Discussion of:

Do Cryptocurrencies Matter?

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The views expressed here are those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System.

The question

- Paper asks: when will households choose to hold an asset like Bitcoin …
- … and does welfare go up or down? ("Are cryptocurrencies good or bad?")
- Naïve answer: if households choose to hold it, they must be better off
  - but … general equilibrium effects, especially in second-best settings

  ⇒ we need a model
- The paper studies this question in a rich model, provides interesting answers

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My discussion

- Give a quick, graphical overview of the model and key mechanisms
  - at a high level, the main results are very intuitive
  - but there are subtle mechanisms, modeling choices at work
- Ask: how “robust” are the results to changes in the model?
  - sketch one alternative model and make some conjectures
- End with two (broad) questions for future research

The model

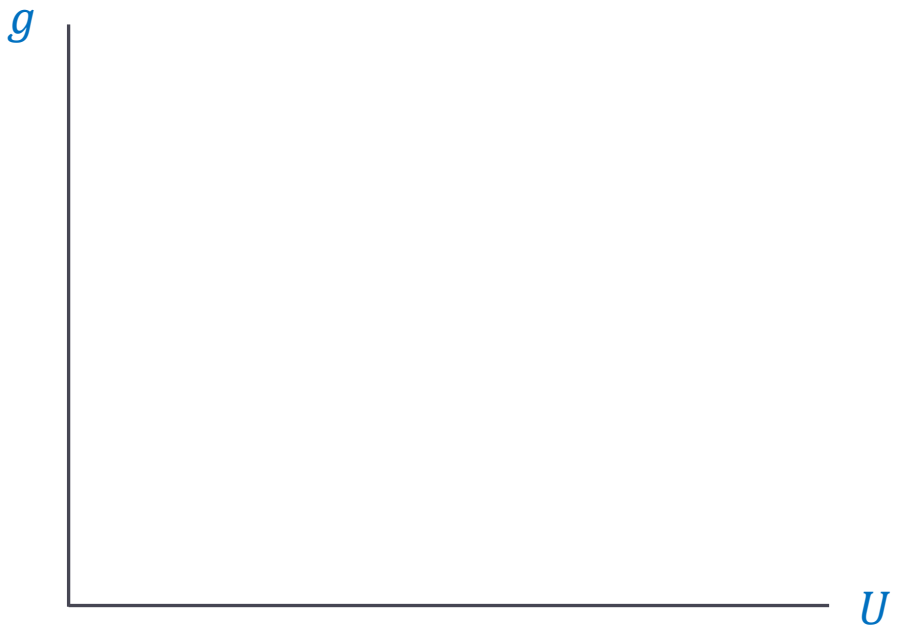
- Endogenous growth model with AK production technology
- Households can save in two assets
  - capital, which has uninsurable idiosyncratic risk (→ Bewley-type model)
  - (safe) fiat money issued by the government
- The government has two tools:
  - a proportional tax (or subsidy) on wealth
  - the growth rate of the money supply (seigniorage income; affects portfolio choices)
- Households care about the expected utility of their own consumption
- Government's objective: $\int_0^1 \mathbb{E}\left[u\left[c^i\right]\right] di + \beta(\text{govt. revenue})$

  govt "steals" the revenue
  - where $\beta \geq 0$ measures the predatory motive

Graphically

- Graph the set of possible combinations of (stylized)

$$U = \int_0^1 \mathbb{E}\left[u\left[c^i\right]\right] di \quad \text{and} \quad g = \text{govt. revenue}$$



- Suppose $g = 0$ (purely benevolent gov.)
- Find optimal policy $\rightarrow U^*$
- Typically involves active fiscal policy
  - recall: markets are incomplete
  - under some conditions:
    - optimal growth rate of M is positive ($\Rightarrow \tau < 0$)
    - because agents tend to over-save in the safe asset (money) (I think)

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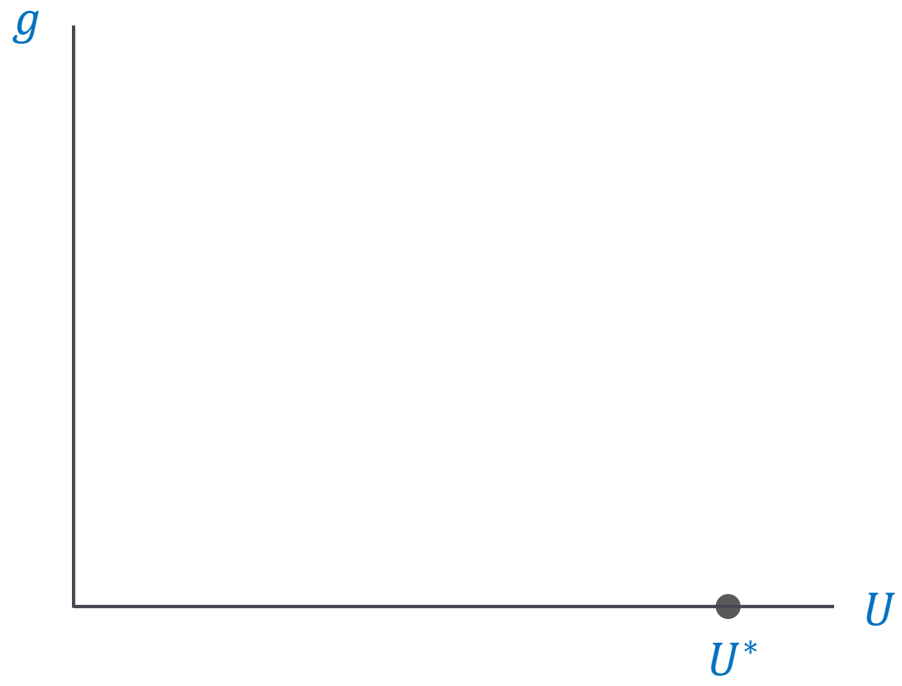

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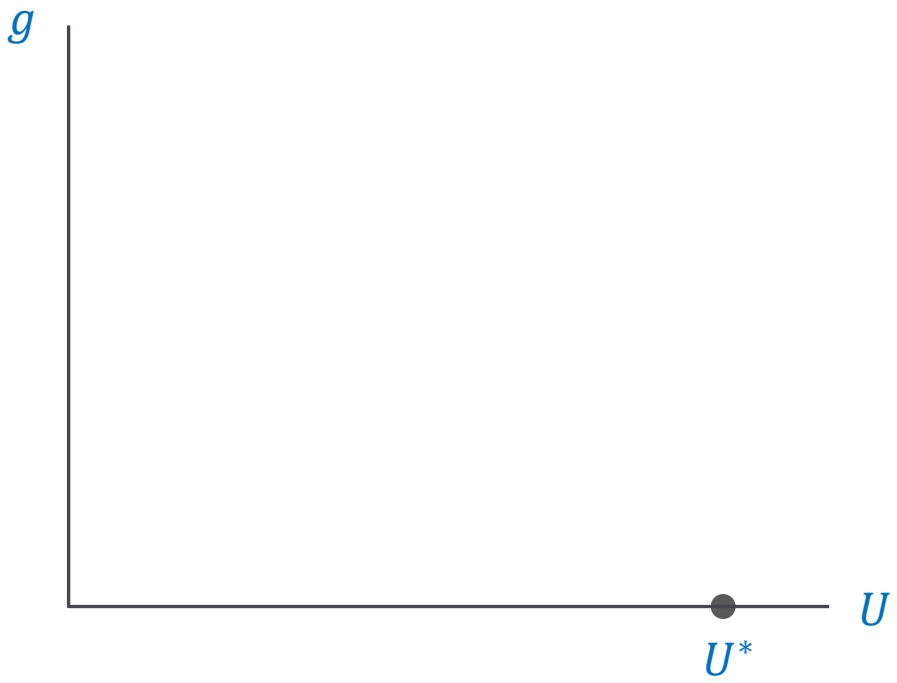

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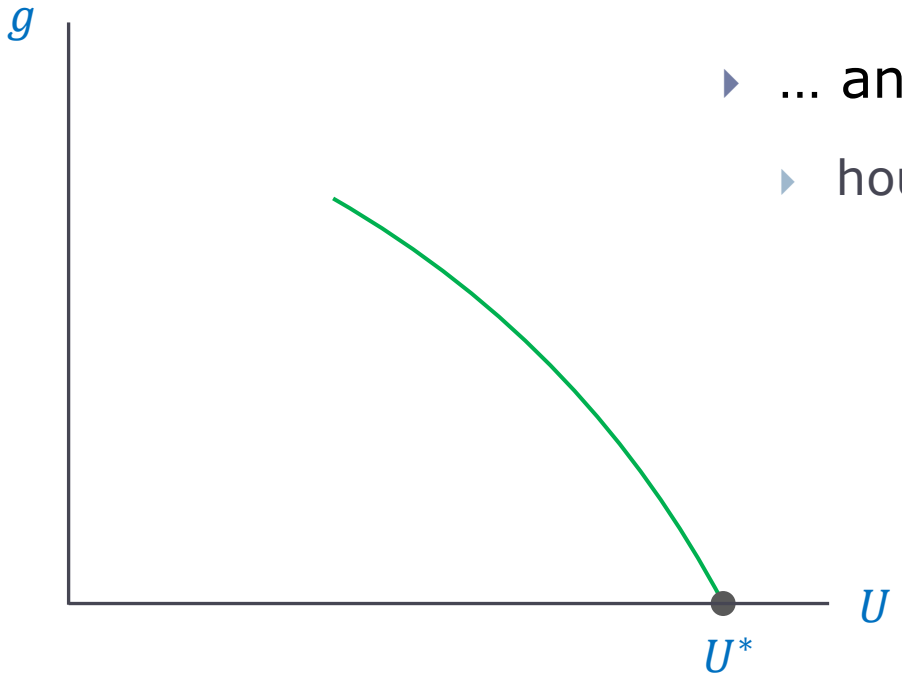
Raising revenue

- Now suppose the government wants to raise revenue
  - Increases the growth rate of M ($\rightarrow$ seigniorage) …
    - which causes agents to shift toward capital (Mundell-Tobin effect)
      - … and sets positive wealth tax $(\tau > 0)$
        - households have less consumption, less insurance
          - At some point: households stop holding money
            - $\Rightarrow$ all saving goes into capital (raises output)
            - govt can still raise revenue with the wealth tax
              - Could have a Laffer curve (or not)



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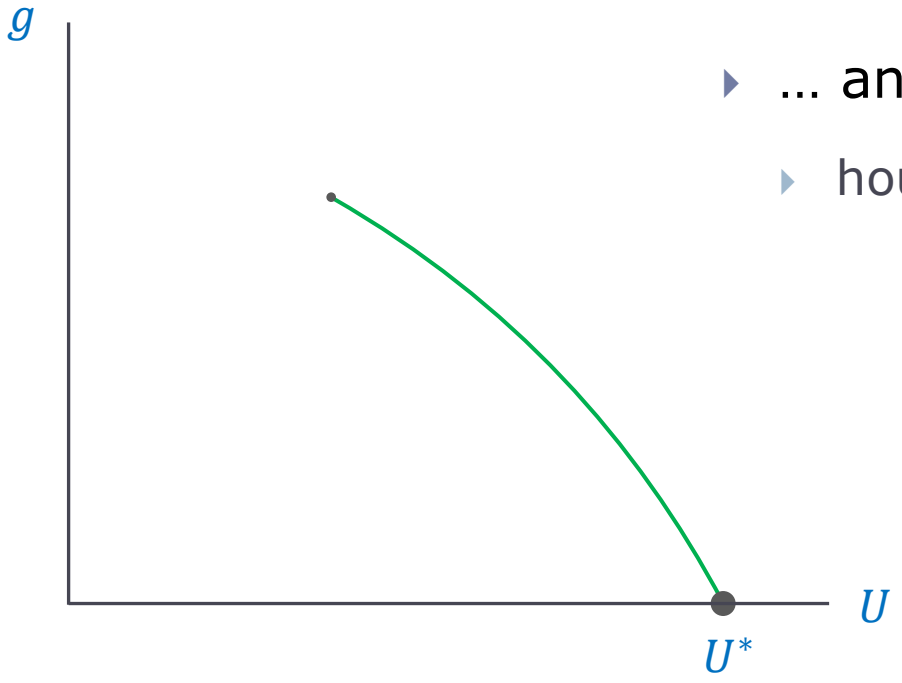

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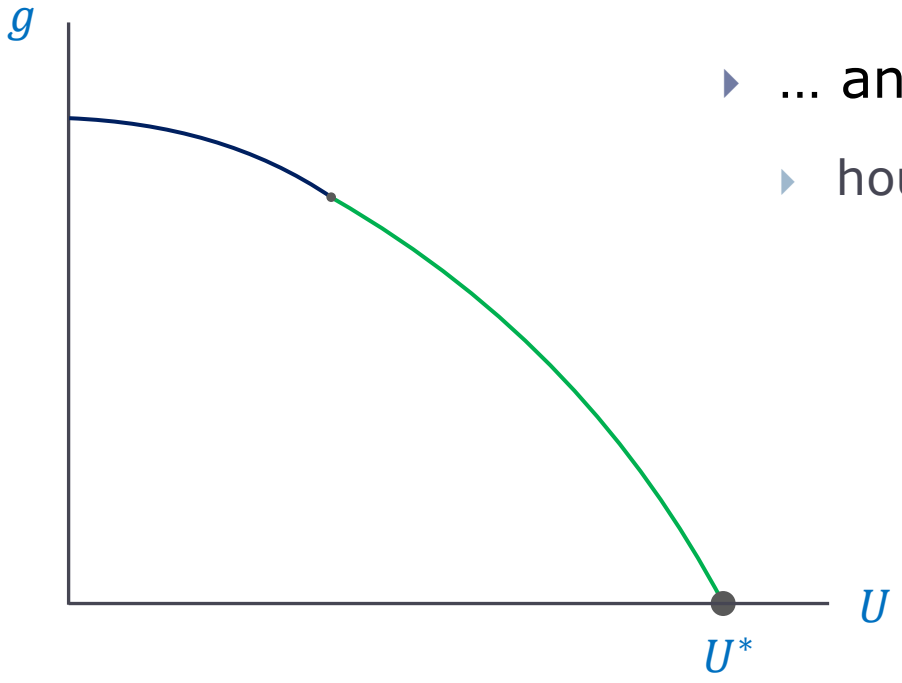

Government policy

- Government objective: $\int_0^1 \mathbb{E}\left[u\left[c^i\right]\right] di + \beta g$ → linear indifference curves; slope $-\frac{1}{\beta}$
  - Fully benevolent govt ($\beta = 0$) ⇒ vertical line
    - implements U^*
  - Somewhat predatory ($\beta > 0$) ⇒ flatter line
    - higher inflation …
    - and higher investment, more revenue from wealth tax
  - If sufficiently predatory (β large) ⇒
    - agents hold no money ("hyperinflation")
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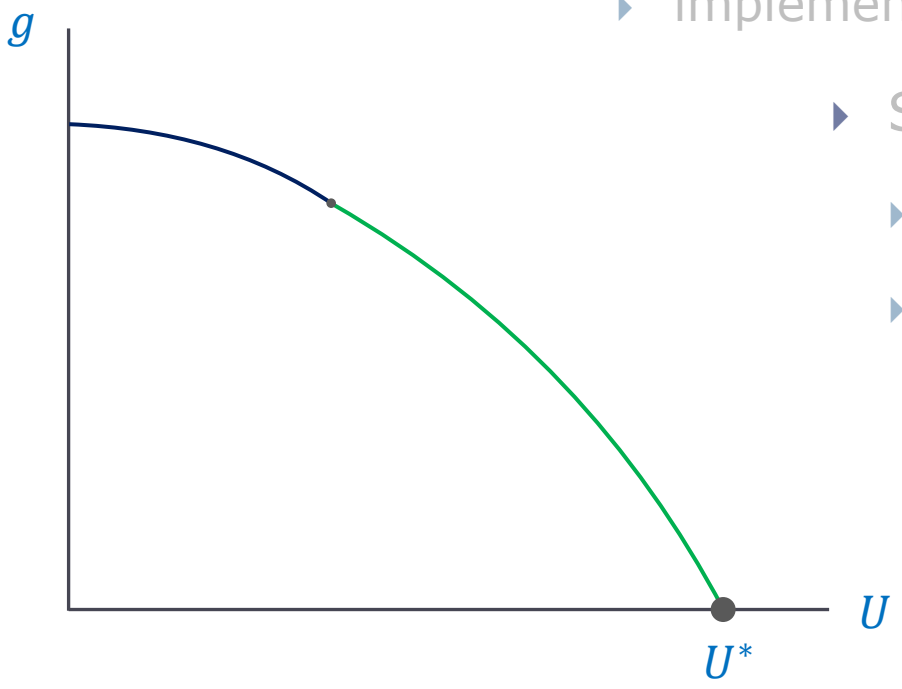

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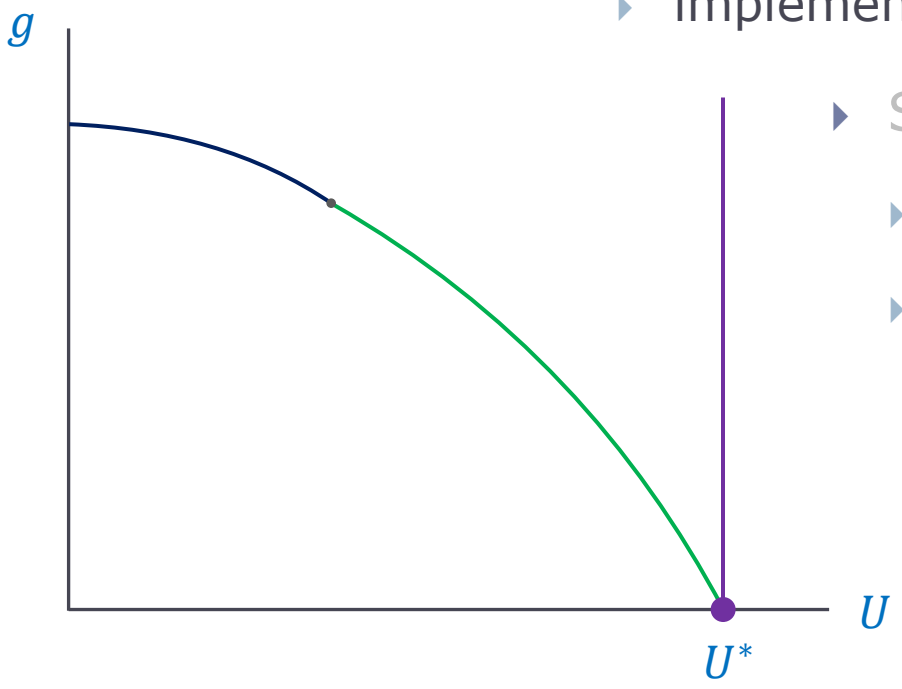

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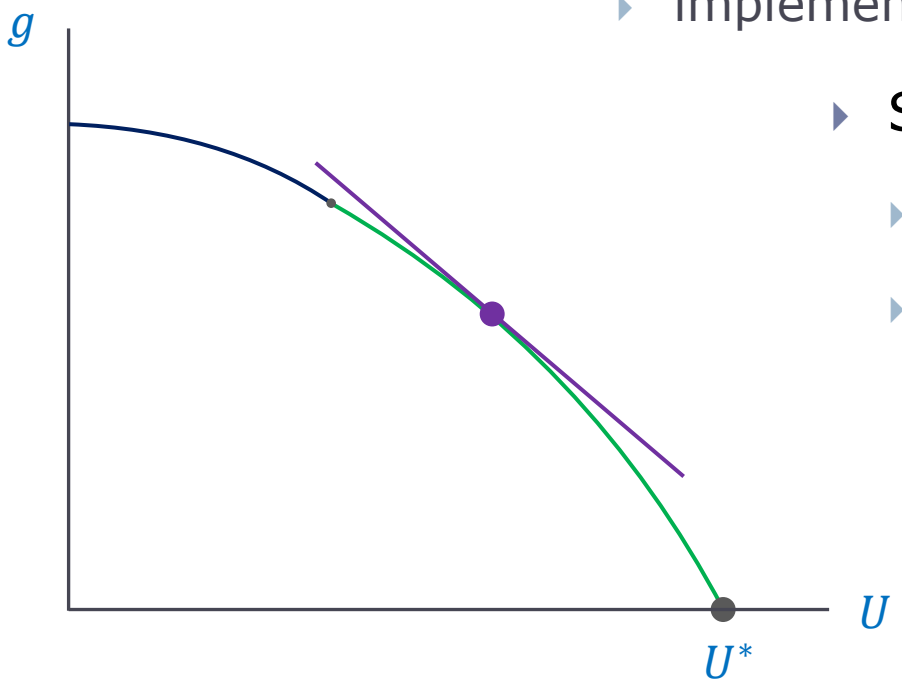

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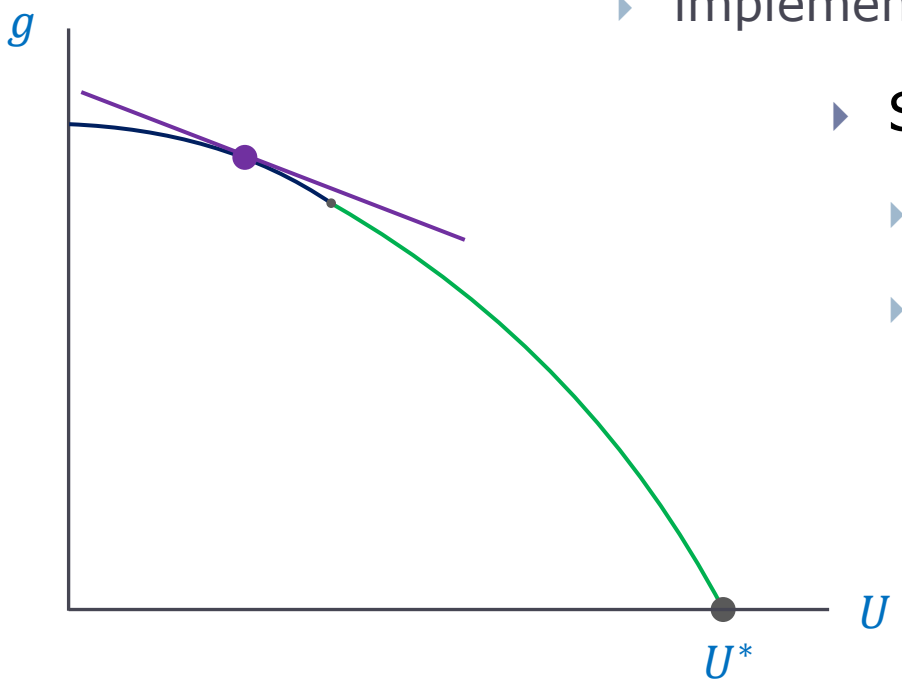

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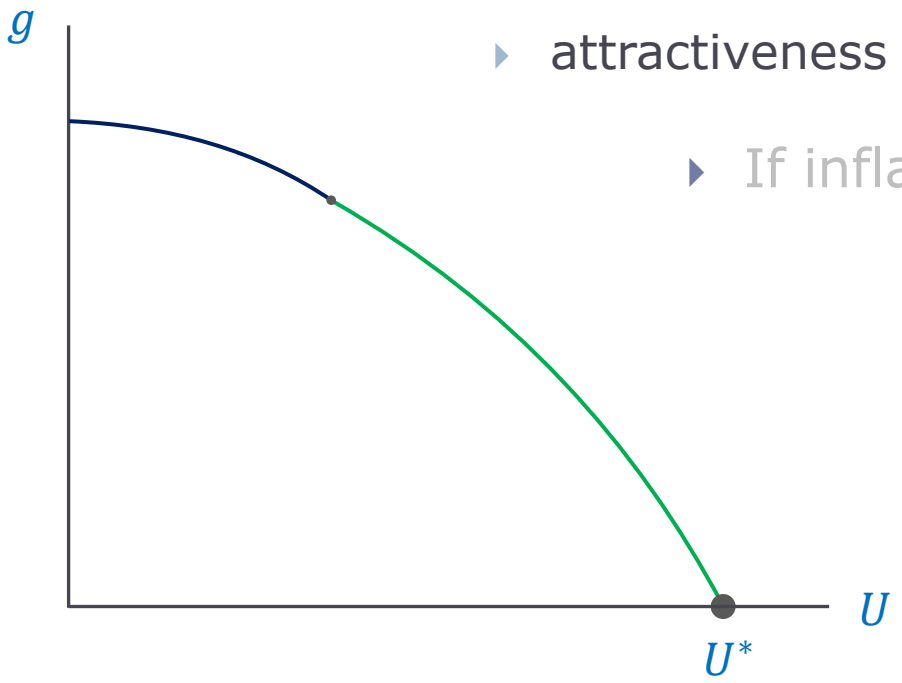
Adding crypto

- Introduce a cryptocurrency with constant supply (⇒ deflation at rate g)
  - but value crashes to zero with probability λ in each period
    - Now: households have an <u>untaxed</u> saving option
      - attractiveness depends on λ (obviously)
        - If inflation is low enough, households will not hold crypto
        - Beyond a point, crypto becomes attractive
          - govt can still increase tax rates and revenue …
          - … but the tradeoff is worse
            - because saving → an inefficient, untaxable form
        - Lower crash risk ⇒ this shift occurs earlier



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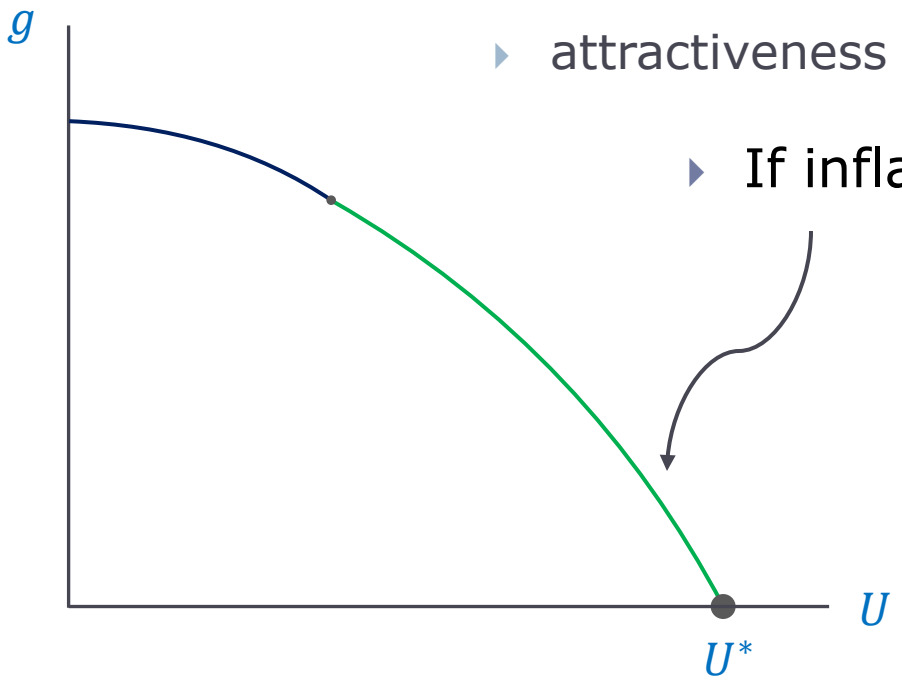

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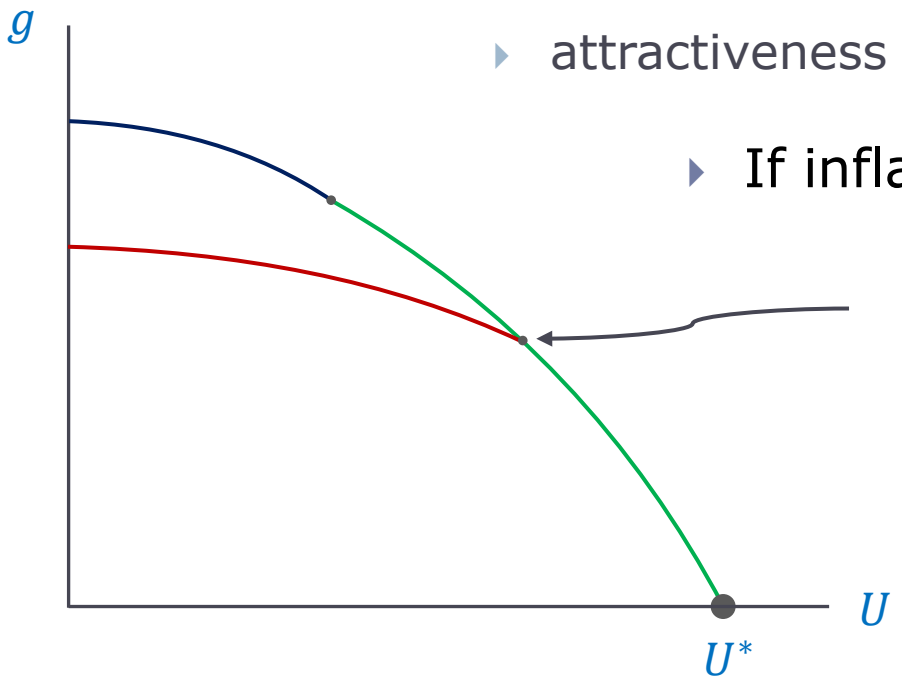

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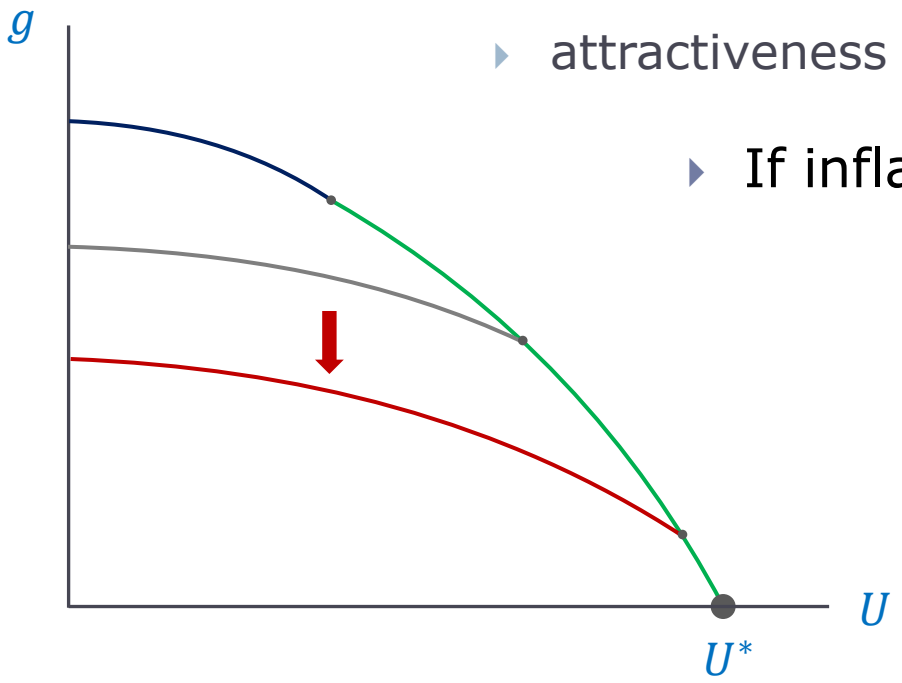

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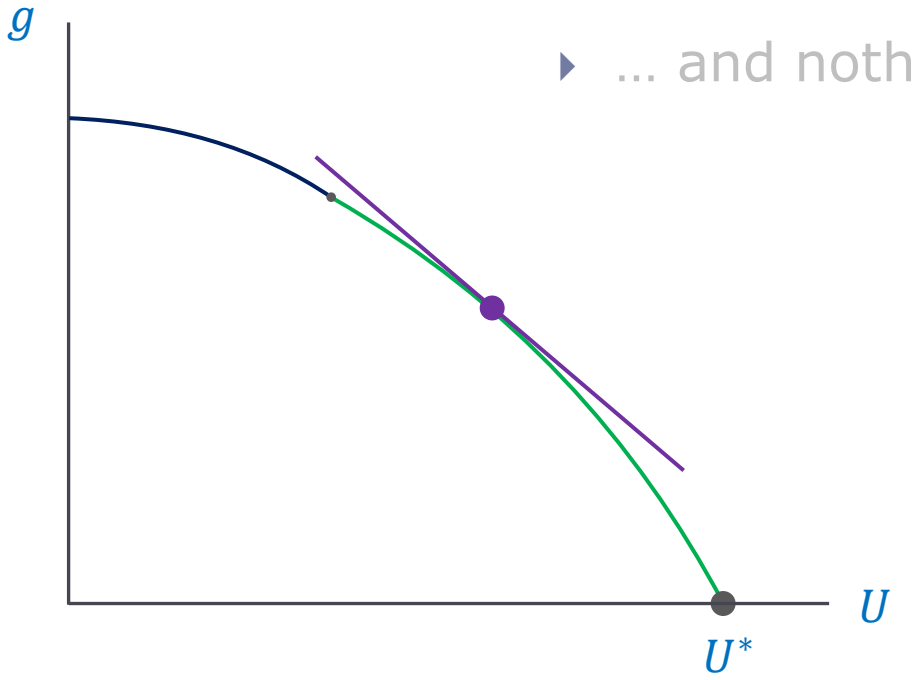

More interesting question:

- If the crash risk is lower …
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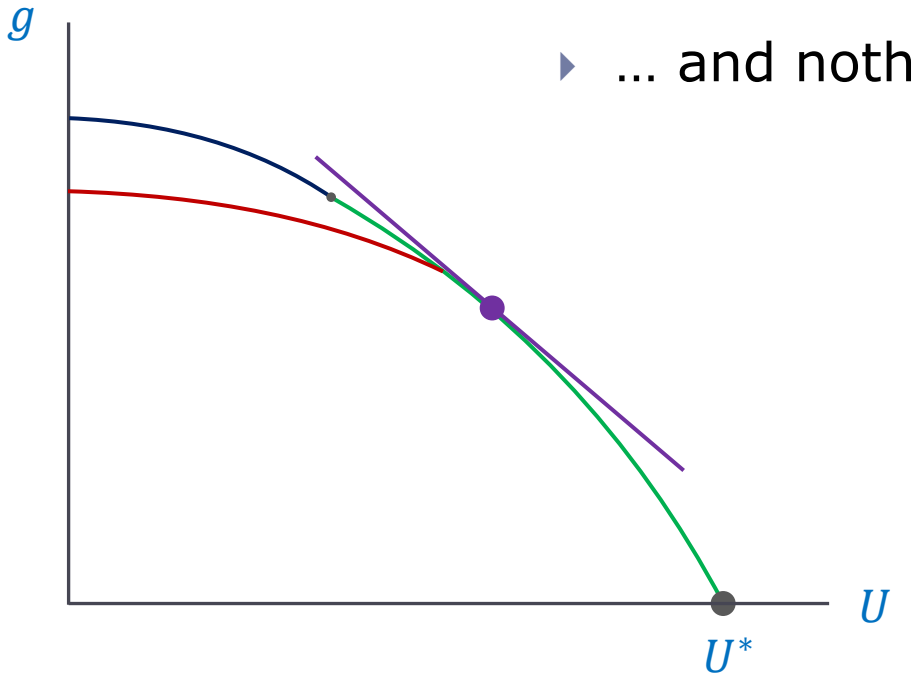

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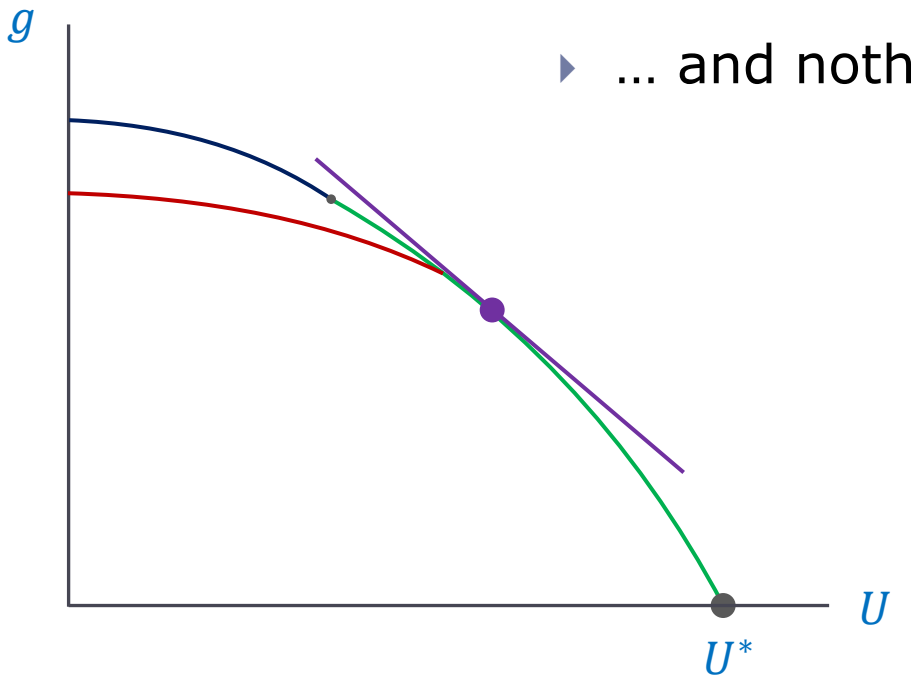

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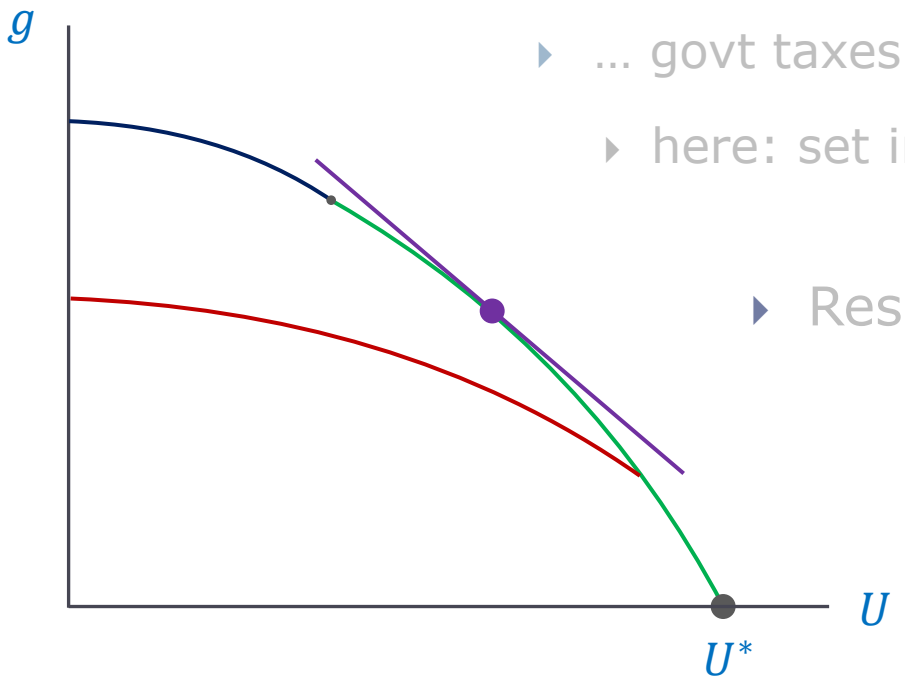
Main result 1

- If the crash risk is smaller → the previous point is no longer feasible
  - How will the government react?
    - because the tradeoff is worse (flatter) …
    - … govt taxes less ⇒ households' utility increases
      - here: set inflation to (just) discourage holding crypto
        - Result: when the govt is predatory, crypto is <u>good</u>
          - Interpretation:
            - applies in countries where inflation is high
            - paper encourages us to think of Argentina, Turkey, etc.



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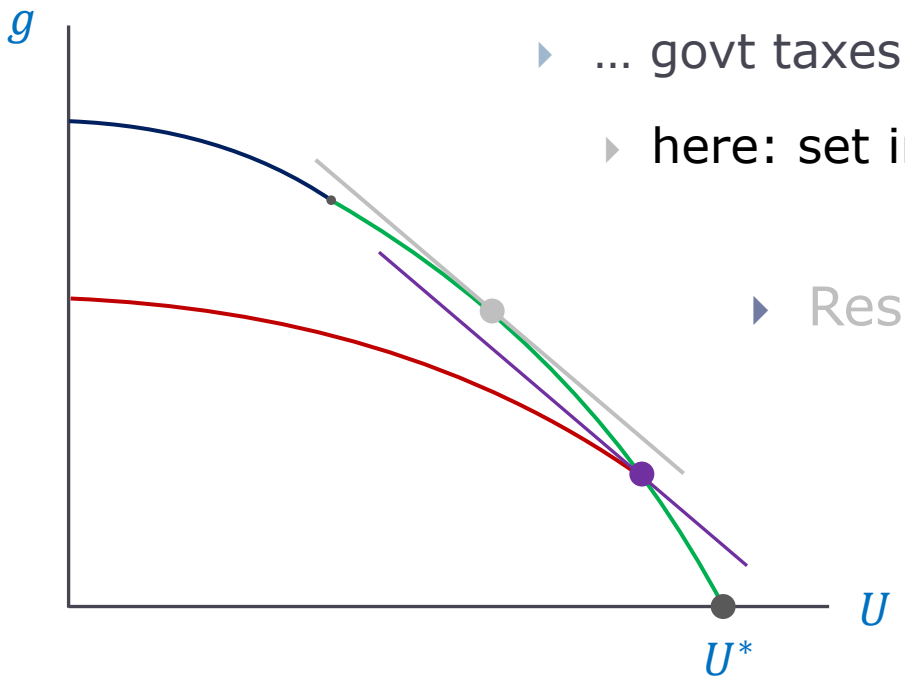

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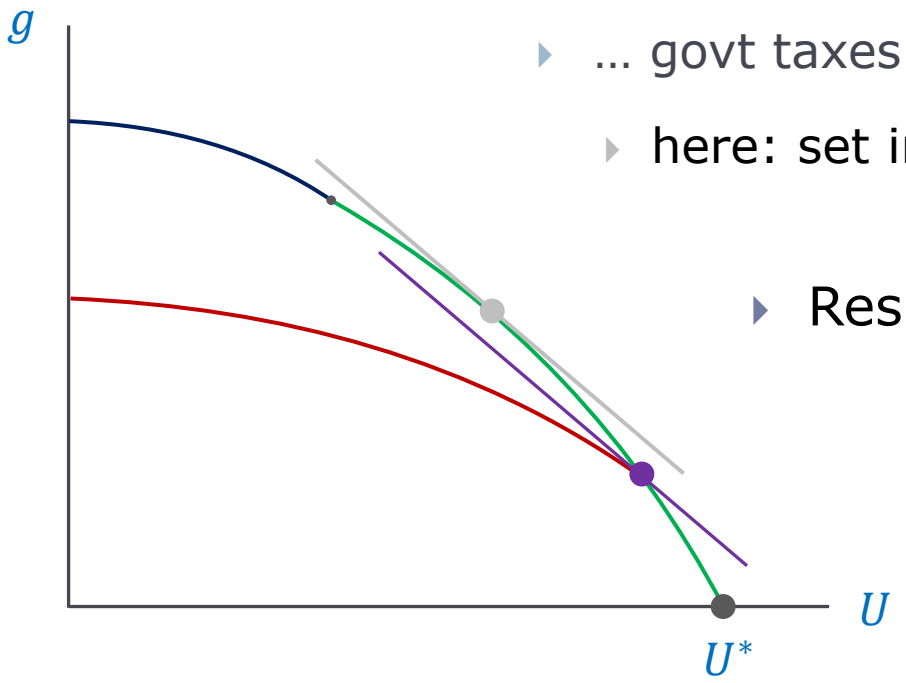

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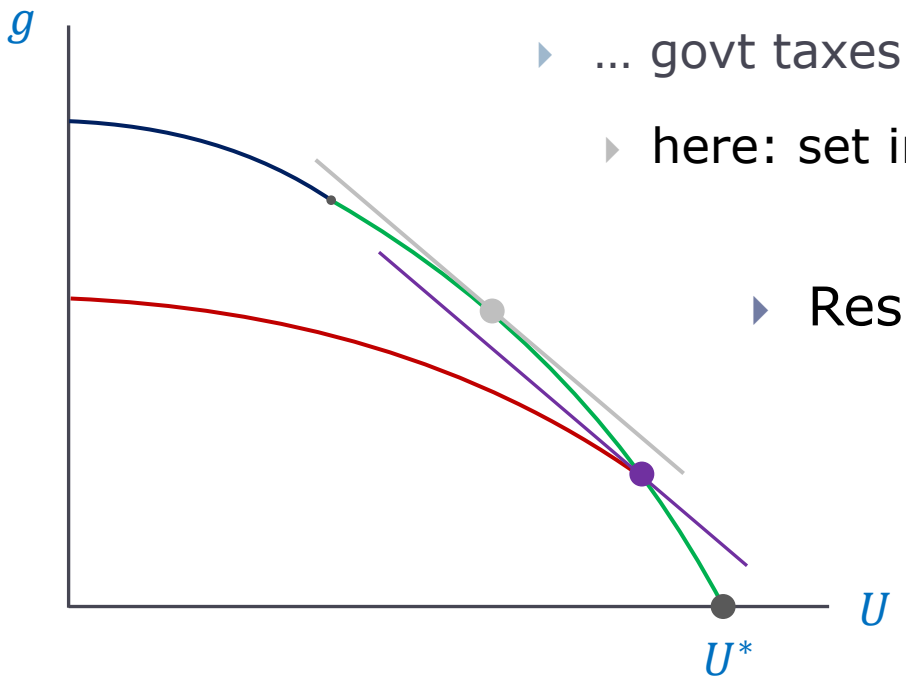

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- As crash risk $\to 0$ … crypto becomes attractive even under the benevolent policy
  - why?
    - Recall:
      - a benevolent govt taxes money holdings (and rebates the proceeds)
      - a good-enough cryptocurrency undermines this policy (I think)
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            - applies in countries where inflation is low
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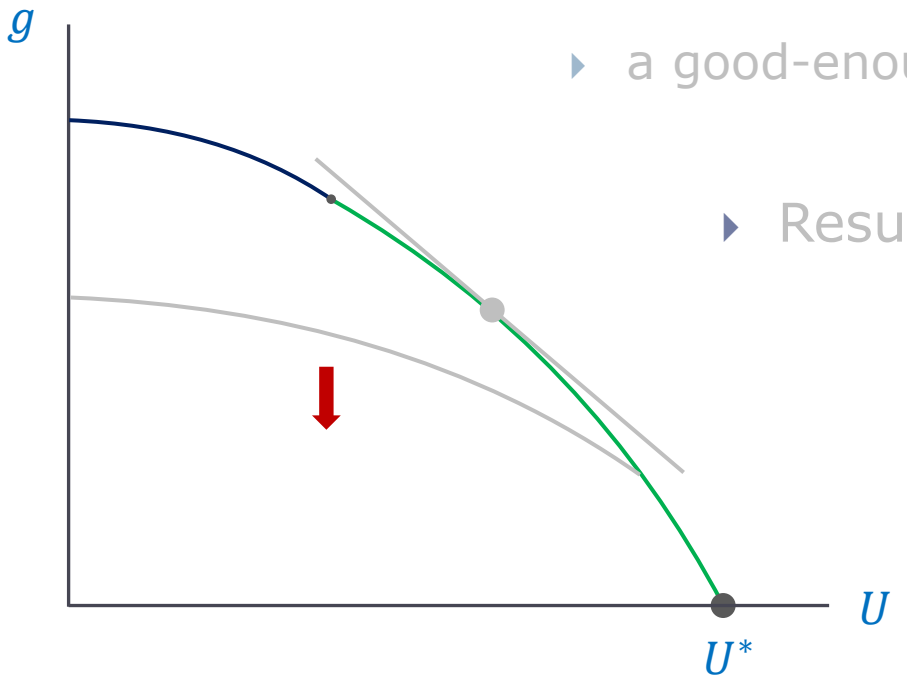

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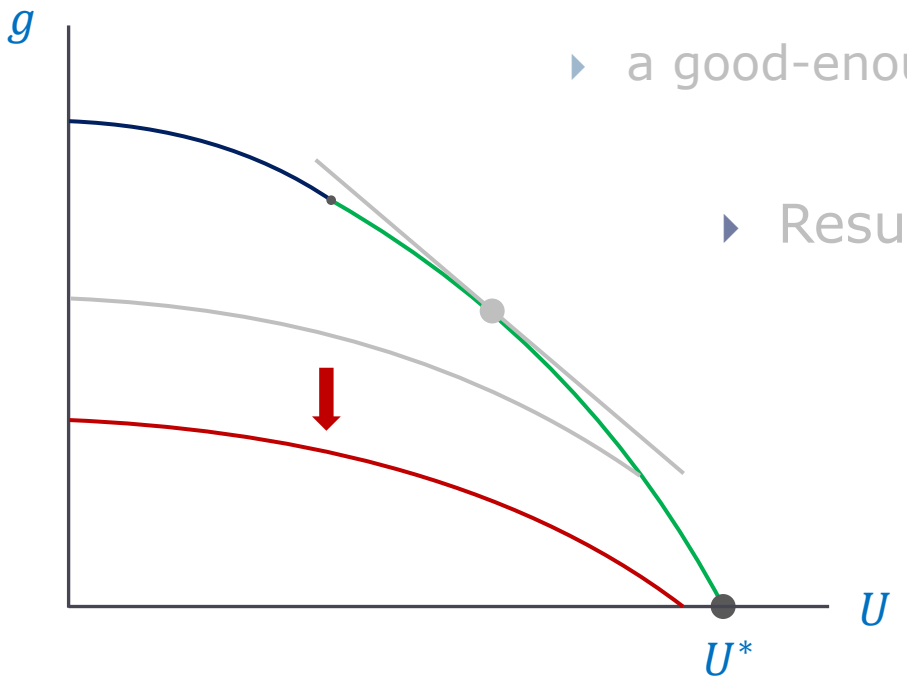

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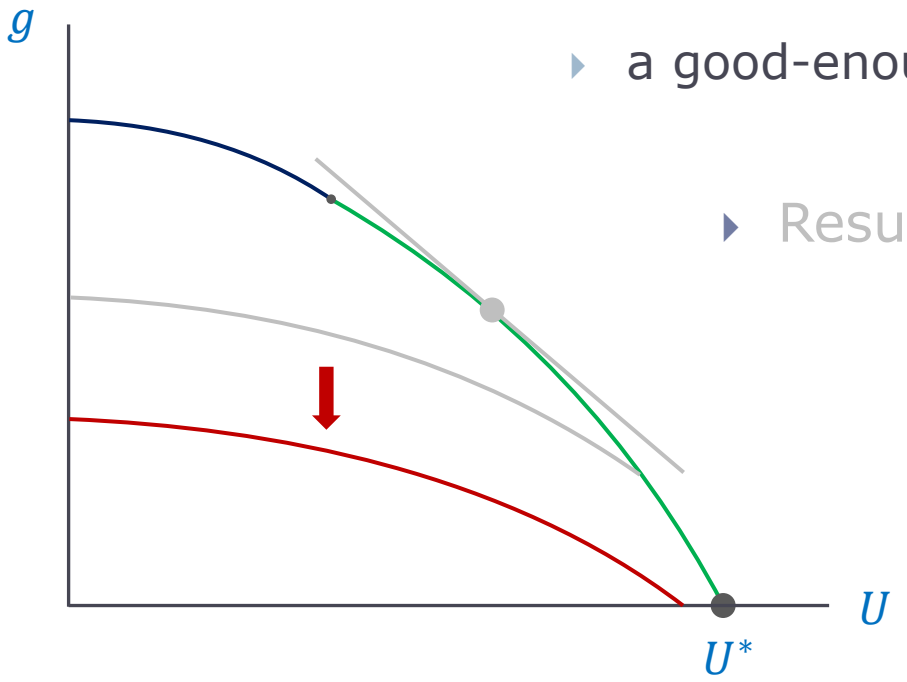

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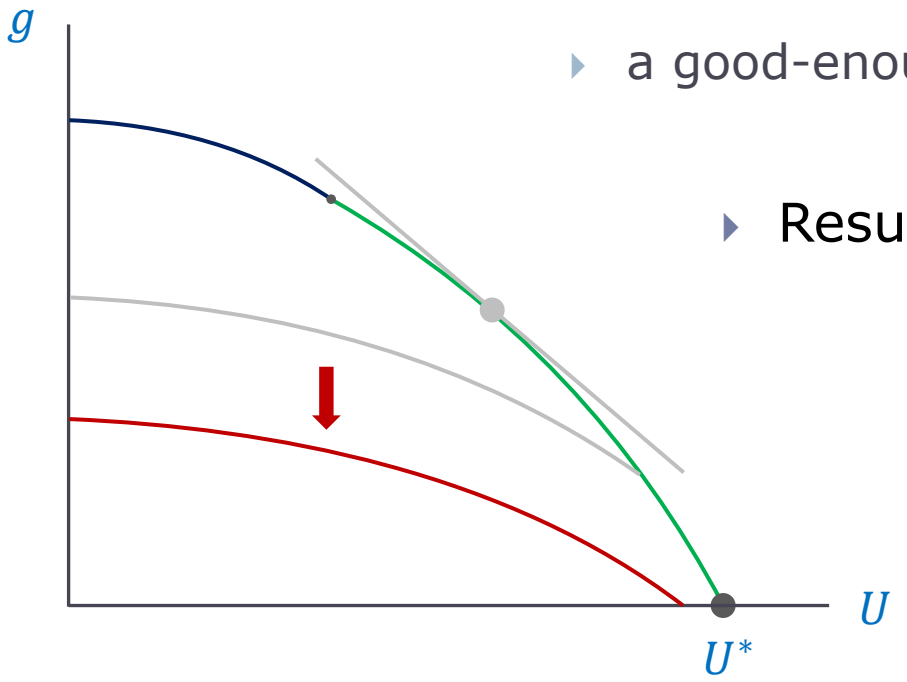

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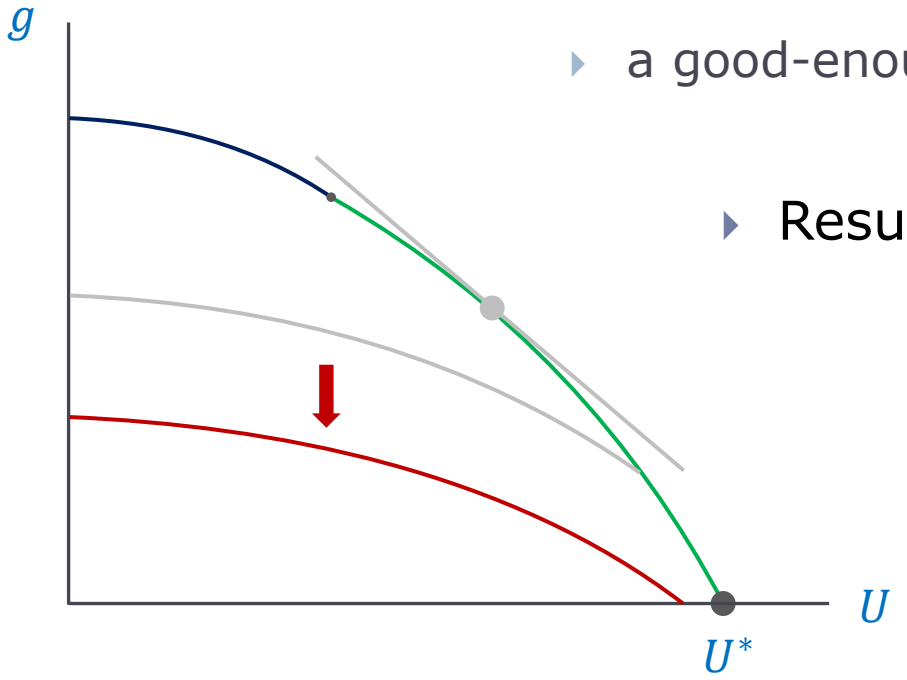

Robustness

- The model has particular features, some counterintuitive
  - high inflation is associated with high investment (Mundell-Tobin)
    - but very high inflation countries typically have low investment, growth, etc.
  - currency is held for insurance rather than transactions purposes
  - a benevolent government inflates because people overinsure
    - is this why central banks target 2%?
  - cryptocurrency competes with physical currency, not (say) bank deposits
  - high inflation reflects predatory policy choices
    - not a reasonable attempt to deal with a bad situation

Q: To what extent are the results driven by these modeling choices?

- and to what extent do they reflect more general phenomena?

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What causes high inflation?

- Here: lower inflation is perfectly feasible, but not optimal for the (predatory) government
- An alternative story:
  - government has a revenue requirement $\bar{g}$
    - needed for national defense, say (or healthcare, …)
  - … and has difficulty raising revenue (tax evasion, large informal sector, etc.)
    - suppose the only way to raise revenue is seigniorage
- Result: a benevolent government (in a bad situation) chooses high inflation
- Introducing a cryptocurrency undermines this policy
  - and makes households worse off (government is unable to raise $\bar{g}$)

- Notice: the main results still hold in this alternative model
  - the government is benevolent, and a cryptocurrency is bad for welfare
    - in fact, the result seems even stronger here (or, the mechanism is more transparent)
- In this sense, the main results seem likely to be quite general
  - could probably think of many models where these two results hold
- But what *we take away* from the results is very different
  - in the paper, crypto is good news for Argentinians
  - in my story: crypto is bad news for them (hospitals close; Brazil invades)
- For interpretations, the modeling details seem to matter

Current vs. past policy

- You might reply: "High inflation is always the result of bad policy."
- Sure. But is it always the result of current bad policy?
- Suppose past decisions have created:
  - high debt, large informal sector, weak fiscal institutions, etc.
- Competition from a cryptocurrency cannot discipline these *past* decisions
- A benevolent, reforming policymaker may need seigniorage revenue
- Is this a relevant case? It depends on who you ask.

Two (broad) questions

1) Can the main results be established in a more general/abstract model?

- general specification of feasible allocations, incentive constraints, etc.
  - which determine the slope of the efficient frontier, govt indifference curves
- aim to show: main results hold in a broad class of models

2) How could we identify whether crypto is good/bad for a given country?

- "good" if the government is sufficiently predatory, but … this is not observable
- can one design a "test" based on observable data?
  - a cryptocurrency with crash risk λ will raise households' welfare if … ?
- how general/specific would that test be?

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interesting paper!

lots more to think about …