Banking with Stablecoins*

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[PRELIMINARY: PLEASE DO NOT CIRCULATE]

Abstract

Issuers of regulated stablecoins pledge to act as narrow banks: they issue a demandable liability that can be used for payments and invest solely in risk-free assets. They compete for funds with traditional banks that invest in risky assets, but suffer from moral hazard in monitoring their portfolio. As stablecoins become more attractive, they raise banks' funding costs, weaken their monitoring incentives, and compress aggregate credit supply. This in turn increases the attractiveness of risky lending for stablecoin issuers and can undermine the credibility of their pledge. Then, the intrusiveness of supervision and/or the penalty that stablecoins issuers pay when deviating from their mandated business model need to increase with stablecoins' attractiveness in order to maintain credibility. Competition among stablecoin issuers and lower yields on safe assets further weaken credibility.

Keywords: Stablecoins; Narrow banks; Financial intermediation; Moral hazard.
JEL codes: D82, E42, E58, G21, O33.

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1 Introduction

Demand for stablecoins – crypto assets that aim to maintain a stable value relative to a specified asset, most commonly the US dollar (Adrian et al., 2025) – has grown rapidly in recent years, with total market capitalization growing from approximately $5 billion in January 2020 to more than $300 billion in January 2026 (Figure 1). Over the same period, new legislation (e.g., MiCA in the EU and the GENIUS Act in the US) has reduced regulatory uncertainty, while high interest rates have generated high returns for stablecoin issuers, leading a wide range of companies to explore issuing their own stablecoins.

Conceptually, issuers of well-backed stablecoins are narrow banks: they offer demandable liabilities, secured by risk-free assets, that can be used directly for payments.[1] Narrow banks have a checkered history, with some ultimately deviating to make risky loans and others outcompeted by banks that did make such loans. An example of the former is the 18th-century Bank of Amsterdam, which eventually failed after it drifted from its charter by engaging in risky lending (Bolt et al., 2024; Frost, Shin and Wierts, 2020). Examples of the latter include US banks issuing banknotes backed by Treasury bonds after the 1863 National Bank Act; scarcity of such bonds limited adoption of the notes and they were ultimately displaced by bank deposits that paid interest (Gorton and Zhang, 2023; Luck, 2025).

Conversely, some regulators worry that narrow banks could become *too* successful, attracting deposits that would otherwise flow to commercial banks and so reducing credit to productive firms. For instance, such concerns were cited by the Federal Reserve when it denied the 2017 application for a Federal Reserve master account by a startup called "The Narrow Bank" (Cochrane, 2018; Federal Reserve System, 2019).

The emergence of stablecoin-based narrow banks therefore raises several questions. First, assuming that their pledge to remain narrow is credible, how do they affect traditional commercial banks? Second, under what conditions do stablecoin issuers both (i) attract

[1] In practice, many stablecoin issuers limit direct demandability to a small number of large arbitrageurs, with most holders redeeming their tokens through sales on secondary markets (Ma, Zeng and Zhang, 2025).

depositors, and (ii) choose to remain narrow banks, rather than deviating from their pledge to invest only in risk-free assets? Furthermore, how do the answers to these questions depend on the regulation and market structure of stablecoin issuers, and on monetary policy?

In this paper, we shed light on these questions by constructing a model in which entrepreneurs can pay a fixed cost to set up either a stablecoin issuer or a commercial bank, after which they source funding from households. Subsequently, commercial banks lend to risky firms and engage in costly monitoring of their loans. In contrast, stablecoin issuers pledge to invest only in safe assets and deviating from this pledge incurs a regulatory penalty, which in practice can take the form of fines or market-access restrictions.[2]

Households value deposits and stablecoins as both means of payment and stores of value. The convenience yields on the two assets can differ, reflecting, for example, wider merchant acceptance of bank deposits; and the stablecoin convenience yield varies across households, reflecting, e.g., differences in openness to new technologies (Agarwal et al., 2024; Borgonovo et al., 2021; Greene, Perry and Stavins, 2024; Hayashi and Klee, 2003). Bank deposits are fully insured, while stablecoin holdings are not. Households thus weigh three factors when choosing between deposits and stablecoins: their convenience for payments, their interest rates, and the risk that a stablecoin will lose value (i.e., de-peg) due to risky lending losses.

Our baseline model permits interest payments on stablecoins, while an extension forbids these. Considering both possibilities is relevant: both the US GENIUS Act and the EU's MiCA regulation forbid direct interest payments. However, the GENIUS Act does not forbid the payment of "rewards" to stablecoin holders, leading to a "loophole" whereby *de facto* interest payments can be offered by an exchange, rather than the stablecoin issuer (who may in turn make bulk payments to the exchange).[3]

[2]For example, GENIUS Act § 4(a)(1) requires 1:1 backing exclusively with permitted reserve assets; noncompliance is a material violation subject to civil penalties of up to $200,000 per day, plus enforcement actions (e.g., cease-and-desist, issuance bans). As a concrete example, the world's largest stablecoin, USDT (Figure 1), is compliant with neither US nor EU regulation, hampering its ability to integrate with other financial services in those regions.

[3]At the time of writing, legislators are still actively debating various proposals and it is unclear if the loophole will be closed. An alternative path for stablecoins to earn interest is by being lent out on decentralized finance platforms (Barbon, Barthelemy and Nguyen, 2025).

We first examine the impact of stablecoins on commercial banks in the case that stablecoin issuers' pledge to remain narrow is credible. The larger the convenience yield on stablecoins, the higher the interest rate that commercial banks must pay to attract depositors.[4] This higher funding cost decreases the return on making loans, which in turn reduces the equilibrium number of commercial banks, reduces the incentive for banks to exert monitoring effort – i.e., increases bank risk-taking – and contracts overall credit provision to firms.[5] Importantly, greater competition among stablecoin issuers accentuates these effects, since more of the convenience yield and interest is passed through to the households.

Second, we analyze under what conditions stablecoin issuers' pledge to remain narrow is credible in equilibrium. The fundamental requirement is that the regulatory penalty is larger than the increase in profits that stablecoin issuers could gain by making risky loans. Market structure plays a first-order role here: the more competitive is narrow banking, the greater the incentive for a given stablecoin issuer to engage in risky lending.

Interestingly, a higher stablecoin convenience yield can also increase the incentive for a stablecoin issuer to deviate from narrow banking, by reducing commercial bank lending and so increasing firms' residual demand for credit from stablecoin issuers. Thus, a rise in the attractiveness of stablecoins can raise the minimum regulatory penalty that is necessary to prevent their issuers from deviating. Put differently, if stablecoins become sufficiently attractive, and regulation does not keep pace, then stablecoin issuers may violate their pledge to invest only in safe assets.

The incentive compatibility conditions that we derive also reveal that monetary policy loosening – modeled as an exogenous decline in the risk-free rate – strengthens the incentive of a stablecoin issuer to engage in risky lending. Deviation incentives are most responsive to monetary policy when there is a single stablecoin issuer, because such an issuer sees the largest drop in profits from remaining a narrow bank when risk-free rates decline. Figure 2

[4] Stablecoin convenience yields change over time and stablecoin issuers work actively to increase them; see Gorton, Ross and Ross (2022) for a detailed account and empirical evidence.

[5] Altavilla et al. (2025) find that public interest in stablecoins, as proxied by Google Trends data, causes a contraction of both retail deposits and bank lending to firms in the euro area.

highlights that the safe-asset share of the largest stablecoin issuer has indeed moved in tandem with US interest rates, and our model thus provides a rationale for this correlation. Holding regulation constant, our finding implies that a sufficiently low risk-free rate can preclude credible stablecoin-based narrow banking even when safe assets pay a positive return.[6]

Turning to the case in which stablecoin issuers are barred from paying interest, we find that imposing such a ban reduces competition for deposits, enabling commercial banks to offer lower deposit and loan rates and expanding commercial bank credit. Moreover, the ban may also ensure the credibility of stablecoin issuers as narrow banks, but this is only guaranteed when the barriers to entry in stablecoin issuance (and thereby the size of each issuer in equilibrium) are small enough.

Lastly, we replace the perfectly-elastic supply of Treasuries in our baseline model with a fixed supply: any improvement in stablecoin convenience is then absorbed by a reduction in the risk-free rate, benefiting the Treasury while leaving financial intermediation unaffected.[7]

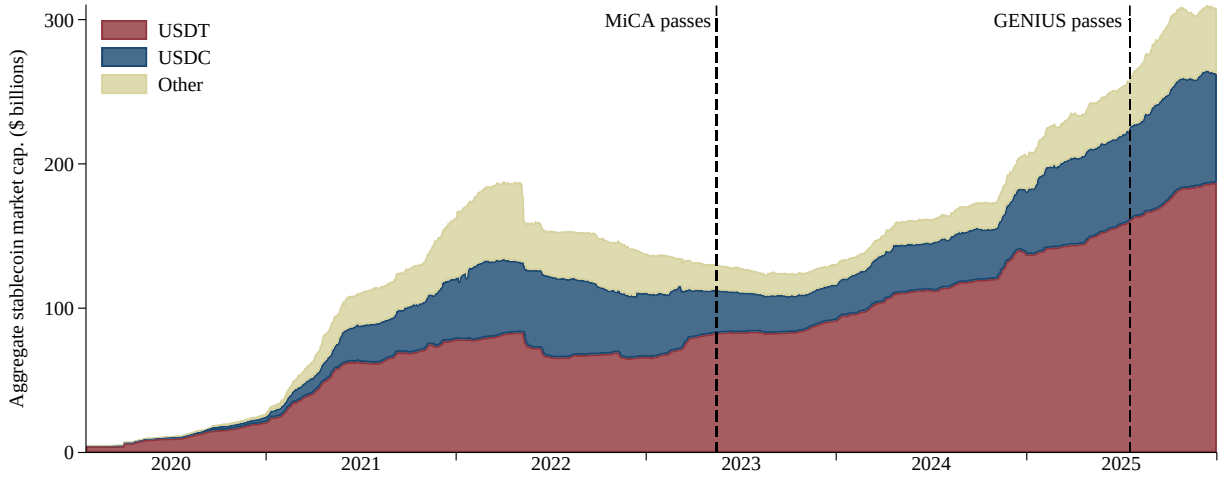
A long literature considers the potential costs and benefits of requiring *all* banks to be narrow (Fisher, 1935; Pennacchi, 2012).[8] We instead consider the implications of narrow banking among a *subset* of financial institutions – stablecoin issuers. Chiu and Monnet (2025) and Huang and Keister (2025) adopt a similar approach but assume that stablecoins only provide payment services to a segmented crypto market. We permit stablecoin payments to compete for the entirety of commercial banks' existing payment business, reflecting the growing use of stablecoins in everyday transactions (McKinsey, 2025). More generally, compared to Chiu and Monnet (2025) and Huang and Keister (2025) we contribute by: (i) analyzing the role of stablecoin issuer market power, the importance of which is highlighted by the prevailing market structure (Figure 1); (ii) incorporating the potential for stablecoin

[6]Stablecoin issuer reallocation to riskier assets can affect the real economy: Barthélemy, Gardin and Nguyen (2026) find that stablecoin issuers' demand for short-term corporate debt has significantly affected yields on that market.

[7]See also Rao (2026), who derives a Modigliani-Miller benchmark under which stablecoins do not affect real allocations.

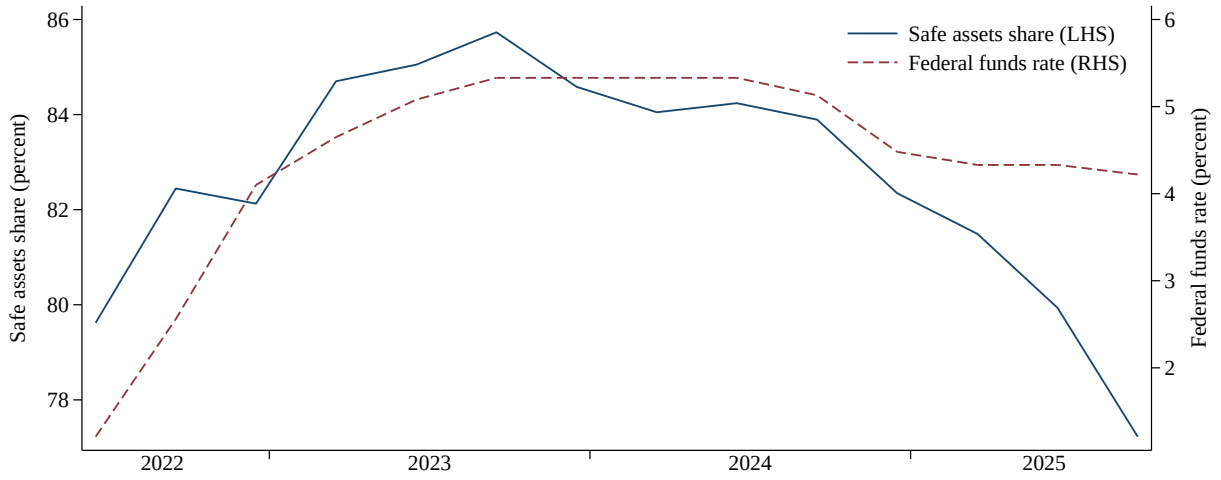
[8]For macroeconomic analyses of narrow banking, see, for example: Chen and Phelan (2025); Grasselli and Lipton (2019); Kumhof and Benes (2012); Merkel (2020).

Figure 1: Stablecoin market capitalization



Notes: This figure plots the total market capitalization of all stablecoins, from DefiLlama. USDT and USDC are the two largest stablecoins, issued by Circle and Tether respectively.

Figure 2: Safe asset share of the largest stablecoin issuer



Notes: This figure plots the share of Tether's reserves that are held in safe assets, defined as the share of assets permissible under the GENIUS Act (Treasuries, repurchase agreements and bank deposits) relative to total assets, aggregated from Tether's own reports. The dashed line plots the the effective federal funds rate, from the St. Louis Fed.

issuers to deviate from narrow banking; (iii) assessing how stablecoin market structure, payment convenience, and monetary policy interact with issuers' incentives to deviate from narrow banking.

Williamson (2024) also considers (ii) although in the form of asymmetric information, whereby unregulated stablecoin issuers can sustain false claims about their asset holdings in equilibrium – whereas in our model (off-equilibrium) deviation arises from time inconsistency. Williamson (2024) finds that stablecoin issuance can only be profitable when commercial banks are inefficiently regulated. Our contributions compared to Williamson (2024) are (i) and (iii) above, as well as analyzing the coexistence of well-regulated and profitable stablecoin issuers and commercial banks in equilibrium – a case that is arguably of increasing relevance in view of regulatory developments.

Regarding (i), we note that the literature on central bank digital currency (CBDC) has considered the relationship between intermediary market structure, the introduction of new forms of digital money and financial intermediation outcomes (Agur, Ari and Dell'Ariccia, 2022; Andolfatto, 2020; Chiu et al., 2023; Keister and Sanches, 2023). However, the implications of stablecoins for financial intermediation can differ from those of CBDCs for three reasons that our model incorporates. First, stablecoins are issued by private, profit-maximizing agents—unlike CBDCs, which can be tailored to support social objectives.[9] Second, multiple stablecoin issuers may compete to issue stablecoins, in contrast to the central bank's monopoly on CBDC issuance. Third, as a liability of the central bank, a CBDC is fully safe while, depending on their backing, stablecoins can be risky.[10]

The rest of this paper proceeds as follows. Section 2 describes our baseline model and examines the equilibrium. Section 3 describes the impact of stablecoin-based narrow banks

[9]For example, through CBDC holding limits to mitigate financial disintermediation risks (Bank of England and HM Treasury, 2024; Burlon, Muñoz and Smets, 2024; Cipollone, 2025).

[10]On stablecoins and financial fragility, including in the form of run risk, see Ahmed, Aldasoro and Duley (2024); Bertsch (2023); d'Avernas, Maurin and Vandeweyer (2022); Gorton et al. (2025); Li and Mayer (2025); Ma, Zeng and Zhang (2025). Stablecoins could also have important additional implications in open economies through, for instance, their impacts on cross-border flows and currency competition (Auer, Lewrick and Paulick, 2025; Azzimonti and Quadrini, 2025; Baughman and Flemming, 2023; CPMI, 2019, 2023; Ferrari Minesso and Siena, 2026; IMF, 2020; Reuter, 2025; Reuter et al., 2025; van Oordt, 2022).

on commercial banks. Section 4 presents the conditions under which a stablecoin issuer's pledge to run a narrow bank is credible. Section 5 considers the implications of changes in monetary policy. Section 6 analyzes the case in which stablecoin issuers are barred from paying interest and Section 7 considers the case of a fixed supply of Treasuries. Section 8 concludes. Some of the mathematical proofs are contained in appendices.[11]

2 Model

We model two groups of agents: households and entrepreneurs, who can set up commercial banks and stablecoin issuers. All agents are risk neutral and we describe their optimization problems below, in turn.

Households. We consider a unit mass of households indexed by i that each have one unit of savings to invest in either bank deposits D or stablecoins S. Bank deposits pay gross return r_D and are fully insured. Stablecoins pay gross return r_S and are uninsured against a potential failure of the stablecoin issuer.

Bank deposits and stablecoins both provide convenience yields that reflect their convenience for making and receiving payments.[12] We denote the convenience yield on bank deposits by $\chi_D > 0$. We denote the average level of the convenience yield on stablecoins by $\chi_S > 0$, but allow it to differ across households, reflecting for instance differences in knowledge of or openness to new technologies. Specifically, household i derives convenience from stablecoins of $\chi_S + \epsilon_i$, where ϵ_i is uniformly distributed: $\epsilon_i \sim U(-\beta, \beta)$ and $\beta > 0$ parameterizes the extent of heterogeneity among households.[13]

Household i's problem is then to choose the savings method $s_i \in \{D, S\}$ that maximizes

[11] We also note that all calculations in the proofs are in a *Mathematica* file that is available on request.

[12] These payments (and therefore the associated convenience) occur prior to any potential failure of the stablecoin issuer.

[13] We also assume a break-even preference for bank deposits over stablecoins if expected returns are equal. This facilitates the derivation of equilibria and comes without loss of generality.

expected utility:

$$\max_{s_i \in \{D,S\}} U_i = \begin{cases} r_D + \chi_D & \text{if choosing bank deposits,} \\ E[r_S] + \chi_S + \epsilon_i & \text{if choosing stablecoins.} \end{cases} \tag{1}$$

Where $E[r_S]$ is the expected gross interest rate on stablecoins that accounts for the probability that saving in stablecoins carries risk if the stablecoin issuer engages in risky lending. Moreover, to save on notation, we hereafter define the relative convenience yield of stablecoins compared to deposits as $\chi \equiv \chi_S - \chi_D$, since, in a choice between two instruments, only the relative convenience between them matters. Moreover, we refer to χ throughout the paper as the stablecoins' *convenience* for brevity. Furthermore, if there are multiple stablecoin issuers offering the same interest rate r_S, we assume that households split their savings evenly between stablecoin issuers.

Commercial banks. A continuum of entrepreneurs can each pay a fixed cost F_B to start a commercial bank. Each such bank engages in monopolistic competition for loans and faces demand L for loans from firms:

$$L(r_L) = \frac{A - \alpha \cdot r_L}{N} \tag{2}$$

where r_L is the gross interest rate charged on loans, N is the number of commercial banks offering loans, and A and α are positive constants.

Each entrepreneur controls the riskiness of their banks' loan portfolio by exerting a monitoring effort q_B at a cost $\frac{1}{2}cq_B^2$. The entrepreneur's effort translates one-to-one into the probability of portfolio repayment.[14] Entrepreneurs fund their loans with deposits and take the deposit interest rate r_D as given. Entrepreneurs are protected by limited liability and repay depositors only when their bank's loans are successful. When a bank's loans are

[14]The modeling of monopolistic competition and monitoring in bank lending follows Dell'Ariccia, Laeven and Marquez (2014).

unsuccessful, the deposit insurance fund repays depositors (both principal and interest).

Stablecoin issuers. Instead of starting a bank, each entrepreneur can pay F_S to establish a stablecoin issuer. Such entrepreneurs sell stablecoins to households and have two options for how to invest the proceeds. First, an entrepreneur running a stablecoin issuer can allocate their receipts entirely to Treasuries, which pay a fixed and certain gross return r_T, creating a stablecoin-based narrow bank. Alternatively, the entrepreneur can use a share of their receipts to make loans L_S to firms at rate $r_{L,S}$, and monitor those loans with effort q_S at cost $\frac{1}{2}cq_S^2$, similar to entrepreneurs running commercial banks. However, an entrepreneur running a stablecoin issuer that chooses to make risky loans incurs a regulatory penalty B if detected, which occurs with probability λ. Stablecoin issuers determine the stablecoin interest rate and if there is more than one issuer, they engage in Bertrand competition on interest rates.[15]

Timing. We structure the model in four stages. At Stage 0, the infinite pool of potential entrepreneurs each decide whether to set up a commercial bank, set up a stablecoin issuer, or stay out of the market. At Stage 1, households make their savings decisions, stablecoin issuers choose r_S, and market clearing determines r_D. At Stage 2, commercial banks choose r_L and stablecoin issuers choose whether to make risky loans, choosing $r_{L,S}$ if so (and investing in treasuries otherwise). At Stage 3, commercial banks choose q_B and any stablecoin issuers making risky loans choose q_S.

Parameter restrictions. We seek parameter restrictions to ensure that the following properties hold in equilibrium: (i) the number of commercial banks N is non-negative, (ii) all gross interest rates are non-negative, reflecting that no lender can lose more than their investment; (iii) the probabilities of portfolio repayment for commercial banks and stablecoin issuers are both between zero and one, i.e., $q_B, q_S \in (0, 1)$; (iv) the total quantity of bank deposits is no smaller and no larger than the number of households, i.e., $\int_{i=0}^{1} \mathbf{1}(s_i = D) \in [0, 1]$;

[15] We abstract from alternative methods through which a provider of private money can profit, such as collecting and selling data (for details, see e.g., Agur, Ari and Dell'Ariccia, 2025).

(v) the same holds for the total quantity of stablecoins, i.e., $\int_{i=0}^{1} \mathbf{1}(s_i = S) \in [0,1]$. The parameter constraints in (3) suffice to ensure such outcomes.[16]

$$\alpha \in (0,1), \quad \beta \in \left(0, \frac{1}{2}\right), \quad A \in \left(\frac{3}{2}, 3\right), \quad c > \frac{2}{\alpha}, \quad r_T \in \left(1, \frac{A}{\alpha}\right), \quad \chi \in (-\beta, \beta) \tag{3}$$

Here, $r_T \in \left(1, \frac{A}{\alpha}\right)$ reflects that the Treasury rate is positive (as expressed in gross rates) but lower than the loan rate that, if charged by a commercial bank, would reduce loan demand from firms to zero. Moreover, $\chi \in (-\beta, \beta)$ means that the most deposit-inclined household experiences more convenience from paying with deposits than with stablecoins; and vice versa for the most stablecoin-inclined household.[17]

3 Stablecoins as narrow banks: equilibrium and results

In this section, we restrict attention to stablecoin issuers that invest only in Treasuries (i.e., $L_S = 0$). Section 4 subsequently derives sufficient conditions under which condition this holds, that is, stablecoin issuers choose to only invest in Treasuries in equilibrium and do not engage in risky lending. In this section, we derive the equilibrium of the game under the restriction that stablecoin issuers hold only Treasuries and then analyze how improvements in stablecoin technology (i.e., higher χ) affect the commercial banking sector, as well as how this depends on the market structure among stablecoin issuers.

3.1 Equilibrium

We solve the game by backward induction, maintaining throughout this section that stablecoin issuers do not make risky loans. Throughout, we use the term "equilibrium" to refer to the Subgame-Perfect Nash Equilibrium.

[16] The sufficiency of these constraints for the properties outlined in the paragraph is shown in a *Mathematica* file that is available on request.

[17] We also note that for c: there is a lower bound, which ensures that monitoring effort does not exceed 1; but no upper bound is needed because $r_L - r_D > 0$ by the other parameter conditions and monitoring effort then always remain strictly positive (i.e., tends to zero for $c \to \infty$).

Stage 3. Commercial banks choose q_B to maximize expected profits

$$E[\Pi_B] = \left(q_B(r_L - r_D) - \frac{1}{2} c q_B^2 \right) L(r_L) \tag{4}$$

giving the solution for monitoring effort as:

$$q_B = \frac{r_L - r_D}{c} \tag{5}$$

Stage 2. Commercial banks choose r_L to maximize equation (4), anticipating their subsequent choice of q_B. This yields:

$$r_L = \frac{1}{3} \left(\frac{2A}{\alpha} + r_D \right) \tag{6}$$

Stage 1: Deposit rate. Households compare bank deposits and stablecoins. By (1), the household that is indifferent between the two options, $\bar{i}$, has $\epsilon_{\bar{i}} = r_D - r_S - \chi$. Households deriving higher convenience from stablecoins ($\epsilon_i > \epsilon_{\bar{i}}$) choose stablecoins, while those deriving lower convenience ($\epsilon_i < \epsilon_{\bar{i}}$) choose deposits. The total supply of deposits to banks S_D is then

$$S_D(r_D, r_S) = \frac{\beta + \epsilon_{\bar{i}}}{2\beta} = \frac{1}{2} + \frac{r_D - r_S - \chi}{2\beta} \tag{7}$$

so that the equilibrium deposit rate can then be found from the market clearing condition that all deposits are used to originate loans: $S_D(r_D, r_S) = N \cdot L(r_L)$. We also note that the total supply of household savings to stablecoin issuers is:

$$S_S(r_D, r_S) = 1 - S_D(r_D, r_S) = \frac{1}{2} - \frac{r_D - r_S - \chi}{2\beta} \tag{8}$$

Stage 1: Stablecoin interest rate. If there are multiple stablecoin issuers, they bid up to $r_S = r_T$ in Bertrand competition and all make zero profit. If there is a single stablecoin

issuer, it instead sets r_S to maximize profits as expressed in (9), yielding the solution in (10):

$$\Pi_S = (r_T - r_S) \cdot S_S(r_D, r_S) \tag{9}$$

$$r_S = \frac{r_D + r_T - \chi - \beta}{2} \tag{10}$$

Stage 0: Entrepreneur entry as commercial banks & stablecoin issuers. Entrepreneurs will continue to set up commercial banks up to the point that the expected profit of a commercial bank equals the fixed cost of creating it: N follows from $E[\Pi_B] = F_B$ where $E[\Pi_B]$ is given by (4).[18] For entrepreneur entry as stablecoin issuers, there are two cases to consider: (i) $F_S = 0$ means that entry continues until the expected profit from narrow banking equals zero, which, given Bertrand competition among issuers, implies $M \geq 2$; (ii) $F_S > 0$ implies that only one stablecoin issuer will enter, since the entrance of any additional issuers implies $\Pi_S < F_S$ because $\Pi_S = 0$ when $M \geq 2$.

Equilibrium and stablecoin issuer market structure. The equilibrium expressions under, respectively, perfectly-competitive stablecoin issuers ($F_S = 0$) and a single stablecoin issuer ($F_S > 0$) are shown in Table 1.[19]

3.2 Stablecoin Convenience and Market Structure

Next, we discuss how an improvement of the convenience of stablecoins, i.e., an increase in χ, affects these equilibrium outcomes (Proposition 1) and how this impact depends on the market structure (Corollary 1).

[18] Although N is a discrete variable, throughout this paper, we will solve for N and treat its comparative statics as though it is a continuous variable. This is without qualitative loss of generality: any force that pushes a continuous N in some direction would push the same way on discrete N except that the latter would change in discrete jumps when thresholds are crossed. But incorporating such jumps, complicates the math without harnessing more intuition from the model.

[19] We note that the Stage 1 subgame is solved as a system of equations of $S_D(r_D, r_S) = N \cdot L(r_S)$,and $r_S = r_T$ under perfect competition and r_S as given by (10) with a single issuer.

Table 1: Equilibrium expressions and stablecoin issuer market structure

Equilibrium: perfect competition		**Equilibrium: single issuer**	
Stage 3: loan monitoring			
$q_B = \frac{2}{c}\frac{A/\alpha + \beta - \chi - r_T}{3 + 2\alpha\beta}$	(11)	$q_B = \frac{2}{c}\frac{A/\alpha + 3\beta - \chi - r_T}{3 + 4\alpha\beta}$	(12)
Stage 2: lending rate			
$r_L = \frac{2A/\alpha + \beta(2A-1) + \chi + r_T}{3 + 2\alpha\beta}$	(13)	$r_L = \frac{2A/\alpha + \beta\,(4A-3) + \chi + r_T}{3 + 4\alpha\beta}$	(14)
Stage 1: deposit and stablecoin volumes & interest rates			
$r_D = \frac{2A\beta + 3(\chi - \beta + r_T)}{3 + 2\alpha\beta}$	(15)	$r_D = \frac{\beta\,(4A-9) + 3\chi + 3r_T}{3 + 4\alpha\beta}$	(16)
$r_S = r_T$	(17)	$r_S = \frac{3r_T + 2\beta\,(A + \alpha\,(r_T - \chi - \beta) - 3)}{3 + 4\alpha\beta}$	(18)
$S_D = \frac{A - \alpha(\chi - \beta + r_T)}{3 + 2\alpha\beta}$	(19)	$S_D = \frac{A + \alpha\,(3\beta - \chi - r_T)}{3 + 4\alpha\beta}$	(20)
$S_S = \frac{3 - A + \alpha(\chi + \beta + r_T)}{3 + 2\alpha\beta}$	(21)	$S_S = \frac{3 - A + \alpha\,(\beta + \chi + r_T)}{3 + 4\alpha\beta}$	(22)
Stage 0: entry			
$N = \frac{2}{\alpha^2 c F_B}\left(\frac{A + \alpha(\beta - \chi - r_T)}{3 + 2\alpha\beta}\right)^3$	(23)	$N = \frac{2}{\alpha^2 c F_B}\left(\frac{A + \alpha\,(3\beta - \chi - r_T)}{3 + 4\alpha\beta}\right)^3$	(24)

Proposition 1 (Impact of stablecoin convenience) *More convenient stablecoins induce banks to raise both deposit and loan rates and take more risk in lending. As more household savings flow to narrow banking through stablecoins, less flow to commercial banking and credit supply contracts, while the number of banks declines.*

Proof. Formally, the statements are $\frac{\partial r_D}{\partial \chi} > 0, \frac{\partial r_L}{\partial \chi} > 0, \frac{\partial q_B}{\partial \chi} < 0, \frac{\partial S_S}{\partial \chi} > 0, \frac{\partial S_D}{\partial \chi} < 0, \frac{\partial N}{\partial \chi} < 0$, and these follow directly from the expressions in Table 1. ■

As stablecoins become more convenient relative to bank deposits, banks have to increase deposit rates to attract funding from households, which is passed through into higher loan rates. Moreover, lending margins for banks compress, leading to increased risk taking.[20] Note that even though banks raise deposit rates, there are outflows from deposits into stablecoins, reducing overall deposits and therefore credit supply. Lastly, compressed bank margins lead to reduced profitability and therefore reduce bank entry.

Corollary 1 (Role of stablecoin market structure) *When stablecoins become more convenient, a single issuer lowers the stablecoin interest rate, increasing its interest margin ($r_T - r_S$) on narrow banking. Consequently, most of the impacts documented in Proposition 1 are weaker (i.e., smaller absolute values) with a single issuer as compared to a perfectly-competitive stablecoin sector. The only exception is the number of banks in equilibrium ($\frac{\partial N}{\partial \chi}$) for which the comparison between stablecoin market structures is ambiguous.*

Proof. See Appendix A.1. ■

Intuitively, a stablecoin issuer with market power captures part of the increased convenience of stablecoins by reducing the interest rate that it pays to stablecoin holders. Therefore, while all the qualitative results about the impact of the convenience of stablecoins are the same as under perfect competition, they are quantitatively less pronounced. That is, with a single issuer, the impact of stablecoins on the banking sector is dampened, as market power

[20] We note that results on bank risk-taking are dependent on functional forms as shown in Dell'Ariccia, Laeven and Marquez (2014).

allows the single issuer to capture some of the benefits of increased stablecoin convenience, rather than passing them on to the households.

4 Credibility conditions

We next turn to the conditions under which stablecoin issuers' pledge to invest only in safe assets is credible in equilibrium. Section 4.1 derives a sufficient condition for such credibility when there is perfect competition among stablecoin issuers, after which Section 4.2 does the same for the case of a single issuer, and subsequently Section 4.3 compares these conditions and their comparative statics.

4.1 Credibility under perfect competition

When a stablecoin issuer chooses to engage in risky lending, this creates a new "island" within the model's monopolistic competition structure. That is, instead of N risky lenders (i.e., commercial banks) there are $N+1$. We focus on unilateral deviations from the equilibrium in which all stablecoins invest only in safe assets. This means that we analyze the incentives to deviate for one stablecoin issuer - whether it chooses to use for risky lending some the funding it has acquired in Stage 1 under the promise of safety - given that all other stablecoin issuers remain fully invested in safe assets.

To establish a sufficient condition for credibility, we center our analysis on the Threshold Issuer (TI), defined as the issuer that, given the amount of funds raised in Stage 1, finds it profit-maximizing to divert its entire portfolio into risky lending, but would divert no additional funds were extra resources available. No issuer could be more inclined to deviate to risky lending than TI and, therefore, if TI chooses to remain invested in safe assets only, any issuer would.

We find TI's credibility condition through backward induction: given $r_S = r_T$ under perfect competition among stablecoin issuers, we solve for the monitoring, q_S, of a deviating

stablecoin issuer at Stage 3 and then the interest rate on its risky lending, $r_{L,S}$, at Stage 2. With q_S and $r_{L,S}$ in hand, we subsequently derive the volume of diverted stablecoin funding that maximizes the profit on risky lending, which is the funding level that identifies TI. The sufficient condition for credibility then follows from having an expected regulatory penalty, λB, that outweighs the risky lending profit of TI.[21]

Using the same steps as for equations (5) and (6), we find

$$q_B = \frac{r_{L,S} - r_T}{c}; \quad r_{L,S} = \frac{1}{3}\left(\frac{2A}{\alpha} + r_T\right) \tag{25}$$

from which the amount of stablecoin funding that identifies TI must equal $L(r_{L,S}) = \frac{A-\alpha \cdot r_{L,S}}{N+1}$ and replacing N from (23) we can calculate $E[\Pi_S] = \left(q_S(r_{L,S} - r_T) - \frac{1}{2}c\left(q_S\right)^2\right) L(r_{L,S})$ – TI's profit from risky lending. We record the outcome in Lemma 1:

Lemma 1 (Credibility with perfectly competitive stablecoin issuers) *Under perfect competition, stablecoin issuers certainly remain narrow banks if* $\lambda B > \underline{\lambda B}_{PC}$*, where:*

$$\underline{\lambda B}_{PC} = \frac{2}{39}\frac{F_B\left(3+2\alpha\beta\right)^3\left(A-\alpha r_T\right)^3}{\alpha^2 c F_B\left(3+2\alpha\beta\right)^3 + 2\left(A+\alpha\left(\beta-\chi-r_T\right)\right)^3} \tag{26}$$

Proof. In text above. ■

4.2 Credibility with a single issuer

For the case of a single stablecoin issuer, we can similarly derive a sufficient condition based on TI. This derivation is more involved, however, and is contained in Appendix A.2.[22] That appendix also contains the resulting expression for the sufficient condition, $\lambda B > \underline{\lambda B}_M$, where $\underline{\lambda B}_M$ represents the minimum required stringency of regulation to ensure that no single issuer would ever want to deviate to risky lending:

[21] I.e., given $\Pi_S = 0$ for narrow banking under perfect competition, TI would want to deviate to risky lending if the profits are greater than the expected regulatory penalty.

[22] The reason that deriving a sufficient condition for the single issuer is more complex than for perfectly competitive issuers, is that the single issuer makes positive profit from narrow banking in equilibrium.

Lemma 2 (Credibility with a single stablecoin issuer) *For a single stablecoin issuer to remain a narrow bank it is sufficient that* $\lambda B > \underline{\lambda B}_M$ *where the expression for* $\underline{\lambda B}_M$ *is shown in (A.2.1) in Appendix A.2.*

Proof of Lemma 2. See Appendix A.2. ■

4.3 Comparing credibility conditions & comparative statics

We next turn to the comparison of $\underline{\lambda B}_{PC}$ to $\underline{\lambda B}_M$. We are interested both in the comparison of their levels - i.e., how does stablecoin issuer market structure affect the minimum regulatory requirement to ensure credible narrow banking - and their comparative statics: First, how does stablecoin convenience affect $\underline{\lambda B}$ and does the direction of this impact depend on stablecoin market structure? Second, how does $\underline{\lambda B}$ depend on the market structure of commercial banks, for which we here focus on F_B - the entry barrier to commercial banking that determines N - and is there an interaction between commercial banking and stablecoin issuer market structure in terms of the implications for the minimum regulatory requirement?

We start from comparing the levels of $\underline{\lambda B}_{PC}$ and $\underline{\lambda B}_M$ in Proposition 2. Intuitively, a perfectly-competitive stablecoin issuer, facing a zero margin ($r_S = r_T$) on narrow banking, more easily gives in to deviation incentives than a single stablecoin issuer with positive profit from narrow banking from $r_T - r_S > 0$:

Proposition 2 (Minimum regulation and stablecoin market structure) *The minimum expected regulatory punishment to ensure that any stablecoin issuers prefers to remain a narrow bank rather than engage in risky lending, is tighter when the stablecoin sector is perfectly competitive than when there is a single stablecoin issuer.*

Proof. Over the parameter space identified in (3), $\inf\left(\underline{\lambda B}_{PC} - \underline{\lambda B}_M\right) > 0$.[23] Hence, $\underline{\lambda B}_{PC} > \underline{\lambda B}_M$. ■

[23] This calculation is conducted using *MinValue* and *MaxValue* operators in *Mathematica*, which calculate infima and suprema of functions over defined parameter ranges. The file is available on request. The same applies for the proofs of Propositions 3 - 6.

Next, Proposition 3 analyzes the relationship between stablecoin convenience and deviation incentives, and how this relationship depends on stablecoin market structure. Under perfect competition among stablecoin issuers, a higher stablecoin convenience yield increases the incentive for a stablecoin issuer to deviate from narrow banking, raising $\underline{\lambda B}_{PC}$. Intuitively, this reflects that more convenient stablecoins reduce the number of commercial banks in equilibrium, increasing firms' residual demand for credit. This residual demand can be served by stablecoin issuers that decide to make risky loans and so raises their incentive to deviate. To offset this, the expected regulatory penalty must rise. In contrast, Proposition 3 finds that there is an ambiguous role for the stablecoin convenience yield in determining $\underline{\lambda B}_{M}$: a rise in χ can have a positive or negative impact on the incentive of a single stablecoin issuer to deviate. In addition to the effect that runs through the number of banks ($\chi \uparrow \Rightarrow N \downarrow \Rightarrow L(r_{L,S}) \uparrow \Rightarrow \underline{\lambda B}_{M} \uparrow$), there two more effects: the margin earned on narrow banking rises, decreasing deviation incentives ($\chi \uparrow \Rightarrow r_S \downarrow \Rightarrow (r_T - r_S) \uparrow \Rightarrow \underline{\lambda B}_{M} \downarrow$); but the lower funding cost of the stablecoin issuer means that its margin earned on risky loans also rises, increasing deviation incentives ($\chi \uparrow \Rightarrow r_S \downarrow \Rightarrow (r_{L,S} - r_S) \uparrow \Rightarrow \underline{\lambda B}_{M} \uparrow$). Parameters determine which effects win this tug-of-war. Even when the overall impact is $\frac{\partial \underline{\lambda B}_{M}}{\partial \chi} > 0$, however, it holds that $\frac{\partial \underline{\lambda B}_{PC}}{\partial \chi} > \frac{\partial \underline{\lambda B}_{M}}{\partial \chi}$ and greater competition on the stablecoin market amplifies the impact of stablecoin convenience on deviation incentives.

Proposition 3 (The impact of stablecoin convenience on minimum regulation) *Increased stablecoin convenience increases the incentive of a perfectly-competitive stablecoin issuer to deviate to risky lending. Instead, with a single stablecoin issuer, the relationship between stablecoin convenience and deviation incentives is ambiguous and – even when positive – always quantitatively weaker than under perfect competition.*

Proof. Over the parameter space identified in (3), $\inf \frac{\partial \underline{\lambda B}_{PC}}{\partial \chi} > 0$, $\inf \left(\frac{\partial \underline{\lambda B}_{PC}}{\partial \chi} - \frac{\partial \underline{\lambda B}_{M}}{\partial \chi} \right) > 0$, while $\inf \frac{\partial \underline{\lambda B}_{M}}{\partial \chi} < 0$ and $\sup \frac{\partial \underline{\lambda B}_{M}}{\partial \chi} > 0$. Hence, $\frac{\partial \underline{\lambda B}_{PC}}{\partial \chi} > 0$, $\frac{\partial \underline{\lambda B}_{PC}}{\partial \chi} > \frac{\partial \underline{\lambda B}_{M}}{\partial \chi}$ and $\frac{\partial \underline{\lambda B}_{M}}{\partial \chi} \lesseqgtr 0$. ■

Furthermore, as barriers to entry in commercial banking (F_B) increase, the number of banks declines, and this increases the profit that can be made on risky lending for a deviating stablecoin issuer. When the stablecoin sector is perfectly competitive, Corollary 2 shows that this unambiguously raises the minimum regulation to ensure credible narrow banks. With a single stablecoin issuer, however, the impact of F_B is ambiguous, because not only profit from risky lending but also from narrow banking rises for the single issuer when banking sector concentration declines. The latter is driven by an interest rate response: a less competitive banking sector offers lower deposit rates, which in turn leads the single stablecoin issuer to also offer a lower stablecoin interest rate, leaving it with a larger margin on narrow banking.

Corollary 2 (Commercial bank concentration and minimum regulation) *Increased barriers to entry in commercial banking increase the incentive of a perfectly-competitive stablecoin issuer to deviate to risky lending. Instead, with a single stablecoin issuer, the relationship between these barriers and deviation incentives is ambiguous.*

Proof. Over the parameter space identified in (3), $\inf \frac{\partial \lambda B_{PC}}{\partial F_B} > 0$, while $\inf \frac{\partial \lambda B_M}{\partial F_B} < 0$ and $\sup \frac{\partial \lambda B_M}{\partial F_B} > 0$. Therefore, $\frac{\partial \lambda B_{PC}}{\partial F_B} > 0$ and $\frac{\partial \lambda B_M}{\partial F_B} \lesseqgtr 0$. ■

5 Monetary policy

This section analyzes the transmission of monetary policy to stablecoin issuers and commercial banks. The transmission from monetary policy to short-term risk-free (e.g., Treasury) rates is well-established (Mishkin, 2022; Woodford, 2003) and we therefore proceed to consider (exogenous) changes in the monetary policy rate as movements of r_T.

Proposition 4 (Monetary loosening under credible narrow banking) *A lower r_T reduces deposit & loan rates and bank risk taking. As more household savings flow to bank deposits, credit supply to firms expands, and more banks enter the market.*

Proof. From the expressions in Table 1, it follows directly that: $\frac{\partial r_D}{\partial r_T} > 0$, $\frac{\partial r_L}{\partial r_T} > 0$, $\frac{\partial q_B}{\partial r_T} < 0$, $\frac{\partial S_S}{\partial r_T} > 0$, $\frac{\partial S_D}{\partial r_T} < 0$, and $\frac{\partial N}{\partial r_T} < 0$. ■

A monetary loosening is fully (with perfectly-competitive issuers) or partially (with a single issuer) passed on to lower stablecoin rates. As r_S declines, stablecoins become less attractive relative to bank deposits. The reduced competition that banks face for their funding base leads to an equilibrium with lower deposit rates and, consequently, lower loan rates and reduced bank risk taking. Firms' demand for loans picks up at those lower loan rates and total credit supply expands. With commercial banking a more profitable enterprise, more banks also enter. Because the single stablecoin issuer absorbs part of the monetary loosening in its profit margins, unlike perfectly-competitive issuers, these monetary transmission effects are nearly all stronger under perfect competition than with a single issuer.

Corollary 3 (Role of stablecoin market structure) *A single issuer only partly passes on monetary policy changes,* $\frac{\partial r_S}{\partial r_T} \in (0,1)$*, while under perfect competition* $\frac{\partial r_S}{\partial r_T} = 1$*. Consequently, most of the effects in Proposition 4 are stronger under perfect competition than with a single issuer (except* $\frac{\partial N}{\partial r_T}$ *for which the impact of market structure is ambiguous).*

Proof. The first sentence follows from (18): $\frac{\partial r_S}{\partial r_T} = \frac{3+2\alpha\beta}{3+4\alpha\beta} \in (0,1)$. The proof of the remainder of Corollary 3 is identical to the proof of Corollary 1 contained in Appendix A.1. ■

Looser monetary policy challenges the credibility of stablecoin issuers' business model as narrow banks. Although the sign of monetary transmission is unambiguous here – a rate cut raises the minimum regulation needed to prevent stablecoin issuers' deviation to risky lending – there are nevertheless countervailing effects underlying this result. On the one hand, the movements of interest margins on both narrow banking and risky lending push issuers' toward deviation: a lower r_T implies either a lower (single issuer) or a constant but zero (perfect competition) interest margin on narrow banking, $r_T - r_S$; at the same time, the reduction of r_T leads to an increase of $r_{L,S} - r_S$, as loan rates decrease by less than the stablecoin interest rate when r_T declines. On the other hand, as the monetary loosening

leads to more entry of commercial banks, the volume of lending on each island – including on a deviator's newly created island – declines. The interest-margin effects always outweigh the latter effect, however, so that deviation incentives increase under monetary loosening.

Furthermore, monetary transmission to deviation incentives is stronger when there is a single issuer than when the stablecoin sector is perfectly competitive: for a single issuer, a monetary loosening simultaneously reduces the interest margins on narrow banking *and* increases the profitability of risky lending, whereas for perfectly-competitive issuers only the latter applies (since the interest margin on narrow banking is always zero).

Proposition 5 (The impact of monetary policy on minimum regulation) *A monetary loosening strengthens the incentive of a stablecoin issuer to make risky loans, increasing the minimum regulatory penalty that is necessary to prevent this. This effect is stronger with a single issuer than with perfectly-competitive stablecoin issuers.*

Proof. Over the parameter space in (3), $\sup \frac{\partial \lambda B_{PC}}{\partial r_T} < 0$ and $\sup \frac{\partial \lambda B_M}{\partial r_T} < 0$. Moreover, $\inf \left(\frac{\partial \lambda B_{PC}}{\partial r_T} - \frac{\partial \lambda B_M}{\partial r_T} \right) > 0$. Therefore, $\frac{\partial \lambda B_M}{\partial r_T} < \frac{\partial \lambda B_{PC}}{\partial r_T} < 0$. ■

Our result that monetary loosening complicates the landscape for credibly sustaining narrow banking by stablecoin issuers is distinct from the more immediate observation that narrow banking cannot remain profitable once the risk-free rate falls too deeply, particularly if, in practice, the presence of cash as an outside option imposes an effective lower bound. This section's derivations center purely on *changes* to r_T, not its level. Thus, depending on parameters, a policy rate cut might lead to deviations to risky lending (or necessitate a regulatory tightening) even when the level of the risk-free rate is still relatively high.

6 Prohibition on stablecoin interest payments

We next consider the case in which interest payments on stablecoins are prohibited (i.e., $r_S = 1$). Prohibiting interest payments obviously makes stablecoins less attractive to

households, which weakens competition for deposit funding, and so encourages commercial banks to expand their lending operations.[24]

The impact of a stablecoin interest prohibition on issuers' deviation incentives is more nuanced, however, and depends critically on the barriers to entry in the stablecoin market. Only when such barriers are *small* enough, does a zero-interest regulation fully ensure the credibility of stablecoin issuers as narrow banks (Proposition 6). Consider the extreme of $F_S = 0$: the prohibition on interest payments creates a protected profit stream, $r_T - r_S > 0$, for entering issuers, which means that $F_S = 0$ encourages infinite entry of stablecoin issuers.[25] Each issuer then captures only a negligible share of total demand for stablecoins. For these small issuers, the discrete cost associated with the expected punishment for deviating will always outweigh the profit earned on a negligible quantity of loans to firms, so their pledge to remain narrow is fully credible.

In contrast, when F_S is large enough that only a single issuer chooses to enter, this interest-constrained single issuer certainly makes less profit than the unconstrained single issuer that we previously considered. This does not necessarily mean that the constrained single issuer is more inclined to deviate to risky lending than the unconstrained: with $r_S = 1$, the issuer faces a more competitive banking sector (higher N) but also a higher interest margin on risky loans, and the effect of the stablecoin interest prohibition on deviation incentives becomes ambiguous.

Proposition 6 (Interest prohibition and credibility) *There exists a threshold value of stablecoin issuer entry costs, F_S, such that for F_S below this threshold a prohibition on interest payments guarantees that stablecoin issuers never deviate from narrow banking, while for F_S above this threshold, the impact of prohibiting interest on issuers' credibility is ambiguous.*

Proof of Proposition 6. See Appendix A.3. ■

[24] Formally, from equation (7) it follows that constraining $r_S = 1 < r_T$ (where unconstrained $r_S \in (1, r_T]$ by (17) and (18)) implies that a larger share of household funding flows to deposits, which, in turn, implies a lower level of r_D to equilibrate the market for loanable funds. From (6), r_L then declines.

[25] This implicitly assumes that $S_S > 0$ when $r_S = 1$. Formally, given $r_S = 1$, $S_S = \frac{3-A+\alpha(\chi+\beta+1)}{3+2\alpha\beta}$, which means that the parameter constraints in (3), particularly, $A < 3$, $\alpha > 0$, and $\chi > -\beta$, suffice for $S_S > 0$.

7 Endogenous Treasury Yield (r_T)

In this section, we assume that the supply of Treasuries is fixed at some T, while the yield on Treasuries, r_T, is endogenous. Note that this is the polar opposite of our baseline model, which assumes that stablecoin demand does not affect Treasury yields, and that there is a perfectly elastic supply of Treasuries available for the stablecoin issuers to purchase. This assumption is most appropriate for a stablecoin sector that is small relative to the overall size of the Treasury market. In contrast, the assumption of this section considers the other extreme, in which stablecoin issuers are the only purchasers of Treasuries. While perhaps less relevant today, as the stablecoin sector grows in size, so could its impact on the yields in the Treasury market.[26] For simplicity, we restrict the analysis of this section to the case of perfectly competitive stablecoin issuers.[27]

Proposition 7 *When the supply of Treasuries is fixed, any change in stablecoin convenience is offset by opposing an change in Treasury yield. The commercial banking sector is unaffected.*

Proof. In the text below. ■

As χ increases then, all else given, household demand for stablecoins rises. However, when Treasury supply is fixed, the market clearing condition that stablecoin supply must equal Treasury supply implies that equilibrium stablecoin supply must remain unchanged. Therefore, any change in stablecoin convenience must be offset by an equal change in the Treasury yield (given that under perfect competition $r_S = r_T$) such that

$$S_S(r_D, r_S) = \frac{1}{2} - \frac{r_D - r_T - \chi}{2\beta} = T \tag{27}$$

[26] For example, Ahmed and Aldasoro (2025) and Cerutti et al. (2026) document statistically significant but small impacts of stablecoins on Treasury yields.

[27] In the context of this section, a single stablecoin issuer would be a monopsonist in the Treasury market and be able to exhibit market power, affecting Treasury yields in ways that require more detailed modeling.

remains unchanged. Note that all other equilibrium conditions remain unchanged from the baseline. Therefore, the commercial banking sector is completely insulated from changes in stablecoin convenience. While this result holds in the edge case of a fixed Treasury supply, it implies that as stablecoins grow large relative to the Treasury market, some of the baseline model's results attenuate, since the gains of stablecoin convenience partly divert to lower Treasury yields – a fiscal boon.

8 Conclusion

We examine the implications of stablecoin-based narrow banks for the wider banking sector. More convenient stablecoins intensify competition for household funding. Commercial banks respond by raising deposit rates, which compresses loan margins and weakens incentives for costly monitoring. The resulting equilibrium features fewer banks, lower aggregate credit to firms, and greater bank risk-taking. Greater competition among stablecoin issuers amplifies these effects, since competition forces stablecoin issuers to pass on the full benefit of increased stablecoin convenience to households.

We also derive the conditions under which stablecoin issuers' pledge to remain narrow is credible. In short, credibility requires that the potential profits from deviating into risky lending are less than the expected regulatory penalty for doing so. Greater competition among stablecoin issuers erodes profits from narrow banking and so increases the temptation to seek higher returns through risky lending – i.e., to deviate from narrow banking. Improvements in the convenience of stablecoins can paradoxically weaken their issuers' credibility by shifting more residual credit demand toward stablecoin issuers, hence increasing the potential returns from making risky loans. Lower risk-free interest rates also strengthen the appeal of risky lending for stablecoin issuers, implying that tighter regulation is required for stablecoin-based narrow banks to remain credible.

Our findings highlight the trade-offs facing regulators of stablecoins. Tighter regulation

supports the credibility of stablecoin-based narrow banks and so improves the payment options available to households, but credible stablecoins also constrict bank credit and increase bank risk-taking. Moreover, the credibility of stablecoin-based narrow banks depends on both interest rates and the stablecoin convenience yield, meaning that the trade-off facing regulators will change with the business cycle and with developments in stablecoin technology and adoption. In our model, a lower risk-free rate, a higher convenience yield on stablecoins, and greater competition among stablecoin issuers can all increase the incentive for a given stablecoin issuer to deviate from narrow banking to making risky loans. Thus, as interest rates fall, stablecoin adoption spreads, and more firms launch their own stablecoins, regulators may need to be prepared to tighten regulation accordingly.

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Appendix

A Proofs

This appendix contains proofs omitted from the main text. Full calculations for all steps are performed in a *Mathematica* file that is available on request.

A.1 Proof of Corollary 1

The first sentence of Proposition 1 follows from (18): $\frac{\partial r_S}{\partial \chi} = -\frac{2\alpha\beta}{3+4\alpha\beta} < 0$. The second sentence derives from the expressions in Table 1, where $\frac{\partial r_D}{\partial \chi}, \frac{\partial r_L}{\partial \chi}, \frac{\partial q_B}{\partial \chi}, \frac{\partial S_S}{\partial \chi}, \frac{\partial S_D}{\partial \chi}$ have the same numerators under both $F_S = 0$ and $F_S > 0$, but have a smaller denominator when $F_S = 0$ than when $F_S > 0$, i.e., $3 + 2\alpha\beta < 3 + 4\alpha\beta$. For $\frac{\partial N}{\partial \chi}$, however, the numerator under $F_S > 0$ is larger, which can sometimes offset the larger denominator: using numerical evaluation in *Mathematica*, we find that within the parameter space in (3), $\frac{\partial N}{\partial \chi}$ can be larger (more negative) under either $F_S = 0$ or $F_S > 0$, depending on parameters.

A.2 Proof of Lemma 2

We note that multiple situations can occur when a single stablecoin issuer engages in risky lending. First, we have to consider the amount of assets that it has raised in the previous stage. That is, if it has raised enough assets to be able to maximize its profit from risky lending without constraints, we call the issuer unconstrained, otherwise we call it constrained. Second, we have to consider if a single issuer will default on its stablecoin liabilities when risky loans do not repay. Therefore, four distinct scenarios could arise.

1. A single issuer uses all of its assets for risky lending, and does default when the loans do not repay.

2. A single issuer uses all of its assets for risky lending, and does not default when the loans do not repay.

3. A single issuer uses some, but not all of its assets for risky lending, and does not default when the loans do not repay.

4. A single issuer uses some, but not all of its assets for risky lending, and does default when the loans do not repay.

Note that the second scenario can be discarded, as a single issuer who diverts all its funds into risky lending necessarily defaults when those loans do not repay. To derive the expression in the Lemma, we consider the case of a single issuer issuer who is at the threshold of being constrained (e.g., will loan out all assets but would not want to loan out any more), and then show that if such an issuer would not engage in risky lending, then no issuer would.

A.2.1 Derivation of the condition

See Mathematica file for the calcuation. The outcome is:

$$\begin{aligned}
\underline{\lambda B}_M &= \frac{F_B \Omega}{27\Theta}\left(\frac{2\Omega^2}{1+\alpha^2 c\left(3+4\alpha\beta\right)^2 F_B/\Theta} - 9\alpha^2\beta c\left(3+4\alpha\beta\right)^2\left(3-\left(A-\alpha r_T\right)+\alpha\left(\beta+\chi\right)\right)\right) \\
\Omega &= \frac{\left(A-\alpha r_T\right)\left(3+2\alpha\beta\right)+2\alpha\beta\left(3+\alpha\left(\beta+\chi\right)\right)}{3+4\alpha\beta} \\
\Theta &= 2\left(A-\alpha r_T+\alpha\left(3\beta+\chi\right)\right)^3
\end{aligned} \tag{A.2.1}$$

A.2.2 Sufficiency of the condition for the other cases:

First, we argue that the condition is sufficient to cover any single issuer who diverts all of its assets into risky lending. Denote by $\underline{L} < \hat{L}_S$ the amount of loans originated by such an issuer. Then this issuer faces the incentive compatibility constraint that

$$\underline{L}(r_T - r_S) > \pi(\underline{L}) + \lambda B \tag{A.2.2}$$

But note that from the threshold issuer's condition we get that

$$\hat{L}_S(r_T - r_S) > \pi(\hat{L}_S) + \lambda B \tag{A.2.3}$$

$$\iff \underline{L}(r_T - r_S) + (\hat{L}_S - \underline{L})(r_T - r_S) > \pi(\hat{L}_S) + \lambda B \tag{A.2.4}$$

$$\iff \underline{L}(r_T - r_S) > \pi(\hat{L}_S) - (\hat{L}_S - \underline{L})(r_T - r_S) + \lambda B \tag{A.2.5}$$

Now note that by definition of the threshold issuer, it is more profitable to divert assets into risky lending up to the amount $\hat{L}_S$ rather than keeping the funds in Treasuries. We therefore know that for the RHS of the inequality the following holds:

$$\pi(\hat{L}_S) - (\hat{L}_S - \underline{L})(r_T - r_S) + \lambda B \tag{A.2.6}$$

$$= \pi(\underline{L}) + \underbrace{(\pi(\hat{L}_S) - \pi(\underline{L})) - (\hat{L}_S - \underline{L})(r_T - r_S)}_{>0} + \lambda B \tag{A.2.7}$$

$$> \pi(\underline{L}) + \lambda B \tag{A.2.8}$$

Now by combining the LHS from A.2.5 and the RHS from A.2.8, we get that

$$\underline{L}(r_T - r_S) > \pi(\underline{L}) + \lambda B \tag{A.2.9}$$

as desired.

Second, we argue that the condition is sufficient to cover any single issuer who diverts some, but not all of its assets into risky lending and does not default when the loans do not repay. Denote by $\bar{S}_S > \hat{L}_S$ the amount assets available to such an issuer. Then the issuer faces the incentive compatibility constraint that

$$\bar{S}_S(r_T - r_S) > \pi(\hat{L}_S) + (\bar{S}_S - \hat{L}_S)(r_T - r_S) + \lambda B \tag{A.2.10}$$

Where we use the definition of the threshold issuer to argue that such an issuer originate $\hat{L}_S$ and keep the rest of the assets in Treasuries. Next, note that

$$\bar{S}_S(r_T - r_S) > \pi(\hat{L}_S) + (\bar{S}_S - \hat{L}_S)(r_T - r_S) + \lambda B \tag{A.2.11}$$

$$\iff \hat{L}_S(r_T - r_S) > \pi(\hat{L}_S) + \lambda B \tag{A.2.12}$$

Which coincides with the incentive compatibility constraint of the threshold issuer.

Third, we argue that the condition is sufficient to cover any single issuer who diverts some, but not all of its assets into risky lending and does default when the loans do not repay. Note that this case is similar to the preceding one, except that due to the risk of default, the incentive compatibility constraint becomes

$$\bar{S}_S(r_T - r_S) > \pi(\hat{L}_S) + q_S(\bar{S}_S - \hat{L}_S)(r_T - r_S) + \lambda B \tag{A.2.13}$$

Which makes the RHS of the inequality more lax compared to the previous case, as $q_S \leq 1$. Therefore the claim follows immediately given that we have shown the previous case to hold.

A.3 Proof of Proposition 6

For $F_S = 0$, the entry of stablecoin issuers at Stage 0 tends to infinity, because for any discrete number of issuers (per the assumption of equal sharing discussed on p. 8) each issuer gains positive market share of stablecoin funding and makes a positive margin. For $M \to \infty$, the amount of stablecoin funding that a given issuer can consider deviating to risky lending is atomistic while the expected cost of such a deviation (λB) is discrete and positive. Hence, for $F_S = 0$, no stablecoin issuer will ever deviate to risky lending.

Instead, for F_S large enough that only one issuer enters ($M = 1$), the deviation incentives of this issuer can be either weaker or stronger than those of the unconstrained single issuer (Section 4.2). Define by $\underline{\lambda B}_M^{Constrained}$ the minimum required regulation when $M = 1$ and $r_S = 1$ as compared to $\underline{\lambda B}_M$ for the interest-unconstrained single issuer. The expression for $\underline{\lambda B}_M^{Constrained}$ is derived in a *Mathematica* file available on request. Within that file, we find that over the parameter space identified in (3), $\sup\left(\underline{\lambda B}_M^{Constrained} - \underline{\lambda B}_M\right) > 0$ and $\inf\left(\underline{\lambda B}_M^{Constrained} - \underline{\lambda B}_M\right) < 0$.

Since for $F_S = 0$, stablecoin issuers never deviate to risky lending, while for F_S large enough that only one issuer enters, the impact of imposing $r_S = 1$ on deviation incentives is ambiguous, then by continuity, the statement in Proposition 6 holds.