Stablecoins: Adoption and Fragility

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Abstract

This paper develops a payment-centric model of stablecoin runs with endogenous consumer adoption and seller acceptance, making the issuer's liability composition an equilibrium outcome. Stablecoin fragility arises endogenously from shifts in the composition of the holder base as adoption expands across transactional environments. Broader adoption attracts users who derive lower transactional value from holding stablecoins, increasing the aggregate propensity to run and generating a destabilizing run externality that individual adoption decisions do not internalize. In addition, sellers' multi-homing choices create uninternalized network effects that erode the transaction value of bank deposits. By linking adoption dynamics to issuer fragility, the model provides theoretical foundations for regulatory concerns about excessive stablecoin adoption and delivers novel testable implications. The analysis further shows that seigniorage and congestion effects can mitigate run risk, whereas issuer moral hazard can amplify fragility, even in the presence of regulatory disclosure.

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1 Introduction

Across banks, money market funds, mutual funds, and short-term funding markets, investor composition is an important driver of fragility (Iyer et al. 2016; Kacperczyk and Schnabl 2013; Chernenko and Sunderam 2014; Cipriani and La Spada 2024).[1] A similar composition-based mechanism appears relevant for stablecoins, which mimic the safety of bank deposits through fiat-currency pegs but remain vulnerable to runs.

The temporary depeg of the stablecoin USDC following the failure of Silicon Valley Bank (SVB) in March 2023 serves as an illustration. After the USDC issuer confirmed it's \$3.3bn reserve exposure to SVB, selling pressure surged on centralized cryptocurrency exchanges–venues with a large retail presence–pushing the USDC price down by around 10%. By contrast, activity on decentralized exchanges was concentrated among long-active, crypto-native addresses that arbitraged price deviations and accumulated discounted USDC.[2] This contrast highlights how shifts in the coin holder composition have the potential to affect run dynamics, a mechanism that becomes increasingly important as stablecoins expand beyond their crypto-native core into broader payment use.

This paper develops a payment-centric theoretical model in which stablecoin adoption, user heterogeneity, and issuer fragility are jointly determined. In practice, the heterogeneity among stablecoin holders is substantial. Use cases range from *crypto-native functions*–such as settlement on cryptocurrency exchanges and decentralized finance–to *real-economy applications*, including cross-border payments, remittances, currency substitution, and privacy-enhanced payments. In the model, the diversity of these *transactional environments* implies substantial variation in the transactional value of holding stablecoins. This matters not only for adoption but also for fragility due to its effect on the composition of stablecoin holders, because holders with lower transactional value place less weight on continued access and are therefore more prone to redeem during stress, generating a composition-driven externality that individual adoption decisions do not internalize.

The continued growth of stablecoins beyond the crypto-native niche strengthens the relevance of this composition effect, motivating a systematic analysis of adoption and fragility. Despite the USDC episode, which revealed the susceptibility of even fully backed issuers to runs, the market has expanded rapidly. In October 2025 the market

[1] Fragility also depends on the characteristics of the instruments held by intermediaries (see Chen et al. (2010) and Falato et al. (2021) for asset illiquidity and other portfolio vulnerabilities).

[2] See, e.g., contemporaneous market analysis by Chainalysis on the March 2023 USDC depeg (`https://www.chainalysis.com/blog/crypto-market-usdc-silicon-valley-bank/`), which document sharp selling pressure and net outflows on centralized exchanges alongside substantial decentralized-exchange activity consistent with arbitrage by long-active on-chain addresses.

capitalization of dollar-pegged stablecoins surpassed $300bn and gross on-chain settlement volume reached $27.6tn in 2024, or approximately $6tn after adjusting for inorganic activity.[3] Crucially, the real-economy applications such as B2B supply-chain payments and remittances are important drivers of this growth (Jhanji et al. 2025; BIS 2025) and are associated with user segments that, through the lens of the model, may derive lower transactional value and have higher redemption sensitivity, thereby increasing fragility.

Regulatory concerns about stablecoin fragility and the risks of excessive adoption provide additional motivation for the analysis in this paper. Stablecoins are high on the regulatory agenda, reflecting their role as a critical link between the rapidly evolving crypto ecosystem and traditional financial markets.[4] In the United States, the GENIUS Act of July 2025 establishes a comprehensive federal oversight framework for dollar-pegged stablecoins. In the United Kingdom, the Bank of England proposes a regulatory regime requiring systemic sterling stablecoins to hold at least 40% of their backing assets in central bank reserves to ensure par convertibility.[5] In the euro area, the European Central Bank (ECB) is advancing its work on the digital euro,[6] one explicit objective of which is to prevent private stablecoins from displacing bank deposits as the primary medium of exchange–that is, to limit excessive stablecoin adoption.[7]

Addressing these concerns requires a theoretical framework that connects stablecoin adoption, holder composition, and issuer fragility, and allows to clarify why adoption may become excessive. This paper offers such a framework and addresses three research questions: *(i)* How is issuer fragility shaped by the adoption choices of heterogeneous users and the acceptance of stablecoins across different transactional environments? *(ii)* What are the theoretical foundations for regulatory concerns that stablecoin adoption could become excessive relative to other media of exchange? *(iii)* How do structural features–such as payment preferences, network effects, transaction costs, seigniorage, and issuer moral hazard–shape stablecoin fragility?

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[3]See Figure A1 in the Appendix for the expansion of the stablecoins market and Higginson and Spanz (2025) and Visa (`https://www.visaonchainanalytics.com`) for the role of stablecoins in transactions.

[4]See Barthelemy, Gardin and Nguyen (2023) and Ahmed and Aldasoro (2025) for empirical studies of the link to commercial paper and treasury markets, respectively.

[5]See the Bank of England's consultation paper on the "Proposed regulatory regime for sterling-denominated systemic stablecoins" (BoE 2025).

[6]The potential launch of the digital euro is in 2029, conditional on the adoption of the relevant legislation. See the October 2025 progress report on the preparation phase of a digital euro (ECB 2025).

[7]For a discussion of the threat of stablecoins to bank deposits, see Philip Lane's speech "The digital euro: maintaining the autonomy of the monetary system" (20 March 2025): `https://www.ecb.europa.eu/press/key/date/2025/html/ecb.sp250320_1~41c9459722.en.html`, and Piero Cipollone's speech "Preparing the future of payments and money: the role of research and innovation" (26 September 2025) on the digital euro's potential to mitigate this risk: `https://www.ecb.europa.eu/press/key/date/2025/html/ecb.sp250926~e856d2e386.en.html`.

To address these questions, I develop a parsimonious two-period model with two media of exchange–bank deposits and stablecoins–in which the diversity of stablecoin use cases and their link to fragility play a central role. Both media of exchange are subject to endogenous acceptance by "sellers" and endogenous adoption by "consumers". In the model, these sellers stand broadly for entities providing access to different transactional contexts–ranging from crypto-native functions to real-economy applications. Consumers differ in their demand for these transactional contexts, reflecting preferences for particular goods or anonymity, as well as the convenience of a medium of exchange, and potential transaction-cost advantages for specific use cases such as cross-border payments.

Unlike deposits, which are insured and risk-free, the stablecoin issuer is vulnerable to runs. The fragility of the issuer is modeled as a global games run problem. The key innovation is to model how heterogeneous payment preferences drive stablecoin demand, while simultaneously affecting fragility. Global games have been used extensively to study bank runs, currency attacks and debt runs (Carlsson and van Damme 1993; Vives 2005). This class of models is well suited to studying stablecoin runs, because issuers operate a unilateral exchange rate peg and share the same vulnerabilities as uninsured bank debt. Compared to standard banking models, heterogeneity in stablecoin use cases requires heterogeneous global games payoffs (Sákovics and Steiner 2012).

The baseline model spans three dates ($t = 0, 1, 2$) and features a stablecoin pegged to a fiat currency. The economy comprises two types of consumption-good sellers, "deposit-native" and "stablecoin-native," characterizing their *preferred habitat*. By default, these sellers only accept their native medium of exchange at $t = 2$: insured bank deposits or stablecoins, respectively. At $t = 0$, sellers may choose to *multi-home*, i.e. accept both monies, by incurring a cost, and consumers decide whether to hold stablecoins or deposits, forming expectations about seller acceptance profiles at $t = 2$. This decision is consequential due to a *matching friction*: consumers are randomly matched with sellers and incur transaction costs if they do not hold the medium of exchange accepted by their matched seller.

As discussed earlier, consumer heterogeneity is a key model feature, which is captured by a *heterogeneity in matching probabilities* with the two types of sellers at $t = 2$. Conceptually, the goods sold by stablecoin-native sellers can be viewed as shorthand for different stablecoin use cases–implying that the two media of exchange compete across distinct transactional environments: deposit-native and stablecoins-native.

At $t = 1$ a run occurs if enough coin holders demand conversion into deposits, such that the stablecoin issuer becomes insolvent. As standard in the global games literature, coin holders receive a noisy private signal that is correlated with the issuer's fundamental before deciding whether or not to convert. The unobserved fundamental captures the issuer's profitability, which may be affected by an adverse shock to the quality of the assets backing the stablecoins or by exposures to other risks, such as cyber risk.

There exists a unique monotone equilibrium of the conversion game where coin holders optimally demand conversion at the interim date whenever they receive a private signal that is below a certain threshold, suggesting an unfavorable fundamental realization. I analyze how this signal threshold and, hence, the probability of runs depends on various factors that play an important role in the market for stablecoins. Moreover, I take the effect on the optimal stablecoin adoption decisions at the initial date into account.

The analysis identifies two primary mechanisms that justify regulatory concerns regarding excessive stablecoin adoption. First, there is a *run externality* driven by consumer heterogeneity: new coin holders derive lower transactional utility than early adopters (e.g., "crypto enthusiasts"). Consequently, the marginal adopter fails to internalize that broader adoption at $t = 0$ triggers a *destabilizing composition effect*—specifically, it dilutes the creditor base with coin holders who have a lower threshold for redeeming at $t = 1$, thereby increasing issuer fragility. Second, the marginal adopter does not internalize *network effects*, which arise when sellers face costly multi-homing decisions. An anticipated increase in stablecoin adoption incentivizes sellers to shift acceptance away from bank deposits. This undermines the transactional value of deposits, creating an *uninternalized erosion of bank deposits*. From a policy perspective, this mechanism formalizes the concerns surrounding the "Facebook Libra" episode, where authorities cautioned that rapid, widespread stablecoin adoption could reduce the role of banks in the payments market, with adverse implications for bank profitability and deposit disintermediation.

The model further demonstrates that factors increasing the fundamental attractiveness of stablecoins generally reduce their fragility. Intuitively, higher transactional utility makes the marginal coin holder–who is indifferent between holding and converting–less prone to run. This applies, for instance, to an increase in seller acceptance. Consequently, higher adoption can be stabilizing if it allows fixed operating costs to be spread across a larger user base or if positive network effects from seller acceptance enhance the coin's medium-of-exchange value. However, in the absence of such countervailing forces, higher adoption strictly increases run risk due to the destabilizing composition effect.

Structural features of the stablecoin ecosystem also play a critical role. Factors that increase issuer revenue, such as fees and seigniorage, promote stability by strengthening the issuer's franchise value. Similarly, *congestion effects*–where transaction costs rise during periods of stress–act as a stabilizer; a common feature of crypto networks based on decentralized ledger technologies.[8] Notably, this stabilizing effect can dampen run incentives even when the costs remain below the exogenous transaction costs of the baseline model.

The theoretical framework yields concrete regulatory implications. First, a *Pigouvian adoption levy* can internalize the run externality that drives excessive adoption and fragility. Second, to address the unpriced network effects eroding the transactional value of deposits, policymakers could employ a similar levy or *acceptance-side instruments*, such as targeted subsidies for seller multi-homing. Third, preserving market-based *congestion pricing* during stress (or embedding automatic conversion fee surcharges) helps to stem agains runs. Fourth, when the issuer faces a portfolio choice problem, *disclosure* alone can be insufficient to align risk-taking with the social optimum, highlighting the necessity of *binding reserve-quality requirements* and *capital buffers*. Finally, *narrow-bank designs* combined with access to *liquidity backstops* can eliminate panic-based equilibria altogether.

This paper connects to, and departs from, three strands of literature: *(i)* models of two-sided currency competition with flexible exchange rates (Schilling and Uhlig 2019; Arifovic et al. 2025), *(ii)* models of peg stabilization for stablecoins (Routledge and Zetlin-Jones 2021), and *(iii)* models of currency attacks (Morris and Shin 1998; Corsetti et al. 2004) and bank runs (Rochet and Vives 2004; Goldstein and Pauzner 2005) using the global-games approach. Unlike the flexible-price models in *(i)*, where shifts in currency adoption are equilibrated by movements in the floating exchange rate, I study a money claim that is redeemable on demand at par into a reference asset (e.g., bank deposits) and, therefore, vulnerable to runs when stablecoin holders seek conversion. The key contribution relative to *(ii)* and *(iii)* is to *jointly endogenize* seller acceptance and heterogeneous consumer adoption, making the issuer's liability composition an equilibrium object. Sellers' acceptance choices determine matching probabilities across media of exchange, shaping the composition of adopters and thus the run threshold. This mechanism generates a novel run externality and allows to analyze compositional effects. An aspect that is not studied in Diamond and Dybvig (1983)-type models, where the liability structure is typically taken as given and the bank chooses assets to trade off returns, liquidity provision, and run risk.

This aspect differentiates my paper from a complementary starnd of research on stablecoin arrangements and instability that emphasizes asset-side mechanisms and market design. Motivated by the fall of the Bank of Amsterdam, Bolt et al. (2024) show that a decline in the service value of a fiat currency can heighten vulnerability to adverse fundamentals and insufficient central bank capitalization. Gorton et al. (2025) rationalize how

[8] Due to block capacity limits, on-chain transaction fees are positively associated with trading volumes. For example, during the run on Terra USD in May 2022, Ethereum gas prices quadrupled (see Figure A2 in the Appendix), which likely contributed to stabilizing Tether's peg by making conversion more costly.

stablecoin lending can drive demand, Ahmed et al. (2024) study theoretically and empirically the ambiguous role of transparency, and Ma et al. (2025) analyze how centralized arbitrage affects run risk and secondary-market dislocations in a global-games framework. In other related work, Uhlig (2022) offers a theory that generates a gradual unfolding of the LUNA and UST crash, as well as a quantitative interpretation. Li and Mayer (2022) build a dynamic model of stablecoin and crypto shadow banking that features an instability trap with token debasement when reserves are low. Finally, d'Avernas et al. (2022) explore the use of smart contracts to enforce pre-determined rules that prevent over-issuance, and Klages-Mundt and Minca (2021) study alternative stabilization mechanisms.

My paper also relates to the literature on digital money, crypto assets and central bank digital currencies (CBDC). Agur et al. (2022) study optimal CBDC design with an emphasis on network effects and the convenience of different means of payment; two aspects that also feature in my paper. Adoption also plays an important role for e-commerce platforms such as Alibaba. Chiu and Wong (2022) study the business model of platforms, who have the choice between accepting cash and issuing digital money, and whether to allow the digital money they issue to circulate outside the platform. Cong et al. (2021) study how user network externalities shape crypto asset adoption and prices. Ahnert et al. (2022) analyze the choice of using CBDC for payments with a view on privacy. Addressing a disintermediation concern related to CBDC, Andolfatto (2021a) and Chiu et al. (2023) argue that CBDC does not lead to disintermediation and can increase banking competition.[9]

The paper is organized as follows. The environment is described in Section 2. Section 3 solves the model, followed by a policy analysis in Section 4. Section 5 discusses several extensions and additional insights for risk assessment. Section 6 presents novel testable implications and offers pathways to bring them to the data. Finally, Section 7 concludes. All proofs are in the Appendix and additional material is in an Online Appendix.

2 Environment

Consider a game with three dates ($t = 0, 1, 2$) comprising a *stablecoin adoption* game played at $t = 0$ and a *stablecoin conversion* (or withdrawal) game played at $t = 1$, followed by consumption at $t = 2$. The economy features a unit continuum of risk-neutral consumers, a monopolistic stablecoin issuer, and a unit mass of competitive sellers. Consumers can hold either insured bank deposits or stablecoins to transfer value across time.

[9] Other papers on disintermediation and bank stability include Whited et al. (2022), Barrdear and Kumhof (2021), Davoodalhosseini (2021), Schilling et al. (2024), Keister and Monnet (2020) and Williamson (2021).

Endowments and production. Each consumer is endowed with $1 in bank deposits at $t = 0$. Sellers operate a constant returns to scale technology that allows them to produce up to one unit of a divisible good at $t = 2$, which they sell at a normalized price of $1.[10]

Bank deposits and stablecoins. Deposits yield a risk-free return $r^D \geq 0$ when held from $t = 0$ to $t = 2$ and earn no interest otherwise. Stablecoins are pegged 1-to-1 to the dollar but may devalue due to issuer fragility. Specifically, the stablecoin issuer offers a 1-to-1 conversion at $t = 0, 1, 2$ but invests reserves in a risky asset yielding $\theta \sim U[\underline{\theta}, \overline{\theta}]$ at $t = 2$ or $r \leq \underline{\theta}$ if liquidated at $t = 1$ with $0 \leq \underline{\theta} < 1 \leq \overline{\theta}$ and $\mathbb{E}[\theta] > 1$. Moreover, a bankruptcy cost $\psi > 0$ applies if reserves fall short of the $t = 2$ payment obligations. Therefore, coin holders face the risk of devaluation ex-post, creating strategic incentives to redeem early.

Seller acceptance decisions at $t = 0$. Sellers choose which monies they accept for payment at $t = 2$. A fraction $0 < \lambda < 1$ of sellers are type-B *(bank deposit-native)* and the rest $(1 - \lambda)$ are type-S *(stablecoin-native)*. Sellers of each type may choose to add the non-native medium of exchange at a cost. Each seller is matched with one consumer at $t = 2$.

When deciding whether or not to *multi-home*, sellers compare the expected utility benefit $u > 0$, which accrues when matched with a consumer who has the "right" money on hand, with a heterogeneous fixed cost of accepting another money for payment at $t = 2$. Let the fixed costs be given by $\delta_j^B \sim U[\underline{\delta}^B, \overline{\delta}^B]$ and $\delta_j^S \sim U[\underline{\delta}^S, \overline{\delta}^S]$ for type-B and type-S sellers, respectively, with $\overline{\delta}^B, \overline{\delta}^S \geq u \geq \underline{\delta}^B, \underline{\delta}^S \geq 0$. These costs capture the idiosyncratic burden of establishing compatibility with an additional medium of exchange, such as the effort or technological investment required to process stablecoin or deposit payments, and generate well-defined cutoff rules that determine an *endogenous seller-acceptance profile*.

Let $N \in [0, 1]$ be the rate of stablecoin adoption determined by consumers in the second stage of $t = 0$, i.e. the fraction of consumers who decide to convert their endowment of $1 in bank deposits to stablecoins. For a given belief about N, solving the sellers' problem, the fractions of type-B/type-S sellers who multi-home (i.e. choose to accept both monies), f^B and f^S, and the fractions of sellers who single-home, $\hat{f}^B$ and $\hat{f}^S$, can be derived as:

$$f^B(N) = \max\{0, \tfrac{uN - \underline{\delta}^B}{\overline{\delta}^B - \underline{\delta}^B}\} \qquad \hat{f}^B(N) = 1 - f^B(N) \tag{1}$$

$$f^S(N) = \max\{0, \tfrac{u(1-N) - \underline{\delta}^S}{\overline{\delta}^S - \underline{\delta}^S}\} \quad \hat{f}^S(N) = 1 - f^S(N), \tag{2}$$

where the adoption rate shapes seller acceptance as follows: $df^B/dN > 0$ and $df^S/dN < 0$.

[10]Production costs are paid in fiat currency at $t = 2$, consistent with the fact that most goods in crypto markets are effectively priced in dollars and productive inputs are priced in fiat currency.

Given seller acceptance profiles, the total acceptance rates for deposits and stablecoins are:

$$B(N) = \lambda + (1-\lambda) f^S(N), \qquad S(N) \ = (1-\lambda) + \lambda f^B(N).$$

The left panel of Figure 1 offers a graphical illustration of the total seller acceptance rates.

Consumer heterogeneity and matching. Consumers belong to groups $g \in \{1, ..., G\}$ of mass m_g, with $\sum_g m_g = 1$. Each group is characterized by a group-specific routing weight $\omega_g \in [0, 1]$ indicating the likelihood of being matched with a deposit-native (type-*B*) seller, where $\sum_g m_g \omega_g = \lambda$. Let the matching probabilities depend on these routing weights and on the seller-side acceptance profiles from Equations (1) and (2), as follows:

$$p_{B,g}(N) = \underbrace{\omega_g}_{\substack{\text{prob. to match} \\ \text{with type-}B}} + \underbrace{(1-\omega_g) f^S(N)}_{\substack{\text{prob. to match with} \\ \text{multi-homing type-}S}}, \quad p_{S,g}(N) = \underbrace{\omega_g f^B(N)}_{\substack{\text{prob. to match with} \\ \text{multi-homing type } B}} + \underbrace{(1-\omega_g)}_{\substack{\text{prob. to match} \\ \text{with type } S}}, \quad (3)$$

where $p_{B,g}(N)$ and $p_{S,g}(N)$, respectively, denote the probabilities that a group g consumer meets a seller who accepts deposits or stablecoins.[11] I assume that ω_g is decreasing in g, so groups with higher g have a lower (higher) probability to meet a seller accepting deposits (stablecoins), as illustrated in the right panel of Figure 1. Note that $p_{B,g}(N), p_{S,g}(N) \in [0, 1]$ and $p_{B,g}(N) + p_{S,g}(N) \geq 1$, where the inequality is strict whenever some sellers multi-home, implying overlapping payment acceptance. By construction, the group-weighted averages match aggregate seller-side acceptance rates: $\sum_g m_g p_{B,g}(N) = B(N)$, $\sum_g m_g p_{S,g}(N) = S(N)$.[12]

Transaction costs. Consumers face fixed conversion costs τ_t when exchanging between the two monies at $t \in \{0, 1, 2\}$. A key model assumption is that there is an advantage to having the "right" money on hand at $t = 2$, i.e., the cost of converting from one money to another at short notice is higher than the cost of an ex-ante conversion at $t = 0$. To capture this idea, we normalize $\tau_0 = 0$ and assume $\tau_1 > 0$, $\tau_2 > 0$. Economically, τ_1 captures interim conversion frictions (such as fees or delays), while τ_2 captures point-of-sale frictions at $t = 2$ if a consumer meets a seller that does not accept the money she holds and must convert on the spot. Holding the "right" money (or planning ahead) avoids paying τ_2.[13]

[11] This setting resembles directed search (Moen 1997; Burdett et al. 2001). Think of deposits and stablecoins as two sub-markets. Sellers choose which rail to accept (and may pay a cost to multi-home), while consumers direct their search according to their preference ω_g, introducing a tilt.

[12] Intuitively, each group g consumer faces a lottery over seller types with weights ω_g and $1 - \omega_g$; within each type, only a fraction multi-home as captured by $f^B(N)$ and $f^S(N)$. Hence the matching probabilities in Equation (3) are convex combinations of seller acceptance rates, weighted by how often each consumer group encounters different seller types.

[13] Recall that all coins issued during the game are redeemed and exchanged for their equivalent $ value at $t = 2$. Unlike consumers, sellers are not facing a transaction cost to exchange coins. Note that the seller-

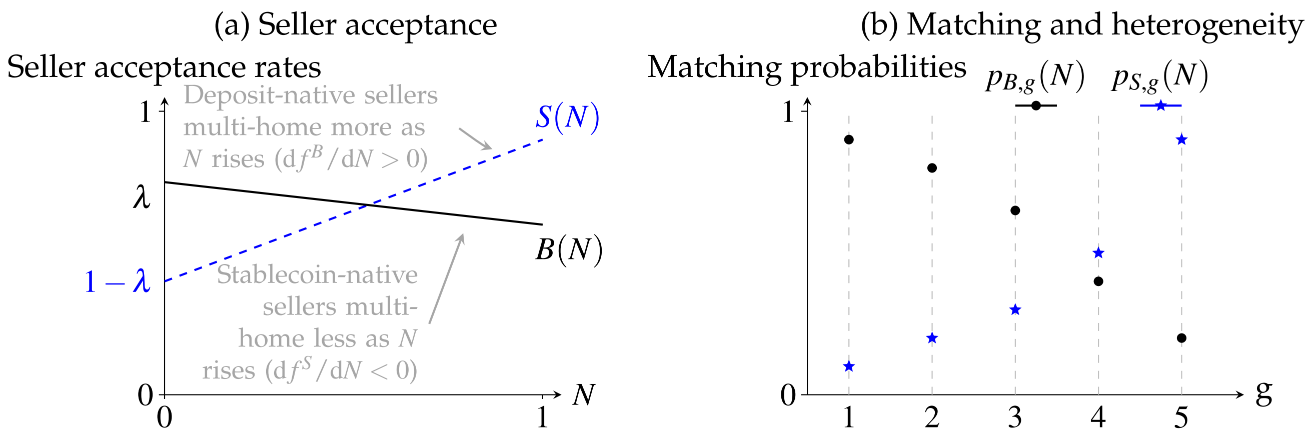

Figure 1: Panel (a) shows the downward sloping total seller acceptance rates of deposits, $B(N)$, and the upward sloping total acceptance rates of stablecoins, $S(N)$, as a function of N. Linearity in N follows from the uniform distribution of seller multi-homing costs and the upper bound on u. Panel (b) depicts the matching probabilities, $p_{B,g}(N)$ and $p_{S,g}(N)$, and their dependency on group-specific preference/routing weights. Consumers belonging to a more stablecoin-oriented group, i.e., a group with a higher g, have a higher (lower) probability to be matched with a seller accepting stablecoins (deposits).

Stablecoin adoption game in the second stage of $t = 0$. After seller acceptance profiles are observed, consumers choose whether to hold deposits or convert and adopt stablecoins. Let $a_{0,i} \in \{0, 1\}$ be the choice of consumer i, where $a_{0,i} = 1$ denotes adoption. The combination of transaction costs and heterogeneous matching probabilities lead to an *endogenous segmentation*: consumers belonging to a more crypto-oriented group (such as consumers belonging to group 5 in Figure 1) are more likely to adopt stablecoins.

Stablecoin conversion game at $t = 1$. At the interim date, each stablecoin holder becomes *active* with probability κ or *passive* otherwise. Active holders receive noisy private signals correlated to the issuer's fundamental, $x_i = \theta + \varepsilon_i$ with $\varepsilon_i \sim U[-\epsilon, \epsilon]$, and decide whether to convert early (or run), while passive holders are dormant till $t = 2$.[14] As common in the global games literature I consider the case of vanish private noise, $\epsilon \to 0$, to simplify the analysis. Let $a_{1,i} \in \{0, 1\}$ denote the choice at $t = 1$, where $a_{1,i} = 1$ denotes early conversion.

Table A1 in Appendix A.2 summarizes the sequence of events. Two remarks highlight how the environment departs from standard bank-run or currency-attack models. First, an ex-ante adoption game and endogenous seller acceptance jointly link payments usage to fragility: anticipated consumer adoption shifts sellers' multi-homing, which in turn alters

side utility benefit u could be interpreted as the benefit from avoiding frictions that arise from meeting a consumer who has the "wrong" money on hand (or, equivalently, as a reduced dis-utility from mismatches).

[14] As will become clear below, the introduction of passive coin holders is used to simplify the analysis (without affecting the key insights) by ruling out the possibility of rationing at $t = 1$, as in Chen et al. (2010).

matching probabilities and the exposure of coin holders at the conversion (or run) stage. Second, heterogeneity across consumer groups matters because it creates group-specific adoption and run incentives. A necessary condition for a positive stablecoin demand is that the most stablecoin-oriented consumers find adoption privately optimal–i.e., their expected savings from avoiding point-of-sale transaction costs exceed both the deposit interest advantage and the expected loss from a potential devaluation of stablecoins.

3 Solving the Model

The model is solved by backward induction and unfolds in three stages: *(i)* in the first stage of $t = 0$ sellers decide which monies to accept, *(ii)* in the second stage of $t = 0$ consumers decide whether to adopt stablecoins, taking seller acceptance as given, and *(iii)* in the third stage a stablecoin run game takes place at $t = 1$, triggered by noisy information about the issuer's solvency. I develop the three building blocks in turn.

First, holding seller acceptance and the consumer adoption rate N fixed, Section 3.1 analyzes the run game at $t = 1$, which follows the structure of a global game of regime change with incomplete information about the fundamental of the stablecoin issuer (Morris and Shin 1998). The key innovation is the introduction of an endogenous payoff heterogeneity across consumers, which is induced by the group-specific matching probabilities $p_{B,g}(N)$ and $p_{S,g}(N)$ and links individual adoption choices to fragility. Building on Sákovics and Steiner (2012), I characterize the equilibrium run threshold θ^* as a function of N.

The determinants of fragility, including the relationship between the probability of runs threshold and stablecoin adoption, are studied in Section 3.2. Thereafter, Section 3.3 analyzes the decisions made at $t = 0$. First, sellers choose whether to accept one or both monies, taking expectations about future stablecoin adoption, N^*, and group-specific matching probabilities, $p_{B,g}(N^*)$ and $p_{S,g}(N^*)$, into account. Given the resulting seller acceptance profile, consumers then choose whether to adopt stablecoins, forming rational expectations about a future devaluation, i.e the run threshold, θ^*. A perfect Bayesian equilibrium of the full game consists of: seller acceptance decisions, consumer adoption decisions, and a run threshold at $t = 1$ that are mutually consistent.

3.1 Stablecoin Runs at $t = 1$

This section analyzes the continuation equilibrium at $t = 1$: active coin holders receive a private signal about fundamentals and play a global-game style conversion game. First, I define the issuer's solvency condition. Thereafter, I state the payoff matrix and discuss how the group-specific expected payoff of an active coin holder depends on her conversion decision, the decision of other coin holders, and the solvency of the issuer. Building on these results, I formulate the $t = 1$ decision problem and solve the conversion game.

Solvency and critical conversion demand. The stablecoin issuer is insolvent whenever she cannot redeem all outstanding stablecoins at par, that is when her available resources fall short of the one-to-one redemption promise. Let $A = \int_i a_{1,i}\, di / (\kappa N)$ denote the fraction of active coin holders who demand early conversion at $t = 1$, where $a_{1,i} = 1$ indicates conversion and N is the aggregate adoption rate. Cash-flow solvency at $t = 1$ is ensured by $r \geq \kappa A$. Solvency at $t = 2$ requires that retained reserves cover remaining claims:

$$(r - \kappa A)\frac{\theta}{r} \geq 1 - \kappa A, \tag{4}$$

Rearranging yields the critical conversion demand at $t = 1$:

$$\widehat{A}(\theta) \equiv \frac{(\theta - 1)r}{\kappa(\theta - r)} \in [0, 1], \forall \theta \in [\theta_\ell, \theta_h], \tag{5}$$

so that the issuer is insolvent iff $A > \widehat{A}(\theta)$.[15] To rule out rationing at $t = 1$, I impose the parameter restriction $r > \kappa$ (see Assumption 1 below). This ensures that all active coin holders can be paid at $t = 1$ whenever the issuer is solvent.[16]

Payoffs. The risk of insolvency only affects stablecoin holders, as bank deposits are insured. When deciding whether to demand conversion of her stablecoins to bank deposits at $t = 1$, each active coin holder i compares the expected utility payoff from doing so with the alternative to keep her coins. Table 1 shows the expected payoffs of coin holder i associated with the two actions, which depend on the realized θ, on the aggregate action A and on expected transaction costs governed by group-specific matching probabilities.

First, consider column 2 in Table 1 when the issuer is solvent, $A \leq \widehat{A}(\theta)$, and can meet her payment obligations in full to both active coin holders demanding conversion and to the remaining active coin holders who keep their coins till $t = 2$, as well as to passive coin holders. Thus, all coin holders demanding conversion receive $1 - \tau_1$ dollars worth of bank deposits at $t = 1$, after accounting for the conversion cost. This allows them to purchase $1 - \tau_1$ units of the good if they are matched with a seller accepting deposits, and $1 - \tau_1 - \tau_2$

[15] Appendix A.4 characterizes the regions in which the issuer is *fundamentally solvent* or *fundamentally insolvent*, as well as the *intermediate range* of fundamental realizations, $\theta \in (\theta_\ell, \theta_h)$, in which solvency depends on the realized conversion demand A, as usual in global games.

[16] This assumption simplifies the analysis Chen et al. (2010) without affecting the key insights.

aggregate action *individual action*	$A \leq \widehat{A}(\theta)$ issuer is solvent	$A > \widehat{A}(\theta)$ issuer is insolvent
Demand conversion, $a_{1,i} = 1$	$1 - \tau_1 - (1 - p_{B,g_i})\tau_2$	$1 - \tau_1 - (1 - p_{B,g_i})\tau_2$
Keep coins, $a_{1,i} = 0$	$1 - (1 - p_{S,g_i})\tau_2$	$\frac{(r-\kappa A)\theta/r-\psi}{1-\kappa A} - (1 - p_{S,g_i})\tau_2$

Table 1: Expected ex-post payoffs in the stablecoin conversion game at $t = 1$ for $\theta \in (\theta_\ell, \theta_h)$.

units if they are matched with a seller only accepting stablecoins, which occurs with probability $1 - p_{B,g_i}$. Taken together, the expected payoff is $1 - \tau_1 - (1 - p_{B,g_i})\tau_2$. Instead, all active coin holders who keep their coins at $t = 1$ receive one unit of the consumption good if they are matched with a seller accepting stablecoins and $1 - \tau_2$ units if they are matched with a seller accepting only deposits, which occurs with probability $(1 - p_{S,g_i})$.

Next, consider column 3 when the issuer is insolvent, $A > \widehat{A}(\theta)$. Now she is unable to meet her payment obligations in full to the remaining active coin holders who keep their coins till $t = 2$, as well as to passive coin holders, which both receive a share of the remaining resources after bankruptcy costs. Conversely, all active coin holders demanding conversion at $t = 1$ still receive the promised \$1 per stablecoin and have the same utility payoff as in the previous case. This is because the first inequality in (6) bounds κ from above such that $r > \kappa > \overline{\kappa}$. Moreover, together with an additional bound on the bankruptcy cos, $\psi \leq \underline{\theta}$, it ensures that the payoffs of both the passive coin holders and the remaining active coin holders are weakly positive, independent of A:

$$\kappa \leq \overline{\kappa} \equiv \frac{\underline{\theta} - \psi - \tau_2}{\underline{\theta} - r\tau_2} r < r \quad \Rightarrow \frac{(r-\kappa A)\theta/r-\psi}{1-\kappa A} - \tau_2 > 0 \text{ if } \psi < \underline{\theta}, \forall A > \widehat{A}(\theta), \theta \in [\underline{\theta}, \overline{\theta}]. \tag{6}$$

The two conditions are summarized in Assumption 1 below and simplify the analysis by allowing to average over the group-specific terms when solving for the equilibrium by applying the Belief Constraint of Sákovics and Steiner (2012), as shown below.[17]

Benefit from conversion. The optimal decision of coin holder i can be studied by analyzing her *relative payment preference*, which is defined as $\Delta p_i(N) \equiv p_{B,g_i}(N) - p_{S,g_i}(N)$. Coin

[17] The implicit assumption is that the use of stablecoins as a means of payment at $t = 2$ is independent of the solvency of the issuer. This assumption could, for instance, be rationalized because a new issuer enters the market or by the ability of the insolvent issuer to continue operating under resolution with a full backing by cash. The main insights do not hinge on this assumption and are robust to a relaxation of the upper bound on κ, which generates a simplified payoff matrix and analysis of the run game as in Rochet and Vives (2004). Importantly, the analysis of the case with $G > 2$ is facilitated by the fact that the group-specific terms are not contingent on A (Sákovics and Steiner 2012). See Goldstein and Pauzner (2005) for a bank run model with payoffs that do not satisfy global strategic complementarities, as it is the case when $\kappa = 1$.

holder i's differential payoff, or benefit, from demanding conversion at $t=1$, instead of keeping her coins can be written as $\Delta_{1,i}(A;\theta) \equiv \mathbb{E}[u_i(A, a_{1,i}=1;\theta)] - \mathbb{E}[u_i(A, a_{1,i}=0;\theta)]$:

$$\Delta_{1,i}(A;\theta) = \begin{cases} \Delta p_i(N)\tau_2 - \tau_1 & \text{if } A \leq \widehat{A}(\theta) \\ 1 + \Delta p_i(N)\tau_2 - \tau_1 - \frac{(r-\kappa A)\theta/r - \psi}{1-\kappa A} & \text{if } A > \widehat{A}(\theta). \end{cases} \tag{7}$$

Observe that $\Delta_{1,i}$ is weakly decreasing in θ. Moreover, $\Delta_{1,i}$ is lower for coin holders belonging to a group with a higher probability to be matched with a seller accepting stablecoins, which, as will become clear below, implies a reduced flightiness.

Let $\widehat{g} \in \{1, ..., G\}$ be the marginal group of coin holders, i.e. the group of consumers with the lowest benefit from holding stablecoins. If $A < \widehat{A}(\theta)$, then $\Delta_{1,i} < 0, \forall g_i \geq \widehat{g}$. Otherwise, consumer i belonging to group $g_i \in \{\widehat{g}, ..., G\}$ would not have adopted stablecoins at $t=0$. Conversely, for $A > \widehat{A}(\theta)$ there is a *global strategic complementarity* in actions; a higher aggregate conversion demand A strictly increases the incentives to demand conversion. Thus, $\Delta_{1,i}$ increases in A and reaches its maximum value for $A=1$, with $\Delta_{1,i}(1;\theta) > 0, \forall \theta \in (\theta_\ell, \theta_h), g_i \in \{\widehat{g}, ..., G\}$ under the sufficient condition that:

$$\psi > \underline{\psi} \equiv (1-\kappa)(\tau_1 - \Delta p_G(N)\tau_2). \tag{8}$$

Formally, the lower bound $\underline{\psi}$ merely ensures that even group G strictly prefers to convert at $t=1$ when they expect all other active coin holders to do the same (i.e., $A=1$) and the fundamental realization falls below the solvency threshold θ_h. As illustrated in Figure A4 in the Appendix, the differential benefit $\Delta_{1,i}$ is increasing in the aggregate conversion rate A: it is negative when few convert, and becomes positive as conversion pressure builds.

Equilibrium of the Continuation Game at $t=1$. Next, I derive the continuation equilibrium of the incomplete information game, where coin holders receive a noisy private signal at $t=1$ that is correlated with the amount of resources available to the issuer at $t=2$. Building on the previous results, Assumption 1 summarizes the key parameter conditions derived above, which are used for the subsequent analysis.

Assumption 1. *Let $\kappa < \overline{\kappa} < r$ and $\psi \in (\underline{\psi}, \underline{\theta})$.*

The upper bound on κ simplifies the payoff structure and ensures global strategic complementarity in actions (this assumption could be relaxed). The lower bound on ψ focuses attention on the plausible case where even crypto enthusiasts have a benefit from demanding conversion if they know that everybody else wants to convert and $\theta < \theta_h$, while the upper bound on ψ avoids negative payoffs (this assumption could be relaxed). Note that the admissible range for bankruptcy costs, $\psi \in (\underline{\psi}, \underline{\theta})$, is non-empty as long as the relative attractiveness of stablecoins is not excessively high for the most crypto-enthusiastic users (group G), and the conversion cost τ_1 is not prohibitively large.

I use the global games approach to analyze the conversion game. Appendix Section A.6 derives coin holders' posterior belief conditional on their private signal x_i and group g_i. Appendix Section A.7 then establishes an upper and lower dominance region of very favorable and unfavorable private signal realizations, respectively, such that the actions of coin holders observing a signal that falls in these regions do not depend on the decisions of others. For the case with multiple groups of coin holders, i.e. $\widehat{g} < G$, the existence of unique equilibrium in threshold strategies is established by adapting the translation argument of Frankel et al. (2003), which has also been used by Garcia and Panetti (2022) to study a Diamond-Dybvig bank run model with wealth heterogeneity.

After establishing existence and uniqueness, I characterize in Proposition 1 a monotone equilibrium of the continuation game by application of the Belief Constraint of Sákovics and Steiner (2012). The equilibrium is fully determined by a critical mass condition and by one indifference conditions for each coin holder group, which are derived in Appendix A.8 and A.9, respectively, and used to back out the equilibrium run threshold θ^*.

Proposition 1. *Given Assumption 1, take a positive level of stablecoin adoption $N > 0$. Then there exists a unique monotone equilibrium of the conversion game characterized by threshold strategies where active stablecoin holders in groups $g \in \{\widehat{g}, .., G\}$ demand conversion if and only if they receive a private signal that is below their group-specific signal threshold, i.e. for $x_i \leq x^*_{g_i}$, and where the issuer faces a run at $t = 1$ for all $\theta < \theta^*$, with $\theta^* \in (1, \theta_h)$ given by:*

$$I(\theta^*; N) \equiv \Delta p(N)\tau_2 - \tau_1 + \int_{\frac{(\theta^*-1)r}{\kappa(\theta^*-r)}}^{1} \left(1 - \frac{(r-\kappa A)\theta^*/r - \psi}{1-\kappa A}\right) dA = 0 \quad (9)$$

$$\Delta\overline{p}(N) \equiv \frac{\mu_{\widehat{g}} m_{\widehat{g}}[p_{B,\widehat{g}}(N) - p_{S,\widehat{g}}(N)] + \sum_{g=\widehat{g}+1}^{G} m_g[p_{B,g}(N) - p_{S,g}(N)]}{\mu_{\widehat{g}} m_{\widehat{g}} + \sum_{g=\widehat{g}+1}^{G} m_g}, \quad (10)$$

where $\widehat{g}$ solves $N = \mu_{\widehat{g}} m_{\widehat{g}} + \sum_{g=\widehat{g}+1}^{G} m_g$, with $\mu_{\widehat{g}} \in (0, 1]$.

Proof. See Appendix Section A.10.1.

The Belief Constraint states that the Laplacian Property holds on average across the different groups of consumers adopting stablecoins, meaning that coin holders' posterior distribution of A is on average uniform over $[0, 1]$. This property allows to derive a tractable solution where the equilibrium fundamental threshold is determined by averaging over the indifference conditions (weighted by their group shares), as in Equation (9).[18] As a result, for a given N, θ^* is a convenient function of the weighted average of group-specific matching probabilities, $\Delta\overline{p}(N) \equiv \mathbb{E}[\Delta p_g(N) \mid \text{adopters at } N]$, a summary statistic for the average relative payment preference for deposits in the population of adopters.

3.2 Determinants of Fragility

The $t = 1$ continuation equilibrium described in Equation (9) can be characterized by application of the implicit function theorem (IFT). This allows to uncover the determinants of fragility. The results are summarized in Proposition 2.

Proposition 2. *The probability of stablecoin runs, $Prob\{\theta < \theta^*\}$, derived in Proposition 1 depends on the model parameters as shown in Table 2.*

Increase in	Probability of a run
Bankruptcy cost, ψ	$\uparrow$
Fraction of active coin holders, κ	$\uparrow$
Liquidation value, r	$\downarrow$
Conversion cost, τ_1	$\downarrow$
Average relative preference for deposits payments, $\Delta\overline{p}$	$\uparrow$

Table 2: Comparative statics

Proof. See Appendix Section A.10.2.

The first three comparative static results in Proposition 2 are consistent with well-known findings in the banking literature and give confidence that the proposed model for stablecoins is sensible. Intuitively, an increase in bankruptcy costs and a decrease in the liquidation value r make the issuer less resilient. Consequently, the issuer faces a higher probability of runs. Similarly, a higher share of active coin holders is destabilizing.

The fourth result states that higher conversion costs have a stabilizing effect. This is because they reduce the incentives to demand conversion. Due to the importance of congestion effects in crypto markets, the stabilizing role of transaction costs appears to be a relevant feature, as a large volume of transactions in a short time window can trigger

[18] Critically, the application of the Belief Constraint requires that the group-specific terms in the indifference condition are not a function of the aggregate action. This is because the Laplacian property does not hold for the threshold type of a group, but it only holds when averaging across groups. However, the main results can be generalized in a less tractable model with $\kappa = 1$ and two groups of coin holders, leading to a dependence of α_g and β_g on A, and when transaction costs are proportional to the amounts converted.

significant increases in transaction fees. To speak to this phenomenon, I endogenize the conversion cost τ_1 in Section 5.1 and show that its stabilizing effect is strengthened.[19]

The fifth comparative static result in Table 2 highlights a novel *composition effect*, which is the main focus of this section. I find that the run probability is increasing in the average induced relative payment preference for deposits among the population of coin holders, as captured by the term $\Delta\overline{p}$, defined in (10). This term reflects how frequently users expect to encounter sellers who accept deposits versus stablecoins. Formally, when the average matching probability with a seller accepting stablecoins, $p_{S,g}(N)$, is high relative to the one with a seller accepting deposits, $p_{B,g}(N)$, then stablecoins have a stronger transactional value, meaning that $\Delta\overline{p}$ is smaller, which makes their holders less inclined to redeem early.

Building on the composition effect via changes in $\Delta\overline{p}$, I can analyze how adoption and other drivers of coin holder heterogeneity shape fragility. Figure 2 illustrates the causal chains for the *stabilizing effect* of a higher seller acceptance of stablecoins and for the *destabilizing effect* of a higher adoption rate for fixed seller acceptance. These effects provide the foundation for Section 4, which studies how policy interventions can influence the adoption–fragility nexus by shaping seller acceptance and coin holder composition.

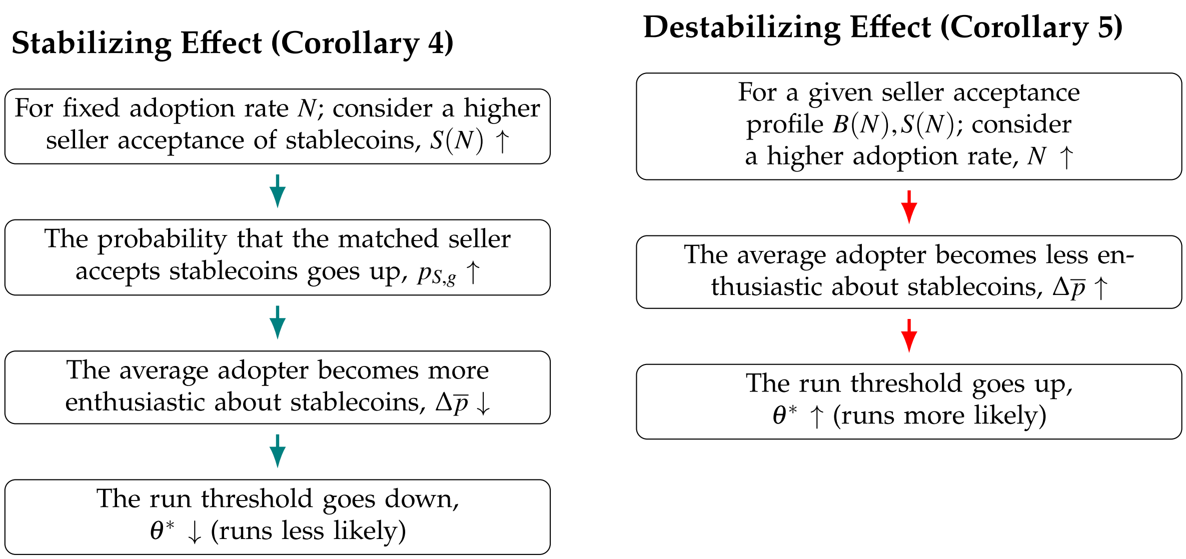

Figure 2: Two causal chains linking adoption, seller acceptance, and fragility. The formal results for the two effects are in Appendix Section A.10.3 as corollaries to Proposition 2.

In practice, stablecoin use cases vary significantly in terms of the potential benefits they offer to holders. This has important implications for the fragility of a stablecoin

[19] I document such an event in Figure A2 in the Appendix for the period around the devaluation of USD Terra in May 2022, when the transaction fees for on-chain transactions on the Ethereum network (which was the dominant network used by USD Terra) shot up more than four-fold, which may have helped to reduce outflows from Tether, counteracting contagion effects across stablecoins.

issuer. For example, retail users may hold stablecoins primarily to explore the broader crypto ecosystem or to leverage the technology for low-cost cross-border remittances. Their relative preference for stablecoins likely differs from that of actors seeking to evade sanctions or to facilitate payments for illicit activities, who belong to a group of crypto enthusiast (i.e. a group with a high level of g). Through the lens of the model, an increase in the use for sanctions evasion could, e.g., be captured by a relative increase in the mass of consumers who are crypto enthusiasts, i.e. a higher m_G, or by higher seller acceptance of stablecoins, i.e. a higher $S(N)$. Such changes manifest as a decrease in $\Delta\overline{p}$, triggering a *stabilizing effect* which lowers θ^* as illustrated in the left panel of Figure 2.

Conversely, the same composition effect also has important implications for the relationship between adoption and fragility. As adoption widens, it may draw in consumers from groups with weaker transactional motives for holding stablecoins, that is more consumers from the marginal group of coin holders $\widehat{g}$ or even consumers from groups with a lower g. Consequently, the average flightiness of the coin holder base increases, leading to a destabilizing compositional effect, as illustrated in the right panel of Figure 2. This *destabilizing effect* establishes a novel feedback channel of endogenous fragility for fixed seller acceptance decisions: the widening of stablecoin adoption can destabilize the system when it alters the composition of users in a way that reduces the transactional value of stablecoin holdings.[20] From a practical perspective this effect is particularly salient when the adoption of stablecoins spreads beyond the core of crypto-enthusiastic early adopters, e.g. for new use cases or by user segments that differ markedly from the initial user base.

3.3 Stablecoin Adoption Game and Seller Decisions at $t = 0$

Moving to $t = 0$, I start with the analysis of the second stage where consumers decide whether to adopt stablecoins, before moving to the first stage where sellers decide which monies to accept. The expected differential payoff, $\Delta_{0,i}(A;\theta) \equiv \mathbb{E}[u_i(a_{0,i} = 1; N, \theta^*(N))] - \mathbb{E}[u_i(a_{0,i} = 0; N, \theta^*(N))]$, of consumer i in group g_i from adopting stablecoins instead of bank deposits at $t = 0$ if she expects an adoption rate N, matching probabilities $p_{B,g_i}(N), p_{S,g_i}(N)$ and believes that all active coin holders behave optimally at $t = 1$, where

[20]With endogenous seller acceptance decisions there is, however, a countervailing effect in that higher expected stablecoin adoption by consumers is associated with higher benefits for deposit-native type-B sellers to also accept stabelcoins, which leads to an decrease in $\Delta\overline{p}(N)$. I will revisit this aspect in Section 4, where adoption and fragility are analyzed jointly in the face of changes in seller acceptance.

$x^*_{g_i} = \theta^*(N)$ solves Equation (9), can be written as:

$$\Delta_{0,i}(N) \equiv \int_{\underline{\theta}}^{\theta^*} \left(\kappa(1-\tau_1-(1-p_{B,g_i})\tau_2) + (1-\kappa)\left(\frac{(r-\kappa)\theta/r-\psi}{1-\kappa} - (1-p_{S,g_i})\tau_2 \right) \right) \frac{d\theta}{\overline{\theta}-\underline{\theta}} + \int_{\theta^*}^{\overline{\theta}} (1-(1-p_{S,g_i})\tau_2) \frac{d\theta}{\overline{\theta}-\underline{\theta}} - (1+r^D-(1-p_{B,g_i})\tau_2), \quad (11)$$

where the dependency of the matching probabilities on N is dropped for brevity.

Equation (11) builds on the payoffs from Table 1 and the results from Proposition 1. The risk of insolvency only affects stablecoins, as deposits are insured. For vanishing private signal noise, there is zero probability mass on fundamental realizations that correspond to a partial run, meaning that $A = 1$ for $\theta < \theta^*$ and $A = 0$ for $\theta > \theta^*$. Then, for a given N, $p_{B,g}(N)$, $p_{S,g}(N)$ and $\theta^*(N)$, the optimal adoption decision of consumer i is:

$$a^*_{0,i}(N) = \begin{cases} 1 & \text{if } \Delta_{0,i}(N) > 0 \\ \in [0,1] & \text{if } \Delta_{0,i}(N) = 0 \\ 0 & \text{otherwise.} \end{cases} \quad (12)$$

Next, consider the problem of a seller who accepts one or both monies, taking expectations about future stablecoin adoption by consumers, N^*, and group-specific matching probabilities, $p_{B,g}(N^*)$ and $p_{S,g}(N^*)$, into account. Let $a^B_j \in \{0,1\}$ ($a^S_j \in \{0,1\}$) denote the choice of deposit-native (stablecoins-native) seller j, where $a^B_j = 1$ ($a^S_j = 1$) if she decides to multi-home. The respective problems of type-B and type-S sellers are:

$$\max_{a^B_j \in \{0,1\}} \left((1-a^B_j)u(1-N^*) + a^B_j(u-\delta^B_j)\right) \qquad \text{and} \qquad \max_{a^S_j \in \{0,1\}} \left((1-a^S_j)uN^* + a^S_j(u-\delta^S_j)\right).$$

Solving for the optimal acceptance decisions gives:

$$a^{B*}_j(N^*) = \begin{cases} 1 & \text{if } uN^* \geq \delta^B_j \\ 0 & \text{otherwise} \end{cases} \qquad a^{S*}_j(N^*) = \begin{cases} 1 & \text{if } u(1-N^*) \geq \delta^S_j \\ 0 & \text{otherwise,} \end{cases} \quad (13)$$

which yields $f^B(N^*)$ and $f^S(N^*)$ in Equations (1) and (2).

Based on the description of the seller and consumer problems at $t = 1$ and of the problem of coin holders at $t = 1$, I can now define a Perfect Bayesian Equilibrium (PBE).

Definition 1. ***Perfect Bayesian Equilibrium*** *A (pure-strategy) PBE consists of: (i) seller acceptance decisions* $\{a^{B*}_j, a^{S*}_j : j \in [0,1]\}$*, (ii) consumer adoption decisions* $\{a^*_{0,g_i} : i \in [0,1]\}$*, (iii)* *an adoption rate N^*, (iv) conversion strategies $\{a^*_{1,g_i}(x_{g_i};N) : i \in [0,1]\}$, and (v) a system of beliefs over future adoption N, matching probabilities, and fundamentals, such that:*

(i) Each seller's acceptance decisions a^{B*}_j and a^{S*}_j are optimal at $t = 0$, given beliefs about N^*.

(ii) Each consumer's adoption decision $a^*_{0,i}$ is optimal at $t = 0$ as in (12)*, given N^*, $p_{B,g_i}(N^*)$ and $p_{S,g_i}(N^*)$, where $\Delta_{0,g_i}(N^*)$ uses the matching probabilities in (iii).*

(iii) The adoption rate is consistent with individual decisions, $N^* = \int_0^1 a^*_{0,i}\, di$, and the matching probabilities $p_{B,g}(N^*), p_{S,g}(N^*)$ in (3) *are consistent with seller decisions for all $g \in \{1,...,G\}$.*

(iv) Active coin holders act optimally at $t = 1$ and the run threshold $\theta^*(N^*)$ solves (9).

(v) Beliefs are Bayes-consistent on- and off-path.

(a) Given N^* and the acceptance shares implied by (i), beliefs assign $p_{S,g}(N^*)$ and $p_{B,g}(N^*)$ as in (iii) for all $g \in \{1,\ldots,G\}$.

(b) If an off-path adoption mass $\tilde{N} \neq N^*$ is observed, beliefs about matching probabilities $p_{S,g}(\tilde{N})$ and $p_{B,g}(\tilde{N})$ update via the same mappings $f^B(\tilde{N})$ and $f^S(\tilde{N})$ used in (iii).

Conditions *(i)*–*(iv)* ensure sequential rationality of acceptance, adoption, and conversion at $t \in \{0,1\}$ given beliefs over (future) adoption N and matching probabilities, while condition *(v)* pins down Bayes-consistent beliefs over adoption and matching probabilities on and off the equilibrium path.

I proceed by first discussing the beneficial role of stablecoins in Section 3.3.1 to highlight the transaction role of money and the advantage of having the "right" money on hand at $t = 2$. To do so, it is instructive to consider a version of the model where stablecoins are riskless. Thereafter, Section 3.3.2 offers a joint analysis of stablecoin adoption and acceptance for the model with stablecoin runs and studies the interaction between fragility and the optimal stablecoin adoption and acceptance decisions.

3.3.1 Transaction Costs and the Beneficial Transaction Role of Stablecoins

Before turning to the joint equilibrium with adoption and runs, it is instructive to consider two knife-edge benchmarks that clarify the transaction-cost channel and its limits, especially the role of τ_2, and the role of safe versus risky backing of stablecoins.

Case A (No Frictions). If $\tau_2 \searrow 0$ or if all sellers multi-home, i.e. $f^B = f^S = 1$, the advantage from holding the "right" money on hand at $t = 2$ vanishes. Bank deposits dominate and the unique equilibrium is $N^* = 0$. Stablecoins have no transactional value, either because consumers can always convert for free or because all sellers accept deposits.

Case B (Safe Stablecoins). If liquidation risk disappears ($r, \underline{\theta} \nearrow 1$), stablecoins become riskless. Then consumers with a sufficiently high probability of meeting a stablecoin-accepting seller adopt in order to economize on τ_2, while others hold deposits. This captures an idealized benchmark of tightly regulated, fully backed stablecoins.

Proposition 3. ***(Safe stablecoins)*** *Let $r \to \underline{\theta}$, $\underline{\theta} \to 1$ and $\tau_1/\tau_2 > p_{S,1}(0) - p_{D,1}(0)$. Moreover, suppose that type-S sellers rarely accept deposits, $f^S \approx 0$. Then a consumer i adopts stablecoins iff:*

$$\frac{r^D}{\tau_2} < p_{S,g_i} - p_{B,g_i}, \tag{14}$$

so that equilibrium adoption is positive if and only if Inequality (14) *holds when evaluated at $g_i = G$. In this case there exists a unique marginal group of stablecoin adopters $\widehat{g}^* \in \{1, .., G\}$.*

Proof. See Appendix Section A.10.4.

Proposition 3 delivers a clear "payments-only" benchmark: adoption requires both a positive transaction cost τ_2 and the presence of sufficiently crypto-oriented consumers, i.e. the transactions benefit of stablecoins must be sufficient such that at least consumers in group G must find it optimal to adopt. Runs are absent, and fragility arises only if liquidation risk is introduced. This benchmark best captures an "ideal world" where stablecoins are tightly regulated, well capitalized and backed by central bank reserves, while offering a technology-enabled access to certain use cases or benefits for consumers that are otherwise unavailable.[21] Notably an equilibrium with stablecoin adoption only requires one group of coin holders, i.e. $G = 1$. Furthermore, observe that optimal continuation at $t = 1$ entails keeping coins, so τ_1 is never paid and does not affect the adoption cutoff.

Moving away from this special case with safe stablecoins, the next section focuses on the practically more relevant version of the model, where the issuer is susceptible to runs due to her risky and illiquid investment. Moreover, I endogenous seller acceptance.

3.3.2 Equilibrium of Acceptance, Adoption and Runs

Adoption with Runs Under Fixed Acceptance. I first re-introduce fundamental risk but seller acceptance is initially held fixed, i.e. $(a_j^B, a_j^S)_{j\in[0,1]}$ and the resulting acceptance profiles (f^B, f^S) are taken as given. Let $\{p_{B,g}, p_{S,g}\}_g$ be the matching probabilities implied

[21] In addition, the benchmark will serve as a basis for discussing in Section 5 regulated stablecoin issuers (U.S. GENIUS Act) or e-money providers (European Markets in Crypto-Assets (MiCA)), narrow banks and a hybrid CBDC through the lens of the model.

by this exogenous acceptance profile. Adoption is monotone in g: there exists a (belief–dependent) marginal group $\widehat{g}(N) \in \{1, \ldots, G\}$ such that consumers adopt iff $g_i \geq \widehat{g}(N)$. Lemma 1 describes how optimal adoption varies with beliefs about fragility.

Lemma 1. ***(Fragility & Adoption)*** *Fix sellers' acceptance (f^B, f^S) so that $p_{B,g}$ and $p_{S,g}$ are constant in the adoption rate N. Under the conditions of Proposition 1, for any belief $\theta' \in [0,1]$ about the probability of stablecoin runs, the adoption rate N is weakly decreasing in θ'.*

Recall from Corollary 5 and from the right panel of that Figure 2 that, for fixed seller acceptance, higher adoption brings in more deposit-oriented users, which raises $\Delta\overline{p}(N)$, and therefore increases the run threshold $\theta^*(N)$. Combining Corollary 5 with Lemma 1 yields the feedback between adoption and fragility. In equilibrium, beliefs about θ^* at $t = 0$ and the adoption outcome N^* must be consistent with the $\theta^*(N^*)$ solving the $t = 1$ conversion game for a given composition of stablecoin holders at N^*, i.e. the implied $\Delta\overline{p}$.

Two–group Simplification. To sharpen intuition, I now restrict attention to the case with $G = 2$ and relegate the general case to the Online Appendix. Group 1 (*deposit-oriented*) has mass m_1 and group 2 (*stablecoin-oriented*) has mass m_2, with $m_1 + m_2 = 1$. Adoption is monotone in type and can occur in blocks or via partial adoption of the marginal group. If group 1 is indifferent at belief N, a unique fraction $\mu_1 \in [0,1)$ adopts, pinned down by:

$$\Delta_{0,1}\left(N, \theta^*(N)\right) = 0 \quad \text{with} \quad N = m_2 + \mu_1 m_1.$$

Because $\Delta_{0,2}$ and $\Delta_{0,1}$ are *weakly* decreasing in N under fixed acceptance (strict whenever the adopter set expands to include any mass of group 1 through the composition channel), the indifference condition delivers a unique μ_1 whenever group 1 is marginal. Let $\Gamma_c(N)$ denote the aggregate adoption best-response at belief N. In the two–group case:

$$\Gamma_c(N) \in \left\{ 0,\ m_2,\ m_2 + \mu_1 m_1,\ 1 \right\},$$

where the middle value appears only when group 1 is marginal. Off that point, the best-response is block-adoption: 0, m_2, or 1. Observe that $\Gamma_c(1) = 1$ iff $\Delta_{0,1}\left(1, \theta^*(1)\right) \geq 0$ and $\Gamma_c(0) = 0$ iff $\Delta_{0,2}\left(0, \theta^*(0)\right) < 0$. Proposition 4 summarizes.

Proposition 4. ***(Unique Adoption Equilibrium under Fixed Acceptance)*** *Let $G = 2$. With fixed acceptance, $N = \Gamma_c(N)$ has a unique solution $N^* \in \{0,\ m_2,\ m_2 + \mu_1 m_1,\ 1\}$, where the intermediate value $m_2 + \mu_1 m_1$ arises only if group 1 is marginal (in which case μ_1 is uniquely determined by the indifference condition). Corner cases $N^* \in \{0, 1\}$ occur when no group (all groups) adopt.*

The key simplification in the two–group case is that $\Gamma_c(N)$ reduces to a step-shaped correspondence with one vertical segment. This makes the discussion of the structure and characterization of the joint equilibrium with endogenous seller acceptance, consumer adoption and runs more transparent (see the Online Appendix for the general case).

Adoption with Runs Under Endogenous Seller Acceptance. Next, I allow for endogenous seller acceptance by type-S sellers who may decide to multi-home based on their belief about N, i.e. $f^S(N)$ is now endogenous and decreasing in N as described in Equation (2), while f^B is kept fixed (e.g., because $\overline{\delta}^B \to \infty$, which makes the type-$B$ seller margin inelastic to changes in the sellers' belief about N).

The main insight is that endogenous seller acceptance gives rise to a *stabilizing network effect*: a higher expected N decreases type-S seller acceptance of bank deposits, which reduces the fragility of the stablecoin issuer by lowering $p_{B,g}(N)$, while $p_{S,g}(N)$ stays fixed. Importantly, this effect can locally overturn the *destabilizing composition effect* from Corollary 5, meaning that the run threshold *decreases* in N, thereby reshaping the aggregate adoption best-response $\Gamma_c(N)$. This happens precisely when $d\Delta\overline{p}/dN < 0$. Lemma 2 summarizes.

Lemma 2. *(Adoption & Fragility Revisited) Let $G = 2$ and $\overline{\delta}^B \to \infty$ so that f^B is fixed while $f^S(N)$ is decreasing in N. A broader adoption of stablecoins is stabilizing if the destabilizing composition effect from new adopters from group 1 is dominated by positive network effects, i.e.:*

$$\frac{d\theta^*}{dN} < 0 \quad \textit{iff} \quad \frac{d\Delta\overline{p}}{dN} < 0,$$

where:

$$\frac{d\Delta\overline{p}}{dN} = \overbrace{\frac{dw_1}{dN}(\Delta p_1 - \Delta p_2)}^{\geq 0;\ \textit{destabilizing composition effect}} \quad + \quad \overbrace{w_1\frac{d\Delta p_1}{dN} + w_2\frac{d\Delta p_2}{dN}}^{<0;\ \textit{stabilizing acceptance/network effect}\ (df^S(N)/dN<0)} ,$$

where $w_g(N)$ is the share of adopters in group g and $\Delta p_g \equiv p_{B,g}(N) - p_{S,g}(N)$ so that:

$$\frac{d\theta^*}{dN} = \begin{cases} < 0, \ \textit{if}\ N \in [0, m_2] \\ < 0, \ \textit{if}\ N \in (m_2, 1)\ \textit{and}\ \left(\frac{m_2}{N^2}(\Delta p_1 - \Delta p_2) + \left(\frac{\mu_1 m_1}{N}(1-\omega_1) + \frac{m_2}{N}(1-\omega_2)\right)\frac{df^S}{dN} \right) < 0. \end{cases}$$

Figure 3 illustrates the implications of Lemma 2 for the aggregate adoption best-response. Panel (a) fixes acceptance. The aggregate adoption best-response is weakly decreasing and has a unique intersection with the 45° line. Instead, with endogenous seller acceptance the best-response can bend upward if $d\theta^*/dN < 0$, creating multiple intersections. The depiction in Panel (b) illustrates the case with a strong seller acceptance effect such that the best-response bends upwards globally. Proposition 5 states the result.

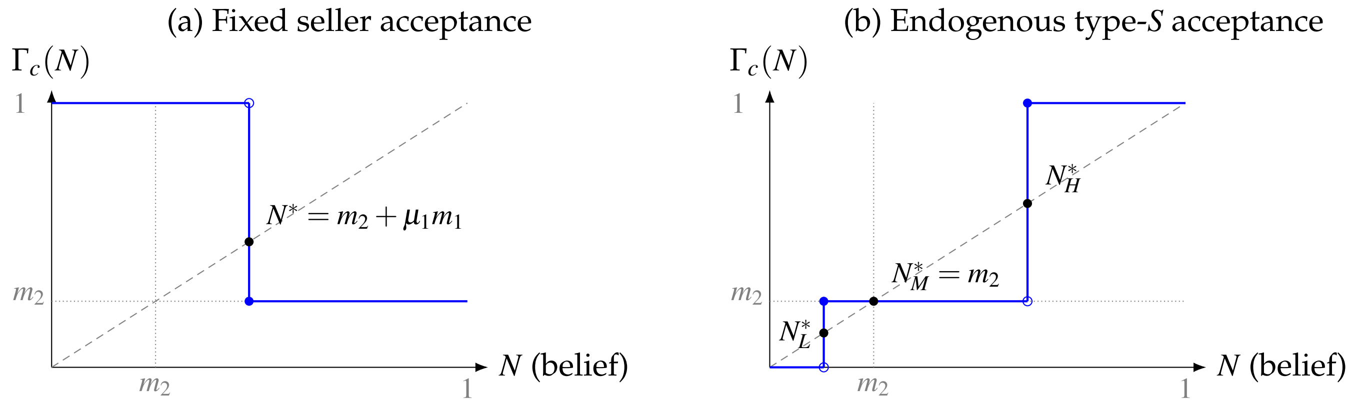

Figure 3: This figure shows the aggregate adoption best-response correspondence, $\Gamma_c(N)$, and the 45° line for the two-group case. Panel (a): step profile with a top plateau $\Gamma_c{=}1$ on $[0, N^*)$, a middle plateau $\Gamma_c{=}[N^*, 1]$, and the equilibrium at $N^* = m_2 + \mu_1 m_1$ on the vertical wheree group 1 is marginal. Panel (b): upward sloping S-shaped best-response.

Proposition 5. ***(Joint Equilibrium)*** *Let $G = 2$ and $\overline{\delta}^B \to \infty$ so that f^B is fixed while $f^S(N)$ is decreasing in N. There exists at least one adoption equilibrium $N^* \in [0, 1]$. If the seller acceptance/network effect dominates the destabilizing composition effect so that $d\theta^*/dN < 0$ for some interval of adoption rates, then $\Gamma_c(N)$ can become S-shaped, yielding multiple fixed points. Otherwise, the equilibrium remains unique.*

The key take away from the analysis of the two-group case is that with fixed acceptance there is a unique adoption equilibrium pinned down by the marginal group of adopters. With endogenous seller acceptance the relative strength of the destabilizing composition effect is key for equilibrium uniqueness. If overturned by strong seller acceptance/network effects, equilibrium multiplicity emerges. The multi-group version follows the same logic and the proof uses Kakutani's fixed-point theorem to establish existence of a Perfect Bayesian Equilibrium (see Online Appendix).

From a policy perspective, the possible emergence of multiple equilibria indexed by different beliefs about stablecoin adoption can be a concern, as sudden shifts in adoption may have significant stability implications that may reverberate in financial markets, due to the role of stablecoins as a link between the crypto and traditional financial markets (Barthelemy et al. 2023; Ahmed and Aldasoro 2025). Beyond concerns related to shifts in adoption, the model offers a series of deeper policy implications that I discuss next.

4 Policy Analysis

Section 4.1 addresses regulatory concerns regarding a widespread, rapid, and from a consumer welfare perspective "excessive" adoption of stablecoins. Specifically, it compares a consumer welfare-centric socially optimal level of stablecoin adoption to the equilibrium level of adoption resulting from privately optimal consumer choices. Thereafter, Section 4.2 speaks to regulatory concerns about moral hazard and the disclosure of risks through the lens of a modified model where the issuer can select the portfolio risk.

4.1 Efficiency Analysis: Excessive Adoption

I study a constrained planner who maximizes *consumer welfare* by choosing the adoption mass $N \in [0,1]$ at $t = 0$. Section 4.1.1 analyzes the benchmark with *fixed* seller acceptance to isolate an *uninternalized destabilizing run externality*, Section 4.1.2 then allows *endogenous* type-S acceptance and analyzes an *uninternalized erosion of the value of bank deposits* through network effects. Lastly, Section 4.1.3 discusses policies to implement the efficient allocation.

Planner's problem. Adopting a consumer welfare criterion, the efficiency analysis builds on a suitable constrained planner benchmark with fixed seller acceptance where a planner maximizes consumer welfare, $W^C(N)$, by choosing the adoption mass $N \in [0,1]$ at $t = 0$ but must *(i)* take the $t = 1$ conversion game (global games selection, panic runs) as given, and *(ii)* respect sellers' $t = 0$ acceptance best responses, which depend on beliefs about N.[22]

4.1.1 Uninternalized Destabilizing Run Externality

The destabilizing run externality builds on the link between adoption and fragility established in Corollary 5. Formally, let N^* denote the market equilibrium and N^{SP} the solution to the constrained planner problem. To cleanly isolate the run externality, I first study the model with fixed seller acceptance. Adoption is classified as "excessive" if $N^* > N^{SP}$. Proposition 6 summarizes the first efficiency result.

Proposition 6. ***(Excessive Adoption: Run Externality)*** *Suppose the conditions of Proposition 1 hold so that $\theta^*(N)$ is uniquely defined for each N. Then, for an interior adoption rate with more*

[22]The focus on consumer welfare is justified under a small-seller-surplus calibration (low per-sale margin u and small acceptance costs), such that seller welfare is plausibly second-order relative to consumer welfare, while equilibrium acceptance and the run probability are unaffected. The analysis is also consistent with regulatory practice, which typically focuses on consumer outcomes and risks to the financial system. Moreover, disregarding profits of the stablecoin issuer can be justified because rents earned by banks are not explicitly modelled. Therefore, treating both bank surplus and issuer surplus as outside the welfare objective is analytically consistent and motivated by actual regulatory policy.

than one group of coin holders and fixed seller acceptance ($\overline{\delta}^B, \overline{\delta}^S \to \infty$), the equilibrium level of adoption is excessive relative to the constrained efficient level, $N^* > N^{SP}$.

Proof. See Appendix Section A.10.5.

Intuitively, an inefficiently high level of stablecoin adoption can arise because the marginal adopter of stablecoins at $t = 0$ does not take into account that she poses a negative externality on other coin holders by increasing the probability of a stablecoin run due to the destabilizing composition effect, i.e. $dProb\{\theta < \theta^*\}/dN > 0$ (Corollary 5), which reduces everyone's differential payoff from adopting stablecoins and pushes N^* above N^{SP}. Because the distribution of groups is discrete, it takes more than one group of adopters for this composition effect to emerge. Without fixed seller acceptance the planner also takes matching effects into account, an aspect that I discuss below in Section 4.1.2.

Regulatory perspective. Settings where a dominant US dollar stablecoin becomes the de-facto instrument for cross-border or offshore transactions suggest to be especially exposed to the "excessive adoption" mechanism established in this paper. To make an example, consider large stablecoin (e.g., Tether) that scales into remittances. This can generate sizable, transitory "parked" balances held by households who plan to convert in the near future and do so immediately after receiving information about potential weaknesses of the balance sheet of the stablecoin issuer. Resultingly, negative issuer news translates into "faster" redemptions among late adopters than among early "crypto-native" users who hold stablecoins mainly as a conduit to access the crypto universe–an empirically testable implication (see Section 6)–and suffer from this negative externality.

Relation to the literature. On a conceptual level, the mechanism developed in this paper contrasts with classical "run externalities," where inefficiency arises from strategic complementarities among ex-ante identical agents–such as in Diamond and Dybvig (1983), Rochet and Vives (2004), and Goldstein and Pauzner (2005)–or through pecuniary price channels in fire-sale and macro-prudential models (Lorenzoni 2008; Davila and Korinek 2017; Farhi and Tirole 2012). Instead, here inefficiency is driven by a *compositional* externality: as adoption widens, the marginal adopter's characteristics alter aggregate fragility $\theta^*(N)$, even when individual decisions are strategic substitutes at the adoption stage.

4.1.2 Uninternalized Erosion of the Transaction Value of Bank Deposits

Building on Section 4.1.1, I next study the effect of an uninternalized erosion of the transaction value of bank deposits. To isolate this effect, I introduce endogenouns seller acceptance by stablecoin-native sellers. Proposition 7 summarizes the efficiency result. Let $\tilde{N}^*$ denote the decentralized adoption level under endogenous type-S acceptance.

Proposition 7. ***(Excessive Adoption: Uninternalized Erosion of Deposits)*** *Under the conditions of Proposition 6, let type-B acceptance be fixed ($\overline{\delta}^B \to \infty$) and type-S acceptance respond to adoption so that $df^S/dN < 0$. Then the equilibrium level of adoption is excessive relative to the constrained efficient level, $\tilde{N}^* > N^{SP}$, under the sufficient condition that $d\Delta\overline{p}/dN > 0$. Moreover, the magnitude of the inefficiency increases if the erosion of deposits is introduced alongside the uninternalized run externality.*

Proof. See Appendix Section A.10.5.

Intuitively, a higher expected level of stablecoin adoption is associated with fewer type-S sellers deciding to also accept deposits as payment. This effect is reminiscent of negative cross-side network effect studied in the two-sided markets literature (Rochet and Tirole 2003). It is in this sense that the transaction value of deposits is eroded, which is to the detriment of consumers belonging to groups $g \in \{1, ..., \widehat{g} - 1\}$ who keep their bank deposits and now face higher transaction costs. Given that stablecoin adopters do not take into account that they pose a negative externality to non-adopters. Therefore, the magnitude of the inefficiency increases (see also Corollary 1 below) provided $d\Delta\overline{p}/dN > 0$, meaning that the composition term dominates the acceptance term in Lemma 2, which ensures uniqueness of the decentralized equilibrium.

Regulatory perspective. Facebook's 2019 announcement to launch a global digital currency (Libra) was a wake-up call for central banks and financial regulators. As discussed in the introduction, policy makers were primarily concerned that a rapid, large-scale stablecoin adoption could reshape the payments landscape and erode banks' retail deposit base, reducing both the funding stability of banks and the transactional value of deposits. In the present framework, such a reduction in deposits' transactional value for non-adopters amplifies the wedge between decentralized and planner allocations, strengthening the rationale for a policy intervention (see Section 4.1.3). Empirically, a decline in deposit acceptance by stablecoin-native sellers–such as crypto-affine merchants offering digital goods–would be associated with a more pronounced excessive adoption.

Relation to the literature. Notably, the uninternalized erosion of bank deposits analyzed in this paper differs conceptually from the financial disintermediation channel emphasized in the existing literature (Andolfatto 2021a; Chiu et al. 2023). The disintermediation concern centers on the reallocation of savings from banks to alternative digital intermediaries–such as stablecoin issuers or the central bank under a retail CBDC–which may impair banks' funding stability and ability to fund loans to the real economy. In contrast, the mechanism in this paper operates through the transactional rather than the intermediation role of bank deposits. In a richer model, the erosion of deposits' transactional role could interact with the traditional disintermediation channel studied in the literature. In the benchmark model of Brunnermeier and Niepelt (2019), such funding shifts away from banks can in principle be neutralized through appropriate central bank intermediation, yet the welfare loss identified in my paper would persist because it arises from a deterioration in deposits' transaction role rather than from impaired credit creation.

4.1.3 Policy Implications

From a policy perspective, one can distinguish between policies that take seller acceptance as given and focus on addressing the concern of excessive stablecoin adoption, and policies that try to establish interoperability of payment systems. Through the lens of the model, the latter set of policies can clearly help to deal with the uninternalized erosion of bank deposits. E.g. by regulating sellers to accept both monies, a regulator can implement multi-homing so that $p_{B,g} = p_{S,g} = 1$ and the inefficiencies identified in Propositions 6 and 7 vanish (see Case A in Section 3.3.1). In fact, multi-homing by all sellers makes bank deposits consumers' preferred medium of exchange due to the superior return. In practice, a limited regulatory reach, high seller acceptance costs, or diverging seller preferences and other attributes may be obstacles to such a regulatory intervention maximixing consumer welfare. Therefore, alternative policies focusing on consumer adoption remain relevant.

Considering the perhaps more interesting case of a constrained planner that cannot directly affect seller acceptance profiles, the inefficiencies created by the externalities discussed in Sections 4.1.1 and 4.1.2 could be corrected with Pigouvian-type interventions that internalize the social cost of excessive adoption. Specifically, I consider a planner (or regulator) who can impose an adoption levy users (or, equivalently, a subsidy for deposits) that aligns private and social incentives. Corollary 1 summarizes the key insights.

Corollary 1. ***(Pigouvian Taxes)*** *Consider a planner that sets an adoption levy but cannot directly set seller acceptance. Let N^{SP} denote the constrained–efficient adoption level that maximizes $W^C(N)$.*

(i) ***Fixed acceptance.*** *Under the conditions of Proposition 6, the optimal levy is:*

$$\iota^* = -\frac{\partial W^C}{\partial \theta^*}\frac{d\theta^*}{dN}\Big|_{N=N^{SP}} > 0. \tag{15}$$

(ii) ***Endogenous type-S acceptance (inelastic type-B).*** *Under the conditions of Proposition*

7, the optimal levy is:

$$\widetilde{\iota}^* = -\frac{\partial W^C}{\partial \theta^*}\frac{d\theta^*}{dN}\Big|_{N=N^{SP}} - \Sigma_{g=\widehat{g}}^{G}\left(\frac{\partial W^C}{\partial p_{B,g}}\frac{dp_{B,g}}{dN}\right)\Big|_{N=N^{SP}} > \iota^*. \tag{16}$$

Proof. See Appendix Section A.10.6.

The second result in Corollary 1 uses that $\partial W^C/\partial p_{B,g} > 0$ and $dp_{B,g}/dN < 0$ on the interior, while $dp_{S,g}/dN \approx 0$ when the type-B margin is inelastic.

Intuitively, when seller acceptance is fixed, the optimal adoption levy is proportional to the marginal effect of adoption on fragility, internalizing the run externality. This is because the derivative of consumer welfare with respect to the run threshold is negative in interior regions, $\partial W^C/\partial \theta < 0$, while $d\theta^*/dN > 0$. This adoption levy parallels the macroprudential taxes proposed by Davila and Korinek (2017), but here the externality operates through the *composition* of adopters rather than through asset prices or leverage.

Instead, with endogenous type-S acceptance, the optimal adoption levy corrects both the run externality–whereby wider adoption raises fragility–and network effects–whereby declining deposit acceptance reduces the transactional value of deposits. In equilibrium, the levy thus includes a fragility component and a deposit-erosion component, each positive when adoption both destabilizes the issuer and undermines deposits' payment role. Notably, the welfare wedge is larger than with fixed seller acceptance under the maintained assumption that $d\Delta\overline{p}/dN > 0$, which ensures uniqueness.

As the purpose of this section is to isolate the externalities in Propositions 6 and 7, type-B seller acceptance is kept fixed throughout. Relaxing this assumption adds another layer of network effects that can also counter the destabilizing composition effect (Lemma 2), but does not directly affect the erosion of the transaction value of bank deposits.

4.2 Disclosure and Moral Hazard

Recent regulatory initiatives, such as the 2025 U.S. GENIUS Act and the EU Digital Finance Package (EU 2022), emphasize enhanced transparency and stricter rules for the composition of stablecoin reserves (monthly public disclosures, restrictions to high-quality liquid assets, and–to some extend–capital requirements). To speak to this debate, I modify the baseline model from Sections 3.1–3.2 by introducing a classical risk-shifting problem.

Modified setup. The issuer chooses a portfolio risk level $x \in \{x_L, x_H\}$, where $x_L > 0$ is the safer choice and $x_H \equiv 0$ the riskier benchmark nesting the baseline model. Now, $\theta \sim U[\underline{\theta}(x), \overline{\theta}(x)]$ with $\underline{\theta}(x) \equiv x\xi_1 R + (1 - x\xi_1)\underline{\theta}$ and $\overline{\theta}(x) \equiv x\xi_1 R + (1 - x\xi_1)\overline{\theta}$, with sensitivity parameter $\xi_1 \in (0,1]$ and $R = (\overline{\theta} + \underline{\theta})/2$, so that x_H is a mean-preserving spread of x_L, because $d\underline{\theta}(x)/dx = -d\overline{\theta}(x)/dx > 0$. In the event of a run, the liquidation value is $\check{r}(x) = x\xi_2 r_L + (1 - x\xi_2)r$, with $r_L \in (r,1)$ and $\xi_2 \in (0,1]$, so that $\check{r}(x_L) > \check{r}(x_H) = r$.

Remark. ***(Socially Optimal Portfolio Choice)*** *Under fixed seller acceptance, consumer welfare is strictly higher for the safer portfolio $x = x_L$, because it lowers the run probability and preserves resources available for redemption.*

The stabilizing effect of x_L operates via *(i)* a higher liquidation value $\check{r}(x_L)$, and *(ii)* a less dispersed fundamental distribution. A sufficient condition for *(ii)* to be stabilizing is $\theta^*(x_L) < R$, which is satisfied when the ex-ante run probability is below one half–an innocuous condition (henceforth assumed to hold); otherwise there would be no adoption. Intuitively, because the support contracts symmetrically toward the mean R, compressing the distribution pulls mass *away* from the run region if the threshold lies below the mean.

Denote by $\pi(N;\theta^*(x;N),x)$ the issuer's expected profits under the portfolio choice x:

$$\pi(N;\theta^*(x;N),x) = \int_{\underline{\theta}(x)}^{\theta^*(x,N)} \frac{0}{\overline{\theta}(x) - \underline{\theta}(x)}\, d\theta + \int_{\theta^*(x,N)}^{\overline{\theta}(x)} \frac{\theta - 1}{\overline{\theta}(x) - \underline{\theta}(x)} N(x,\theta^*)\, d\theta, \tag{17}$$

and by $\Delta\pi(N) \equiv \pi(N;\theta^*(x_H;N),x_H) - \pi(N;\theta^*(x_L;N),x_L)$ the private gain from risk-taking. Note that for a given adoption rate profits are decreasing in the run threshold, $\partial\pi/\partial\theta^* < 0$.

No commitment. If the issuer's portfolio choice cannot be credibly verified, coin holders correctly anticipate $x = x_H$. Choosing x_L only lowers the issuer's upside without affecting beliefs or adoption. Thus, selecting $x^* = z_H$ maximizes expected profits.

Commitment. Suppose instead that the issuer can credibly commit to x (e.g., via a regulatory disclosure regime). Even then, private and social incentives may diverge:

Proposition 8. ***(Portfolio Choices under Commitment)*** *Under fixed seller acceptance the privately and socially optimal portfolio choices can differ even if the issuer can commit. An example for $\Delta\pi > 0 \Leftrightarrow x^* = x_H < x^{SP} = x_L$ emerges for $x_L \searrow 0$ if the adoption rate is locally unaffected by changes in x_L, i.e. if $\Delta_{0,\widehat{g}} > 0$ and $\Delta_{0,\widehat{g}+1} < 0$, and if $\xi_2/\xi_1 < \overline{\xi}$.*

Proof. See Appendix Section A.10.7, which also defines $\overline{\xi} > 0$.

Intuitively, for ξ_2/ξ_1 sufficiently small, the safe portfolio has a significantly lower upside, while generating small stability gains. The result is an incentive for the bank to take risk. Although the existence result in Proposition 8 is established for the limiting case $x_L \searrow 0$, the key mechanism continues to hold away from the limit, as long as the response of N^* and

θ^* to changes in portfolio risk remains weak–which is assured when adoption is locally insensitive (for $\Delta_{0,\hat{g}} > 0$ and $\Delta_{0,\hat{g}+1} < 0$). In such environments, disclosure and market discipline alone are insufficient: capital, liquidity, or collateral-quality requirements are needed to restore the alignment between private and social incentives.

Skin in the game. In fact, the misalignment between the privately and socially optimal portfolio choice is less likely to occur if the monopolistic issuer has additional skin (or capital) exposed, which could, e.g., stem from future transaction fee income (Section 5.2), or from the affiliation with a cryptocurrency exchange.[23] Corollary 2 develops this insight by adding a disutility term d in a parsimonious way to the issuers expected profits in (17).

Corollary 2. ***(Skin in the Game)*** *Suppose the stablecoin issuer incurs an extra disutility, $d > 0$, from bankruptcy. Then $\exists \underline{d} > 0$, such that $x^* = x^{SP}$ for $x_L \searrow 0$ if $d > \underline{d} > 0$.*

Competition. Notably, the mechanism described in Proposition 8 is not robust to the introduction of fierce competition among multiple issuers. Assuming a contestable market, new entrants can credibly announce their risk and compete by setting x. This results in an outcome that maximizes consumer welfare. Thus, barriers to entry, such as switching costs, suggest to play a significant role in creating a moral hazard wedge.

Policy discussion. The results in this section speak directly to the policy debate on stablecoin regulation. Persistent opacity regarding reserve composition and self-reported, non-verifiable disclosures have been central regulatory concerns since at least 2021 (US 2021; Bains et al. 2022). Without credible commitment, a classic moral-hazard problem arises, inducing excessive risk-taking. Disclosure regimes such as the U.S. GENIUS Act can strengthen commitment by enabling external verification of portfolio quality, yet disclosure alone may not suffice–particularly in a highly concentrated market (Figure A1) where competitive discipline is weak. Effective regulation must directly shape issuer portfolios through requirements on reserve-asset quality, liquidity, diversification, and custodial risk management. Moreover, adequate capitalization is essential: capital buffers not only absorb losses but *skin-in-the-game* also helps to align private and social incentives.

[23] In practice, USD Coin and the exchange Coinbase is such a cases. A crypto exchange experiences a significant disruption and possibly risks bankruptcy if its affiliated stablecoin is devalued. Consequently, its issuance policy is likely to be more prudent. The self-reported asset breakdowns published by issuers suggest that this conjecture can be verified; already in October 2022 USD Coin claimed to be exclusively backed by U.S. government guaranteed debt instruments, which stands in stark contrasts to the more risky investments by the non-affiliated stablecoin Tether USD during that time (see Table A2 in the Appendix).

5 Extensions and Robustness

In this section I discuss several extensions to the model and the robustness of the main findings. First, Section 5.1 discusses the stabilizing role of congestion effects leading to an endogenous response of conversion costs. Then Section 5.2 considers the resilience of the issuer, introducing fixed costs, transaction fee revenue and a drop in seigniorage. Thereafter, Section 5.3 discusses e-money providers, narrow banks and a hybrid CBDC. Finally, Section 5.4 covers alternative model specifications and robustness.

5.1 Congestion: Endogenous Conversion Cost

Congestion effects are important in crypto markets, where large transaction volumes within short time windows can trigger sharp fee increases. Figure A2 in the Appendix documents such an episode around the USD Terra devaluation in May 2022, when Ethereum on-chain fees on the dominant network used by USD Terra rose more than fourfold, likely dampening outflows from Tether and mitigating contagion across stablecoins.

To study the stabilizing role of congestion, I let the conversion cost at $t = 1$ depend on the aggregate conversion demand, $\tau_1^e(A) = \overline{\tau} + \chi A$ with $\chi > 0$. Similar to Diamond–Dybvig models with increasing nominal t=1 good prices (Skeie 2021; Schilling et al. 2024), higher conversion demand raises conversion costs and rations the run threat.

Corollary 3 shows formally that a stronger endogenous response to congestion has a stabilizing effect. Perhaps surprisingly, the probability of runs is lower than in the benchmark model even if the endogenous conversion cost is lower than the exogenous conversion cost used in the benchmark model for a wide range of aggregate conversion demands, which can reach up to $A = 1/2$.

Corollary 3. ***(Endogenous congestion cost)*** *Under the conditions of Proposition 2, the revised equilibrium condition for the stablecoin runs game is:*

$$I^e(\theta^*) \equiv \Delta\overline{p}\tau_2 - \left(\overline{\tau} + \frac{\chi}{2}\right) + \int_{\frac{(\theta^*-1)r}{\kappa(\theta^*-r)}}^{1} \left(1 - \frac{(r-\kappa A)\theta^*/r - \psi}{1-\kappa A}\right) dA = 0. \tag{18}$$

The probability of runs decreases when the conversion cost is more sensitive to increases in the conversion demand, $d\theta^*/d\chi < 0$. Moreover, it is lower than in the benchmark model with an exogenous conversion cost if $\tau_1 < \overline{\tau} + \chi/2$. This result holds even if $\tau_1^e(A) < \tau_1, \forall A \in [0, 1/2)$.

5.2 Resilience of the Issuer and Seigniorage

The probability of stablecoin runs, $Prob\{\theta \leq \theta^*\}$, stands in a close relationship to the profitability and resilience of the issuer via the critical threshold $\widehat{A}(\theta)$ from Equation (5), which describes the strength of the issuer to stem against conversion demands at $t = 1$. I consider two modifications of the baseline model that alter the issuer profits in Equation (17). First, I consider a variant of the model with fixed operating costs. Second, I allow the issuer to generate income from transaction fees. Lastly, I study the effects of changes in seigniorage. Proposition 9 gives a formal summary of the results.

Proposition 9. ***(Fixed Costs of Operation and Transaction Fee Income)*** *Under the conditions of Proposition 2, the probability of a stablecoin run:*

(a) increases in the level of the fixed cost: $dProb\{\theta \leq \theta^*\}/d\xi > 0$

(b) decreases in the transaction fee income: $dProb\{\theta \leq \theta^*\}/df < 0$*, if* $f\tau_1$ *is not too high*

(c) decreases in seigniorage income: $dProb\{\theta \leq \theta^*\}/d\psi < 0$.

Proof. See Appendix Section A.10.8, which also explains each model variant.

Note that the results of Proposition 9 are derived for a fixed adoption rate N by analyzing the continuation equilibrium as in Proposition 2. Intuitively, factors lowering the resilience of the issuer to withstand redemption requests lower the probability of a stablecoin run.

5.3 Stablecoins vs. E-money, Narrow Banking, and Hybrid CBDC

The GENIUS Act authorizes insured banks and qualified non-bank institutions to issue stablecoins, subject to federal oversight and a 100% reserve requirement. If accompanied by adequate safeguards for operational and technological risks, and a central bank backstop, privately issued stablecoins can in theory serve as a risk-less medium of exchange that fulfills the *no-questions-asked* principle (Gorton and Zhang 2021). In fact, tightly regulated stablecoins can be a substitute for a US retail CBDC (Waller 2021; Andolfatto 2021b).[24]

Through the lens of the model, tightly regulated issuers can be represented by adjusting the fundamental θ and the liquidation value r (see Section 3.3.1). Specifically, requiring investments in safe assets (e.g., short-term Treasuries) and imposing capital buffers ensures $\underline{\theta} \geq 1$. The remaining fragility arises solely from liquidity shocks when divesting assets is costly or uncertain, which can be modeled as incomplete information about $r(\theta)$ with

[24] Such arrangements are akin to a *hybrid CBDC* architecture, where users hold a direct claim on the central bank BIS (2021). China's e-CNY and the narrow-banking regime applied to Alipay and WeChat Pay illustrate this approach, where the issued e-money is fully backed with deposits at state-owned banks.

$r'(\theta) > 0$, where the liquidation value can fall short of one for low fundamental realizations. Applying the same global games logic as in Section 3.1 yields similar insights.

To remove such liquidity-based runs, a central bank can grant issuers access to its balance sheet or require them to hold reserves like narrow banks, so that $r \geq 1$ in all states. A remaining concern is the limited profitability of these designs in a low interest-rate environment (Proposition 9c),[25] which may call for additional capital buffers or subsidies.

5.4 Robustness

Throughout the paper, I consider a monopolistic stablecoin issuer. Allowing for multiple issuers primarily reinforces the role of fixed operating costs discussed in Section 5.2: duplicated costs spread over smaller user bases make smaller issuers more fragile. Conversely, the destabilizing composition effect from Section 3.1 strengthens if the dominant issuer, with the highest adoption, disproportionately attracts flighty coin holders.

From a policy perspective, contagion risk warrants focusing on the weakest link, which could be lightly regulated off-shore issuers. Empirical evidence points to strong interconnectedness within crypto, where market spillovers often exceed idiosyncratic variation Ferroni (2022). Likewise, stablecoins exhibit high co-movement across issuers and with other crypto assets Gorton et al. (2022). Hence, assessing individual issuers in isolation is insufficient: institutional similarities and potential linkages imply that a run against one coin can serve as a wake-up call, prompting a wider run (Ahnert and Bertsch 2022).

6 Testable Implications

The nascent empirical literature on the stablecoins market has documented that stablecoins play a key role in the $3-4tn market for crypto assets (Hoang and Baur 2021). Moreover, there is an increasingly closer link with traditional financial markets, as well as a high co-movement within the stablecoins universe, which raises the risk of contagious runs.[26] In fact, changes in the stablecoin market capitalization affect the US commercial paper and treasury markets (Barthelemy, Gardin and Nguyen 2023; Ahmed and Aldasoro 2025). As

[25] As emphasized by Jean Tirole in a 2025 *Financial Times* interview, `https://www.ft.com/content/445e7fb6-1ec8-47f3-b74d-87f7960e85d6`.

[26] Gorton et al. (2022) measure the frictions faced by stablecoin holders when transacting and converting their coins to fiat currency, documenting a negative association with the convenience yield and a high co-movement. Grobys et al. (2021) show that Bitcoin volatility is an important factor driving the volatility of stablecoins. In related work, Lyons and Viswanath-Natraj (2020) show that Tether's peg to the US dollar is primarily stabilized by arbitrage traders, rather than by the issuer.

the stablecoin market continues to evolve, further research in this area will be critical to ensuring stability and resilience through the design of effective regulatory frameworks.

This section discusses the implications of the proposed theory and how they could be tested. First, the model offers a prediction for adoption and fragility that highlights the destabilizing role of increasingly flighty adopters (Proposition 1 and Corollary 5).

Prediction 1: *The most marginal (or recent) stablecoin adopters tend to be more flighty than the average stablecoin holder.*

Prediction 1 rests on the heterogeneity in matching probabilities for consumers. Does the marginal stablecoin adopter become more flighty when adoption reaches broader market segments? By how much? One way to test the relevance of consumer heterogeneity is to group wallet address data according to whether wallets are likely to belong to early stablecoin adopters or to more recent adopters. Thereafter, groups can be associated with a flightiness measure based on the sensitivity to deviations from the peg, e.g. during a run (USDC during the Silicon Valley Bank failure; Terra-Luna crash).

Next, I move to the model predictions for stablecoin adoption and fragility in relation to the transaction role of stablecoins (Sections 3.1-3.2).

Prediction 2a: *The stability of stablecoins is positively associated with their transaction value.*
Prediction 2b: *The transaction value of stablecoins is (i) positively associated with seller acceptance, and (ii) negatively associated with the flightiness of the marginal coin holder.*

The predictions follow from Proposition 2 and Corollaries 4-5, respectively. Empirically, these predictions are more challenging to test. A stability measure could be constructed based on the tightness of the peg, e.g. the width of the price band around dollar parity and the frequency of peg deviations. The transaction value, a proxy for the medium-of-exchange role of stablecoins, could be proxied by their usability for purchase of goods and services, and by measuring the transaction fees for purchasing crypto assets.[27] An empirical pattern consistent with these predictions would be that peg stability improves with the scale of transactional usage or outstanding supply.

Lastly, I turn to conditions under which stablecoins may be prone to runs that have to do with the characteristics of traders and the market infrastructure. Prediction 3 is based on the negative effect of the proportion of active traders, κ, on the stability of the stablecoin (Proposition 2). It could be tested by distinguishing between sophisticated and unsophisticated investors (Liu et al. 2023) and measuring the sensitivity to peg deviations. Prediction 4 follows from Corollary 3 on the role of congestion effects. It could be tested

[27] In a richer model, consumers may also derive an interest income from lending stablecoins (Bertsch 2023), which constitutes an additional benefit from holding stablecoins beyond transaction-cost savings.

using data on transaction fees and blockchain network volumes. Regular network updates and changes in the market infrastructure may offer quasi-exogenous shocks to the sensitivity of conversion costs to network congestion. One could also test whether coins on a blockchain with more sensitive transaction fees are more stable.

Prediction 3: *The stability of stablecoins increases if the proportion of active traders is lower.*
Prediction 4: *The stability of stablecoins increases if transaction costs are more sensitive to spikes in conversion demand.*

7 Conclusion

This paper modifies existing theories of bank runs and currency attacks to analyze the stability of stablecoin arrangements. Critically, I take a payment perspective where both insured bank deposits and risky stablecoins offer a transaction value for heterogeneous users who wish to have the right money on hand. This allows me to highlight a novel link between issuer fragility and the composition of coin holders, which is shaped by endogenous stablecoin adoption and seller acceptance. The theoretical framework aims to inform risk assessment and appropriate regulation of stablecoins. It identifies two mechanisms that justify prominent concerns about excessive stablecoin adoption: *(i)* a *run externality*, whereby broader adoption increases the flightiness of marginal holders, raising run risk; and *(ii) network effects*, which erode the payment role of bank deposits. Moreover, the analysis provides theoretical support for the GENIUS Act's approach of combining disclosure requirements with reserve management oversight, while suggesting that additional capital requirements may be necessary to address systemic fragility.

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A Appendix

A.1 Additional Figures

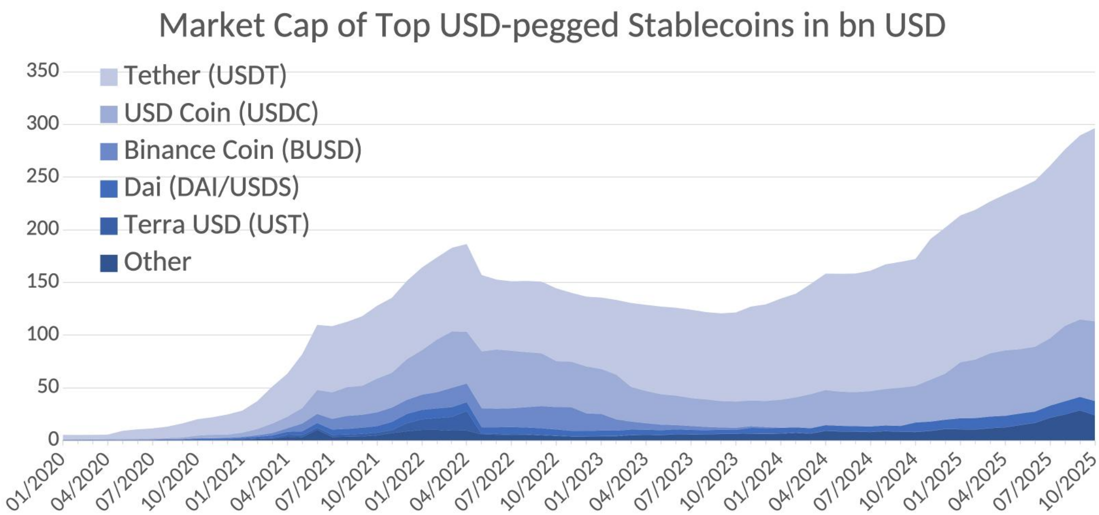

Figure A1: End of month market capitalization over the period from Jan. 2020 to Oct. 2025, when the total capitalization expanded from ca. \$5bn to \$300bn. Source: coingecko.com.

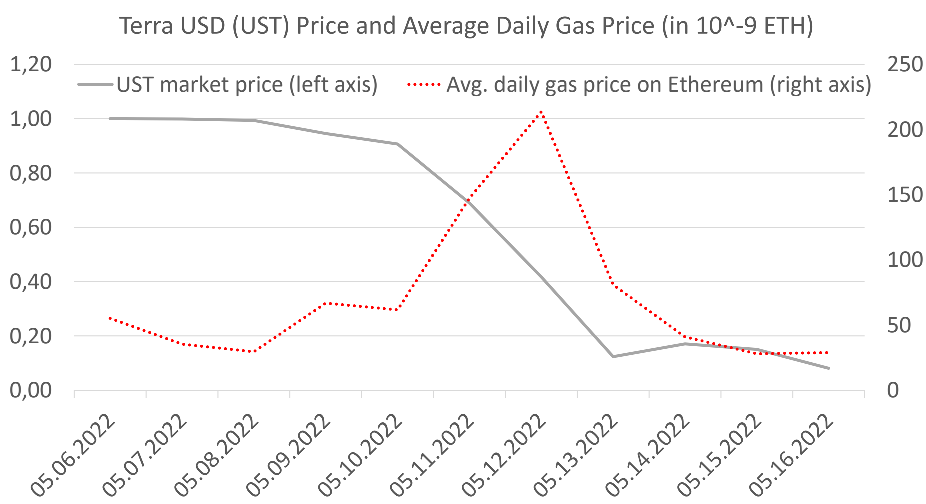

Figure A2: End of day (CEST) price in US dollars (left axis) and average daily gas price on the Ethereum network measured in 10^{-9} units of the cryptocurrency *ETH* (right axis) over the period from May 6, 2022 to May 16, 2022. Source: coingecko.com and ycharts.com.

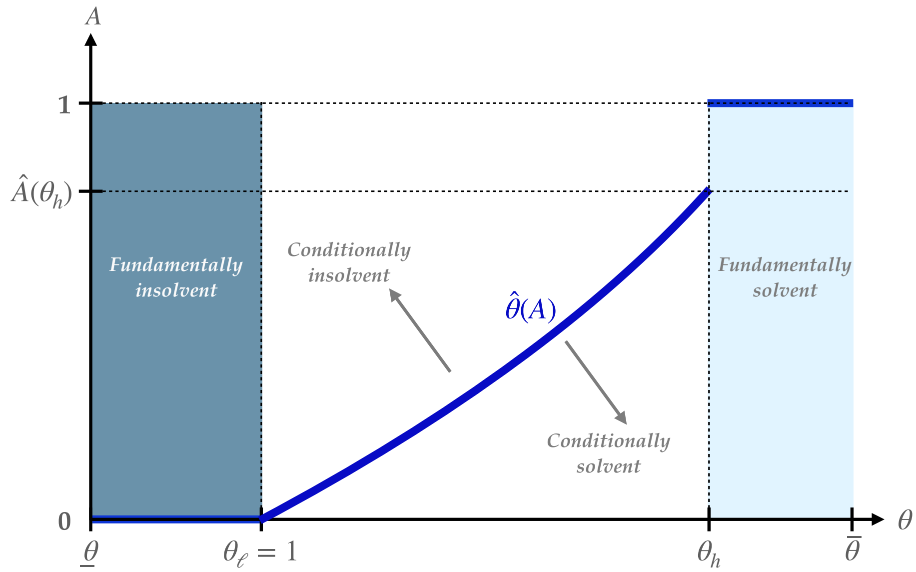

Figure A3: Solvency of the stablecoin issuer as a function of the fundamental realization θ and the population fraction A of coin holders demanding conversion. Only in the intermediate region, $\theta \in (\theta_\ell, \theta_h)$, the solvency of the issuer depends on the level of the aggregate conversion demand A.

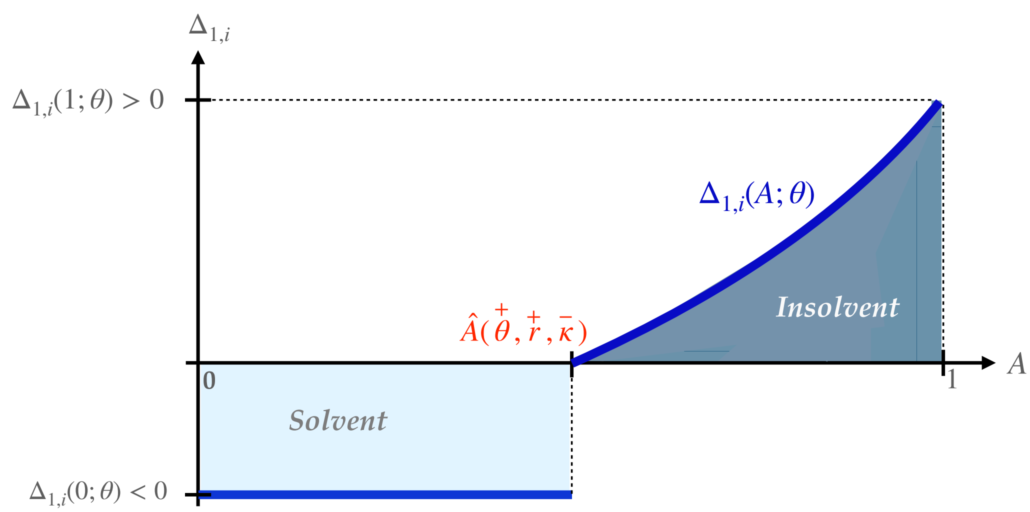

Figure A4: The above figure illustrates how the differential utility payoff $\Delta_{1,i}(A;\theta)$ varies with A for a given $\theta \in (1, \theta_h)$. If the issuer is solvent, i.e. for $A < \widehat{A}(\theta)$, then $\Delta_{1,i}$ is (locally) invariant in the aggregate conversion demand and negative, meaning that there is no benefit from demanding conversion. As shown in Section 3.3, this is because consumer i belonging to group g_i would otherwise not have adopted stablecoins at $t = 0$.

A.2 Timeline

Time $t = 0$	**Time $t = 1$**	**Time $t = 2$**
1. **Seller acceptance decisions:** Sellers choose which monies to accept for payment at $t = 2$	4. The fundamental θ is realized, but unobserved; a fraction κ of coin holders become active; others remain passive	7. The outcome of the $t = 1$ conversion game and the fundamental θ are observed; each consumer is matched with a seller
2. **Consumers' adoption game:** Consumers simultaneously decide whether to convert deposits to stablecoins ($a_{0,i} = 1$) or not ($a_{0,i} = 0$)	5. **Stablecoin conversion game:** Active coin holders receive private signals x_i and simultaneously choose whether to demand conversion to deposits ($a_{1,i} = 1$) or keep coins ($a_{1,i} = 0$); passive holders are dormant	8. If the issuer's reserves fall short of the face value of claims held by the remaining active and passive coin holders, the issuer is insolvent and the stablecoins are devalued
3. The stablecoin issuer invests all funds received from consumers who adopt stablecoins	6. The issuer meets coin holders' conversion requests by divesting assets	9. Consumers buy goods and convert their money (if necessary)
		10. Type-B and type-S sellers convert the coins received; all sellers pay production costs with insured deposits ($)

Table A1: Timeline of events.

A.3 Tether Asset Breakdown

Table A2 shows Tether's self-reported asset breakdown as of June 2022 and September 2022, when USDT was backed by a range of risky assets, including corporate bonds, secured loans, investments in digital tokens, commercial paper and deposits in non-US regulated financial institutions. The latest reporting from June 2023 in column 3 indicates a reduced exposure to commercial paper and bank deposits, but more granular data is not available, and the quarterly reporting is published with a substantial delay.

Assets		**Value in bn USD**		
		06/30/2022	09/30/2022	06/30/2023
Commercial Paper		8,402	50	
& Certificates of Deposit	A-1+ rating	1,434	50	
	A-1 rating	5,465		
	A-2 rating	1,499		
Cash & Bank Deposits		5,418	6,077	91
Money Market Funds		6,810	7,102	8,134
U.S. Treasury Bills		28,856	39,678	55,810
Non-U.S. Treasury Bills		397	182	63
Reverse Repurchase Agreements		2,992	3,024	9,470
Secured Loans		4,494	6,136	5,504
Corporate Bonds, Funds & Precious Metals		3,487	3,194	3,386
Other Investments & digital tokens		5,551	2,617	4,041
Total		66,410	68,061	86,499

Table A2: Tether asset breakdown at 30 June 2022, 30 September 2022 and 30 June 2023. Assurance opinion by *BDO*, Italy.

A.4 Fundamental Solvency and Insolvency

The condition in Inequality (4) defines a solvency threshold in terms of the issuer's fundamental θ. The issuer is *fundamentally solvent* for any $\theta \geq \theta_h$, regardless of the redemption demand A, where:

$$\theta_h \equiv \frac{(1-\kappa)r}{r-\kappa} > 1. \tag{19}$$

Following the standard approach in the global games literature, I assume $\overline{\theta} > \theta_h$ so that this solvency region is non-empty. Conversely, rearranging (4) yields a critical threshold $\widehat{\theta}(A)$ such that the issuer is insolvent for all $\theta < \widehat{\theta}(A)$, given a redemption demand A:

$$\widehat{\theta}(A) \equiv \frac{(1-\kappa A)r}{r-\kappa A} > 1. \tag{20}$$

This defines the threshold below which the issuer cannot meet her obligations at $t = 2$. $\widehat{\theta}(A)$ is strictly increasing in A, κ and decreasing in r, implying that higher liquidation values improve solvency prospects, while greater redemption pressure worsens them.[28] A lower bound for insolvency is obtained by evaluating (20) at $A = 0$, yielding $\theta_\ell = 1$. Hence, if $\theta < \theta_\ell$, the issuer lacks sufficient resources to meet obligations even in the absence of redemptions. Assuming $\underline{\theta} < 1$, she is *fundamentally insolvent* for all $\theta \in [\underline{\theta}, \theta_\ell)$.

Intermediate region. In the intermediate range $\theta \in (\theta_\ell, \theta_h)$, solvency depends on the realized aggregate conversion demand A. Equation (20) allows to trace the solvency boundary as a function of A, as illustrated in Figure A3 in the Appendix.

A.5 Complete Information Benchmark: $\epsilon = 0$

This section considers the benchmark with complete information, where active coin holders obtain a precise signal at $t = 1$ about the resources available to the issuer at $t = 2$. Under complete information, each holder compares the payoff from converting at $t = 1$ to the payoff from keeping coins, taking as given the matching probabilities $p_{B,g}(N)$ and $p_{S,g}(N)$ induced by the $t = 0$ acceptance/adoption profile (see Equation (3)).

Suppose an individual active coin holder i believes that all others keep their coins, i.e. $a_{1,-i} = 0$. Then her optimal strategy is to demand conversion if and only if the differential payoff from conversion relative to keeping coins is weakly positive. A weak preference for conversion holds whenever $\theta \leq \theta_\ell = 1$, which implies that for all $\theta \leq 1$ it is (weakly) dominant to convert.

Following the same logic, I can derive an upper bound from the weak preference for not demanding conversion when the active coin holder i believes that all others demand

[28]Observe that $\widehat{A}(\theta)$ is strictly increasing in θ and in r for all $\theta \in (1, \theta_h)$, as the issuer is only insolvent at $t = 2$ for higher levels of aggregate conversion demand at $t = 1$. Moreover, $\widehat{A}(\theta)$ is strictly decreasing in κ, as a higher share of active coin holders translates into a higher conversion demand, thereby making it harder for the issuer to be solvent. Finally, note that $\widehat{\theta}(A) \leq \theta_h$ requires $A < \widehat{A}(\theta_h)$.

conversion, i.e. $a_{1,-i} = 1$. Let $\tilde{\omega}$ denote the *cutoff routing weight* that solves:

$$(p_{B,s} - p_{S,s})\,\tau_2 - \tau_1 = 0, \tag{21}$$

where $s \in \{1, \ldots, G\}$ is the group of coin holders with the lowest probability of being matched with a seller who accepts stablecoin payments. Then it is the (weakly) dominant action for all coin holders with $\omega_s \geq \tilde{\omega}$ to keep their stablecoins whenever $\theta \geq \theta_h$.

As the analysis of the conversion game at $t = 1$ requires that stablecoins are adopted by at least some consumers, I assume (and later verify) that the cutoff condition in Equation (21) is satisfied for a positive mass of types, which intuitively requires that the routing weight of the most stabelcoins-oriented group, ω_G, is not too high.

Next, I analyze what happens in the intermediate region $\theta \in [1, \theta_h]$. Recall that the intermediate region is non-empty and observe that for any $\theta \in [1, \theta_h]$, multiple belief-driven equilibria exist. Specifically, there always exists a pure strategy Nash equilibrium where all coin holders demand conversion and a pure strategy Nash equilibrium where all coin holders keep their stablecoins. Proposition 10 summarizes.

Proposition 10. ***(Continuation Equilibrium Under Complete Information)*** *Let $\epsilon = 0$. Given Assumption 1 and a positive level of adoption $N > 0$, there exists a unique equilibrium of the conversion game where all active stablecoin holders demand conversion if $\theta \in [\underline{\theta}, 1)$ and a unique equilibrium where no stablecoin holder demands conversion if $\theta \in (\theta_h, \overline{\theta}]$. In the intermediate range, $\theta \in [1, \theta_h]$, there exist multiple pure strategy Nash equilibria.*

A.6 Posterior Beliefs

Recall that the marginal group $\widehat{g} \in \{1, ..., G\}$ is defined as the group of stablecoin adopters who find holding stablecoins least attractive. Using Equation (7), I define for each coin holder i in group $g_i \in \{\widehat{g}, ..., G\}$ the differential expected payoff from demanding conversion, i.e. $a_{1,i} = 1$, conditional on her private signal x_i:

$$\begin{aligned} E[\Delta_{1,i}(A;\theta)|x_i] \quad \equiv \quad & Prob\{A \leq \widehat{A}(\theta)|x_i\}\,(\Delta p_{g_i}\tau_2 - \tau_1) \\ & + Prob\{A > \widehat{A}(\theta)|x_i\} \int_{\underline{\theta}}^{\overline{\theta}} \left(1 + \Delta p_{g_i}\tau_2 - \tau_1 - \frac{\frac{r - \kappa A}{r}\theta - \psi}{1 - \kappa A} \right) h(\theta|x_i)\,d\theta, \end{aligned} \tag{22}$$

where $h(\theta|x_i)$ denotes the posterior probability of a fundamental realization of θ, after observing the signal x_i. While coin holders potentially face heterogenous type-specific payoff functions, they all share an identical differential expected payoff conditional on their group and private signal.

A.7 Derivation of Dominance Regions

The posterior belief that the realization of θ exceeds the level $y \in [\underline{\theta} + \epsilon, \overline{\theta} - \epsilon]$ is:

$$Prob\{\theta \geq y | x_i\} = Prob\{x_i - \varepsilon_i \geq y | x_i\} = \begin{cases} 1 & if\ x_i > y + \epsilon \\ \frac{1}{2} + \frac{x_i - y}{2\epsilon} & if\ x_i \in [y - \epsilon, y + \epsilon] \\ 0 & if\ x_i < y - \epsilon\ . \end{cases} \tag{23}$$

Based on Equation (23), I next establish an upper and lower dominance region of very favorable and very unfavorable private signal realizations, respectively, such that the actions of coin holders observing a signal that falls in these regions do not depend on the decisions of others. Specifically, given Assumption 1 there exist two bounds $\underline{x}$ and $\overline{x}$ that define the dominance regions $[\underline{\theta} - \epsilon, \underline{x})$ and $(\overline{x}, \overline{\theta} + \epsilon]$.

Upper dominance region. A coin holder i belonging to group $g_i \in \{\widehat{g}, ..., G\}$ with the signal $x_i > \overline{x}_{g_i}$ strictly prefers to keep her coins even when all other active coin holders demand conversion, i.e. $A = 1$, where $\overline{x}_g$:

$$Prob\{\theta \geq \theta_h | x_i = \overline{x}_g\} - 1 + (p_{S,g} - p_{D,g})\tau_2 + \tau_1 + \int_{\underline{\theta}}^{\theta_h} \frac{\frac{r-\kappa}{r}\theta - \psi}{1-\kappa} h(\theta | x_i = \overline{x}_g) d\theta = 0. \tag{24}$$

Observe that the left-hand side of Equation (24) takes on a negative value if $x_i < \theta_h - \varepsilon$ and a positive value if $x_i > \theta_h + \varepsilon$ and $\tau_1 + (p_{S,g} - p_{B,g})\tau_2 > 0$, which holds provided there is adoption of stablecoins. Moreover, the left-hand side strictly increases in $x_i = \overline{x}_g$. As a result, a sufficient condition for no conversion demand by all coin holders can be obtained by solving Equation (24) for the marginal group s. There exists a unique $\overline{x} \equiv \overline{x}_s$ such that it is the dominant action for all coin holders with a private signal $x_i > \overline{x}$ to keep their coins.

Lower dominance region. Analogously, a coin holder i belonging to group $g_i \in \{\widehat{g}, ..., G\}$ who receives the private signal $x_i < \underline{x}_g$ strictly prefers to demand conversion even when all other coin holders keep their stablecoins, i.e. $A = 0$, where $\underline{x}_g$ solves:

$$\begin{aligned} Prob\{\theta \leq \theta_\ell | x_i = \underline{x}_g\}(1 - \tau_1 - (1 - p_{B,g})\tau_2) - \int_{\underline{\theta}}^{1} \left(\frac{\frac{r-\kappa}{r}\theta - \psi}{1-\kappa} - (1 - p_{S,g})\tau_2 \right) h(\theta | x_i = \underline{x}_g) d\theta \\ - Prob\{\theta > \theta_\ell | x_i = \underline{x}_g\}(\tau_1 + (p_{S,g} - p_{B,g})\tau_2) = 0. \end{aligned} \tag{25}$$

Observe that the left-hand side of Equation (25) takes on a positive value if $x_i < \theta_\ell - \varepsilon$ due to $\psi > \overline{\psi}$ in Assumption 1. Conversely, it takes on a negative value if $x_i > \theta_\ell + \varepsilon$ since $-\tau_1 - (p_{S,g} - p_{B,g})\tau_2 < 0$. Moreover, the left-hand side is strictly decreasing in $x_i = \underline{x}_g$. As a result, a sufficient condition for no conversion demand by all coin holders can be obtained by solving Equation (25) for group G. There exists a unique $\underline{x} \equiv \underline{x}_G$ such that it is the dominant action for all coin holders with a private signal $x_i < \underline{x}$ to demand conversion. This defines the dominance regions $[\underline{\theta} - \epsilon, \underline{x})$ and $(\overline{x}, \overline{\theta} + \epsilon]$.

A.8 Critical Mass Condition

Suppose that $x^*_{g+1} \leq x^*_g, \forall g \in \{\widehat{g}, ..., G-1\}$, meaning that coin holders belonging to a group with a higher relative benefit from stablecoins are less inclined to demand conversion. For adoption by at least one and up to $G-(\widehat{g}-1)$ groups, the *critical mass condition* is:

$$\frac{\mu_{\widehat{g}} m_{\widehat{g}} \max\{0, \min\{\frac{1}{2} + \frac{x^*_{\widehat{g}}-\theta^*}{2\epsilon}, 1\}\} + \sum_{g=\widehat{g}+1}^{G} m_g \max\{0, \min\{\frac{1}{2} + \frac{x^*_g-\theta^*}{2\epsilon}, 1\}\}}{N} = \widehat{A}(\cdot) = \frac{(\theta^*-1)r}{\kappa(\theta^*-r)}, \quad (26)$$

where $\mu_{\widehat{g}} \in (0,1]$ accounts for the fact that the coin holders belonging to group $\widehat{g}$, who have the lowest relative benefit from holding stablecoins, may be indifferent between adopting stablecoins or holding bank deposits, as discussed in Section 3.3.

A.9 Indifference Conditions

There are $G-(\widehat{g}-1)$ *indifference conditions*, one equation for coin holders in each group, that depend on the run threshold θ^* and the group-specific signal thresholds $x^*_{\widehat{g}}, ..., x^*_G$:

$$E[\Delta_{1,i}(A;\theta^*)|x^*_{g_i=g}] \quad = \quad 0, \forall g \in \{\widehat{g}, ..., G\}. \quad (27)$$

A.10 Proofs

A.10.1 Proof of Proposition 1

I start with preliminary results. It is convenient to redefine the private signal as $x_i = \theta + \sigma\eta_i$, where $\eta_i = U \sim [\epsilon, +\epsilon]$ and $\varepsilon_i = \sigma\eta_i$. Following Sákovics and Steiner (2012) the aggregate action can be rescaled as:

$$\tilde{A}(\xi,\Gamma) \quad \equiv \quad \sum_{g=s+1}^{G} m_g F(\Gamma_g - \xi) + m_s \mu_s F(\Gamma_s - \xi),$$

where ξ is a scalar and Γ is a vector of Γ_gs that relates the group-specific threshold signals to the signal threshold of a group k as follows: $\Gamma_g \equiv (x^*_g - x^*_k)/\sigma$ and $\theta = x^*_k + \sigma\xi$. Then I write the strategic beliefs as:

$$A_g(A,\Gamma) = \Pr\{\tilde{A}(\Gamma_g - \eta, \Gamma) < A\} = \Pr\{\sum_{h=s+1}^{G} m_h F(\Gamma_h - \Gamma_g + \eta) + m_s \mu_s F(\Gamma_s - \Gamma_g + \eta) < A\}.$$

Define $\vartheta(A,\Gamma)$ as the inverse function of $\tilde{A}(\xi,\Gamma)$ with respect to ξ, where $d\vartheta/dA < 0$, because $d\tilde{A}(\xi,\Gamma)/d\xi < 0$ for $\tilde{A}(\xi,\Gamma) \in (0,1)$. Next, following Lemma 4 in Sákovics and Steiner (2012) I establish that the densities associated with the strategic belief are bounded:

$$0 \leq \frac{\partial A_g(A,\Gamma)}{\partial A} = \frac{f(\Gamma_g - \vartheta(A,\Gamma))}{\sum_{g=s+1}^{G} m_g f(\Gamma_g - \xi) + m_s \mu_s f(\Gamma_s - \xi)} \leq \frac{1}{m_g}.$$

Finally, define the expected utility payoff of the threshold type as:

$$H_g^\sigma(x_1,\Gamma) \equiv E[\Delta(A;\theta,N)|(x_g^*,g_i=g)] = \int_0^1 \Delta(x_1+\sigma\vartheta(A,\Gamma),A)dA_g(A,\Gamma),$$

where the adoption rate is dropped in the last line for simplicity. Note that the beliefs are independent of σ so that the $H_g^\sigma(x_k,\Gamma)$'s are well-defined for all $\sigma \geq 0$.

The proof proceeds in three steps. *Step 1* follows the translation argument in Frankel et al. (2003) and establish by contradiction that if there is a solution to the system of indifference conditions given by:

$$H_g^\sigma(x_1,\Gamma) = 0, \forall g \in \{s,...,G\},$$

then it must be unique. Thereafter, I establish equilibrium convergence (*Step 2*) and apply the Belief Constraint of Sákovics and Steiner (2012) (*Step 3*) to derive (9) in Proposition 1. Finally, existence is established by iterated elimination of dominated strategies.

Step 1: Suppose there exist two distinct solutions, (x_1,Γ) and (x_1',Γ').

First, consider the case where $\Gamma = \Gamma'$ and $x_1 \neq x_1'$. Recall that Δ_i is weakly decreasing in θ for all groups so that $\Delta_i(x_1'+\sigma\vartheta(A,\Gamma'),a) \leq \Delta_i(x_1+\sigma\vartheta(A,\Gamma),a)$ if $x_1' > x_1$. Moreover, $A^* > (A^*)'$ if $x_1' > x_1$ since $\widehat{A}(\theta)$ is strictly increasing in θ. As a result, $A_g(A^*,\Gamma) > A_g((A^*)',\Gamma)$. There is a contradiction: $H_g^\sigma(x_1',\Gamma) < H_g^\sigma(x_1,\Gamma)$, because $\Delta_i(x_1'+\sigma\vartheta(A,\Gamma')) \leq \Delta_i(x_1+\sigma\vartheta(A,\Gamma))$ for $A \in ((A^*)',A^*)$ due to the discontinuity of Δ_i at the solvency threshold $\widehat{A}(\theta)$ so that:

$$\int_0^1 \Delta_i(A,x_1'+\sigma\vartheta(A,\Gamma))dA_g((A^*)',\Gamma) < \int_0^1 \Delta_i(A,x_1+\sigma\vartheta(A,\Gamma))dA_g(A^*,\Gamma).$$

Second, consider the case where $\Gamma \neq \Gamma'$ and, without loss of generality, $x_1 \leq x_1'$. Choose $h \in \arg\max_g(\Gamma_g'-\Gamma_g)$ and let $D = \max_g(\Gamma_g'-\Gamma_g) \geq 0$. Notice that $\Gamma_h'-\Gamma_g' \geq \Gamma_h - \Gamma_g, \forall g \in \{s,...,G\}$ holds with strict inequality at least for one group g due to the assumption that $\Gamma \neq \Gamma'$. Let $\tilde{x}_1 = x_1'+\sigma D$, then:

$$H_h^\sigma(\tilde{x}_1,\Gamma) \leq H_h^\sigma(x_1,\Gamma),$$

which leads to a contradiction, as shown below. Next, use the substitution $a = \tilde{a}(\Gamma_h - \eta_h,\Gamma)$, $\tilde{x}_h = \tilde{x}_1 + \sigma\Gamma_h$, and $x_h' = x_1' + \sigma\Gamma_h'$ to re-write the expected utility payoff as:

$$H_h^\sigma(\tilde{x}_1,\Gamma) = \int_{-\eta}^{+\eta} \Delta_h(\tilde{x}_h - \sigma\eta_h, \tilde{a}(\Gamma_h-\eta_h,\Gamma))df(\eta_h)d\eta_h$$
$$H_h^\sigma(x_1',\Gamma') = \int_{-\eta}^{+\eta} \Delta_h(x_h' - \sigma\eta_h, \tilde{a}(\Gamma_h'-\eta_h,\Gamma'))df(\eta_h)d\eta_h,$$

where I use that $\vartheta(A,\Gamma)$ is the inverse function of $\tilde{A}(\xi,\Gamma)$ with respect to ξ. Observe that

$\tilde{x}_h = x_1' + \sigma D + \sigma\Gamma_h = x_h'$. Moreover, because of $\Gamma_h' - \Gamma_g' \geq \Gamma_h - \Gamma_g, \forall g \in \{s, ..., G\}$:

$$\sum_g m_g(1 - F(\Gamma_g' - \Gamma_h' + \eta_h)) + m_s\mu_s(1 - F(\Gamma_s - \Gamma_h' + \eta_h'))$$
$$\geq \sum_g m_g(1 - F(\Gamma_g - \Gamma_h + \eta_h)) + m_s\mu_s(1 - F(\Gamma_s - \Gamma_h + \eta_h)),$$

which implies: $\tilde{a}(\Gamma_h' - \eta_h, \Gamma') \geq \tilde{a}(\Gamma_h - \eta_h, \Gamma), \forall \eta_h$. Next, I establish strict inequality by noting that the η_h^* solving $\tilde{a}(\Gamma_h - \eta_h^*, \Gamma) = \widehat{A}(\tilde{x}_h - \sigma(\eta_h^*))$ and the $(\eta_h^*)'$ solving $\tilde{a}(\Gamma_h' - (\eta_h^*)', \Gamma') = \widehat{A}(x_h' - \sigma(\eta_h^*)')$ are related to each other as $(\eta_h^*)' \geq \eta_h^*$ for $\tilde{x}_h = x_h'$. Moreover, I can show that $(\eta_h^*)' > \eta_h^*$ by contradiction. Suppose that $(\eta_h^*)' = \eta_h^*$ and recall that there exists a g such that $\Gamma_h' - \Gamma_g' > \Gamma_h - \Gamma_g, \forall g \in \{s, ..., G\}$, for which:

$$(1 - F(\Gamma_g' - \Gamma_h' + \eta_h^*)) > (1 - F(\Gamma_g - \Gamma_h + \eta_h^*)).$$

As a result, $\tilde{a}(\Gamma_h' - \eta_h^*, \Gamma') > \tilde{a}(\Gamma_h - \eta_h^*, \Gamma)$, which contradicts $(\eta_h^*)' = \eta_h^*$. Hence, $H_h^\sigma(\tilde{x}_1, \Gamma) - H_h^\sigma(x_1', \Gamma') < 0$, meaning there exists at most one equilibrium characterized by threshold strategies, which concludes *Step 1*.

Step 2: Next, I show that the system of indifference conditions given by:

$$H_g^\sigma(x_1, \Gamma) = 0, \forall g \in \{s, ..., G\}$$

is well approximated by $H_g^0(x_1, \Gamma) = 0$, as $\sigma \searrow 0$. Note that $\lim_{\sigma \searrow 0} \xi = \lim_{\sigma \searrow 0} \vartheta(A, \Gamma) = 0$. Moreover, all group-specific signal thresholds x_g^* must lie in the $\sigma/2$-neighborhood of the fundamental threshold $\theta^*(\sigma)$ for the indifference conditions to hold. Following Sákovics and Steiner (2012) I can show that $H_g^\sigma(x_1, \Gamma) = 0$ converges uniformly to $H_g^0(x_1, \Gamma)$ when σ is small. To do so, I use the fact that the differential payoff from demanding conversion, Δ, is Lipschitz continuous to the left and right of $\widehat{A}(\theta)$.

Step 3: Next, I apply the Belief Constraint. Using the previous results, the signal thresholds x_g^* converge to the fundamental threshold θ^* solving:

$$\int_0^{\frac{(\theta^*-1)r}{\kappa(\theta^*-r)}} ((p_{B,g} - p_{S,g})\tau_2 - \tau_1)\, dA_g(A, \Gamma^*)$$
$$+ \int_{\frac{(\theta^*-1)r}{\kappa(\theta^*-r)}}^1 \left(1 + (p_{B,g} - p_{S,g})\tau_2 - \tau_1 - \frac{(r - \kappa A)\theta/r - \psi}{1 - \kappa A}\right) dA_g(A, \Gamma^*) = 0, \forall g \in \{s, ..., G\}. \quad (28)$$

Summing over the coin holder groups on both sides, I arrive at Equation (9) using the Belief Constraint, which crucially depends on the assumption that the $p_{B,g}$s and $p_{S,g}$s are not contingent on the aggregate action of coin holders, to obtain:

$$\int_{\frac{(\theta^*-1)r}{\kappa(\theta^*-r)}}^1 \left(1 - \frac{(r - \kappa A)\theta^*/r - \psi}{1 - \kappa A}\right) dA + \Delta\overline{p}\tau_2 - \tau_1 = 0,$$

where $\sum_{g=s+1}^G m_g A_g(A, \Gamma^*) + m_s\mu_s A_s(A, \Gamma^*) = A$.

It remains to establish the existence of a threshold equilibrium following iterated elimination of dominated strategies as in Sákovics and Steiner (2012), building on Appendix Section A.7. The existence of the upper and lower dominance regions assures that $\theta \in (x_G^* - \epsilon, x_{\hat{g}}^* + \epsilon)$ holds. This concludes the Proof of Proposition 1.

A.10.2 Proof of Proposition 2

I establish the comparative static results summarized in Proposition 2 for fixed seller acceptance by analyzing Equation (9): $\frac{dI}{d(\overline{p}_S - \overline{p}_B)} = -\tau_2 < 0$, $\frac{dI}{d\alpha} = \frac{\partial \Delta \overline{p}}{\partial \alpha}\tau_2 > 0$, $\frac{dI}{d\beta} = \frac{\partial \Delta \overline{p}}{\partial \beta}\tau_2 < 0$, $\frac{dI}{d\tau_1} = -1 < 0$, $\frac{dI}{d\tau_2} = \Delta \overline{p}$, $\frac{dI}{d\psi} = \int_{\frac{(\theta^*-1)r}{\kappa(\theta^*-r)}}^{1} \frac{1}{1-\kappa A} dA > 0$,

$$
\begin{aligned}
\frac{dI}{dr} &= -\int_{\frac{(\theta^*-1)r}{\kappa(\theta^*-r)}}^{1} \frac{\kappa A}{r^2(1-\kappa A)}\theta^* dA - \frac{\theta^*-1}{\kappa}\frac{\theta^*}{(\theta^*-r)^2}\left(1 - \frac{1-\frac{(\theta^*-1)}{\theta^*-r}\frac{\theta^*}{r}}{1-\frac{(\theta^*-1)}{\theta^*-r}r} + \frac{\psi}{1-\frac{(\theta^*-1)r}{\theta^*-r}}\right) < 0, \\
\frac{dI}{d\kappa} &= -\int_{\frac{(\theta^*-1)r}{\kappa(\theta^*-r)}}^{1} \left(\frac{A}{(1-\kappa A)^2}\left(1 - \frac{\theta^*}{r} - \psi\right)\right) dA + \frac{(\theta^*-1)r}{\kappa^2(\theta^*-r)}\left(1 - \frac{1-\frac{(\theta^*-1)}{\theta^*-r}\frac{\theta^*}{r}}{1-\frac{(\theta^*-1)}{\theta^*-r}r} + \frac{\psi}{1-\frac{(\theta^*-1)r}{\theta^*-r}}\right) > 0, \\
\frac{dI}{d\theta^*} &= -\int_{\frac{(\theta^*-1)r}{\kappa(\theta^*-r)}}^{1} \frac{\frac{r-\kappa A}{r}}{1-\kappa A} dA - \frac{r}{\kappa}\frac{1-r}{(\theta^*-r)^2}\left(1 - \frac{1-\frac{(\theta^*-1)}{\theta^*-r}\frac{\theta^*}{r}}{1-\frac{(\theta^*-1)}{\theta^*-r}r} + \frac{\psi}{1-\frac{(\theta^*-1)r}{\theta^*-r}}\right) < 0.
\end{aligned}
$$

By application of the IFT the results in Proposition 2 follow. This concludes the proof.

A.10.3 Corollary 4 and 5

Corollary 4 and 5 offer a formal analysis of the stabilizing and destabilizing effects.

Corollary 4. ***(Composition Effect)*** *Under the conditions of Proposition 2 and for a given $N > m_G$, consider am increase in seller acceptance of stablecoins, $S(N)$, or a shift in consumption preference weights towards stablecoin-native sellers, i.e. a decrease in ω_G or a relative increase in the mass of crypto-enthusiasts, e.g. $dm_G = -dm_{G-1} > 0$. This decreases the probability of stablecoin runs.*

Corollary 5. ***(Adoption & Fragility)*** *Under the conditions of Proposition 2 and for fixed seller acceptance profiles the probability of stablecoin runs increases with the adoption rate if broader adoption reduces the average relative payment preference for stablecoins, i.e., $d\theta^*/dN > 0$ if $d\Delta\overline{p}/dN > 0$, which holds for $N \geq m_G$.*

A.10.4 Proof of Proposition 3

Fix the seller acceptance profiles f^B, f^S. The game is solved by backward induction. At $t = 2$ consumers enter the consumption stage either as coin holders or as bank depositors and use the available funds to consume. At $t = 1$, consumers also enter the period either as coin holders or as depositors. Depositors do not find it optimal to convert their money at $t = 1$, because they found it optimal to hold deposits initially and would otherwise forgo the positive interest rate. Given that the issuer can always assure a value that is arbitrarily close to one dollar at $t=2$, it is the dominant strategy for active coin holders not to demand conversion, i.e. $a^*_{1,i}=0, \forall i$.

Let's consider the adoption game at $t=0$. Given $r, \underline{\theta} \nearrow 1$, consumer i's problem is:

$$\max_{a_{0,i}\in\{0,1\}} \left(a_{0,i}(1-(1-p_{S,g_i})\tau_2)+(1-a_{0,i})(1+r^D-(1-p_{B,g_i})\tau_2)\right),$$

where $p_{B,g}=\omega_g+(1-\omega_g)f^S$ and $p_{S,g}=\omega_g f^B+(1-\omega_g)$. The adoption results of Proposition 3 follow. This concludes the proof.

A.10.5 Proof of Propositions 6 and 7

Total welfare (W) comprises consumer welfare (W^C), seller welfare (W^S) and the issuer's monopoly rent (Π):

$$\begin{aligned} W^C(N,f) \quad &\equiv \quad \sum_{g=\widehat{g}(N,f)+1}^{G} m_g \left(\int_{\underline{\theta}}^{\theta^*(N,f)} u^{\text{run}} \frac{d\theta}{\overline{\theta}-\underline{\theta}} + \int_{\theta^*(N,f)}^{\overline{\theta}} u^{\text{no run}} \frac{d\theta}{\overline{\theta}-\underline{\theta}}\right) \\ &\quad + \sum_{g=1}^{\widehat{g}(N)} m_g(1+r^D-(1-p_{B,g}(N,f))\tau_2) \end{aligned} \tag{29}$$

$$u_g^{\text{run}}(N) \quad \equiv \quad \begin{pmatrix} \kappa(1-\tau_1-(1-p_{B,g}(N,f))\tau_2) \\ +(1-\kappa)\left(\frac{(r-\kappa)\theta/r-\psi}{1-\kappa}-(1-p_{S,g}(N,f))\tau_2\right) \end{pmatrix} \tag{30}$$

$$u_g^{\text{no run}}(N) \quad \equiv \quad 1-(1-p_{S,g}(N,f))\tau_2 \tag{31}$$

$$W^S(N,f) \quad \equiv \quad \lambda\frac{\max\{0,(uN-\underline{\delta}^B\})^2}{2(\overline{\delta}^B-\underline{\delta}^B)}+(1-\lambda)\frac{\max\{0,(u(1-N)-\underline{\delta}^S\})^2}{2(\overline{\delta}^S-\underline{\delta}^S)} \tag{32}$$

$$\Pi(N,f) \quad \equiv \quad \int_{\theta^*(N,f)}^{\overline{\theta}} \frac{N(\theta-1)}{\overline{\theta}-\underline{\theta}} d\theta, \tag{33}$$

where we used in (29) the fact that the marginal group $\widehat{g}(N)$ is exactly indifferent. Note that under our focus on an environment with a low per sales margin and a small acceptance costs, i.e. when scaling down u and cost distributions with some parameter $\varphi \to 0$, the seller welfare becomes arbitrarily small. Further, abstracting from the issuer profits the constrained planner maximizes W^C.

Take the equilibrium N^* attaining the highest level of welfare (if multiple fixed-points exist) and suppose the adoption rate is interior, i.e. $N^* \in (\sum_{g=j}^{G} m_g, \sum_{g=j-1}^{G} m_g)$. Using an envelope-type argument at the interior adoption margin, I evaluate the first derivative at

N^* by plugging in from the adoption indifference condition (Equation (11)):

$$\frac{dW^C(\theta^*;N)}{dN}|_{N=N^*} = \sum_{g=\hat{g}+1}^{G} m_g \frac{d\theta^*}{dN} \frac{u_g^{\text{run}}(N) - u_g^{\text{no run}}(N)}{\overline{\theta} - \underline{\theta}}|_{N=N^*} + \mu_{\hat{g}} m_{\hat{g}} \frac{d\theta^*}{dN} \frac{u_{\hat{g}}^{\text{run}}(N) - u_{\hat{g}}^{\text{no run}}(N)}{\overline{\theta} - \underline{\theta}}|_{N=N^*} + \sum_{g=\hat{g}+1}^{G} m_g \left(\int_{\underline{\theta}}^{\theta^*(N)} \frac{du_g^{\text{run}}(N)}{dN} \frac{d\theta}{\overline{\theta} - \underline{\theta}} + \int_{\theta^*(N)}^{\overline{\theta}} \frac{du_g^{\text{no run}}(N)}{dN} \frac{d\theta}{\overline{\theta} - \underline{\theta}} \right) |_{N=N^*} + \sum_{0}^{g=\hat{g}} m_g p'_{B,g}(N) \tau_2 |_{N=N^*}. \tag{34}$$

Note that the first and second summands are negative if $d\theta^*/dN > 0$, which holds whenever the adoption rate is interior (Corollary 5). Moreover, summands three and four are zero for fixed seller acceptance and negative for endogenous seller acceptance with an elastic acceptance margin of type-S sellers, $p'_{B,g}(N) < 0$, and an inelastic acceptance margin of type-B sellers, e.g. if $\overline{\delta}^B \to \infty$, which implies that $p'_{S,g}(N) \to 0$.

As a result, $N^* > N^{SP}$ whenever the adoption rate is interior (this requires that consumers from more than one group adopt stablecoins and $N^* \notin \{\sum_{g=2}^{G} m_g, ..., \sum_{g=G-1}^{G} m_g\}$) and seller acceptance is fixed (Proposition 6), or $\widetilde{N}^* > N^{SP}$ when the acceptance margin of type-S sellers is elastic and the acceptance margin of type-B sellers is inelastic (Proposition 7). Note that for fixed seller acceptance W^C does not have a global maximum to the right of N^*. For endogenous type-S seller acceptance a sufficient condition that allows exclusion of a global maximum to the right of $\widetilde{N}^*$ is given by $d\Delta\overline{p}/dN > 0$, meaning that the composition term dominates the acceptance term (Lemma 1).

A.10.6 Proof of Corollary 1

Let the planner impose a small levy ι on the marginal adopter. In the interior region (a positive mass of the marginal group exists), consumers' private differential benefit from adopting stablecoins in the $t = 0$ adoption game becomes $\Delta_{0,\hat{g}}(N, \theta^*(N)) - \iota(N) = 0$. We continue to focus on a consumer welfare criterion. So the planner's first-order condition at the constrained optimum N^{SP} is $dW^C/dN|_{N^{SP}} = 0$. To decentralize the planner's choice, there must be the same incentive at the private margin so that the externality is fully internalized, which implies a levy $\iota^*(N) = -dW^C/dN$ evaluated at N^{SP} for implementation. Thus, the decentralized cutoff $\Delta_{0,\hat{g}}(N, \theta^*(N)) - \iota^*(N) = 0$ holds precisely when the planner's first-order condition holds.

From Equation (34) in the Proof of Propositions 6 and 7 we can obtain:

$$\frac{dW^C}{dN} = \frac{\partial W^C}{\partial \theta^*} \frac{d\theta^*}{dN} + \Sigma_{g=\hat{g}}^{G} \left(\frac{\partial W^C}{\partial p_{B,g}} \frac{dp_{B,g}}{dN} + \overbrace{\frac{\partial W^C}{\partial p_{S,g}} \frac{dp_{S,g}}{dN}}^{\approx 0} \right). \tag{35}$$

If seller acceptance is fixed, $dp_{B,g}/dN = dp_{S,g}/dN = 0$, then Equation (15) follows. On interior regions with at least two groups of adopters, $d\theta^*/dN > 0$ under fixed acceptance, while $\partial W^C/\partial\theta^* < 0$, so $\iota^*(N^*) > 0$.

Instead, with endogenous type-S seller acceptance and $\overline{\delta}^B \to \infty$ we obtain Equation (16), where $dp_{B,g}/dN < 0$ and $\partial W^C/\partial p_{B,g} > 0$. The results in Corollary 1 follow.

A.10.7 Proof of Proposition 8

Using Equation (17), the differential expected payoff from selecting $x = x_L$ is:

$$\Delta\pi = \pi(x_H) - \pi(x_L) = -\int_{\theta^*(x_L)}^{\overline{\theta}(x_L)} (\theta - 1)\check{N}^* \frac{d\theta}{\overline{\theta}(x_L) - \underline{\theta}(x_L)} + \int_{\theta^*(0)}^{\overline{\theta}} (\theta - 1)N^* \frac{d\theta}{\overline{\theta} - \underline{\theta}} \tag{36}$$

$$= \underbrace{-\int_{\theta^*(x_L)}^{\theta^*(0)} (\theta - 1)\frac{\check{N}^*}{\overline{\theta}(x_L) - \underline{\theta}(x_L)}\, d\theta}_{\substack{<0, \text{ cost of weakly} \\ \text{more runs if } x = x_H}} - \underbrace{\int_{\theta^*(0)}^{\overline{\theta}(x_L)} (\theta - 1)\left(\frac{\check{N}^*}{\overline{\theta}(x_L) - \underline{\theta}(x_L)} - \frac{N^*}{\overline{\theta} - \underline{\theta}}\right) d\theta}_{\substack{\text{dispersion/adoption effect} \\ \text{(sign depends on primitives)}}} + \underbrace{\int_{\overline{\theta}(x_L)}^{\overline{\theta}} (\theta - 1)\frac{N^*}{\overline{\theta} - \underline{\theta}}\, d\theta}_{\substack{>0, \text{ benefit of a higher} \\ \text{upside if } x = x_H}} .$$

where $\check{N}^* \equiv \check{N}^*(x_L, \theta^*(x_L))$ denotes the adoption rate given x_L and N^* is the adoption rate from the baseline. Note that $\pi > 0$, $\forall \check{N}(x, \theta^*(x)) > 0$ since $\theta^*(x) \leq \theta_h < \overline{\theta}$.

Whether or not it is optimal for the issuer to select x_L depends on the relative strength of the three effects in Equation (36). Intuitively, a lower sensitivity of the probability of runs and of adoption to a change in the riskiness of the investment portfolio are more likely to incentivize the issuer to select x_H. To make this point, I construct an existence result by showing that $\Delta\pi = \pi(x_H) - \pi(x_L) > 0$ for $x_L \searrow 0$ in case adoption is locally insensitive to change in the portfolio riskiness: $\frac{d}{dx_L}\check{N}^*(x_L, \theta^*(x_L))|_{x_L=0} = 0$.

Specifically, the proof establishes an example for $x^* = x_H < x^{SP}$ that arises for $x_L \searrow 0$ if the adoption rate is locally unaffected by changes in x, which is assured if $\Delta_{0,\widehat{g}}(N, \theta^*(N)) > 0$. To do so, I take the derivative of (36) with respect to x_L and then examine the limiting case $x_L \searrow 0$. First, note that for $x_L = 0$ $\pi(x_H) - \pi(0) = 0$. Moreover:

$$\begin{aligned}\lim_{x_L \to 0} \frac{d\pi}{dx_L} &= \lim_{x_L \to 0} \frac{\partial \theta^*(x_L)}{\partial \check{r}} \frac{d\check{r}}{dx_L} (\theta^*(x_L) - 1) \frac{\check{N}^*}{\overline{\theta}(x_L) - \underline{\theta}(x_L)} \\ &\quad - \lim_{x_L \to 0} \frac{d\overline{\theta}(x_L)}{dx_L} (\overline{\theta}(x_L) - 1) \frac{\check{N}^*}{\overline{\theta}(x_L) - \underline{\theta}(x_L)} + \lim_{x_L \to 0} \int_{\theta^*(x_L)}^{\overline{\theta}(x_L)} (\theta - 1) \frac{\check{N}^*\left(\frac{d\overline{\theta}}{dx_L} - \frac{d\underline{\theta}}{dx_L}\right)}{(\overline{\theta}(x_L) - \underline{\theta}(x_L))^2},\end{aligned} \tag{37}$$

because $\check{N}^*$ is locally unaffected by changes in x_L by assumption. Note that the first summand is negative and the third summand is also negative (because $\theta^*(x_L) > 1$, $\partial\theta^*/\partial\check{r} < 0$ and $d\check{r}/dx_L > 0$). Instead, the second summand is positive. Given that the derivatives of the run threshold are finite, we have that the overall expression is positive and, thus, $\lim_{x_L \to 0} \Delta\pi > 0$ if $\xi_2/\xi_1 \to 0$. To see this, observe that the negative second summand strictly dominates the positive third summand. By continuity, there exists a $\overline{\xi} > 0$ such that the result in Proposition 8 holds for all $\xi_2/\xi_1 < \overline{\xi}$. This concludes the proof.

A.10.8 Proof of Proposition 9

This proof comprises three parts and builds on results from the Proof of Proposition 2.

Part (a): So far, I assumed that the issuer does not face costs of operation. Now, consider a fixed operating cost $\xi > 0$ that accrues at $t = 0$ and is deducted from the funds collected:[29]

$$\pi(\theta^*, N^*; \xi) = \int_{\theta^*(N^*;\xi)}^{\overline{\theta}} \frac{(N^*(\xi) - \xi)\theta - N^*(\xi)}{\overline{\theta} - \underline{\theta}}\, d\theta. \tag{38}$$

Observe that ξ lowers the issuer's profits for a given θ^* and N^*. Furthermore, profits decrease in θ^* and increase in N^*. Proposition 9(a) establishes that $d\theta^*/d\xi > 0$, meaning that the reduction in profits gives rise to a destabilizing effect and to lower adoption. This is because of a lower resilience of the issuer who is insolvent already for a lower level of aggregate conversion demand. The fixed cost lowers the available resources, thereby making it harder to meet the payment obligations. Specifically, the issuer cannot meet her $t = 2$ payment obligations if $N(\kappa(1-A) + 1 - \kappa) > (N - \xi)\theta - N\kappa A\theta/r$. Rearranging gives:

$$\widehat{A}(N^*; \theta, \xi) \equiv \frac{\frac{N^*-\xi}{N^*}\theta - 1}{\kappa(\theta - r)} r < \widehat{A}(N^*, \theta, 0), \forall \xi > 0. \tag{39}$$

Notably, for a given level of $\Delta\overline{p}$, the described effect is weakened as adoption increases when the fixed cost is shared by a larger user base (formally, ξ is divided by N^*).

Using the modified critical threshold in Equation (39), I can, for a given N, derive the modified equilibrium condition as follows:

$$I(\theta^*; N, \xi) \equiv \Delta\overline{p}\tau_2 - \tau_1 + \int_{\frac{\frac{N-\xi}{N}\theta^* - 1}{\kappa(\theta^* - r)} r}^{1} \left(1 - \frac{\frac{\frac{N-\xi}{N} r - \kappa A}{r}\theta^* - \psi}{1 - \kappa A}\right) dA = 0. \tag{40}$$

As in the Proof of Proposition 2, I have that $dI(\theta^*; N, \xi)/d\theta^* < 0$. Moreover:

$$\frac{dI(\theta^*; N, \xi)}{d\xi} = \int_{\frac{\frac{N-\xi}{N}\theta^* - 1}{\kappa(\theta^* - r)} r}^{1} \frac{\theta^*/N}{1 - \kappa A} dA + \frac{\theta^* r}{N\kappa(\theta^* - r)} \left(\frac{\psi}{1 - \kappa\widehat{A}}\right) > 0.$$

By application of the IFT. This concludes the proof or *Part (a)*. Notably, $N^*/d\xi < 0$, meaning that the reduction in profits gives rise to a destabilizing effect and to lower adoption.

Part (b): Next, I consider the variant of the model with transaction fee income.[30] Let $f \in [0, 1]$ denote the fraction of transaction costs that are accounted for as fee income by the issuer. The modified issuer profits are:

$$\pi(\theta^*, N^*; f) = \int_{\theta^*(N^*;f)}^{\overline{\theta}} N^* \frac{\theta - 1 + (1 - \overline{p}_S) f \tau_2}{\overline{\theta} - \underline{\theta}}\, d\theta, \tag{41}$$

[29] A variable cost has effects that are identical to a reduction in transaction fee income.

[30] In practice, part or all of the transaction cost may stem from fees earned by other parties, such as by crypto miners for on-chain transactions or by cryptocurrency exchanges and other intermediaries for off-chain transactions. However, some stablecoins are affiliated with exchanges (e.g. USD Coin with Coinbase), meaning that issuers may accrue part of the fees. To account for this institutional feature, I consider a profit sharing arrangement between the issuer and other parties.

where $1-\overline{p}_S$ is the weighted average over the group-specific probabilities to meet a consumption good seller who only accepts bank deposit, meaning that coin holders need to convert to bank deposits at $t=2$ and incur the transaction cost τ_2. Now, the issuer is only insolvent for a higher aggregate conversion demand:

$$\widehat{A}(\theta,f)\equiv\frac{\theta-1}{(1-f\tau_1)\theta-r}\frac{r}{\kappa}>\widehat{A}(\theta),\forall f>0. \tag{42}$$

The additional resources available translate into a higher critical threshold for the population fraction of coin holders demanding conversion, i.e. $d\widehat{A}(\theta,f)/df>0$ provided $f\tau_1$ is not too large. The extra revenue promotes the issuer's ability to meet its payment obligations. The issuer cannot meet its $t=2$ payment obligations if $N(\kappa(1-A)+1-\kappa)>N\theta-N\kappa A(1-f\tau_1)\theta/r$.[31] Rearranging gives $\widehat{A}(\theta;N,f)$ in Equation (42), which is unique as long as $f\tau_1$ is not too large.

The equilibrium fundamental threshold $\theta^*(N^*;f)$ is governed by a modified equilibrium condition. By application of the IFT it can be shown that $d\theta^*/df<0$ provided $f\tau_1$ is not too large. This concludes the proof of *Part (b)*.

Part (c): Lastly, I consider a change in seigniorage income, which I capture as a shift in the fundamental support in an additive fashion: $\underline{\theta}(\psi)=\underline{\theta}+\psi$ and $\overline{\theta}(\psi)=\overline{\theta}+\psi$, where $0\leq\psi<\theta_\ell-\underline{\theta}$. Given that θ^* is not affected by changes in ψ, the result in *Part (c)* follows.

[31]Observe that I assume that the revenue from the $t=2$ transaction fees does not count against the payment obligation, e.g because it does not accrue in time. This assumption simplifies the analysis.

A Generalization of Proposition 5

I start with a partial equilibrium analysis, taking sellers' acceptance decisions as given. The objective is to describe the interplay between beliefs about fragility and adoption. Then I discuss the joint equilibrium of seller acceptance, consumer adoption and run.

Adoption with Runs Under Fixed Acceptance. Recall that for any given $N \in [0,1]$, Proposition 1 delivers a unique monotone equilibrium of the $t = 1$ conversion game, characterized by the threshold $\theta^*(N)$. Holding seller acceptance fixed, broadening adoption brings in less crypto-oriented users (a composition effect) and raises fragility (i.e., θ^* increases).

Define the block mass $M(k) \equiv \sum_{h=k}^{G} m_h$ for $k \in \{1, \ldots, G\}$, with $M(1) = \sum_{h=1}^{G} m_h = 1$, and:

$$\underline{g}(N) \equiv \max\{g : \Delta_{0,g}(N, \theta^*(N)) < 0\}, \qquad \overline{g}(N) \equiv \min\{g : \Delta_{0,g}(N, \theta^*(N)) > 0\}$$

with the conventions $\underline{g}(N) = 0$ ($\overline{g}(N) = G+1$) if no group has $\Delta_{0,g} < 0$ ($\Delta_{0,g} > 0$).

Definition 2. ***(Aggregate Best-Response Correspondence)*** *The aggregate adoption best-response at belief N is the correspondence:* $\mathscr{B}(N) \equiv \left[M(\overline{g}(N)), M(\underline{g}(N)+1)\right] \subseteq [0,1]$.

The lower endpoint $M(\overline{g}(N))$ sums the masses of all strictly adopting groups ($g \geq \overline{g}(N)$), while the upper endpoint $M(\underline{g}(N)+1)$ adds, when present, the indifferent group $\widehat{g}(N) = \underline{g}(N)+1$ at full adoption. If there is no indifferent group, then $\overline{g}(N) = \underline{g}(N)+1$ and $\mathscr{B}(N)$ collapses to the singleton $\{M(\overline{g}(N))\}$. Note that on any interval of N where the pair $(\underline{g}(N), \overline{g}(N))$ is constant, both endpoints $M(\overline{g}(N))$ and $M(\underline{g}(N)+1)$ are constant; the correspondence changes only at finitely many N where either cutoff switches.

For $g > \widehat{g}(N)$ adoption is strictly optimal and for $g < \widehat{g}(N)$ non-adoption. If the marginal group exists, i.e. if $\widehat{g}(N) = s$ where s solves $\Delta_{0,s} = 0$, its members are indifferent. Let's fix the following ex-ante tie-break (all adopt) using the right-continuous selection: $\mu_{\widehat{g}}(N) \equiv 1$ and $\Gamma_c(N) = M(\widehat{g}(N)) \in \mathscr{B}(N)$. Then Γ_c is a piecewise constant function with finitely many kinks (when $\widehat{g}(N)$ changes). The best-response itself remains the set-valued $\mathscr{B}(N)$.

Next, I evaluate incentives at the two extremes. At $N = 0$, compute $\theta^*(0)$ from the $t = 1$ game; if $\Delta_{0,G}(0, \theta^*(0)) \leq 0$, then even the most crypto-oriented group G does not adopt, so $N^* = 0$. At $N = 1$, compute $\theta^*(1)$; if $\Delta_{0,1}(1, \theta^*(1)) \geq 0$, then even the least crypto-oriented group 1 adopts, so $N^* = 1$. Recall that $m_g > 0, \forall g \in \{1, ..., G\}$. Moreover, from Equation (11) $\Delta_{0,g}(N, \theta)$ is strictly increasing in g and strictly decreasing in θ. Based on these properties, Proposition 11 describes the partial equilibrium for fixed sellers' acceptance decisions.

Proposition 11. ***(Equilibrium of the Adoption Game under Fixed Acceptance)*** *Suppose Proposition 1 holds so that $\theta^*(N)$ is uniquely defined for each N. Then, under fixed acceptance:*

1. ***Corner cases.*** *If $\Delta_{0,G}(0, \theta^*(0)) < 0$, then $N^* = 0$. If $\Delta_{0,1}(1, \theta^*(1)) \geq 0$, then $N^* = 1$.*
2. ***Lower bound.*** *If $\Delta_{0,G}(0, \theta^*(0)) = 0$ and $\Delta_{0,G-1}\big(0, \theta^*(M(G))\big) < 0$, then $N^* \in [0, m_G]$. Moreover, if $\Delta_{0,G}(0, \theta^*(0)) > 0$ and $\Delta_{0,G-1}\big(0, \theta^*(M(G))\big) < 0$, then $N^* = m_G$.*

3. ***Uniqueness.*** *Away from the cases in (1.) and (2.), $\Gamma_c(N)$ is piecewise constant, right-continuous and weakly decreasing on $[0,1]$. Therefore, $\Gamma_c - N$ is strictly decreasing and the fixed point N^* solving $N^* = \Gamma_c(N^*)$ is unique.*

Away from the boundary cases, $\Gamma_c(0) > 0$ and $\Gamma_c(1) < 1$, so an interior sign change for $\Gamma_c(N) - N$ is guaranteed and the unique fixed point is interior.

The key insight formalized by Proposition 11 is that with fixed seller acceptance decisions, only the composition channel links N to $\theta^*(N)$, yielding a (generically) strictly decreasing $\Gamma_c(N)$ and a unique adoption equilibrium N^*. I next endogenize seller acceptance and show how the additional feedback reshapes these relationships.

Joint Equilibrium: Endogenous Acceptance, Adoption, and Runs. In this subsection I solve for a Perfect Bayesian Equilibrium (PBE) with endogenous seller acceptance. Seller acceptance at $t = 0$ depends only on their beliefs about the aggregate adoption rate N (formed at the beginning of $t = 0$), whereas consumer adoption determines the realized N and depends on *(i)* matching probabilities $p_{B,g}(N), p_{S,g}(N)$ implied by the acceptance profile $f^B(N), f^S(N)$ (see Equations (1), (2) and (3)) and *(ii)* the run threshold $\theta^*(N)$ from the $t = 1$ conversion game (see Proposition 1). Proposition 12 establishes existence.

Proposition 12. ***(Existence of a PBE)*** *Under the conditions of Proposition 1, $\mathscr{B}$ has nonempty, compact, convex values and a closed graph, with only finitely many N at which the endpoints change (when $\widehat{g}$ switches). Hence, by Kakutani's fixed-point theorem, there exists at least one $N^* \in [0,1]$ such that $N^* \in \mathscr{B}(N^*)$. Sellers' acceptance profile at belief N^*, consumers' adoption that implements N^*, and $\theta^*(N^*)$ constitute a Perfect Bayesian Equilibrium.*

Proof. I proceed in four steps: *(Step 1)* sellers' best responses, *(Step 2)* induced matching probabilities and payment-preference statistic $\Delta\overline{p}(N)$, *(Step 3)* continuation equilibrium run threshold $\theta^*(N)$, and *(Step 4)* adoption fixed point $N = \Gamma(N)$.

Step 1: The seller acceptance shares $f^B(N)$ and $f^S(N)$ in Equations (1) and (2) are continuous and piecewise linear in N. The former is strictly *increasing* in N for all $\underline{\delta}^B < uN < \overline{\delta}^B$ and constant, otherwise. Conversely, the latter is strictly *decreasing* in N for all $\underline{\delta}^S < u(1-N) < \overline{\delta}^S$ and constant, otherwise. Importantly, seller acceptance decisions only depend on beliefs about the adoption rate N and not on beliefs about θ^*.

Step 2: Given a belief N' about the adoption rate the matching probabilities, $f^B(N')$ and $f^S(N')$, for each group of consumers are given by Equation (3), which allows us to compute the weighted average of group-specific matching probabilities $\Delta\overline{p}(N') \equiv \mathbb{E}[\Delta p_g(N') \mid \text{adopters at } N']$ as in Proposition 1. On interior regions:

$$\frac{d\Delta p_g(N')}{dN'} = (1-\omega_g)\frac{df^S}{dN'} - \omega_g \frac{df^B}{dN'} < 0.$$

Hence, for a *fixed composition of stablecoin adopters*, the belief about a higher N' gives rise to a *network effect* in that it reduces $\Delta\overline{p}(N')$, meaning that it *increases* the average relative payment preference for stablecoins via sellers' acceptance decisions. At the same time, the aggregate $\Delta\overline{p}(N)$ also moves with the composition of adopters. This generates an opposing effect. Specifically, from Corollary 5, for a *fixed seller acceptance*, I have that

$d\Delta\overline{p}/dN > 0$ when adoption expands to more marginal, less crypto-oriented groups. In other words, I have a *decrease* in the average relative payment preference for stablecoins via consumer adoption decisions due to a *composition effect* and an increase due to a *network effect*. The overall $d\Delta\overline{p}/dN$ is the sum of these forces and can have either sign.

Step 3: Observe that θ^* is continuous in N. Using the results from Propositions 1-2:

$$\frac{d\theta^*}{dN} = \frac{\partial \theta^*}{\partial \Delta\overline{p}}\frac{d\Delta\overline{p}}{dN} = \underbrace{\frac{-\tau_2}{\mid \partial I/\partial \theta \mid}}_{>0} \underbrace{\frac{d\Delta\overline{p}}{dN}}_{\begin{cases} \geq 0 & \text{if composition effect dominates} \\ < 0 & \text{if network effect dominates} \end{cases}} \gtrless 0.$$

Continuity of f^B, f^S and the IFT ensure that $\theta^*(N)$ is continuous (piecewise C^1) in N.

Step 4: By construction, $\mathscr{B}(N)$ is either a singleton $\{M(\overline{g}(N))\}$ (if there is no indifferent group) or a closed interval $\left[M(\overline{g}(N)), M(\underline{g}(N)+1)\right]$ (the marginal group mixes). Because $\Delta_{0,g}(N, \theta^*(N))$ is continuous in N and strictly increasing in g, the cutoff $\widehat{g}(N)$ changes only at finitely many points of N, and between such points the endpoints of $\mathscr{B}(N)$ are constant. In either case the set is a nonempty, compact, convex subset of $S = [0,1]$.

Because $\Delta_{0,g}(N, \theta^*(N))$ is strictly increasing in g, the pair $(\underline{g}(N), \overline{g}(N))$ is well-defined. As N varies, these indices can only change when some $\Delta_{0,g}(N, \theta^*(N))$ crosses 0. Between such "changes points", the pair $(\underline{g}, \overline{g})$ is constant, so $\mathscr{B}(N)$ is a fixed singleton/interval. At a "change" where, say, $\underline{g}$ increases from $k-1$ to k (equivalently, $\overline{g}$ increases from k to $k+1$), the adjacent values of $\mathscr{B}$ share the common endpoint $M(k)$:

$$\mathscr{B}(\text{left}) = \left[M(k), M(k)\right] \quad \text{and} \quad \mathscr{B}(\text{right}) = \left[M(k+1), M(k)\right],$$

or vice versa. Thus the correspondence “moves” by sliding intervals that overlap at their boundary points. Now fix any sequence $N_n \to N$ and $x_n \in \mathscr{B}(N_n)$ with $x_n \to x$. If N is not a point where a "change" happens, then for all large n, $(\underline{g}(N_n), \overline{g}(N_n))$ is constant and equals $(\underline{g}(N), \overline{g}(N))$; hence $x_n \in \mathscr{B}(N)$ eventually and the limit x also lies in $\mathscr{B}(N)$. If N is a "change point", then along any subsequence the pair $(\underline{g}(N_n), \overline{g}(N_n))$ is eventually constant on either side and the corresponding sets $\mathscr{B}(N_n)$ share a common endpoint with $\mathscr{B}(N)$. Therefore any limit x of $x_n \in \mathscr{B}(N_n)$ must lie in $\mathscr{B}(N)$. Hence the graph of $\mathscr{B}$ is closed.

Taken together, $\mathscr{B}$ is upper hemicontinuous and I invoke Kakutani’s fixed-point theorem: there exists $N^* \in [0,1]$ with $N^* \in \mathscr{B}(N^*)$. The acceptance profile at belief N^*, consumers’ adoption that implements N^* (with marginal mixing if needed), and $\theta^*(N^*)$ satisfy the PBE requirements on and off the equilibrium path. This concludes the proof. □

Whether the joint equilibrium is unique or not depends on two effects. First, a *composition effect* (broader adoption brings in more deposit-oriented consumers, raising fragility) and, second, an *acceptance externality* (higher expected stablecoin adoption induces more sellers to also accept stablecoins, lowering fragility). Intuitively, the adoption best-response is monotone in a way that yields a unique fixed point if the composition effect dominates (formally, $d\Delta\overline{p}(N; f)/dN \geq 0$ for all selections). When the acceptance externality dominates locally (formally, $d\Delta\overline{p}(N; f)/dN < 0$ along some selection on an interval), the best-response can become S-shaped, generating multiple fixed points.