskless assets (= gov't debt in hands of public + M)

  - obligation divided (lump-sum) among households according to tax shares θ^h $(\theta^h \geq 0, \ \sum_h \theta^h = 1)$

    – Note: Ricardian fiscal policy

Financial Markets

- Borrowing:
  - only enforceable debt contracts only allow lender to seize collateral backing the loan if not paid
  - debt can be discharged either by delivering specified amount of money, or specified amount of durable good (collateral)(at option of borrower)

    — each amount specified independently of state s

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  - w.l.o.g., assume contract j promises 1 unit of money, or C_j units of durable

Financial Markets

- Endogenous collateral requirements (Geanakoplos, 1997):
  - assume market exists (in principle) for every possible contract C_j, Walrasian auctioneer finds prices that clear all markets
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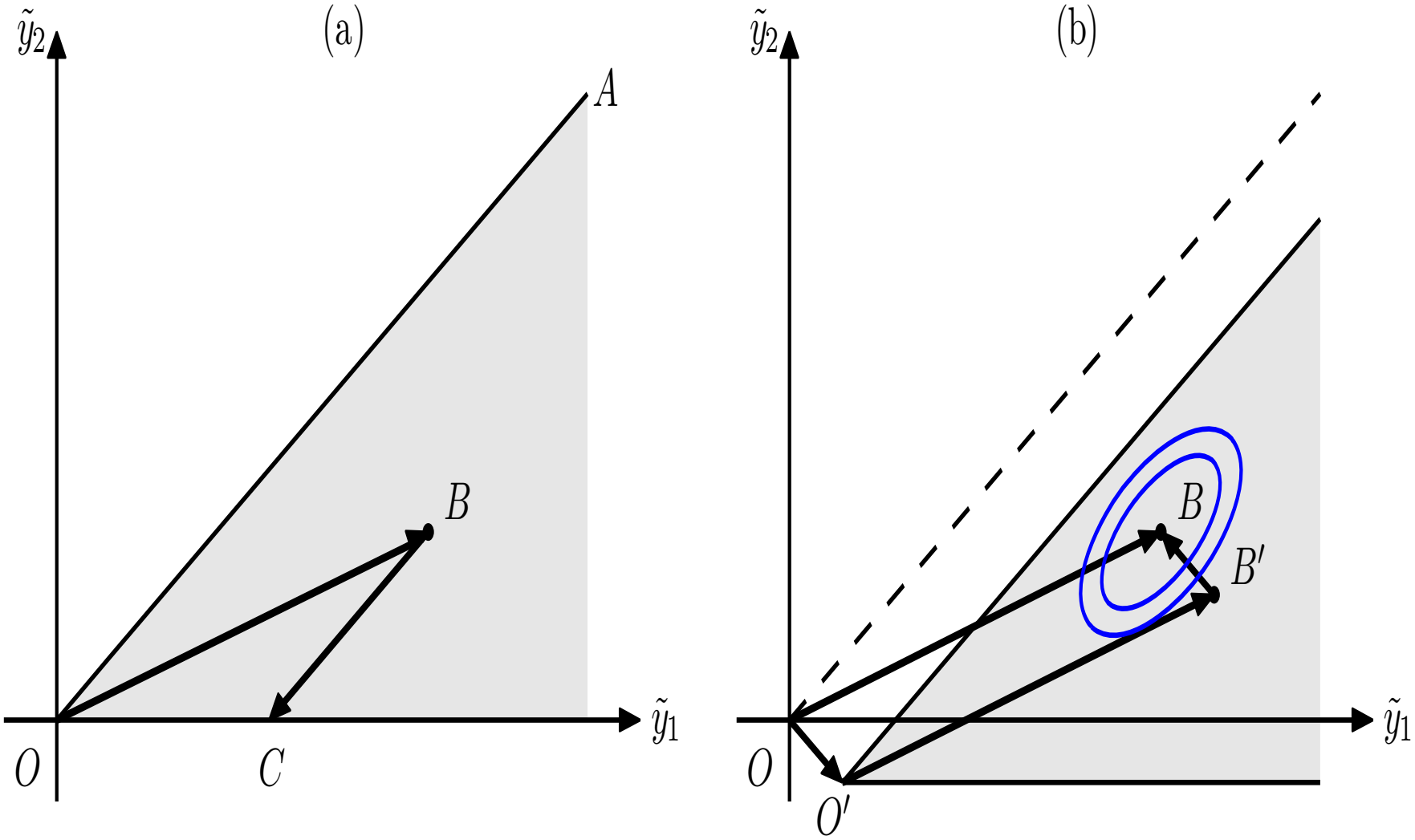
- Lemma: only open markets are (at most) $j = 1, \ldots, S$ with collateral requirements $C_s = 1/p_{s2}$

Asset Purchases: An Irrelevance Result

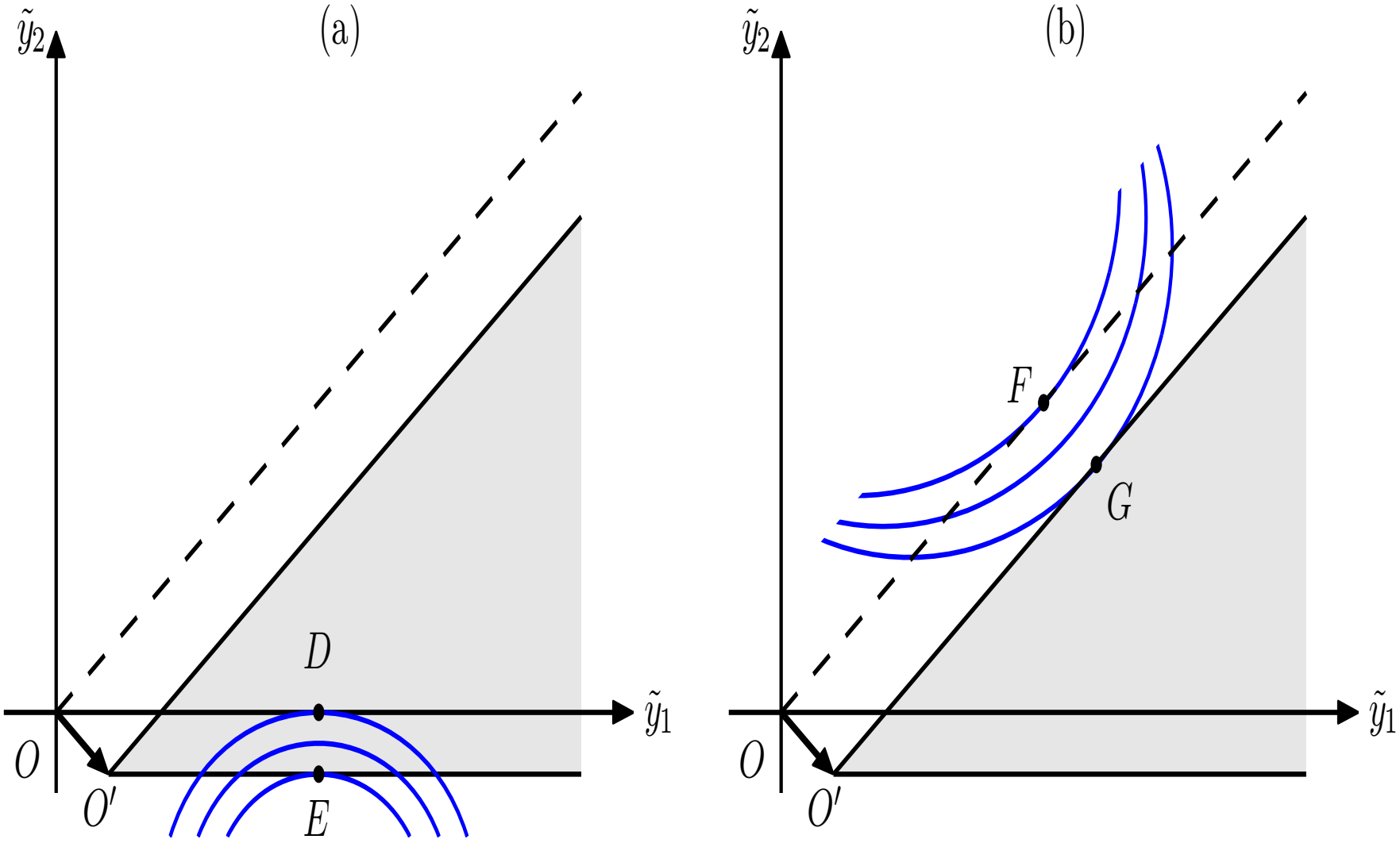
- Proposition: suppose there is sufficient collateral for no household's collateral constraint to bind in equilibrium, and that this continues to be true after an increase in x_3^{CB}. Then the equilibrium asset prices, goods prices, and consumption allocation are all unaffected by the CB's additional purchases of the durable.

How Asset Purchases Can Be Irrelevant



Set of feasible vectors $\tilde{\mathbf{y}}^{\mathbf{h}}$ of intertemporal transfers

Two Ways that Asset Purchases Can Matter



Two ways that collateral constraint can bind

Two Ways that Asset Purchases Can Matter

- Lesson: Even when collateral constraints bind, it is not necessarily true that CB asset purchases will "ease financial conditions," in the sense of relaxing financial constraints:

  — collateral constraints may be tightened or loosened, depending on the endowment pattern

A Binding Leverage Constraint

- Consider first the case in which "natural buyers" of the risky asset are constrained in their ability to leverage themselves further, in order to buy more of the asset (panel (a) of previous slide)

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- Special case: $H = 2$, each have homothetic preferences, with $\gamma \leq 1$
- Consider eq'a in which leverage constraint binds for one type ($h = 2$), other type is unconstrained

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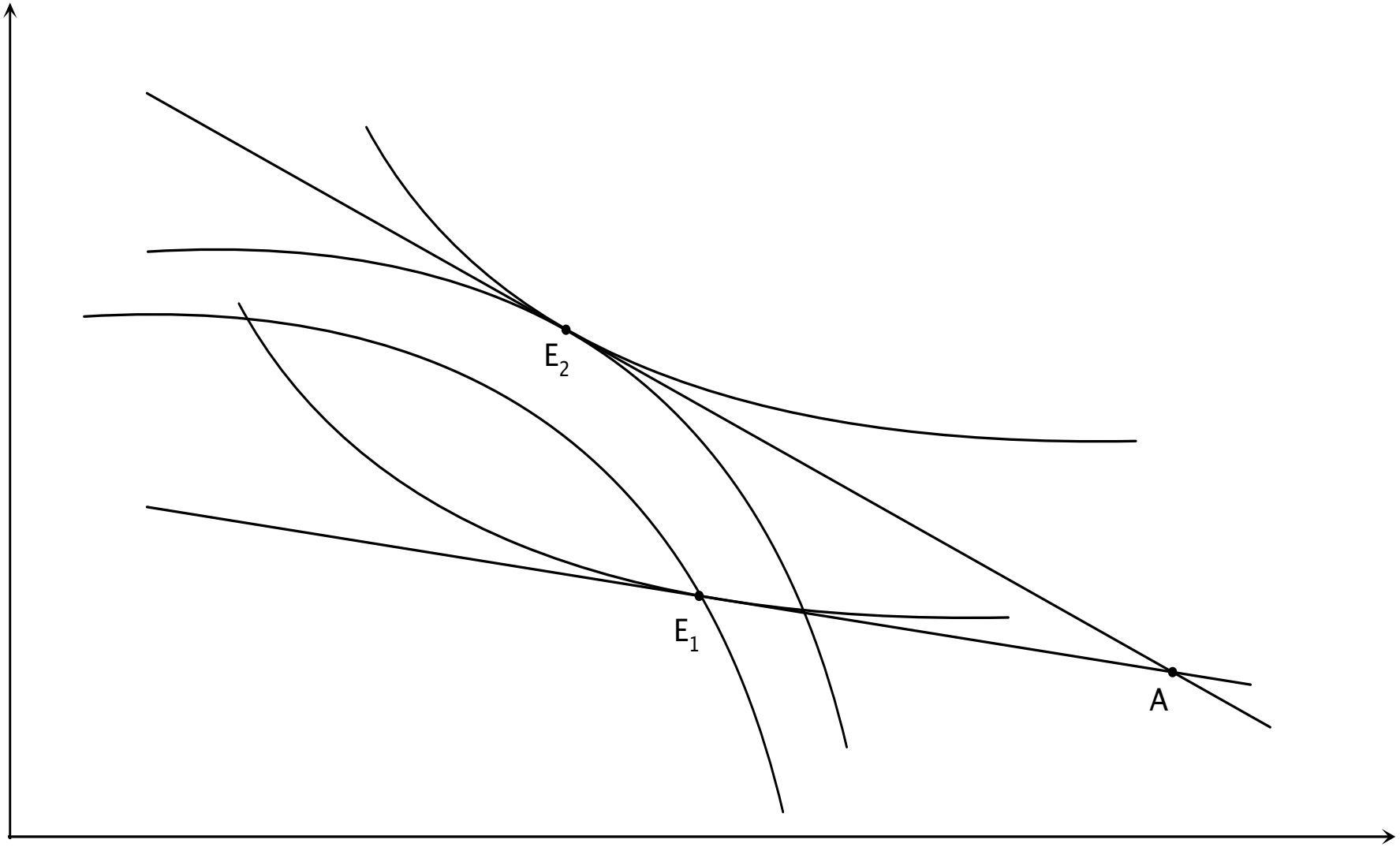
- Possible eq'm allocations with only (at most) a binding leverage constraint can be represented in an Edgeworth Box diagram

Leverage-Constrained Equilibria



Eq'a with differing tightness of constraint on hh 2.

Leverage-Constrained Equilibria

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  - reduction in spread $\hat{r}^{dur} - \hat{r}$;

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  - reduction in spread $\hat{r}^{dur} - \hat{r}$;
  - if i unchanged, increases in both p_1, p_3 (p_1 increases by greater proportion);
  - hence general price level and aggregate nominal spending in period 0 increased

Effects of CB Asset Purchases

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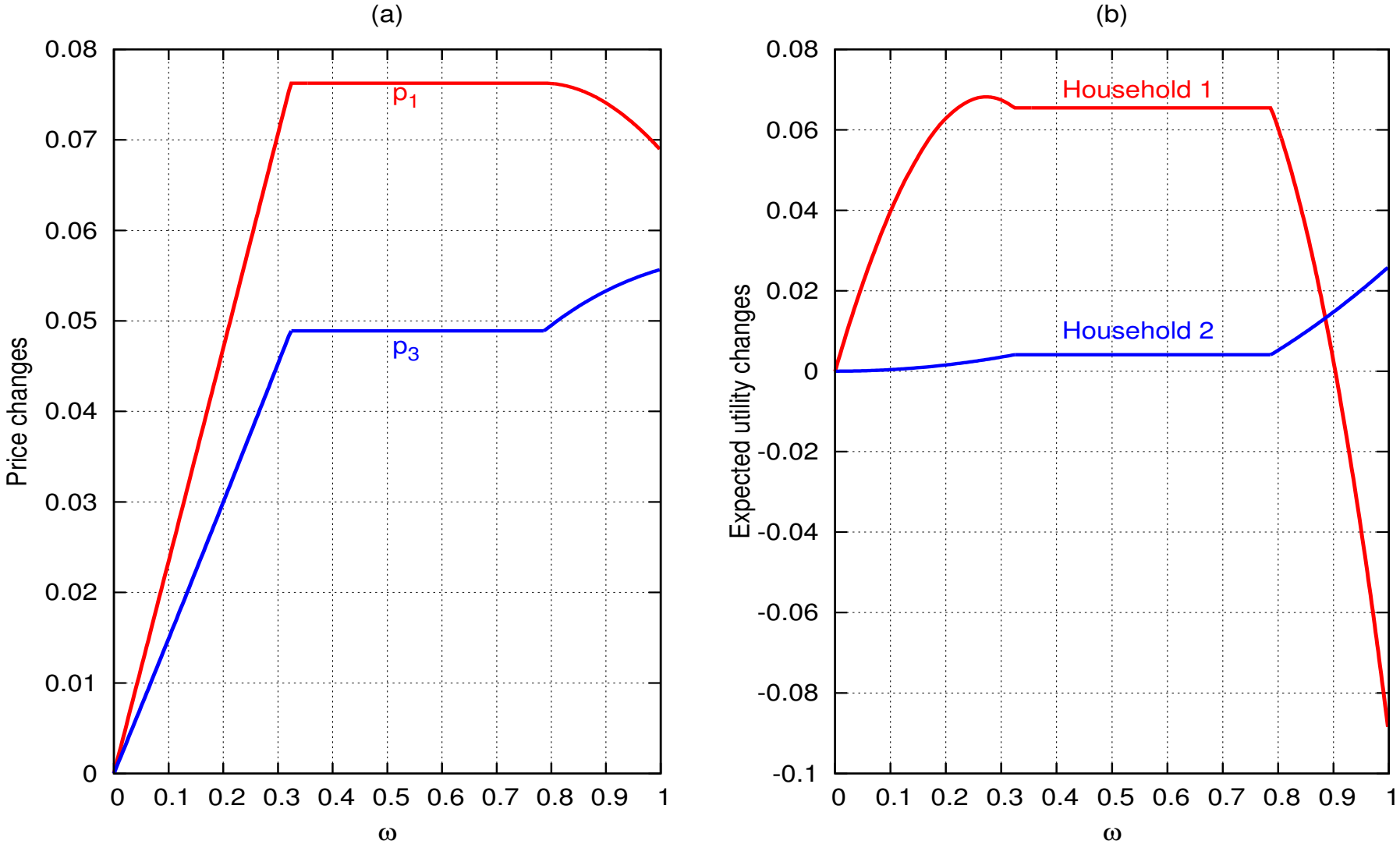
- But for large enough asset purchases, (generically) some households become short-sale constrained

  — and above analysis will not apply

Consequences of Binding Short-Sale Constraint

- Even when CB is able to increase asset price (reduce risk premium) by purchasing more of the durable,
  - need not relax hh collateral constraints
  - need not increase aggregate demand, or raise general level of prices in period 0
  - may reduce welfare of some or even all

A Numerical Example



Effects of varying ω over entire range

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- Even when CB purchases of moderate size are beneficial, larger CB purchases may be counter-productive