# Stablecoins vs. Tokenized Deposits: The Narrow Banking Issue Revisited

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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.*

# Motivation

- Strong demand for a blockchain-native form of money
  - denominated in traditional units (such as U.S. dollars)
  - so-called stablecoins are currently playing this role
- Ongoing debate about how this money should be created
- One view: should be backed by safe, liquid assets (100% T-bills)
  - good for financial stability, transparency; (true) *stablecoins*
- Competing view: should be issued by regulated/insured banks
  - would be backed by the usual assets that banks hold (loans, etc.)
  - builds on current system; *tokenized deposits*
- Or: could allow both types → competition will determine what is best

# Narrow banks

- One way to frame this debate:

  Should tokenized money be created by narrow or traditional banks?

- More precisely, two questions:
  - $(i)$ should we allow narrow banks to create tokenized money?
  - $(ii)$ should we require banks that create tokenized money to be narrow?
- The narrow banking debate has a long history …
- … but the question here is a little different because of its limited scope
  - suppose we take as given that traditional banks will issue traditional deposits
  - the question is whether narrow banking is desirable in a new sector
    - will show: this fact makes narrow banking more attractive

# Our focus

- The narrow banking issue has several dimensions
  - financial stability, legal, regulatory, etc.
- We focus on one: money's role in facilitating exchange and investment
- If there is a liquidity premium …
  - i.e., money has a lower return than illiquid assets
- … the assets backing money have privileged financing
  - they are financed more easily, at lower cost, more securely, etc.

Q: What assets do we want to benefit from this privilege?

# Preview

- We develop a simple model of money and trade (Lagos-Wright) in which:
  - traditional trade takes place using (traditional) bank deposits
    - banks have a portfolio of risky projects (~ loans) and safe bonds
  - "crypto" trade requires a tokenized medium of exchange
    - could be created by traditional banks (*tokenized deposits*)
    - or by narrow banks holding only safe bonds (*stablecoins*)
- Study three policy regimes:
  - both types allowed
  - only banks
  - only stablecoins
- Ask which regime generates the highest welfare
  - answer depends on parameter values (in an intuitive way)
  - only stablecoins (narrow banking) is more attractive than you might think

# Related literature

- Stablecoins:
  - Baughman, Carapella, Gerszten & Mills (2022), Gorton & Zhang (2023), Gorton, Klee, Ross, Ross & Vardoulakis (2025), Ma, Zeng, and Zhang (2023), van Buggenum , Gersbach & Zelzner (2023), Azzimonti & Quadrini (2025), Gomis-Porqueras & Sanches (yesterday), BIS Annual Report (2025), etc.
- Narrow banking:
  - Williamson (2024), Pennacchi (2012), Wallace (1996), Friedman (1960), Douglas et. al (1939)
- Inside and outside money
  - Gurley and Shaw (1960), Cavalcanti & Wallace (1999), Bullard & Smith (2003), Lagos (2008), others
- Central bank digital currency:
  - Andolfatto (2021), Chiu, Davoodalhosseini, Jiang & Zhu (2023), Williamson (2023), Keister & Sanches (2023), Niepelt (2024), and many others

# Outline

1. Introduction
2. The model
3. Baseline equilibrium: a neutrality result
4. Equilibrium with risk and regulation
   - do crypto buyers use stablecoins or tokenized deposits?
5. Legal restrictions
   - should one be prohibited?
6. Conclusion

# Setup

- Dynamic GE model in tradition of Lagos & Wright (2005) and others
  - alternating centralized and decentralized markets (CM & DM)
  - matching/information frictions ⇒ need for a medium of exchange
  - builds on Keister and Sanches (2023) … and many others
- Agents:
  - buyers — produce in CM; consume in DM
  - sellers — produce in DM; consume in CM
  - bankers — issue deposits, invest in risky projects and safe assets (bonds)
  - stablecoin issuers — issue coins, invest in safe assets
  - government — insures deposits; regulates banks (Pigouvian tax)
- Let's look at each in turn …

# Buyers and sellers

- Buyers: like to consume the DM good $U^b = x_t^b + u(q_t)$
- Sellers: can produce the DM good $U^s = x_t^s - w(q_t)$
  - no bilateral credit in DM trades (due to anonymity)

    → completely standard

- Two types of DM matches
  - measure $\lambda_1$: traditional → must pay using a bank deposit
  - measure $\lambda_2$: crypto → must pay with blockchain-native money

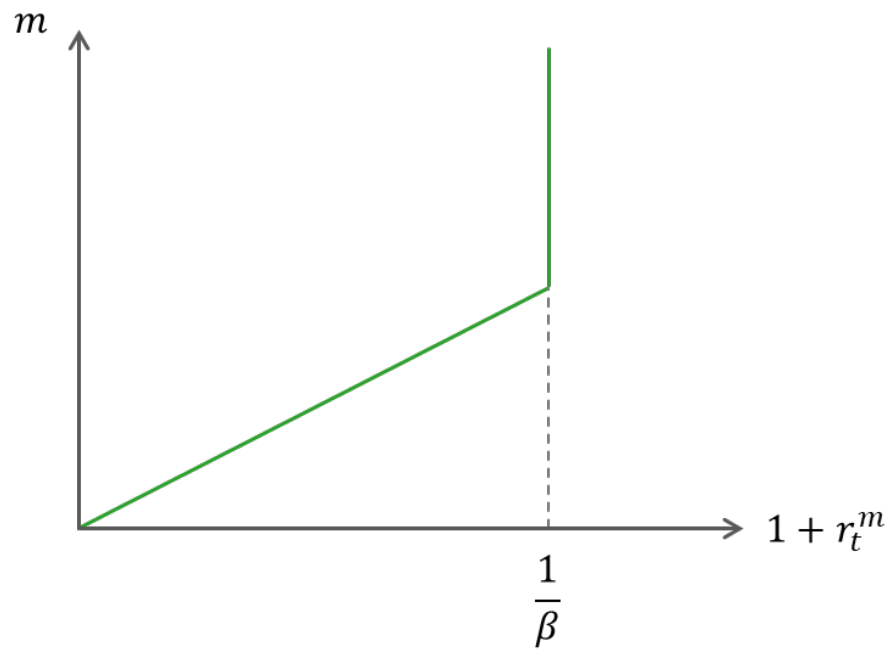
Q: Who can create this blockchain-native money?

- bankers: tokenized deposits (backed by portfolio of projects and bonds)
- stablecoin issuer: stablecoins (backed only by safe bonds)

# Individual money demand

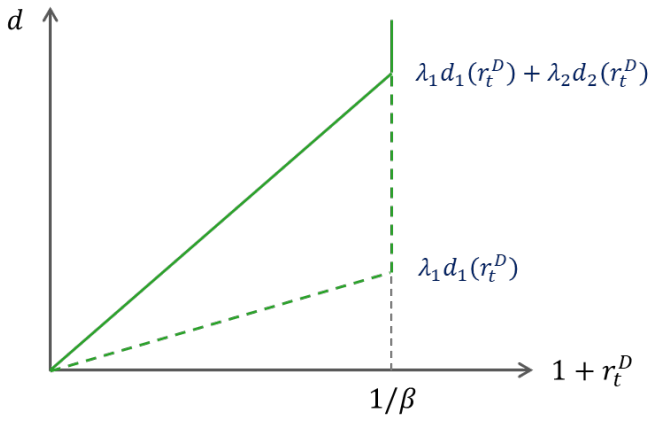
- A buyer learns the type of meeting in advance
  - exits CM holding deposits or a mix of tokenized deposits and stablecoins
- Choses quantity based on the usual considerations
  - terms of trade (buyer makes take-it-or-leave-it offer), etc.
  - focus on: the real return on that type of money

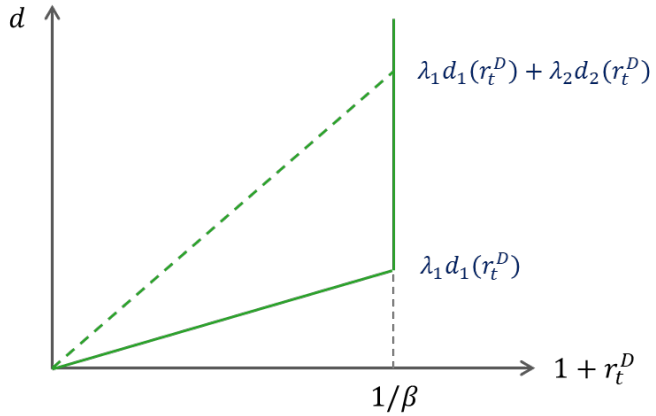
individual money demand

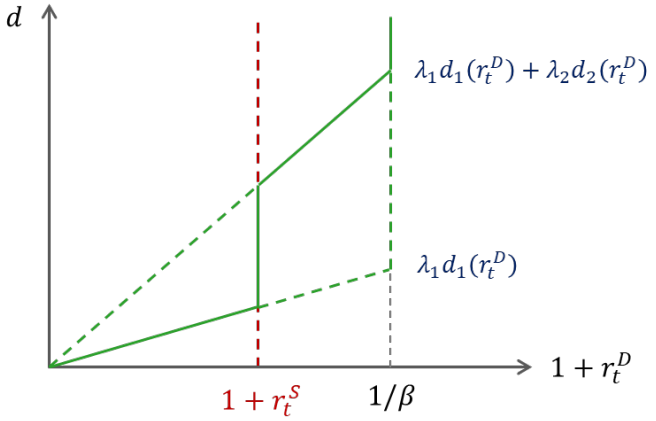


# Aggregate deposit demand

- Depends on what can be used in crypto meetings:



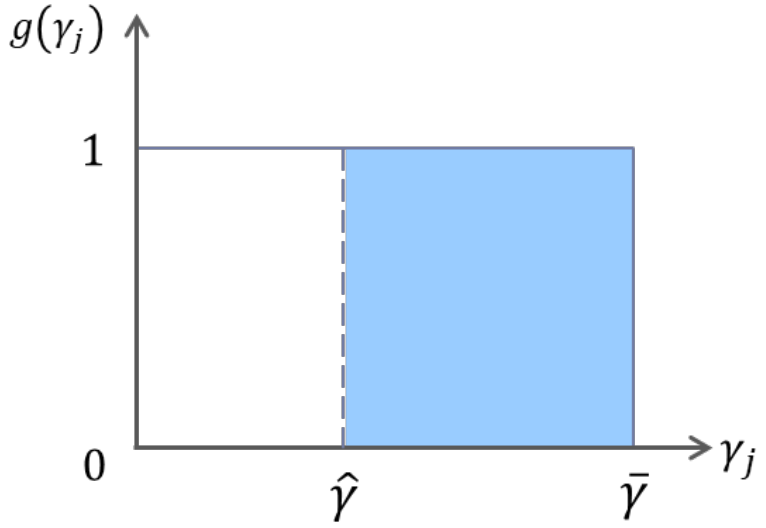




- Only tokenized deposits:
  - sum the demand of the two types
- Only stablecoins:
  - demand only from traditional buyers
- Both:
  - crypto buyers hold the higher return option
  - return on stablecoins: $1 + r_t^S$

# Bankers

- Measure $\eta$ of bankers born in each CM; live until next CM
- Each has access to a set of risky projects (indexed by $j$)
  - requires fixed input (1) in the CM
  - output in the next period is:
    - $\gamma^j$ with prob. $1-q$
    - $0$ with prob. $q$
  - a banker's projects are perfectly correlated (all succeed or all fail)
    - shock is i.i.d. across bankers




⇒ Diminishing returns to investment

- Can also invest in risk free storage technology ("bonds")
  - fixed, relatively low return $1+r^B < \frac{1}{\beta}$

- Bankers live for two periods, must borrow to fund projects
  - issue deposits in competitive market at interest rate $1 + r_D$
- Deposits are insured by the government
  - promised rate $1 + r_D$ must be feasible if banker's projects succeed
- Banker is taxed on deposits at rate $\theta$ (if successful)
  - reflects DI premium, but also regulation of leverage, risky assets, etc.
- A period-$t$ banker chooses $\hat{\gamma}_t, b_t, D_t$ to maximize:

$$(1-q)\left(\int_{\hat{\gamma}_t}^{\bar{\gamma}} (\gamma_j) d\gamma_j + (1+r^B) b_t - (1+\theta)(1+r_t^D) D_t\right) + q \cdot 0$$

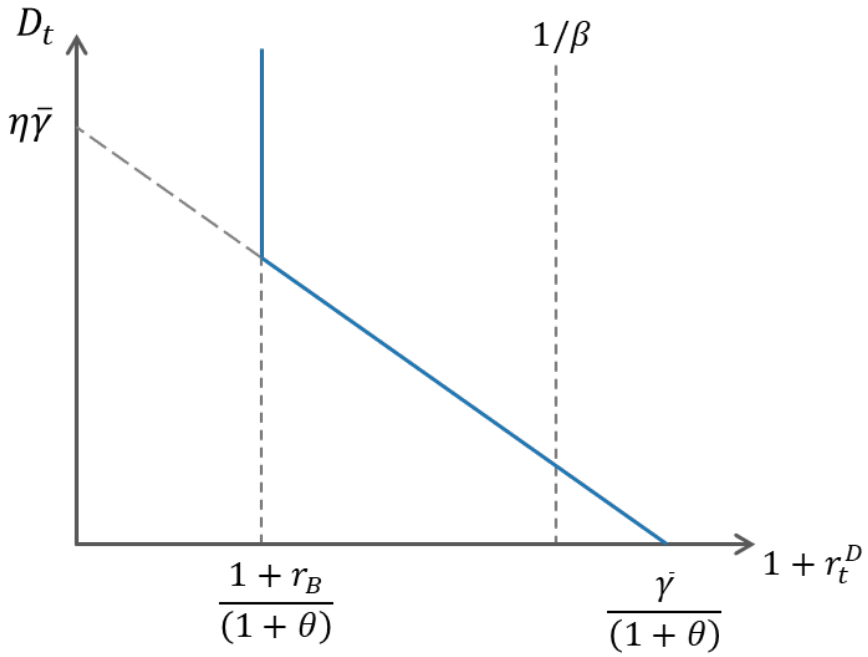
$$s.t. \qquad D_t = \left(\bar{\gamma} - \gamma_j + b_t\right)$$

$$b_t \geq 0$$

# Deposit supply

- Optimal investment cutoff is: $\hat{\gamma}(r_t^D) = (1+\theta)(1+r_t^D)$
  - project return needs to cover funding cost (including the tax)
  - supply of deposits is $D_t = \eta\left(\bar{\gamma} - \hat{\gamma}(r_t^D)\right)$
  - unless: $1 + r^B = (1+\theta)(1+r_t^D)$
    - in which case: banker will hold bonds

- Height of curve determined by:
  - $\eta$ : measure of bankers
  - $\bar{\gamma}$ : upper bound on return
  - $\theta$ : tax on bankers



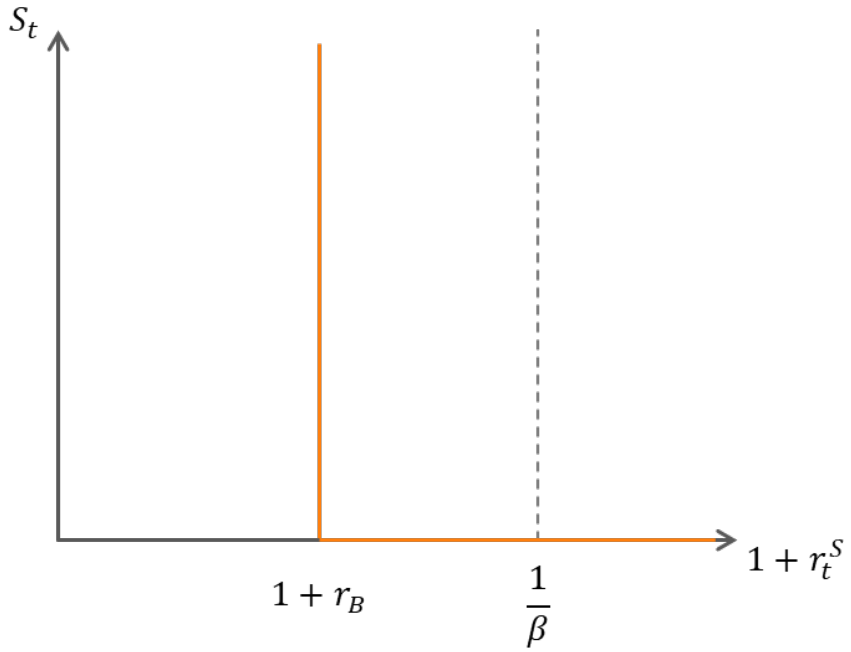
# Stablecoin issuer

- Stablecoin issuer is like a banker with no productive projects
  - can only invest in risk-free bonds
  - never fails → no tax on its operations
- Issuer chooses: $b_t^S, S_t$ to maximize:

$$(1 + r^B) b_t^S - (1 + r_t^S) S_t$$

$$s.t. \quad S_t = b_t^S$$

$$S_t \geq 0$$




- Any equilibrium with $S_t > 0$ must have:

$$1 + r_t^S = 1 + r^B$$

# Final bits

- Government:
  - collects taxes from banks, pays depositors at failed banks
  - balances budget with a lump-sum tax in the CM
- Welfare:

$$\sum_{t=0}^{\infty} \beta^t \Big( \underbrace{x_t^b + x_t^s + \eta x_t}_{\equiv X_t} + \lambda_1 [u(q_t^1) - w(q_t^1)] + \lambda_2 [u(q_t^2) - w(q_t^2)] \Big)$$

- CM Feasibility:

$$X_t \leq \eta(1-q) \int_{\hat{\gamma}_{t-1}}^{\bar{\gamma}} \gamma_j \, d\gamma_j + (1+r^B)\left(b_{t-1} + b_{t-1}^S\right) - [\eta(\bar{\gamma} - \hat{\gamma}_t) + b_t + b_t^S]$$

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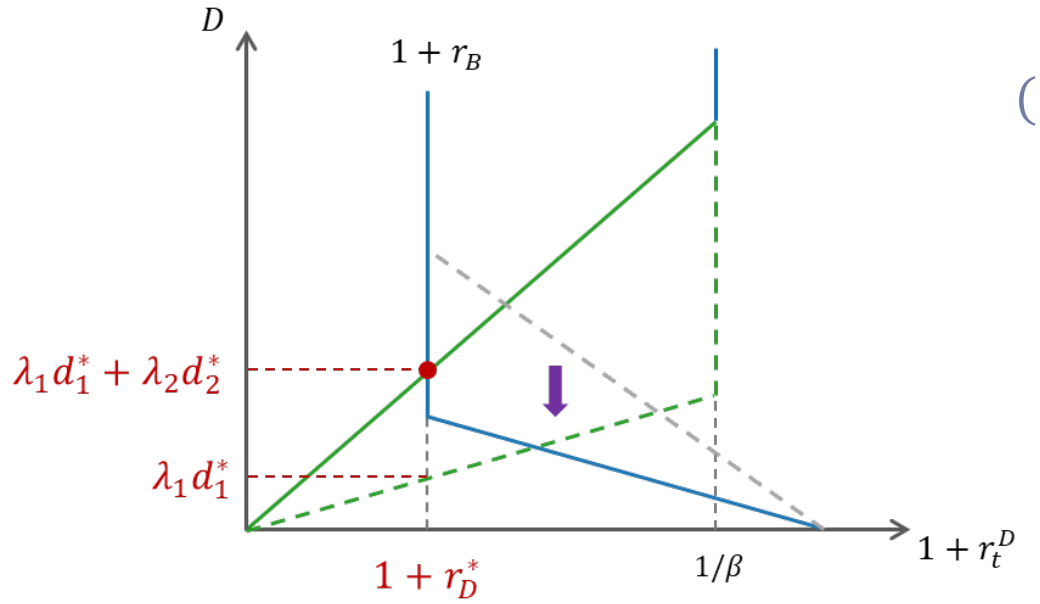
# A special case

- Suppose projects are not risky $(q = 0)$ …
  - … and banks are not taxed/regulated $(\theta = 0)$
- Assume for a moment: only bankers operate (no stablecoins)
- Equilibrium: two cases depending on availability of projects




$(ii)$ With greater scarcity of good projects:

- banks invest in a mix of projects/loans and bonds
- deposits are a mix of *inside money* and *outside money*

# Neutrality

Q: What does this tell us about stablecoins vs. tokenized deposits?

- Reintroduce the stablecoin issuer (but continue to focus on $q = \theta = 0$)

Result: The equilibrium consumption allocation is unchanged

- if banks held bonds in the original equilibrium, there is now a continuum of equilibria
- different mix of $D^*$ and $S^*$, but $D^* + S^*$ is the same in all of them

- Reason: bankers can do anything the stablecoin issuer can do
  - the vertical parts of the two supply curves are on top of each other
  - the model pins down the assets backing money (inside vs outside)
  - but not who issues the money (banks vs stablecoins)

So …

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# Risk and regulation

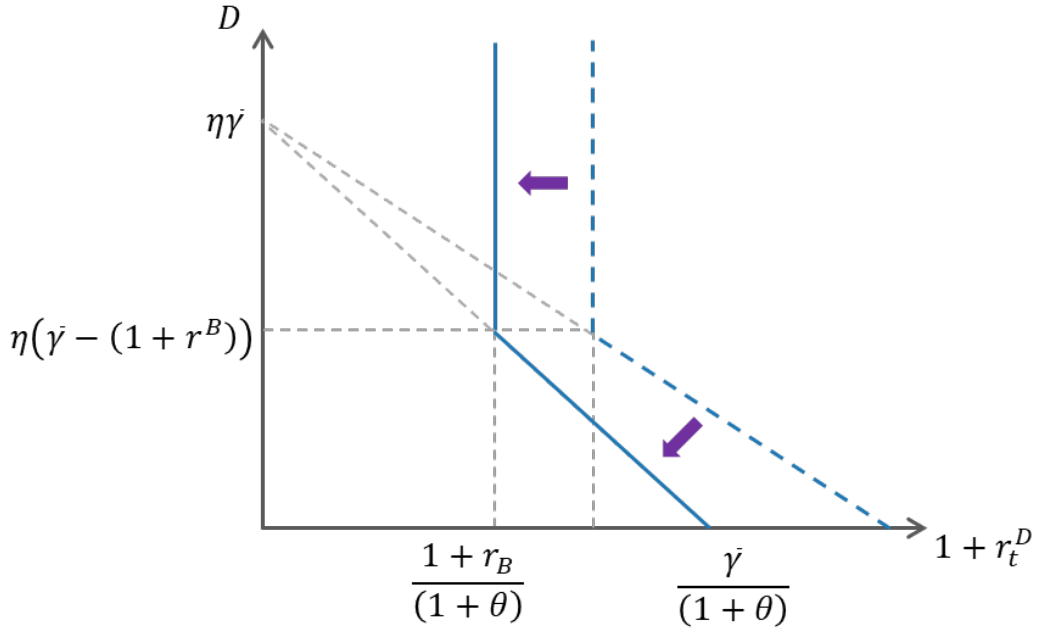
- Now: projects are risky $(q > 0)$ and banks are taxed/regulated $(\theta > 0)$

Banker chooses: $\hat{\gamma}_t, b_t, D_t$ to maximize:

$$(1-q)\left(\int_{\hat{\gamma}_t}^{\bar{\gamma}} (\gamma_j) d\gamma_j + (1+r^B) b_t - (1+\theta)(1+r_t^D) D_t\right) + \mathrm{q} \cdot 0$$

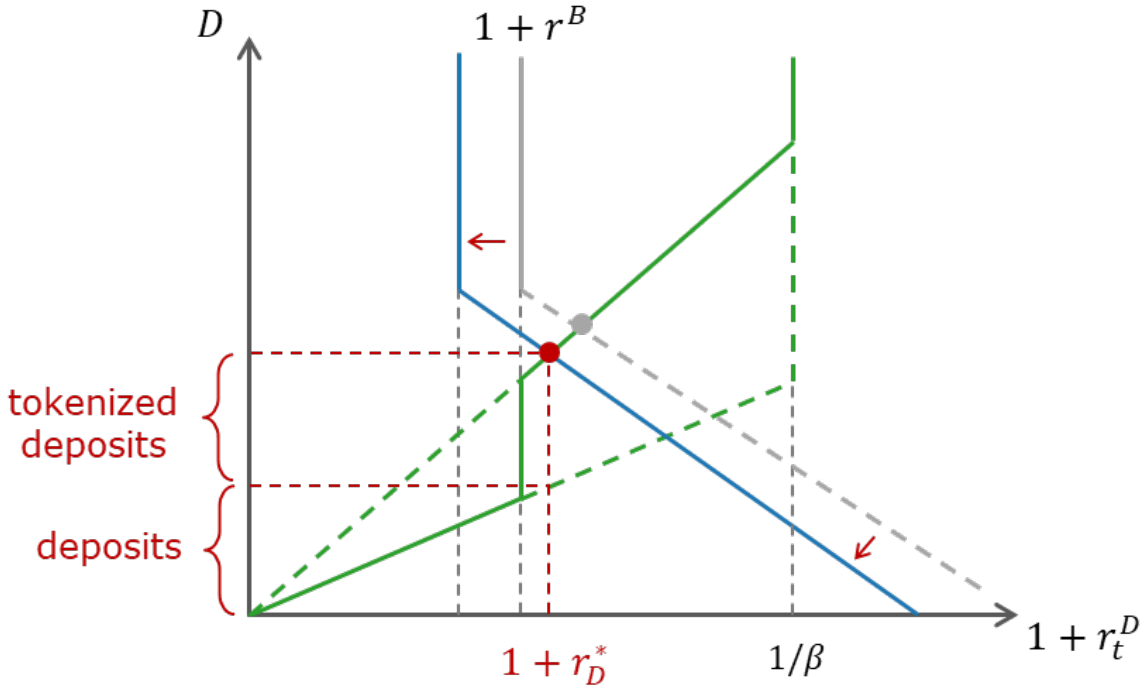
$$s.t. \qquad D_t = (\bar{\gamma} - \gamma_j + b)$$

- How does risk affect the supply of deposits?
  - not at all
- How does the tax $\theta$ affect it?
  - fewer projects are profitable at any $1 + r^D$
  - and the bond cutoff decreases



# A small tax

- Start from a situation where only deposits are used in equilibrium (mild scarcity)
- If we introduce a small tax on banks …
- … the deposit rate is still above $1 + r^B$ …
- … and stablecoins are still not used




Result: If $\theta < \bar{\theta}_1$, only tokenized deposits are used (in crypto meetings)

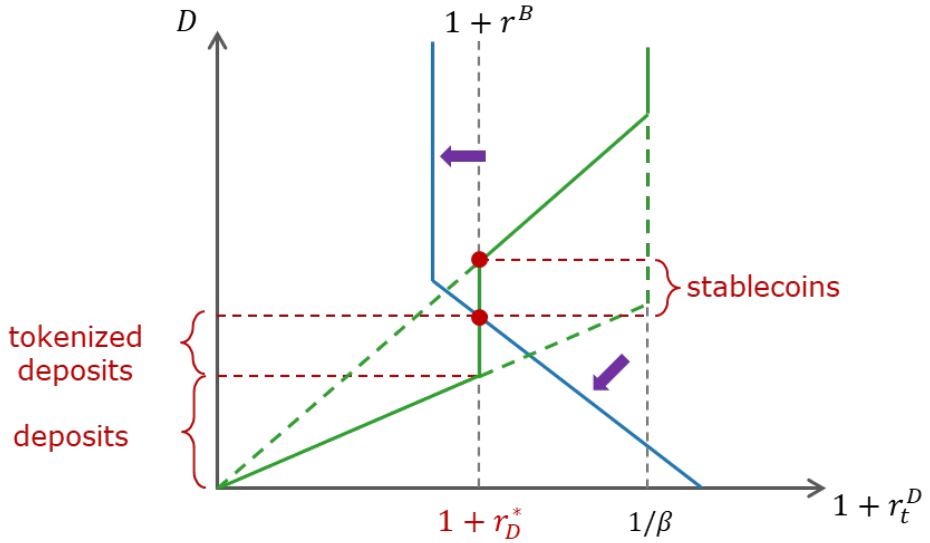
# Increasing the tax further

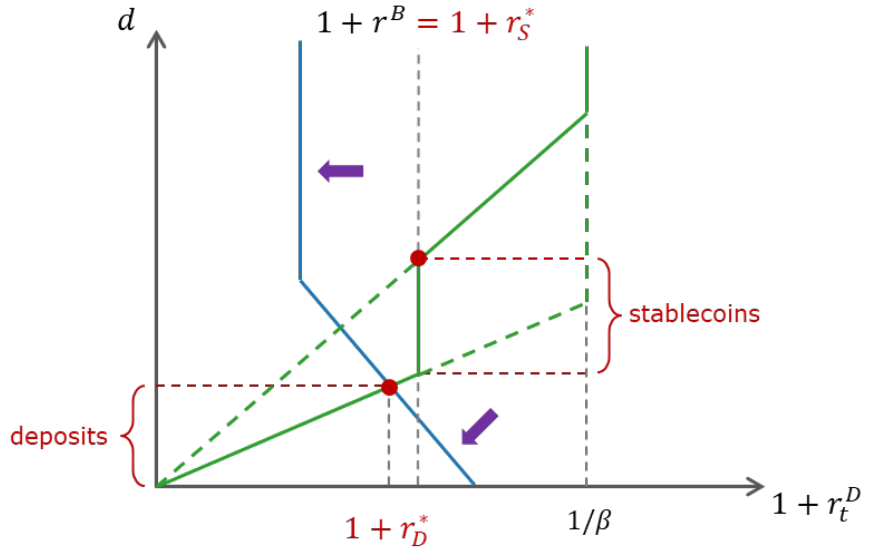
- Deposit rate falls until …
  - … stablecoins are attractive to crypto buyers

Result: If $\bar{\theta}_1 < \theta < \bar{\theta}_2$ , a mix of tokenized deposits and stablecoins is used

- If we keep increasing $\theta$ …
  - deposit rate falls below $1 + r^B$
  - all crypto buyers use stablecoins
  - markets are effectively segmented

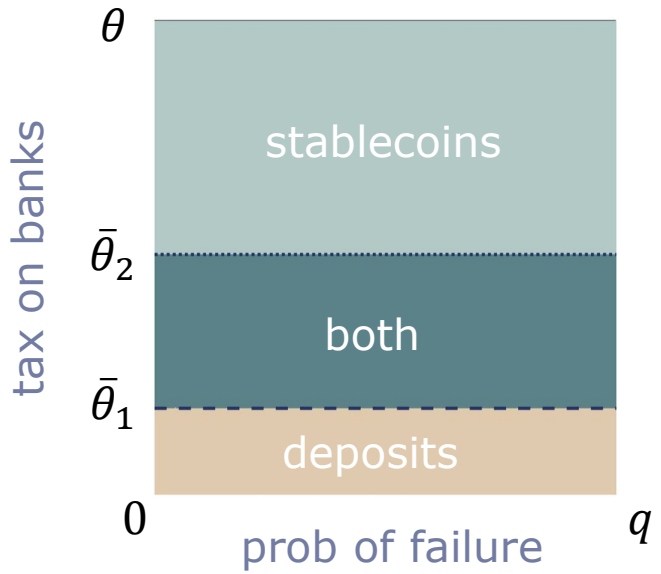
Result: If $\theta > \bar{\theta}_2$ , only stablecoins are used (in crypto matches)



# What do crypto buyers use?

- Summarizing:




Recall:
$q$ has no effect on equilibrium

- If both banks and stablecoins are allowed to operate …
- … we have a simple theory of what will be used in equilibrium
- But … should both banks and stablecoins be allowed to operate?
  - what is the best policy regime?

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# Motivation

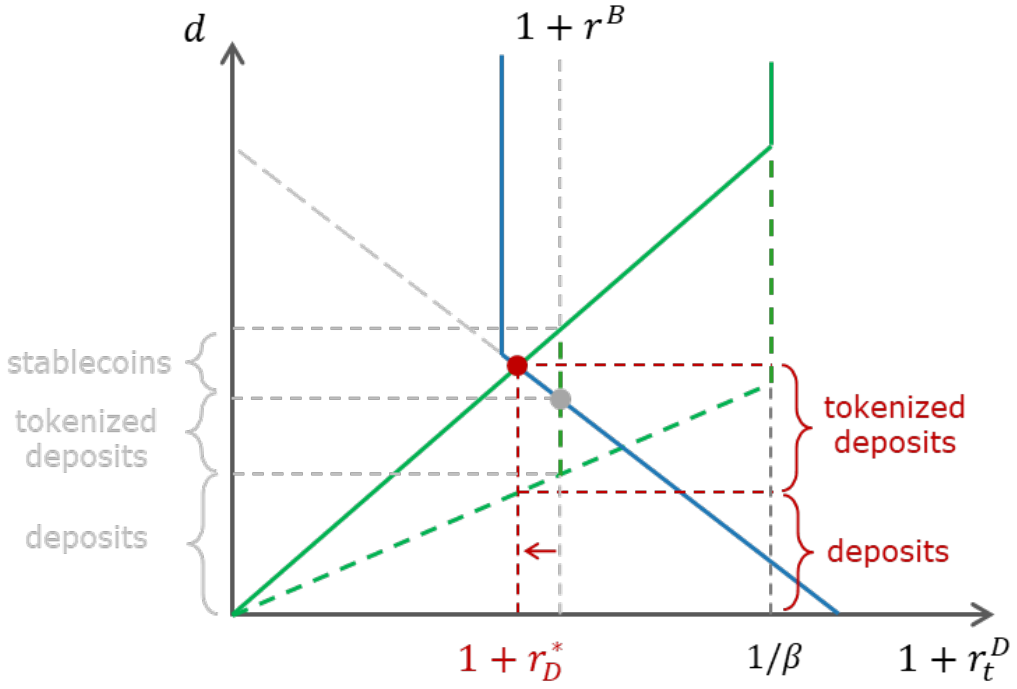
- Some people argue that money (deposits) should only be created by banks
  - who make loans to households, small businesses
  - allowing stablecoins limits credit to the real economy

**Bank of England Governor Warns Against Stablecoins, Backs Tokenized Deposits Instead**

- Others argue that money should be backed by sound assets
  - credit can be provided in other ways; banks distort the allocation of credit
  - stablecoins are an opportunity to "get it right"
- What does our model say?
  - it is ever desirable to restrict who can issue tokenized money?

# Tokenized deposits only

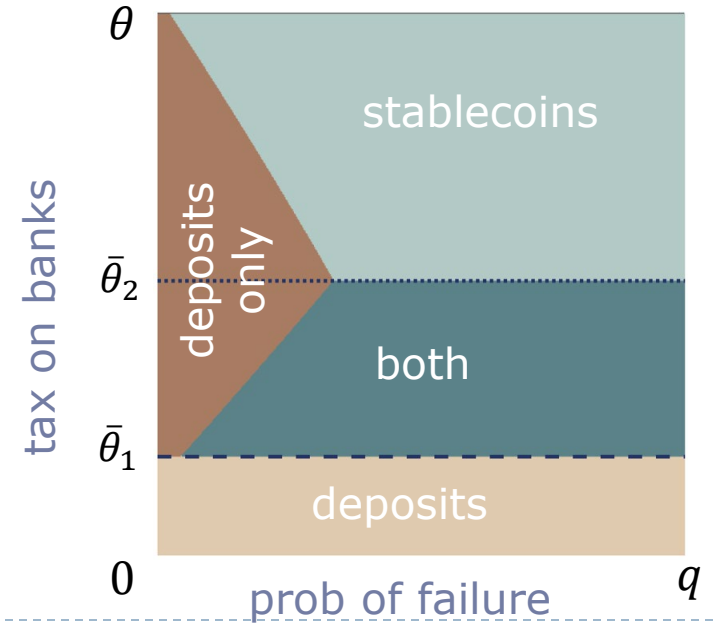
- Suppose a mix of deposits and stablecoins is used in equilibrium (middle case)
- If only banks can issue tokenized money:
  - the return on deposits $1 + r_D^*$ decreases
    - real money balances decrease; lower DM trade in all meetings (bad)
  - total bank deposits increase ⇒ more projects are funded
    - shift in funding from bonds to projects




- Is this good or bad?
  - answer depends (in part) on the social return of the marginal project $\hat{\gamma}$ :

$$\rho(\hat{\gamma}^*) = (1 - q)(1 + \theta)(1 + r_D^*)$$

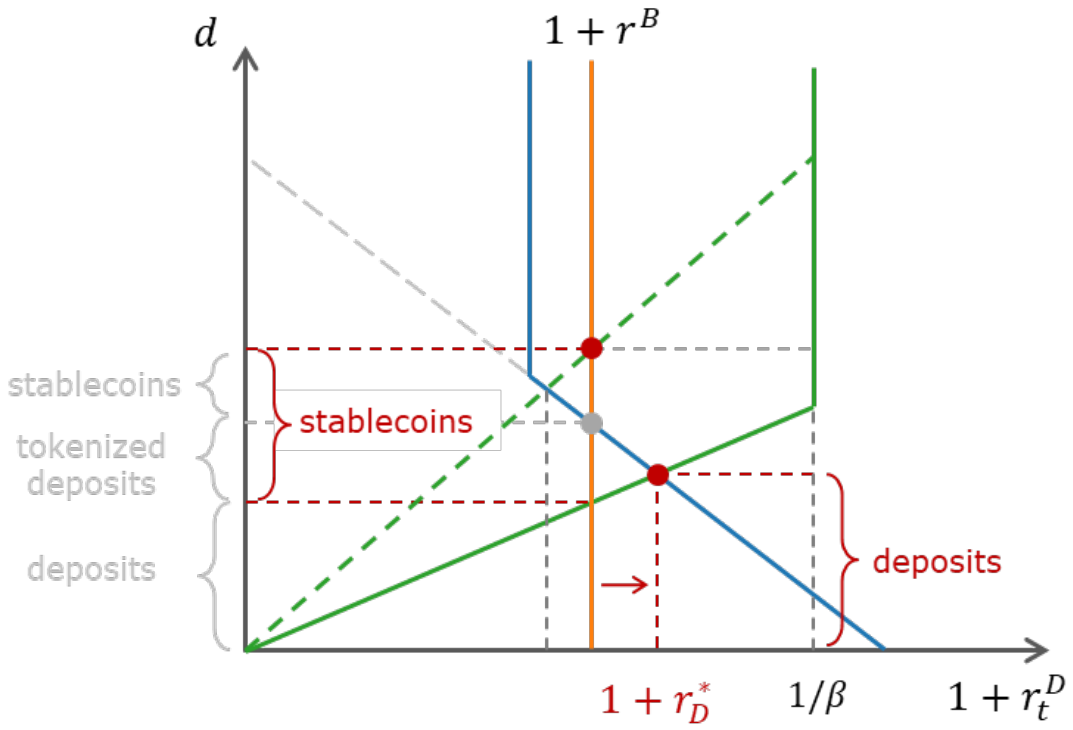
- Repeating: $\rho(\hat{\gamma}^*) = (1-q)(1+\theta)(1+r_D^*)$
- When $q$ is small and $\theta$ is large:
  - banks face high funding costs, operate at small scale
  - social return on the marginal product is high (can be $\gg 1 + r^B$ )
  - in these cases: prohibiting stablecoins can raise welfare




- Captures a common intuition:
  - narrow banks crowd out productive investment
- But: crowding out is only bad if $\theta$ is large
  - if $\theta = 0$, banks tend to <u>overinvest</u> (as in Williamson, 2023, and others)
  - similar in spirit to Keister and Sanches (2023)

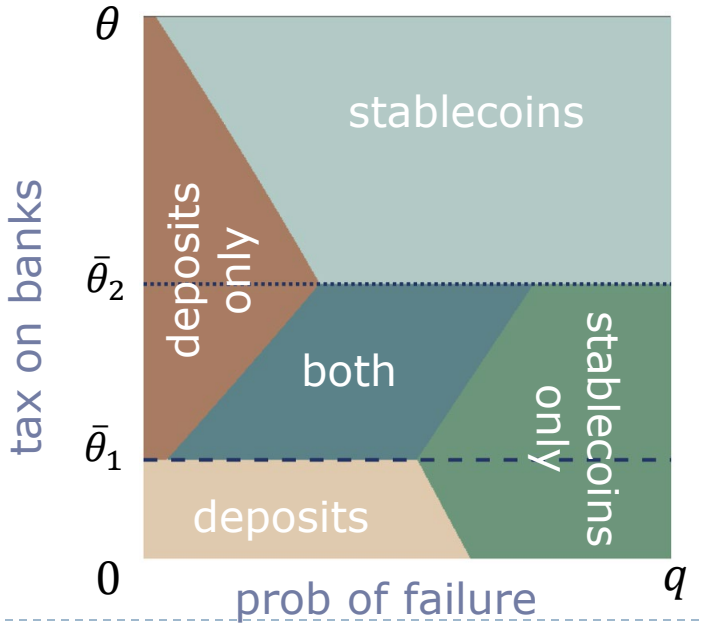
# Stablecoins only

- If only stablecoins are allowed:
  - the return on stablecoins is unchanged (remains $= 1 + r^B$)
    - DM crypto trade is unchanged
  - the return on deposits increases
    - traditional DM trade increases
    - ⇒ total DM trade increases (good)
  - downside: total deposits decrease
    - shift of funding from projects to bonds




- Is this good or bad?
  - again depends on: $\rho(\hat{\gamma}^*) = (1 - q)(1 + \theta)(1 + r_D^*)$

- Repeating: $\rho(\hat{\gamma}^*) = (1-q)(1+\theta)(1+r_D^*)$
- When $q$ is large and $\theta$ is small:
  - significant moral hazard problem → banks overinvest in risky projects
  - social return on the marginal product is low (can be $\ll 1 + r^B$ )
  - in these cases: requiring stablecoins to be used can raise welfare




- Can be optimal even if the marginal project has a higher return than bonds
  - because it raises the deposit rate

  ⇒ for the projects that are still operated …
  - … a higher fraction of return goes to depositors …
  - … which increases DM trade

# Summarizing

- What assets do we want to back a new form of money?
- Might naively think: those with the highest return (among viable options)
  - allow different forms to compete → let the market decide
- Our model shows this answer is incorrect for two reasons (at least)

1) Social returns are different from private returns
   - especially when there is deposit insurance, regulation

2) A spillover effect on traditional markets
   - which assets are allowed to back the new money …
   - … affects the return depositors receive on traditional deposits

# Spillover

- Requiring narrow banks in the tokenized sector:
  - decreases the total demand for bank liabilities
  - which raises the interest rate depositors receive (and ↓ banker's profits)
  - which results in more DM trade, can raise welfare
    - reminiscent of result in Chiu et. al (2023), Shao & Wang (yesterday), but with price-taking banks
- Note: this benefit is absent in the usual narrow banking debate
  - because that debate is about requiring all banks to be narrow
    - for example: Wallace (1996), Williamson (2024)
- A "limited" form of narrow banking is more desirable than full NB

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# Summary

- The current debate about stablecoins vs. tokenized deposits …
- … is a form of the (old) narrow banking debate
  - but a particular (new, limited) form of this debate
- We present a simple model for organizing the discussion along one dimension
  - focusing on the liquidity premium and its effect on investment
- Some results are intuitive
  - if banks invest in too many risky projects → encourage stablecoins
  - if bank credit is scare and funds high-return projects → ban stablecoins
- But also highlights an interesting spillover on traditional deposits
  - makes stablecoins (narrow banks) more attractive in limited form