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Preventing (Panic) Bank Runs

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ABSTRACT
Andolfatto et al. (2017) proposes a mechanism to eliminate bank runs that occur as a coordination problem among depositors (Diamond and Dybvig, 1983). Building on their work, we conduct a laboratory experiment where we offer depositors the possibility to relocate their funds to a priority account. We find evidence that the mechanism reduces not only bank runs that occur because of a coordination problem among depositors but also panic bank runs (Kiss et al., 2018) that occur when depositors can observe the action of others.

JEL codes: C91, D90, G21, G40
Keywords: bank run, coordination problem, panic behavior, experimental economics, policy tools, financial stability

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(Pánik) bankrohamok megelőzése

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ÖSSZEFOGLALÓ

Andolfatto és szerzőtársai (2017) egy olyan mechanizmust javasolnak, amely elméletileg képes megszüntetni a betétesek között fellépő koordinációs problémákból adódó bankrohamokat (Diamond and Dybvig, 1983). Munkájuk alapján laboratóriumi kísérletet végzünk, melyben a betéteseknek felajánljuk, hogy a pénzüket egy elsőbbségi számlára helyezhessék. Azt találjuk, hogy a mechanizmus nem csak a koordinációs problémákból adódó bankrohamok előfordulását csökkenti, hanem a pánik bankrohamokét (Kiss et al., 2018) is, melyek akkor történnek, ha a betétesek megfigyelhetik egymás döntését.

JEL: C91, D90, G21, G40

Kulcsszavak: bankroham, koordinációs probléma, pánik viselkedés, kísérleti közgazdaságtan, pénzügyi stabilitás

Preventing (Panic) Bank Runs[⋆]

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Abstract

Andolfatto et al. (2017) proposes a mechanism to eliminate bank runs that occur as a coordination problem among depositors (Diamond and Dybvig, 1983). Building on their work, we conduct a laboratory experiment where we offer depositors the possibility to relocate their funds to a priority account. We find evidence that the mechanism reduces not only bank runs that occur because of a coordination problem among depositors but also panic bank runs (Kiss et al., 2018) that occur when depositors can observe the action of others.

Keywords: bank run, coordination problem, panic behavior, experimental economics, policy tools, financial stability

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1. Introduction

Banking crises cause considerable harm to the economy and require costly policy interventions (Caprio and Klingebiel, 1999; Claessens et al., 2014). Laeven and Valencia (2013) estimate that, on average, banking crises lead to an output loss of 23.2% of the GDP. Laeven and Valencia (2013) further argue that a defining feature of the crises is that the banking system experiences significant financial distress, which is often manifested in the form of bank runs. Run-like phenomena also occur in other segments of the financial system, including the repo market (Gorton and Metrick, 2012) or bank lending (Ivashina and Scharfstein, 2010). While there is evidence that banks with bad fundamentals are more likely to suffer a bank run (Gorton, 1988; Calomiris and Mason, 2003; Calomiris and Wilson, 2004), there is also convincing evidence that even fundamentally healthy banks may experience mass withdrawals (Davison and Ramirez, 2014; De Graeve and Karas, 2014). Two alternative explanations for the occurrence of bank runs that affect fundamentally healthy banks suggest that bank runs may emerge as a bad equilibrium outcome in a coordination game (Diamond and Dybvig, 1983) or may be the result of panicking behavior of depositors who withdraw their deposits if they observe that others have done so, even if this behavior is irrational (Kiss et al., 2018). To deal better with such episodes in the future, it is important to understand how to prevent both sources of bank runs (coordination and panic) to mitigate the costs that they may entail.

This paper aims to examine whether a mechanism inspired in Andolfatto et al. (2017) helps prevent bank runs. Andolfatto et al. (2017) follow the workhorse model by Diamond and Dybvig (1983) and consider two types of depositors: impatient depositors (with urgent liquidity needs) and patient depositors (who do not need their funds immediately). Depositors decide simultaneously what to do with their funds. In Diamond and Dybvig (1983), depositors are restricted to either withdraw or keep their funds deposited, and the game has two equilibria: one in which all patient depositors keep their funds deposited (no bank run), and one in which all of them withdraw their funds from the bank (bank run) because they expect other depositors to do so (self-fulfilling prophecy). In Andolfatto et al. (2017), depositors are allowed to communicate sequentially and privately their intentions to the bank, which allocates consumption based on these announcements. In their direct mechanism, depositors who announce to be impatient (and hence withdraw) receive their payoff immediately (this payoff depends on the vector of previous announcements). In contrast, depositors who keep their funds deposited (and hence announce to be patient) receive a pro-rata share of the matured assets that earn some positive net interest in the late period. Andolfatto et al. (2017) show that it is always possible to implement the equilibrium with no bank runs in the direct mechanism, albeit this equilibrium is not unique. Their contribution is to show that the no bank run equilibrium is uniquely implemented in an indirect mechanism, in which depositors also have the possibility to send an alternative message to communicate their belief that a run is underway. The authors propose an implementation of the mechanism in which depositors can communicate an impending run by relocating their funds to a priority account that will yield depositors a (future) payment that is slightly larger than the (immediate) payment that they would receive upon withdrawing. This is made possible because payments are suspended immediately when such an announcement is made. Clearly, impatient depositors do not have incentives to make such an announcement because they only value immediate consumption. While patient depositors strictly prefer making such an announcement to withdrawing, if all patient depositors restrict their choices by eliminating the possibility of withdrawing, keeping their funds deposited yields a higher payment than making the announcement. Since all patient depositors are in the same situation, none of them announces an impending bank run. Thus, the indirect mechanism in Andolfatto et al. (2017) implements the no-bank-run equilibrium uniquely.[1]

We propose an experimental approach to examine whether a mechanism inspired by Andolfatto et al. (2017) prevents bank runs. In our setting, three depositors are located in a social network. The social network embodies the potential information flow between depositors. For instance, if depositor A and B are connected by the network and depositor A decides before depositor B, then depositor B observes the decision of depositor A who is aware that her choice will be observed. In our model, one of the depositors (simulated by the computer) plays the role of the impatient depositor and is forced to withdraw, while the other two participants play the role of patient depositors and are expected to maximize payoffs. Our experiment consists of two treat-

[1]Note that the proposed mechanism combines elements of existing policy tools. The mechanism guarantees a sure payment, as deposit insurance, but only to those depositors who relocate to the priority account. Moreover, it also uses the suspension of payments that is triggered by the action of depositors (the relocation) and not by the decision of the bank.

ments executed in a between-subject design: one in which participants choose between withdrawing or keeping their funds deposited and one in which they are also offered the possibility to relocate their funds to a priority account. The decision to relocate the funds dominates withdrawal for patient depositors; thus participants in this treatment should not withdraw in equilibrium. In addition, no patient depositor should want to use the priority account because keeping the funds deposited entails higher payoffs for them if the other patient depositor keeps her funds deposited or relocates her funds to a priority account.[2] Importantly, the information that participants receive in the experiment varies across rounds, depending on the social network that is randomly selected in each round. As a result, depending on the social network, participants know the decision of other depositors in some rounds, while this information is absent in other rounds. This aspect of our design is borrowed from Kiss et al. (2014a), who show that the possibility to observe the action of others should solve the coordination problem and prevent bank runs. The rationale is that patient depositors can reveal their types by keeping their funds deposited so that other patient depositors who observe this choice decide to follow suit; in fact, there is a unique equilibrium where no patient depositor withdraws if decisions are sequential (see also Kinateder and Kiss (2014) for a more general model). However, the experimental evidence in Kiss et al. (2014a) suggests that observability does not always reduce the occurrence of bank runs because depositors who observe withdrawals tend to withdraw as well.[3] The reason behind is that depositors who observe withdrawals do not infer that impatient depositors caused them, or even worse, they attribute those withdrawals to patient depositors, and this results in panic bank runs (Kiss et al., 2018). By varying the information that depositors receive regarding the choice of others, our experimental data permit the examination of whether (and how) the priority account influences

[2]While our payments relate to the indirect mechanism in Andolfatto et al. (2017), we do not freeze payments when depositors use the priority account. In section 2.4 we explain in detail how our mechanism resembles the one in Andolfatto et al. (2007).

[3]There is empirical evidence that observing what other depositors do affect withdrawal decisions, and as a consequence the emergence of bank runs (Kelly and O Grada, 2000; Starr and Yilmaz, 2007; Iyer and Puri, 2012; Iyer et al., 2016; Atmaca et al., 2017). The experimental evidence highlights also that depositors react to the action of others (Kiss et al., 2014a; Garratt and Keister, 2009; Shakina and Angerer, 2018; Davis and Reilly, 2016).

the emergence of bank runs that occur both when actions cannot be observed (and it is possible to have bank runs as a coordination problem) and when actions can be observed (and bank runs result from panic).

We believe that the experimental approach is the ideal toolkit to examine whether or not the mechanism in Andolfatto et al. (2007) affects the emergence of bank runs, as it is not always feasible (or desirable) to test the efficacy of policy interventions in the field. One of the main advantages of laboratory experiments is the ability to control the environment in which decisions are made. The exogenous *ceteris paribus* variation allows us to make causal inferences on the impact of the priority account on the behavior of depositors, depending on whether or not actions can be observed. There are other advantages of laboratory experiments as well. For example, we know the information that depositors receive when making their choices, thus we can assess whether the mechanism inspired in Andolfatto et al. (2017) helps in preventing both sources of bank runs. In addition, we elicit a set of variables in our experiment (e.g., the expectations of depositors that a bank run is underway or the individual characteristics of participants) that cannot always be observed in the field. These variables can be used as additional controls in the analysis. Finally, choices in experiments have payoff consequences for participants, which makes them different from survey data in which participants are presented hypothetical scenarios and asked to make a choice (Graham and Harvey, 2001; Guiso et al. 2013, 2018).

Our experimental findings show that the mechanism inspired by Andolfatto et al. (2017) reduces the incidence of bank runs that result from a coordination problem as well as those that are due to panicking behavior. In both settings, the fact that it is possible to relocate the funds to a priority account lowers the likelihood that depositors withdraw their funds from the bank. Further, we observe that depositors who are not observed by subsequent depositors have a higher tendency to keep their funds deposited when they are offered the priority account, compared with the case in which the priority account is not available. When depositors observe the action of others, the existence of the priority account reduces the beliefs of depositors that a panic bank run is underway; i.e., depositors are more accurate in their predictions that an observed withdrawal was due to the impatient depositor instead of attributing this withdrawal to the patient depositor. This, in turn, implies that the occurrence of panic bank runs is also reduced because depositors who observe withdrawals are more likely to keep their funds deposited when the priority account is available. There is also evidence that some of the depositors (roughly 10 percent) use the priority account even when (theoretically) they should not. Notably, the use of the priority account is never associated with a decrease in the likelihood of keeping the funds deposited; thus having the priority account is never harmful to bank runs.

Two of the main policy tools to deal with bank runs are suspension of convertibility (or deposit freezes) (Diamond and Dybvig, 1983; Zhu, 2005; Ennis and Keister, 2009) and deposit insurance (Zhu, 2005; Diamond and Dybvig, 1983; Iyer et al., 2016). Diamond and Dybvig (1983) prove theoretically that the mere existence of suspension of convertibility eliminates bank runs due to coordination failure, without having to use it actually. The idea is that if the bank can credibly announce the suspension of convertibility, then patient depositors know that there will be enough funds in the bank to pay them later a higher payment than the payment related to immediate withdrawal. However, Ennis and Keister (2009) argue that suspension of convertibility may be susceptible to time-inconsistency problems and show that such a scheme may fail to work properly if the bank cannot commit to freezing deposits as promised.[4] Deposit insurance is the other main policy instrument to prevent bank runs (Diamond and Dybvig, 1983). It is based on the same basic idea as suspension of convertibility: the insurance guarantees that depositors who do not need liquidity immediately will receive a higher payment later than the payment they could secure by withdrawing early. Arguably, deposit insurance has an undesirable side-effect in the form of moral hazard (Grossman, 1992; Demirgüç-Kunt and Detragiache, 2002; Demirgüç-Kunt and Kane, 2002; Hooks and Robinson, 2002), increasing the willingness of banks to take on excessive risk and decreasing the market discipline exerted by depositors. In addition, Wallace (1988) criticizes that the theoretical solution in Diamond and Dybvig (1983) to solve bank runs using the deposit insurance, as it does not take the sequential service constraint seriously into account. This, in turn, implies that it is worth exploring other mechanisms to cope with bank runs.[5] The main contribution of this paper is to examine the effectiveness of the novel mechanism that has been proposed

[4]Ennis and Keister (2009) show that the same problem affects another policy tool, the rescheduling of payments to depositors. This mechanism has been experimentally tested in Davis and Reilly (2016).

[5]Theoretically, it is also possible to offer depositors complex contracts that prevent withdrawals from patient depositors (Green and Lin, 2003; Peck and Shell, 2003; Ennis et al., 2009).

by Andolfatto et al. (2017) to eliminate bank runs. To our knowledge, this mechanism has not yet been tested empirically. While lack of empirical evidence is always undesirable, it becomes an even more serious problem in the context of bank runs because policy interventions are costly. For this reason, theory alone gives us little guidance regarding the effects of policy tools to prevent bank runs.

This study belongs to the strand of the experimental literature on bank runs that examine the effect of policy tools (see Kiss et al. (2021) for a recent recent survey on experimental bank runs). The experimental studies by Madies (2006) or Davis and Reilly (2016) highlight the benefits of suspension of convertibility. Experimental evidence also shows that deposit insurance diminishes the incidence of bank runs, albeit it does not eliminate them completely (Schotter and Yorulmazer, 2009; Kiss et al., 2012; Peia and Vranceanu, 2019).[6] Our study is also related to Kinateder et al. (2020), who assume that only withdrawals are observed as a default, but depositors can make visible to subsequent depositors the decision to keep their funds deposited (at a modest cost). In this environment, the iterated elimination of dominated strategies implies that the mere possibility of the costly announcement should be enough to eliminate bank runs. However, depositors use extensively the announcements expressing a strong desire to coordinate on the no-bank-run outcome. In fact, the frequency of withdrawals is greatly diminished when these announcements are observed.[7]

The rest of the paper is structured as follows. Section 2 presents the model. We detail the testable hypotheses in Section 3. Section 4 contains the experimental design and the procedures. In section 5 we present the results. In section 6 we discuss the main findings of our paper. Section 7 concludes.

[6]Davis et al. (2019a) test experimentally the consequences of liquidity requirement regulations, and show that the benefits of preventing bank runs compensate the lower profitability associated to high liquidity levels. In an experiment, Duffy et al. (2019) examine which interbank networks are more robust to bank runs, and find that bank runs occur even under complete networks, which are theorized to prevent them.

[7]The possibility to relocate the funds to a priority account relates our study to Shakina (2019), investigating how depositors relocate their funds among banks. She finds that this possibility makes banks whose depositors may abandon them more fragile, but makes the banking system as a whole less fragile.

2. Model and Hypotheses

2.1. Model

We model the possibility of bank runs as a coordination problem where depositors differ in their liquidity needs (Diamond and Dybvig, 1983). In our model, there are three depositors who deposit their initial endowment in a bank in period $t = 0$.[8] After depositing, depositors realize their liquidity needs. We assume that one of the depositors is impatient, while the other two depositors are patient. As in Diamond and Dybvig (1983), there is no aggregate uncertainty about the distribution of types, which is common knowledge.

In period $t = 1$, depositors contact their bank to decide (sequentially) what to do with their deposits. The order of decisions is randomly determined and independent of the types.[9] Following the idea in Andolfatto et al. (2017), the impatient depositor is forced to withdraw, while the patient depositors have the option to withdraw, keep their funds deposited, or relocate their funds to the priority account. Any depositor who withdraws receives her payment immediately in period $t = 1$. Any depositor who does not withdraw receives her payment in period $t = 2$, once the bank carries out a project that yields a certain positive net return on the remaining funds that the bank has after paying to all depositors who withdrew in period $t = 1$. Figure 1 presents the timeline of our model.

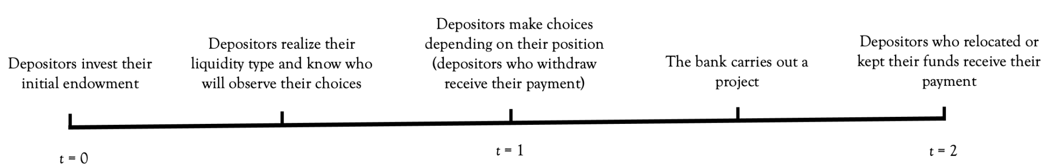

Figure 1: Timeline of the model

As in Kiss et al. (2014a), depositors are able to observe the action of others when they choose in $t = 1$, depending on an underlying social network

[8]The three-depositor setting is the simplest one to study the coordination problem embedded in Diamond and Dybvig (1983). Our theoretical results hold in some more general settings, see Kinateder and Kiss (2014) or Kiss et al. (2020). Other experimental models with small-scale banks include Garratt and Keister (2009); Schotter and Yorulmazer (2009); Arifovic et al. (2013); Davis and Reilly (2016); Shakina (2019).

[9]See Kiss et al. (2020) for an attempt to endogenize the order of decisions.

between depositors. We hereafter refer to depositor i as the one that decides in position i={1,2,3}. If depositor j observes the choice of depositor i, we say that the link ij exists, for $i, j \in \{1, 2, 3\}$, and $i < j$. Depositors only know their own links, thus depositor i does not know whether the other two depositors are linked; i.e., depositor i does not know whether the link jk exists. This, in turn, implies that the observability of actions can be modeled through a network in which depositors have local knowledge of the network structure.

There are 8 possible networks in our setting: (12, 13, 23), (12, 13), (12, 23), (13, 23), (12), (13), (23), (∅), where (∅) stands for the empty network that has no links at all. The network (12, 13, 23) contains all of the possible links and represents a fully sequential setup (as is assumed in Kinateder and Kiss (2014)). In this network structure, *i*) depositor 1 knows that depositors 2 and 3 will observe her choice, *ii*) depositor 2 chooses after learning what depositor 1 has done and is aware that depositor 3 will observe her choice, and *iii*) depositor 3 decides after learning what depositors 1 and 2 have done.[10] The empty network (∅) represents the opposite situation as depositors have no information regarding the choice of other depositors. This setting resembles the simultaneous-move game in Diamond and Dybvig (1983).

2.2. Parametrization

In our setting, each of the three depositors deposits 80 ECUs in the bank. The payment of each depositor is independent of the network structure, but it depends on her decision, her position in the line and the decision of other depositors (see Table 1).

Position	If you decide to withdraw and…		If you decide to keep the funds deposited and…		If you decide to relocate your funds to a priority account and…	
	The other depositor keeps the fund deposited in the bank (or relocates to a priority account)	The other depositor and the computer withdraw	The other depositor keeps the fund deposited in the bank (or relocates to a priority account)	The other depositor and the computer withdraw	The other depositor keeps the fund deposited in the bank (or relocates to a priority account)	The other depositor and the computer withdraw
1	100	100	140	60	101	101
2	100	100	140	60	101	101
3	100	40	140	60	101	60

Table 1: Payoffs of the game when depositors can relocate their funds.

If a depositor withdraws, she receives 100 ECUs in period $t = 1$ as long as there is enough money in the bank to pay this amount (out of this amount, 80 ECUs correspond to the initial endowment, and 20 ECUs are obtained in

[10] As there is local information, depositor 1 does not know if depositor 2 and 3 are linked.

the form of interest). In our experiment, if depositors 1 or 2 withdraw, they definitely receive 100 ECUs. However, if depositor 3 decides to withdraw after two withdrawals, she only receives 40 ECUs (because the first two depositors who withdrew received 100 ECUs each, and the bank has only 40 ECUs to pay depositor 3). Nonetheless, if depositor 3 withdraws after less than two withdrawals, the bank pays her 100 ECUs, and the depositor who did not withdraw receives her payment in period $t = 2$.

Depositors who keep their funds deposited or relocate their funds to a priority account are paid once the bank carries out a project in period $t = 2$. The amount that depositors receive depends on the total number of depositors who keep their money in the bank at $t = 1$. If only one depositor keeps her money deposited, she receives 60 ECUs. If two depositors do so, their payoff is 140 ECUs. Because our model incorporates an impatient depositor, who is forced to withdraw, it is not possible that the three depositors keep their funds deposited.

The decision to relocate the funds to the priority account yields 101 ECUs if there are less than two withdrawals in period $t = 1$. That is, relocating the funds to a priority account as depositor 1 or 2 yields a payment of 101 ECUs in period $t = 2$. Depositor 3 can also obtain a payment of 101 ECUs in period $t = 2$ if the project is carried out, because the other patient depositor decided to keep the funds deposited or relocated the funds to the priority account. If a depositor relocates to the priority account after two withdrawals, she earns only 60 ECUs in $t = 2$.

2.3. Treatments

We consider two treatments that differ in whether or not depositors are allowed to relocate their funds to the priority account in $t = 1$.

- In the first treatment (T_0), participants have to decide between withdrawing or keeping their money deposited in the bank, i.e., they are not given the possibility of relocating their funds to the priority account.

- In our second treatment (T_1), we allow participants to withdraw, keep their funds deposited in the bank, or relocate their funds to the priority account.

2.4. Priority account and suspension of convertibility

While our payments in T_1 relate to the indirect mechanism in Andolfatto et al. (2017), the underlying logic is somewhat different because we do not consider suspension of convertibility when a depositor uses the priority account. In this section, we briefly discuss how our payoffs resemble the mechanism in Andolfatto et al. (2017).

Andolfatto et al. (2017) argue that one way of implementing the mechanism would be to create a priority account such that, if sufficient depositors choose it, the bank activates the suspension of convertibility. In our setting, the suspension of convertibility would be activated when a patient depositor opts for the priority account. Importantly, for the depositor who chooses the priority account, our payoffs are equivalent to the ones she would obtain if we implemented suspension of convertibility. This is the case because a depositor who chooses the priority account after 0 or 1 withdrawals receives 101 ECUs in $t = 2$. If the depositor chooses the priority account after 2 withdrawals, then a depositor who relocates her funds receives the highest possible payment that she can obtain in $t = 2$ (40 ECUs) after two withdrawals; in fact, this payment is equivalent to the one obtained by a depositor who keeps her funds deposited after two withdrawals.

The difference between our payoffs and the ones that result from suspension of convertibility occurs when a depositor withdraws after another depositor has chosen the priority account. If suspension of convertibility is activated after 0 or 1 withdrawals, the bank has enough funds to carry out the long run project, and therefore, to pay the efficient payoffs. This implies that for any patient depositor choosing after the activation of suspension of convertibility, the payment should be 140 ECUs, because the bank should not accept any withdrawal demand and should pay the promised payoff in $t = 2$. We considered that this feature could be challenging to understand, since it implies a situation where the subject decides to withdraw but receives the efficient payoff. Thus, we decided to simplify the payoff structure by offering 100 ECUs to any depositor who withdraws after someone else decided to relocate her funds to the priority account. This is the same payoff that a patient depositor would receive if the other depositor would have kept the funds deposited. Thus, a withdrawal provides the same payoff to the patient depositor who withdraws regardless of whether the other patient depositor kept her funds deposited or relocated the funds to the priority account. Strategically, our payoff structure provides incentives that are similar to those created by the suspension of convertibility: if the depositor knows that the other patient depositor has already opted for the priority account, then the decision to withdraw is a dominated action (and will not affect the payoff of other depositors). If the depositor has to decide without knowing that the priority account has been chosen, her decision has no effect on the payoffs of the other depositors both in the mechanism by Andolfatto et al. (2017) as well as in our case.

Albeit we do not use the idea of suspension of convertibility the theoretical prediction is the same as in Andolfatto et al. (2017) (see Section 3) and it uses the idea of the iterated deletion of dominated strategies. We decided to carry out the experiment this way because we thought it was easier to explain these payoffs to participants.

2.5. Definition of bank run

Our main interest is to assess whether having the possibility to relocate the funds prevents bank runs. We define a bank run as a situation in which *any of the patient depositors* withdraws her funds from the bank in period $t = 1$. If both of the patient depositors do so, then we say that the bank run is severe.

Definition. *There is a bank run if (at least) one of the patient depositors withdraws her funds from the bank in period $t = 1$. The bank run is severe if both patient depositors withdraw their funds in $t = 1$.*

Our definition of a bank run takes into account that when a patient depositor withdraws in $t = 1$, the bank pays the other patient depositor an amount that is less than her initial deposit. This is due to the fact that the impatient depositor will also withdraw in $t = 1$, therefore the patient depositor only receives 60 ECUs if she keeps her funds deposited or if she relocates the funds to the priority account after two withdrawals. When both patient depositors withdraw their funds in period $t = 1$, then one of the depositors receives a payment of 40 ECUs. This is also a bank-run situation because the last depositor in the line does not recoup her initial endowment. Arguably, this is the worst possible outcome because the bank goes bankrupt and liquidates investments at $t = 1$; thus, it cannot carry out the (riskless) profitable project.[11]

3. Behavioral Predictions

Given our parametrization, depositor 3 should never withdraw her funds if patient, regardless of the treatment.[12] This assumption in our model follows from Ennis and Keister (2010): *"If [the last agent in the line] chooses to withdraw early, she will receive whatever resources are left in the bank. If she chooses to wait, however, she will receive the matured value of these assets in the later period, which is larger. Hence, if she is patient, she is strictly better off waiting to withdraw."* (see also Green and Lin (2003)).

Because any patient depositor in position 3 does not withdraw in equilibrium, it is crucial to know whether or not link 12 exists to determine if patient depositors face a coordination problem. Consider first the case of T_0 where depositors cannot relocate their funds. From a theoretical point of view, Kiss et al. (2014a) show that if depositors 1 and 2 are not connected (i.e., link 12 does not exist), then bank runs can occur as an equilibrium outcome as in Diamond and Dybvig (1983). However, if the first two depositors are connected (i.e., link 12 does exist), there is a unique (perfect Bayes-Nash) equilibrium without bank runs in which both patient depositors keep their funds deposited in the bank. The rationale for this result is that any patient depositor in position 1 should keep her funds deposited if the link 12 exists so as to induce the other patient depositor to follow suit. Note that the patient depositor can be in position 2 or 3. In the former case, if depositor 2 observes that depositor 1 kept her funds deposited, then she best-responds by doing the same to obtain 140 ECUs instead of 60 ECus. If the patient

[11] Our parametrization (implicitly) assumes that there is a liquidation cost for the bank in the case of a bank run. This assumption is in line with other bank-run studies (Cooper and Ross, 1998; Ennis and Keister, 2009), and it can be seen by looking at the return on investment (ROI). When only the impatient depositor withdraws, the bank can invest 140 ECUs in the project. The ROI equals $(280 - 140)/140 = 100\%$, since the bank pays 140 ECUs to each of the patient depositors who kept their funds deposited. If there is a bank run (i.e., if one of the patient depositors withdraws in $t = 1$), the bank can only invest 40 ECUs in the project and this results in 60 ECUs to the patient depositor who kept the funds deposited (or relocated). This corresponds to a ROI equal to $(60 - 40)/40 = 50\%$.

[12] It is easy to see that keeping the funds deposited yields a higher payoff than withdrawal if the other two depositors withdrew ($60 > 40$) or if only the impatient depositor withdrew ($140 > 60$); i.e., keeping the funds deposited dominates withdrawal for depositor 3.

depositor is in position 3, then she will never withdraw (as detailed above); thus any patient depositor 1 should keep her funds deposited in equilibrium to secure 140 ECUs. In equilibrium, any patient depositor 2 who observes the action of depositor 1 should keep her funds deposited, regardless of what she observes. The reason behind it is that only impatient depositors withdraw in position 1 in equilibrium, so any observed withdrawal from depositor 1 should be attributed to the impatient depositor.

Previous experimental evidence suggests that link 12 reduces the frequency of bank runs (Kiss et al., 2014a). As predicted by the theory, depositor 1 withdraws less frequently when linked to depositor 2, who best responds by keeping funds deposited when she observes that the first depositor decided to keep her funds deposited. However, depositor 2 tends to withdraw when she observes a withdrawal from depositor 1 (even if this was most likely due to the impatient depositor). This (irrational) behavior leads to panic bank runs because depositors withdraw in a setting where they should not (Kiss et al. 2014a, 2014b, 2016, 2018). In order to assess whether the priority account affects the emergence of bank runs, we first need to determine whether or not panic bank runs emerge in our data. As a first step, we would like to replicate the findings in Kiss et al. (2014a, 2018) and Kinateder et al. (2020) that the observability of actions influences withdrawal rates (see also Kiss et al. (2014b, 2016), Garratt and Keister (2009), Shakina and Angerer (2018), Davis and Reilly (2016) for similar experimental findings).

Prediction 1 (The effect of observability). *When depositors do not have the possibility to relocate their funds to a priority account, the existence of link 12 eliminates bank runs due to a coordination problem among depositors, but can lead to panic bank runs. In particular, when the action of depositor 1 is observed by depositor 2, a patient depositor 1 is less likely to withdraw and more likely to keep her funds deposited. Contrary to the theoretical prediction based on rational behavior, depositor 2 reacts to what she observes and keeps her funds deposited in the bank (withdraws) if she observes that depositor 1 keeps her funds deposited (withdraws), respectively.*

The main aim of this study is to test the effects of the priority account on the decision of depositors. In Andolfatto et al. (2017), the possibility to relocate the funds implies that patient depositors never withdraw their funds from the bank because this is a dominated action. In our game, depositors obtain a payoff of 101 or 60 ECUs if they relocate their funds to the priority account, while they are paid 100 or 40 ECUs if they withdraw. This, in turn, implies that the mechanism has a direct effect on the decision to withdraw as there is no equilibrium in which patient depositors withdraw. When the priority account is available, patient depositors should not relocate their funds to the priority account in equilibrium either. Note that any patient depositor who expects that the other patient depositor does not withdraw, best responds by keeping her fund deposited to receive 140 ECUs (the depositor obtains 101 or 60 ECUs if she relocates her funds in this case). Hence, the mechanism works through a two-step reasoning. On the one hand, there is a *direct effect* of the priority account because the decision to relocate dominates the decision to withdraw, so no patient depositor should withdraw her funds. On the other hand, there is an *equilibrium effect* because depositors should anticipate that other patient depositors will not withdraw, thus they best respond to this decision by keeping their funds deposited in the bank.

Since in our setup link 12 eliminates bank runs that occur because of a coordination problem, we expect that the direct and the equilibrium effect of the priority account play a role when there is no link 12. In this case, depositors will be less likely to withdraw and more likely to keep their funds deposited in the bank if they can relocate their funds to the priority account, compared with the case in which the priority account is not available. Furthermore, depositors should not relocate their funds to the priority account in equilibrium.

Prediction 2 (The effect of the priority account to prevent bank runs that occur because of a coordination problem). *If depositor 2 does not observe the choice of depositor 1 (i.e., link 12 does not exist), the possibility to relocate funds to a priority account decreases (increases) the likelihood of withdrawal (keeping the funds deposited), respectively.*

The mechanism in Andolfatto et al. (2017) is supposed to have an effect when depositors have no information about the choice of others. If choices can be observed (e.g., if link 12 exists), there should be no bank run in equilibrium because the observability of actions solves the coordination problem. Thus, allowing depositors to relocate their funds to the priority account should have no effect on the behavior of depositors. Arguably, there is evidence of panic bank runs when depositors are affected by what they observe Kiss et al. (2014a, 2014b, 2018). It is natural to ask whether the mechanism in Andolfatto et al. (2017) also prevents panic bank runs. Since the decision to withdraw is not rational in a panic bank run, we do not expect that the priority account increases the likelihood of keeping the funds deposited. However, we expect that having the priority account has a direct effect on the likelihood of withdrawal (because this action is dominated by relocating to the priority account). One important question to be addressed concerns how depositors react when they observe a withdrawal. We predict that depositors will be less likely to panic, because depositors will be more likely to attribute a withdrawal from depositor 1 to the impatient depositor if there is the possibility to relocate the funds to the priority account.

Prediction 3 (The effect of the priority account to prevent panic bank runs). *If depositor 2 observes the choice of depositor 1 (i.e., link 12 does exist), the possibility to relocate funds to a priority account decreases the likelihood of withdrawals but does not necessarily increase the likelihood of keeping the funds deposited. The priority account has an effect on the beliefs of depositor 2 when she observes a withdrawal. In particular, depositor 2 is more likely to attribute the withdrawal to the impatient depositor when the priority account is available, compared with the case in which there is no possibility to relocate the funds.*

To summarize, we expect that depositors will be more likely to coordinate successfully on the no-run equilibrium if link 12 exists, but depositor 2 will react to what she observes (Prediction 1). In the absence of link 12, the priority account is expected to reduce the likelihood of bank runs that occur because of a coordination problem by decreasing (increasing) withdrawals (the frequency of keeping funds deposited), respectively (Prediction 2). Finally, we expect that the priority account lowers the likelihood of panic bank runs by affecting the beliefs of depositor 2 if she observes a withdrawal. More concretely, depositor 2 will be less (more) likely to withdraw (keep her funds deposited) if she observes a withdrawal from depositor 1 when the priority account is available (Prediction 3). Arguably, the last prediction is based on the idea that panic bank runs exist (i.e., we expect to find support for Prediction 1). If we do not find evidence of panic bank runs (e.g., depositor 2 keeps the funds deposited when she observes the action of depositor 1, regardless of what she observes), then we expect that the priority account will have no effect on the behavior of depositors, because link 12 will suffice to solve the coordination problem and no bank runs will be observed in equilibrium.

4. Experimental design and procedures

Our computerized sessions (Fischbacher, 2007) were run at the LINEEX lab (Universitat de Valencia) in Spain. At the beginning of each session, participants were welcomed and asked to draw lots to be randomly assigned one of the terminals. Once all participants were seated, they received a hard copy of the instructions that were read aloud by the experimenter.

We recruited a total of 200 participants; all of them were Business or Economics students with no previous experience in coordination problems or experiments on financial decisions. Our experiment relies on a between-subject design with two different treatments. Both treatments were gender-balanced. In one treatment (T_0), participants had to choose between keeping their funds deposited or withdrawing. In the other treatment (T_1), they were also given the possibility to relocate their funds to the priority account. In both treatments, we have 100 participants who played the bank-run game for a total of 15 rounds with random re-matching and no pairing repeated in consecutive rounds. At the beginning of each round, participants were randomly matched in pairs and assigned a third depositor (simulated by the computer) to form a three-depositor bank. We divided participants into matching groups of 10 subjects so that subjects from different matching groups never interacted with each other during the session. In all the sessions, participants completed three trial rounds to get familiar with the software and were allowed to ask questions before starting the actual experiment.[13]

Before starting the experiment, it was common information to participants that their position in the line would be randomly determined in each round, and that the computer was programmed to withdraw always, regardless of its position. Figure 2 presents a screenshot of our experiment when participants had the possibility to relocate their funds to the priority account (T_1). In this example, the participant decides first (that is, she is depositor 1) and knows that her decision will be observed by depositor 2, but not by depositor 3 (note that there is a line that connects depositors 1 and 2, but there is no line that connects 1 and 3). As the information is local, depositor 1 does not know whether depositors 2 and 3 are linked (this explains the question mark symbol "?" on the line that connects depositors 2 and 3). The left-hand side of the screenshot presents this information verbally to the participant. At the bottom of the screen, participants were reminded

[13]Appendix Appendix A contains the translated version of the instructions.

of the payoff consequences of each possible decision and the fact that the computer was programmed to withdraw always.[14] Once participants made their choices, they were informed of their payoffs and the decision of the other depositors in their bank.

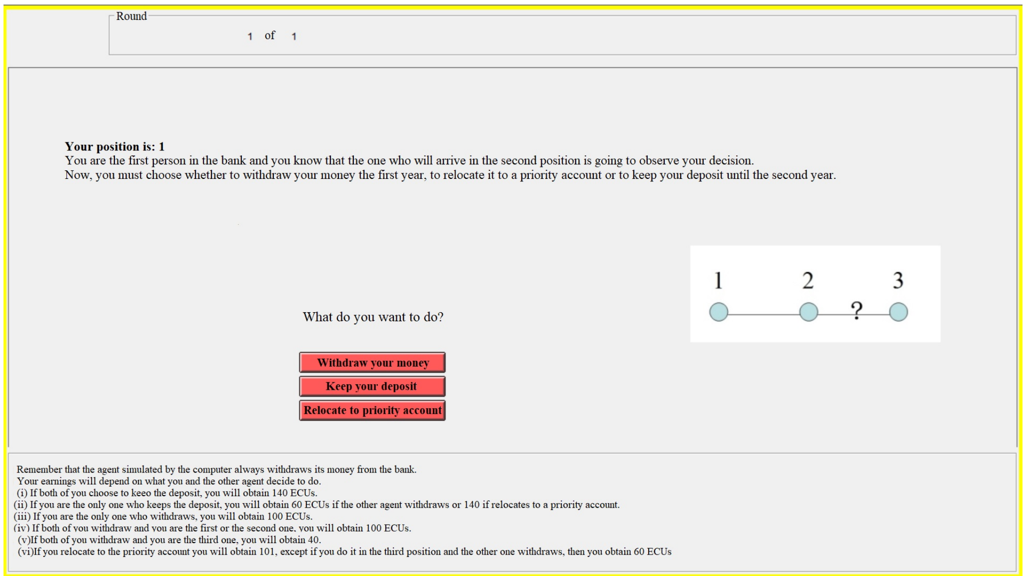

Figure 2: A decision screen from the experiment

At the end of the experiment, participants filled out a questionnaire that was used to collect additional information about their gender, age, risk attitudes and cognitive abilities (see Appendix B for further details).[15] Following Kiss et al. (2018), we also elicited the beliefs of depositors regarding the possibility of panic bank runs. In particular, we asked participants at the end of the experiment whether they believed that a withdrawal of depositor 1 was more likely due to i) the impatient depositor (i.e., the computer), ii) the patient depositor (i.e., the other participant), or iii) any of the two with the

[14]If depositors could not relocate their funds (T_1), we used the payoffs in Table 1 except for the last column.

[15]We elicit risk attitudes using the investment game in Gneezy and Potters (1997), while we use the cognitive reflection test in Frederick (2005) to measure cognitive abilities. The Mann-Whitney Wilcoxon test indicates that women are more risk averse ($p = 0.032$) and have a lower score in the CRT than men ($p = 0.0005$). This is in line with previous evidence; e.g., see Charness and Gneezy (2012) or Brañas-Garza et al. (2019).

same probability.

Each session lasted approximately 90 minutes. For the payment, we used a random lottery incentive procedure by which one choice (i.e., one of the rounds) was randomly chosen. The ECUs earned in the chosen round were converted into Euros at the rate 10 ECUs = 1 Euro. Participants received on average 13 Euros, including the show-up fee.

5. Experimental results

5.1. Descriptive statistics

Following our predictions, first we investigate the role of observability and the possibility of panic bank runs. Since the existence of link 12 determines both observability and the source of bank runs, the upper panel of Table 2 reports the frequency of depositors who withdraw (keep their funds deposited in the bank) in each treatment, depending on the existence of link 12. We present the frequency of bank runs and the frequency of severe bank runs in the bottom panel of Table 2. The interested reader on the behavior of depositors in each possible network structure can see Appendix Appendix B.

Panel A. *Behavior of depositors in each treatment .*

	Frequency of withdrawal		Frequency of keeping the funds deposited	
	T_0	T_1	T_0	T_1
Link 12	0.169	0.036	0.831	0.786
No link 12	0.279	0.041	0.721	0.737

Panel B. *Frequency of (severe) bank runs in each treatment.*

	Bank run (at least one patient withdraws)		Severe bank run (both patient withdraw)	
	T_0	T_1	T_0	T_1
Link 12	0.317	0.075	0.032	0.002
No link 12	0.473	0.070	0.071	0.000

Table 2: Effect of the priority account depending on the existence of the link 12.

Our first prediction concerns the effect of link 12 when depositors cannot relocate their funds to a priority account. Similarly to Kiss et al. (2014a), we find evidence that the link 12 reduces the frequency of withdrawals in T_0 (0.169 vs. 0.279, $p < 0.001$).[16] Similarly, the frequency of depositors who keep their funds in the bank in T_0 is higher when link 12 exists (0.831 vs. 0.721, $p < 0.001$). As a consequence of lower (higher) frequency of withdrawals (keeping the funds deposited), the incidence of bank runs is also lower in T_0 (0.317 vs. 0.473 in the case of bank runs, and 0.032 vs. 0.71 for severe bank runs, $p < 0.001$ in both cases) when link 12 is in place.[17]

Finding 1. *Link 12 reduces the likelihood that depositors withdraw and increases the likelihood that depositors keep their funds deposited when it is not possible to relocate the funds to a priority account. As a result, link 12 helps prevent (severe) bank runs when the priority account is not available.*

The chief question to be addressed concerns whether or not the mechanism inspired in Andolfatto et al. (2017) prevents (panic) bank runs. Table 2 suggests that the decrease in the frequency of withdrawals and the reduction in bank runs (of any severity) is independent of link 12. Thus, the decline in the withdrawal rates translates into less (severe) bank runs when depositors can use the priority account. Overall, the frequency of depositors who withdraw (keep their funds deposited in the bank) is 0.224 (0.776) in T_0, while it is 0.037 (0.763) in T_1.[18] The considerably lower frequency of withdrawals in T_1 relative to T_0 also led to less bank runs. Figure 3 depicts the likelihood of bank runs and the likelihood of severe bank runs in each treatment.[19] Figure

[16] Unless otherwise noted, our non-parametric analysis refers to the Wilcoxon signed-rank test (e.g., when comparing the effect of the link 12) or the Mann-Whitney Wilcoxon test (e.g, when comparing the effect of the treatment). We perform the analysis by considering each participant as an independent observation; i.e., we compute the frequency of withdrawal (keeping the money deposited) for each participant separately, and then compare the behavior of subjects across treatments or conditions.

[17] The presence of link 12 does not seem to affect withdrawals when depositors can relocate their funds to the priority account in T_1 (0.036 vs. 0.041, $p = 0.82$). Arguably, withdrawals are very rare in this treatment. Finally, the presence of link 12 seems to increase the likelihood that depositors keep their funds deposited in T_1 (0.786 vs. 0.737, $p = 0.059$).

[18] Note that the frequencies do not add to 1 in T_1 as participants in this treatment had the option to relocate their funds to the priority account. Table B1 in the Appendix shows that that the possibility to relocate the funds leads to less withdrawals in every possible network structure ($p < 0.001$).

[19] Recall that we define a bank run as a situation in which at least one of the patient depositors withdraw. If both of them do it, then we say that the bank run is severe.

3 shows that bank runs are less likely when depositors can use the priority account (0.396 vs. 0.072, $p < 0.001$). The same result holds when we look at the frequency of severe bank runs (0.052 vs. 0.001, $p < 0.001$).

Finding 2. *The possibility to relocate the funds to a priority account reduces the frequency of withdrawals. This leads to a reduction in the frequency of (severe) bank runs, both when there is link 12 and when there is no link 12.*

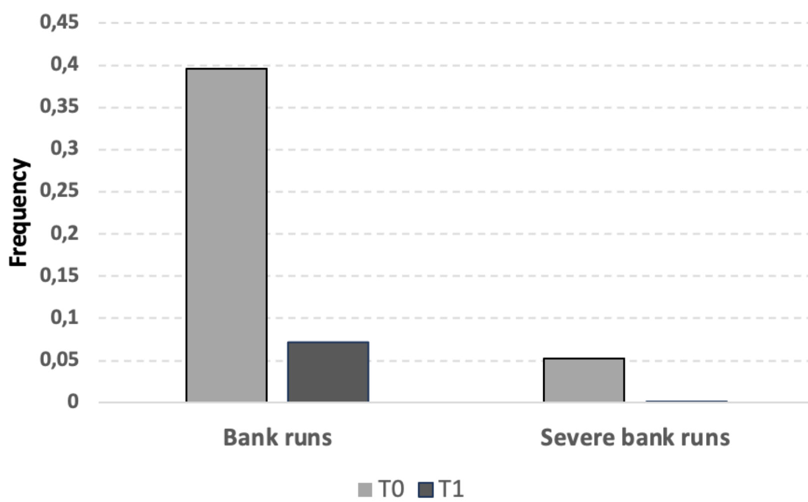

Figure 3: Effect of the priority account on the frequency of (severe) bank runs.

While these findings highlight the importance of link 12 and the mechanism to prevent bank runs, we expect that depositors react differently depending on their position in the line and the actions they observe (if any). In what follows, we discuss with further detail the choices of depositors 1 and 2, who are the ones that may face a coordination problem. Recall that deposito3 has a dominated strategy and should never withdraw her funds (if patient). Our analysis shows that withdrawing is indeed rare for this depositor (less than 10%). We also find that the treatment has a significant effect on the withdrawal rate of depositor 3, who is less likely to withdraw if she can relocate her funds to a priority account (0.090 vs. 0.021, $p < 0.001$).

5.2. Behavior of depositor 1

Figure 4 displays the behavior of depositor 1 in each treatment, depending on whether or not the link 12 exists. We depict the likelihood of keeping the funds deposited (withdrawing) in white (black), respectively. The grey area represents the likelihood that depositor 1 relocates her funds to the priority account in T_1.

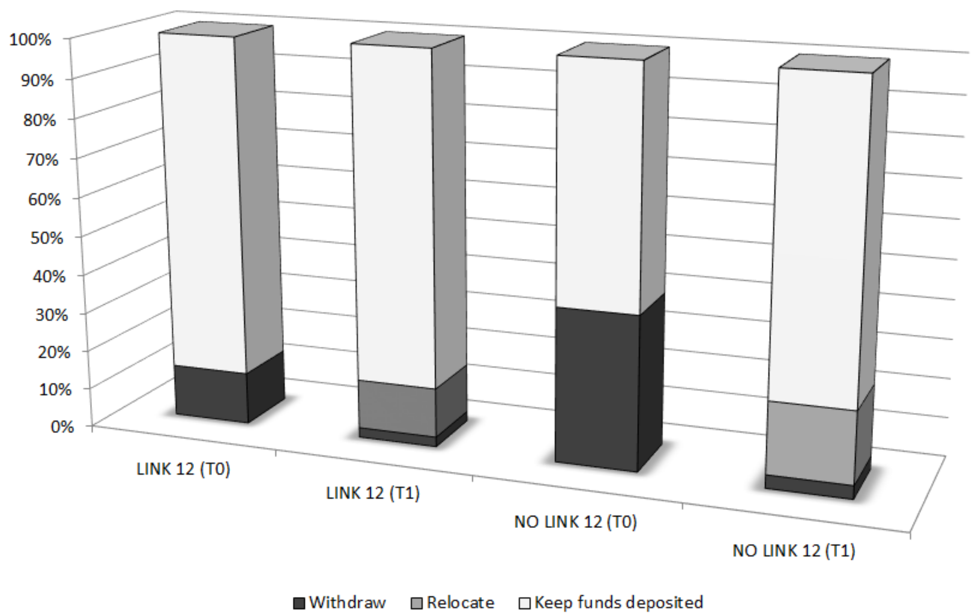

Figure 4: Behavior of depositor 1

When looking at the behavior of depositor 1 across treatments, we observe that withdrawal rates are clearly lower in T_1, both when link 12 is in place (0.133 vs. 0.025, $p < 0.001$) and when it is not (0.393 vs. 0.034, $p < 0.001$). As for the likelihood of keeping the funds deposited, depositors seem to be more likely to do it when they can relocate their funds to a priority account, but only if link 12 does not exist (0.607 vs. 0.783, $p < 0.001$). If link 12 exists, the effect is statistically insignificant (0.867 vs. 0.849, $p = 0.77$); thus the reduction in the withdrawal rate seems to be at the expenses of depositor 1 using the priority account when the link 12 exists. This is in line with our prediction that the possibility to relocate the funds will have a direct effect on the frequency of withdrawal, but will not necessarily increase the frequency of depositors who keep their funds deposited if their actions are observed.[20]

We carry out an econometric analysis to understand the behavior of depositor 1 better. Columns (1)-(3) in Table 3 present the estimates of a random-effect logit model for the likelihood that depositor 1 withdraws, depending on whether or not there is the possibility to relocate the funds to the priority account; i.e., we include a dummy variable taking the value 1 for treatment T_1.[21] Our analysis in column (1) takes into account whether or not subsequent depositors will observe the decision of depositor 1 by including dummy variables for the existence of the links 12 and 13, and an interaction term to assess whether there is any effect of having both links simultaneously. We include the interaction between the treatment variable T_1 and the different links to allow for the possibility that links have different effects on the behavior of depositor 1 depending on whether or not she can relocate her funds to the priority account. In columns (2) and (3), we look at the effect of the priority account on the likelihood of withdrawal, both when there is no link 12 and when there is link 12, separately. We replicate the analysis for the likelihood that depositor 1 keeps her funds deposited in columns (4) and (6). The estimates for the determinants of relocating the funds to the priority account are presented in the last column (7) of Table 3. In all our specifications, we control for age, gender, risk aversion, and cognitive abilities. There exists experimental evidence that participants who experience more bank runs during the experiment might behave differently than those who observe fewer bank runs (see, among others, Garratt and Keister (2009), Kiss et al. (2014a), Peia and Vranceanu (2019) or Davis et al. (2019b)). To account for this possibility, we include a dummy variable (Observed bank run) that takes the value 1 if the subject witnessed a bank run in the previous round.

Our results in columns (1) highlight that being observed by subsequent depositors reduces (increases) the likelihood of withdrawal (keeping the funds

[20]Recall that withdrawing in position 1 is irrational if the choice is being observed.

[21]All our findings are robust to a linear probability model.

	Frequency of withdrawal			Frequency of keeping the funds			Priority account
	All	No L12	L12	All	No L12	L12	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Priority account (=1 if T1)	-5.273***	-3.436***	-1.899**	1.982***	1.368***	-0.529	
	(0.911)	(0.590)	(0.906)	(0.632)	(0.495)	(0.685)	
L12	-2.691***			2.928***			-0.959
	(0.463)			(0.489)			(0.616)
L13	-1.983***			2.182***			-1.036*
	(0.450)			(0.481)			(0.546)
L12L13	0.413			-0.498			-0.121
	(0.771)			(0.825)			(0.637)
Priority account * L12	2.059**			-1.946***			
	(0.851)			(0.662)			
Priority account * L13	2.782***			-1.470**			
	(0.973)			(0.640)			
Priority account * L12 L13	-0.510			0.570			
	(1.356)			(1.025)			
Observed bank run	0.887**	0.902***	1.199*	-0.770**	-1.026***	-0.614	0.436
	(0.371)	(0.346)	(0.709)	(0.357)	(0.374)	(0.649)	(0.664)
Constant	-0.311	-0.012	-5.748***	-0.132	-0.494	6.300***	-1.758
	(1.423)	(1.037)	(1.407)	(1.550)	(1.239)	(1.639)	(4.156)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	973	487	486	973	487	486	486

Notes: Robust standard errors in parentheses. Significance at the *** p<0.01, ** p<0.05, * p<0.1

Table 3: Behavior of depositor 1: Random-effect logit regressions

deposited), respectively.[22] In line with our previous discussion, we find that withdrawals are reduced when depositors are allowed to relocate their funds to the priority account, both when there is no link 12, and when there is link 12 (see columns (2) and (3)). The effect is greater when link 12 is not in place. As for the effect of the treatment on the likelihood of keeping the funds deposited, column (4) indicates a positive effect of the priority account on the likelihood of keeping the funds deposited. This seems to be due to the behavior of depositor 1 when her action cannot be observed by the subsequent depositor 2 (see columns (5) and (6)).[23]

[22]Appendix B presents the analysis considering the effect of link 12 and link 13 in both treatments (see Appendix Appendix B.2). Our data support the findings in Kiss et al. (2014a) and Kiss et al. (2014b) in that depositor 1 values the fact of being observed when there is no possibility to relocate the funds deposited, thus both link 12 and link 13 are important to reduce (increase) the likelihood of withdrawal (keeping the funds deposited) in T_0. As expected, link 12 does not matter if depositors can relocate their funds to the priority account in T_1. This is because the priority account is expected to eliminate (panic) bank runs.

[23]These results are robust when we include the link 13 or the interaction between the link 13 and the priority account as controls (see Section Appendix B.2 in the Appendix).

Finding 3. *The possibility to relocate the funds to a priority account reduces (increases) the likelihood that depositor 1 withdraws (keeps her funds deposited), respectively. When link 12 exists, the priority account reduces the likelihood that depositor 1 withdraws, but this does not affect the likelihood that depositor 1 keeps her funds deposited. In the absence of link 12, the availability of the priority account lowers the withdrawal rate of depositor 1, and increases the likelihood that depositor 1 keeps her funds in the bank.*

Taken together, our findings for depositor 1 suggest that the mechanism in Andolfatto et al. (2017) helps prevent bank runs á la Diamond and Dybvig (1983) (when coordination problems are possible, i.e., when there is no link 12). If the decision of depositor 1 can be observed by depositor 2, we find that depositor 1 is less likely to withdraw if it is possible to relocate the funds, but depositor 1 seems to use the account instead of being more likely to keep her funds deposited. Our interpretation of these findings is consistent with the possibility of panic bank runs. When link 12 exists, depositor 1 should keep the funds deposited in equilibrium, and more than 80 percent of depositors do so (see Figure 4). The introduction of the priority account does not influence their (equilibrium) behavior; i.e., the frequency of depositors who keep their funds deposited is not affected when the priority account is available. However, the priority account has a major (direct) effect on the behavior of (irrational) depositors who withdraw in position 1 when link 12 exists. They communicate their belief that a bank run is underway and substitute withdrawals for the use of the priority account. As for the use of this account, our results in column (7) of Table 3 indicate that the observability of actions is not relevant for the decision to relocate the funds to the priority account; i.e., the existence of the links 12 and 13 do not affect the likelihood of using the priority account.

5.3. Behavior of depositor 2

Figure 5 displays the behavior of depositor 2 in each treatment, depending on the action that she observes (if any).[24] We find that withdrawal rates are

[24]We do not include the possibility that depositor 1 decided to relocate her funds to the priority account because this behavior can only be observed in T_1. In our data, however, no depositor 2 withdraws upon observing that depositor 1 relocated her funds to the priority account; in this case, depositor 2 either keeps her funds deposited (0.84) or relocates her funds as well (0.16)

clearly lower in T_1, if depositor 2 observes nothing (0.343 vs. 0.053, $p < 0.001$) or if she observes a withdrawal (0.518 vs. 0.102, $p < 0.001$). In the former setting, depositor 2 seems to use the possibility to relocate the funds to the priority account, instead of keeping her funds deposited in the bank (0.669 vs. 0.694, $p = 0.590$). At the same time, there is an increase in the frequency that depositor 2 keeps her funds deposited when she observes a withdrawal from depositor 1 (0.482 vs. 0.612, $p = 0.037$). The possibility of relocating the funds to a priority account does not seem to affect the behavior of depositor 2 if she observes that depositor 1 keeps her funds deposited. In most cases, depositor 2 recognizes her dominant strategy and keeps her funds deposited in the bank.

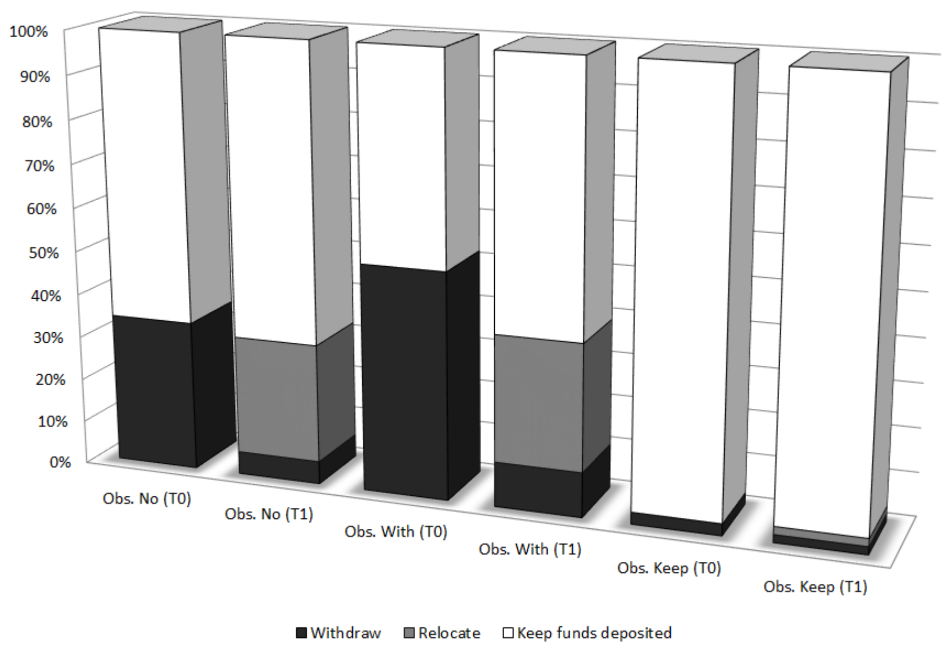

Figure 5: Behavior of depositor 2

We follow an econometric approach to study the behavior of depositor 2. Columns (1)-(4) in Table 4 present the estimates of a random-effect logit model for the likelihood that depositor 2 withdraws, depending on what depositor 2 observes.[25] We include a dummy variable that takes the value 1 in T_1 (i.e., when depositor 2 has the possibility to relocate the funds to the priority account), and a dummy variable that takes the value 1 if the action of depositor 2 will be observed by the subsequent depositor 3. The estimates for the determinants of keeping the funds deposited are presented in columns (5)-(8). The last column (9) shows the estimates for the decision to relocate the funds to the priority account. All our specifications include controls for age, gender, risk aversion, cognitive abilities, and the history of decisions. The robust standard errors are reported in parenthesis.[26]

	Frequency of withdrawal				Frequency of keeping the funds				Priority account
	All	Obs. No	Obs. With	Obs. Keep	All	Obs. No	Obs. With	Obs. Keep	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treatment (=1 if T_1)	-3.212***	-3.897***	-4.579***	0.677	0.330	0.102	0.0686	-1.421	
	(0.587)	(0.887)	(1.634)	(1.988)	(0.473)	(0.670)	(1.377)	(2.047)	
L23	-0.829***				0.941***				-0.773*
	(0.309)				(0.252)				(0.404)
Obs. Withdrawal	0.931***				-1.021**				0.882*
	(0.360)				(0.408)				(0.474)
Obs. Keeping	-4.382***				4.799***				-4.936***
	(1.145)				(1.255)				(1.164)
Treatment * Obs With	-0.0816				0.0455				
	(0.870)				(0.587)				
Treatment * Obs Keep	3.490**				-1.031				
	(1.486)				(1.407)				
Observed bank run	0.822***	0.724	1.776**	2.034	-0.871***	-0.726	-2.802**	-1.825	0.926
	(0.293)	(0.498)	(0.729)	(1.508)	(0.296)	(0.508)	(1.269)	(1.291)	(0.680)
Constant	-1.434	-2.743	0.134	-2.099	2.600**	4.044*	2.460	1.158	-7.151**
	(1.204)	(1.986)	(2.937)	(8.862)	(1.316)	(2.343)	(4.596)	(9.831)	(3.565)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	912	453	157	158	912	453	157	158	463

Notes. Regressions (1)-(4) correspond to random-effect logit regressions to estimate the decision to withdraw. Regressions (5)-(8) correspond to random-effect logit regressions to estimate the decision to keep the funds deposited. Regression (9) corresponds to a random-effect logit model to estimate the use of the priority account. All the specification control for gender, age, risk aversion, and cognitive reflection. Robust standard errors are reported in parenthesis. Significance at *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 4: Behavior of depositor 2: Random-effect logit regressions.

We find that the possibility to relocate the funds in T_1 reduces the frequency of withdrawal for depositor 2, except when she observes that depositor 1 kept her funds deposited. In this setting, the mechanism has no effect on the behavior of depositor 2 mainly because withdrawals are rare (see Figure 5). Notably, the possibility to relocate the funds does not affect the frequency of keeping the fund deposited.

[25]Recall that depositor 2 never withdraws if she observes that depositor 1 relocated her funds, thus we do not include in our analysis the possibility that depositor 2 observed a relocation from depositor 1.

[26]The results are robust when we include the link 23 as a control (see Section Appendix B.3 in the Appendix)

A crucial question concerns how depositor 2 reacts to the (observed) behavior of depositor 1. First, it is worth noting that panic bank runs exist when depositors cannot relocate their funds in T_0. This occurs because depositor 2 acts differently depending on what she observes; in particular, the observation of a withdrawal (keeping the funds deposited) leads to a significant increase (decrease) in the frequency of withdrawals, and an increase (decrease) in the frequency of keeping the funds deposited, respectively (Kiss et al., 2018). As a result, we find that depositor 2 acts differently depending on whether she observes that depositor 1 withdrew her funds or kept the funds deposited ($p < 0.001$). Arguably, panic behavior seems less important when depositors can relocate their funds to the priority account in T_1. In this treatment, depositor 2 acts differently depending on whether she observes that depositor 1 withdrew her funds or kept the funds deposited ($p < 0.001$), but observing a withdrawal has no effect on the likelihood of withdrawal compared with the case in which nothing is observed ($p = 0.286$). This, in turn, implies that we can reject the null hypothesis that observing a withdrawal in T_1 has the same effect as observing a withdrawal in T_0 at any common significance level ($p < 0.001$).

Finding 4. *When link 12 does not exist, the priority account reduces the likelihood that depositor 2 withdraws, but this does not affect the likelihood that depositor 2 keeps her funds deposited. The priority account helps in preventing (panic) bank runs when link 12 does exist. In particular, the possibility to relocate the funds to a priority account reduces (increases) the likelihood that depositor 2 withdraws (keeps her funds deposited) if she observes a withdrawal from depositor 1, respectively.*

Recall that the possibility to relocate the funds to the priority account reduces the likelihood that depositor 1 withdraws her funds when depositor 2 observes her action. Our findings for depositor 2 indicate that she is more likely to keep the funds deposited upon observing a withdrawal, compared with the case in which the priority account is not available. We argue that a possible effect of the mechanism in Andolfatto et al. (2017) (that can help prevent panic bank runs) is that the possibility to relocate the funds affects the beliefs of depositor 2 that a bank run is underway. Our data support this conjecture. Table 5 presents the beliefs of depositor 2 that the observation of a withdrawal is due to i) the impatient depositor, ii) the patient depositor, or iii) any of the two depositors with the same probability, for each of the two treatments separately.[27]

	T_0	T_1
The other depositor was forced to withdraw (impatient)	0.37	0.56
The other depositor was not forced to withdraw (patient)	0.15	0.12
Both options are equally likely	0.48	0.32

Table 5: Beliefs of depositor 2 when depositor 1 withdraws

Theoretically, depositor 2 should believe that (in equilibrium) any withdrawal from depositor 1 was due to the impatient depositor. Only 37% of depositors have such belief when there is no possibility to relocate the funds to a priority account in T_0. This is in sharp contrast with the elicited beliefs when depositors can relocate their funds to the priority account in T_1. In this treatment, 56% of depositors believe that the withdrawal was due to the impatient depositor. The Kruskal-Wallis test indicates that the beliefs of depositors differ across treatments ($p = 0.048$).

Finding 5. *When observing a withdrawal, depositor 2 is less likely to believe that this was due to the other patient depositor when depositors can relocate their funds to a priority account.*

Taken together, these findings suggest that the possibility to relocate the funds to the priority account reduces the frequency of withdrawals when depositor 2 cannot infer the decision of the other patient depositor; i.e., when she observes nothing or a withdrawal. While the theoretical prediction is that depositor 2 will be more likely to keep her funds deposited in the former setting, we find the priority account to be particularly effective when depositor 2 observes a withdrawal from depositor 1. In this setting, depositor 2 is less likely to believe that the observed withdrawal was due to the other patient depositor, thus the possibility to relocate the funds reduces panic behavior.

[27]The results in T_0 replicate Kiss et al. (2018), where subjects make their choices in a fully sequential setting (i.e., the complete network) with no repetition. In Kiss et al. (2018) ($N = 84$) the frequency of depositors who believe that the withdrawal in position 1 was due to the impatient (patient) depositor is 0.34 (0.19), respectively.

6. Discussion

This paper was inspired by the work of Andolfatto et al. (2017), who propose a novel mechanism to prevent bank runs that occur because of a coordination problem among depositors. In their model, depositors can communicate to the bank their beliefs that a bank run is underway; e.g., by using a priority account that pays off in the future more than the immediate payoff that depositors obtain from withdrawing. Theoretically, the mere possibility of the priority account should solve the coordination problem. This occurs because relocating to the priority account dominates withdrawal for patient depositors, but patient depositors prefer to keep their funds deposited instead of using the priority account if other patient depositors are going to use the priority account. In this paper, we build on these features and design a laboratory experiment to examine whether offering depositors a priority account (that should never be used in equilibrium) can prevent bank runs.

We leave aside the possibility that bank runs occur due to fundamental problems to examine whether the priority account may curb withdrawals when bank runs can emerge as a coordination problem among depositors (if the action of depositor 1 is not observed by depositor 2 because link 12 does not exist), or may be the result of panic behavior (if the action of depositor 1 is observed by depositor 2 because link 12 exists). Our findings indicate that the introduction of the priority account leads to a huge decrease in the frequency of bank runs, both when there is link 12 and when there is not. Interestingly, the mechanism works differently in both settings. When link 12 does not exist, depositor 1 is less likely to withdraw and more likely to keep the funds deposited if the priority account is available. In this setting, we would expect similar behavior from depositor 2. However, we find that even though depositor 2 is less likely to withdraw when the priority account is available, but she seems to use the priority account to communicate that a bank run is underway; i.e., the decrease in the withdrawal rate of depositor 2 is not linked to an increase in the frequency of keeping the funds deposited. In our data, the possibility to relocate the funds to a priority account does not decrease the frequency of depositors who keep their funds deposited, implying that the mechanism is never harmful and leads to a reduction in bank runs.

When link 12 is present, bank runs due to coordination problem should be prevented in equilibrium, but the observation of withdrawals may result in panic behavior. In this respect, the mechanism creates a richer pattern of behavior when link 12 exists because the priority account has different effects on behavior, depending on whether or not panic bank runs can be observed. Our data show that panic bank runs indeed occur as depositors react to the action they observe from other depositors. We also find that introducing the priority account affects the behavior of depositor 1 by decreasing her likelihood of withdrawal when her action is observed by depositor 2. However, the priority account does not affect the frequency of keeping the funds deposited, suggesting that some (irrational) depositors use the priority account unreasonably. Our interpretation is that depositor 1 uses the priority account to communicate to the bank her belief that a bank run is underway, in line with the direct effect of the mechanism that we expected. As for the behavior of depositor 2, the possibility to relocate the funds has a major effect on her beliefs. More precisely, depositor 2 is less likely to believe that a withdrawal was due to the patient depositor if the priority account is available. This leads to a decrease (increase) in the frequency of withdrawals (keeping the funds deposited) when they observe a withdrawal. This explains why the priority account reduces panic bank runs.

The model of Andolfatto et al. (2017) predicts that depositors will not use the priority account in equilibrium but some participants (less than 15 percent) do it in our experiment.[28] This finding is in line with previous evidence on bank runs. For example, Kinateder et al. (2020) test experimentally a different mechanism to prevent bank runs, also based on the principle of iterated elimination of dominated strategies. They also find that participants frequently use the action introduced to dominate withdrawal instead of opting to keep the money in the bank. In principle, this behavior could be explained because it may be cognitively too demanding to understand the complete line of reasoning that results from iterated dominance. In fact, there is a new literature suggesting that dominant even strategies are not enough to achieve the desired outcomes and the idea of obviously dominant strategies have been put forward (Li, 2017). It is also possible that participants find it difficult to form beliefs about the behavior of others (Shafir and Tversky, 1992; Esponda and Vespa, 2014) or doubt that other depositors will behave rationally. We believe that more research is needed to tease apart

[28] We identify the settings in which depositors are more likely to use the priority account; e.g., we find that depositor 2 relocates her funds to the priority account when she observes a withdrawal, but the introduction of the priority account does not seem to affect the likelihood that she keeps her funds deposited.

whether using the priority account occurs because depositors are irrational or they believe that others are.

Although the mechanism inspired by Andolfatto et al. (2017) is useful to reduce bank runs, it is worth mentioning that we deliberately considered a simple setting for the mechanism to work; e.g., we decided to focus on the case with no aggregate uncertainty. One possible extension would be to test the efficacy of the mechanism in more challenging environment with aggregate uncertainty. While our experimental design follows from recent research in bank runs that considers a small number of depositors (e.g.,Garratt and Keister (2009); Schotter and Yorulmazer (2009); Arifovic et al. (2013); Davis and Reilly (2016); Shakina (2019)), it may be worth investigating whether or not the results are robust to other settings with more depositors, as it occurs in (Arifovic et al., 2020).[29] From a policy perspective, we also think that it may be worth exploring other mechanisms to overcome bank runs so as to compare their efficiency.

7. Conclusion

Our work makes two important contributions to the study of bank runs. First, we rely on a novel (theoretical) mechanism that has been proposed by Andolfatto et al. (2017), and we design a controlled laboratory experiment to test its efficacy to prevent bank runs. Second, we provide experimental evidence that the mechanism helps prevent bank runs that occur not only because of a coordination problem among depositors but those that result from panic behavior. In this regard, the mechanism works mainly by reducing the likelihood of withdrawal. At the same time, it also has an effect on the frequency of depositors who keep their funds deposited in two informational environments. On the one hand, depositors at the beginning of the sequence of decisions are more likely to keep their funds deposited if their actions will not be observed by subsequent depositors when the priority account is available. On the other hand, depositors who observe withdrawals are more likely to attribute them to impatient depositors and are more likely to keep their funds deposited if they can relocate their funds to the priority account.

[29] Kiss et al. (2021) discuss in detail the recent literature on bank runs, including limitations and fruitful areas for future research.

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Appendix A. Instructions

Here we reproduce the instructions used in the experiment. The original instructions were in Spanish. The text in italics denotes the extra parts that the instructions of the treatment contained.

Welcome to this experiment!

In this experiment, we study how individuals solve decision-making problems. We are not interested in your particular decision, but the average behavior of individuals. That is why you will be treated anonymously during the experiment, and nobody in this room will ever know the decisions you make.

Next, you will see the instructions that explain how the experiment goes. These instructions are the same for all participants, and it is of utmost importance that you understand them well because your earnings will depend to a large extent on your decisions.

If you have any doubt or question during the experiment, raise your hand, and we will come to you. Remember also that you are not allowed to speak during the experiment.

Number of rounds

This experiment will have 18 rounds. The first three rounds will be trial rounds, so you will have the opportunity to understand the experiment better and become familiar with the software. The following 15 rounds will be relevant for your final payoff. Your decisions in these rounds determine your earnings.

Deposit

In each round, you will be endowed with an amount of money (80 ECUs) that you deposit in a bank, along with other depositors. The bank that you deposit your money in will have three depositors: one of them are you, another one is somebody from this room, and the computer will simulate the third depositor. Therefore, the bank will start each round with 240 ECUs of deposits.

Decision and Earnings

Your decision consists of choosing between withdrawing your money from the bank in the first year, *relocating it to a priority account*, or keeping he funds deposited until the second year. Keep in mind that your earnings depend not only on your decisions but also the decisions of the other depositors in your bank. It is important to note that the computer will always withdraw the money from the bank. Hence, your earnings in each round depend on what you and the other depositor in this room make with your funds.

More concretely, if both of you choose to keep the funds deposited until the second year, you will receive 140 ECUs, corresponding to your initial deposit (80 ECUs) and the interests accrued during the first year (when you decided to keep the funds deposited).

If only one of you decides to withdraw the money in the first year, then she will receive 100 ECUs, the same amount that the computer gets. This amount comprises the initial deposit (80 ECUs) and 20 ECUs in accrued interests. If the other depositor in the room decided to keep her funds deposited, she will earn 60 ECUs (that is, she will receive the remaining amount in the bank – 40 ECUs -, and an additional amount of 20 ECUs in the form of interests).

It may be the case that both of you choose to withdraw the money in the first year. Then, your earnings will depend on whether there is enough money in the bank or the other depositors withdrew too much money. That is, if you are the first or second to withdraw, you will receive 100 ECUs, but if you are the third to withdraw, then the bank will have only 40 ECUs, and this is the amount that you will receive.

Finally, let' see what happens if somebody decides to relocate the funds to the priority account. In this case, the bank suspends payments and pays a guaranteed amount of 101 ECUs. This occurs if you relocate and there was at most one previous withdrawal. A depositor, who relocates to the priority account after two withdrawals, will receive 60 ECUs (that is, she will receive the remaining amount in the bank – 40 ECUs -, and an additional amount of 20 ECUs in the form of interests). If a depositor chooses to keep her funds deposited until the second year while the other relocates her funds to the priority account, the one who keeps her funds will receive a payment of 140 ECUs.

Hence, we can summarize the earnings in the following way:

Before starting the experiment, you should know that

1. The individual that you are paired with to form a bank changes in each round. Thus, when you decide in a round, do not think that you will interact with the same individual as in the previous round.

2. Before choosing between keeping the funds deposited until year 2 or withdrawing in year 1, you will always know your position in the line.

			If you decide to keep the funds deposited and…		
		If you decide to withdraw in the first year	The other depositor keeps the funds deposited in the bank *or relocates to the priority account*	The other depositor and the computer withdraw	*If you decide to relocate your funds to a priority account…*
Number of previous withdrawals:	0	100	140	60	*101*
	1	100	140	60	*101*
	2	40	Cannot happen	60	*60*

Concretely, you may be in positions 1, 2, or 3 with the same probability. This is true also for the computer.

3. In each round, you may have different information about what happened in your bank. You will know what occurred before you contacted the bank in some rounds, while in others you will not know. In the same vein, in some rounds, you will know if a depositor who chooses after you will observe your decision or not. You may take into account this information when you decide. The information will appear on the left-hand side of the screen. For instance:

    - You are in position 1. Depositors in positions 2 and 3 will observe your decision.
    - You are in position 2. Depositor 1 decided to keep her funds deposited. Depositor 3 will not observe your choice.

    On the right-hand side of the screen, a picture will indicate whom you are connected with (that is, an image will show which decisions you may observe and who will observe your decision). When there is no link between two numbers, the depositor who decides later will not observe the decision of the depositor choosing before. The symbol "?" indicates that you do not know if the two depositors represented by the numbers are connected or not.

Final payoff

At the end of the experiment, the computer will randomly choose one of the 15 rounds, and you will receive the earnings in that round. An exchange rate of 10 ECUs=2 Euros will be used to determine your final payoff.

Next, you will be able to read the same instructions on the screen of your computer. We ask you to read them carefully and make sure that you understand them. Once everybody finishes reading them, we will start with the three trial rounds.

Appendix B. Data Analysis

Appendix B.1. Behavior of depositors in each network structure

The frequency of depositors who withdraw (keep their funds deposited in the bank) is 0.224 (0.776) in T_0, while it is 0.037 (0.763) in T_1. Table B1 summarizes the behavior of depositors in each treatment, for each possible network structure.[30] This includes the p-values for the effect of the treatment on the frequency of withdrawals and keeping the funds deposited in each of the network structures.[31] At the bottom of the table, we present the frequency of withdrawal and keeping the funds deposited when there is link 12 and when there is not, in each of the treatments. This information is also reported in the main text of the paper.

	Frequency of withdrawal			Frequency of keeping the funds deposited		
	T_0	T_1	p-value	T_0	T_1	p-value
(12,13,23)	0.130	0.016	(<0.001)	0.870	0.857	(0.916)
(12,13)	0.167	0.061	(<0.001)	0.833	0.729	(0.031)
(12,23)	0.181	0.037	(<0.001)	0.819	0.761	(0.790)
(12)	0.225	0.018	(<0.001)	0.775	0.825	(0.227)
(13)	0.216	0.068	(<0.001)	0.784	0.734	(0.638)
(13,23)	0.250	0.025	(<0.001)	0.750	0.829	(0.078)
(23)	0.300	0.04	(<0.001)	0.700	0.726	(0.351)
0	0.318	0.024	(<0.001)	0.682	0.676	(0.588)
Link 12	0.169	0.036	(<0.001)	0.831	0.786	(0.378)
No link 12	0.279	0.041	(<0.001)	0.721	0.737	(0.257)
p-value	(<0.001)	(0.820)		(<0.001)	(0.059)	

Table B1: Behavior of depositors in each treatment for each possible network structure.

Our data in T_0 confirm the main result in Kiss et al. (2014a) that the existence of the link 12 helps in preventing bank runs. In network structures that contain the link 12, the frequency of withdrawal is below 0.225 and the frequency of keeping the funds deposited is above 0.775. In the absence of the link 12, the frequency of withdrawal is above 0.216 and the frequency

[30]We have ranked the networks depending on the frequency of withdrawal in T_0. Note that the frequencies do not add to 1 in T_1 as participants in this treatment had the option to relocate their funds to the priority account.

[31]We perform the analysis (Mann-Whitney Wilcoxon test) by considering each participant as independent observation; i.e., we compute the frequency of withdrawal (keeping the money deposited) for each participant separately, and then compare the behavior of subjects across treatments or conditions.

of keeping the funds deposited is below 0.784 . Statistically, we find that depositors are less (more) likely to withdraw (keep their funds deposited) when the link 12 is in place; i.e., the frequency of withdrawing is lower in all network structures that contain the link 12, compared with the case in which this link is absent (0.169 vs 0.279, $p < 0.001$) while the frequency of keeping keeping the funds in the bank is higher (0.831 vs 0.721, $p < 0.001$). Table B1 reveals that the presence of the link 12 does not affect withdrawals when depositors can relocate their funds to the priority account in T_1 (0.036 vs 0.041, $p = 0.82$). Arguably, withdrawals are very rare in this treatment. Finally, the presence of the link 12 seems to increase the likelihood that depositors to keep their funds deposited in T_1 (0.786 vs 0.737, $p = 0.059$).

Appendix B.2. Behavior of depositor 1

In line with Kiss et al. (2014a), our data suggest that the observability of actions is important to explain the behavior of depositors in that the link 12 can help in preventing bank runs. In Table B2 we undertake an econometric approach to better understand the behavior of depositor 1. In particular, we estimate random-effect logit regressions for each treatment T_0 (with no priority account) and T_1 (with priority account) to see whether the links of depositor 1 (L12 and L13) are important to explain her decision to withdraw or keep the funds deposited.

For the treatment in which depositors cannot relocate their funds to the priority account (T_0), we replicate the findings of Kiss et al. (2014a) or Kiss et al. (2014b) in that depositor 1 values the fact of being observed; in particular, there is a reduction (increase) in the frequency of witdhrawal (keeping the funds deposited) when the link 12 and the link 13 exist. This does not occur when depositors can relocate their funds to the priority account; i.e., depositor 1 does not seem to value the links 12 and 13 in T_1.

Given that depositor 1 values the fact of being observed (not only the link 12), we may want to control for the presence of the link 13 when looking at the effect of the priority account on her behavior. Following our approach in the main text (see Table 4) we estimate a random-effect logit model to assess the effect of the priority account on the behavior of depositor 1 when we control for the presence of the links L12 and L13 and we allow for the possibility that the priority account has a different effect depending on whether or not these links exist. The main results are reported in Table **??**.

We confirm that the results reported in the main text are robust when we control for the presence of the link 13. In particular, we confirm our Finding

	Frequency of withdrawal		Frequency of keeping the funds	
	T_0	T_1	T_0	T_1
	(1)	(2)	(3)	(4)
L12	-2.627***	-0.822	2.627***	1.167*
	(0.470)	(0.897)	(0.470)	(0.606)
L13	-1.933***	0.721	1.933***	0.799
	(0.450)	(0.921)	(0.450)	(0.494)
L12L13	0.381	-0.0625	-0.381	0.0639
	(0.760)	(1.217)	(0.760)	(0.658)
Observed bank run	0.831**	1.484	-0.831**	-0.732
	(0.375)	(1.161)	(0.375)	(0.777)
Constant	0.0507	-9.005*	-0.0507	1.508
	(1.433)	(4.883)	(1.433)	(4.425)
Controls	Yes	Yes	Yes	Yes
Observations	487	486	487	486

Table B2: Effect of the links when there is (no) priority account.

3 that the priority account reduces (increases) the likelihood of withdrawal (keeping the funds deposited) in the absence of the link 12 when bank runs can occur as a coordination problem. If the link 12 exists and panic bank runs are possible, then the priority account reduces the likelihood that depositor 1 withdraws but it does not affect the likelihood that depositor 1 keeps the funds deposited. In line with the results reported in Table B2 above, we find that the link 13 is also important to explain the decision of depositor 1, who is less (more) likely to withdraw (keep the funds deposited) when the link 13 exists.

	Frequency of withdrawal				Frequency of keeping the funds			
	No L12	No L12	L12	L12	No L12	NoL12	L12	L12
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Priority account (=1 if T1)	-3.668***	-4.881***	-1.902**	-2.826**	1.486***	1.938***	-0.547	-0.248
	(0.686)	(0.907)	(0.933)	(1.122)	(0.564)	(0.635)	(0.711)	(0.796)
L12								
L13	-1.197***	-1.674***	-0.847	-1.496**	1.614***	2.064***	1.154**	1.667**
	(0.394)	(0.461)	(0.533)	(0.651)	(0.377)	(0.533)	(0.501)	(0.736)
L12L13								
Priority account * L12								
Priority account * L13		2.512***		2.146*		-1.142*		-0.892
		(0.935)		(1.202)		(0.662)		(1.015)
Priority account * L12 L13								
Observed bank run	1.068***	1.138***	1.231*	1.208*	-1.307***	-1.341***	-0.640	-0.636
	(0.373)	(0.389)	(0.745)	(0.721)	(0.416)	(0.428)	(0.726)	(0.728)
Constant	0.467	0.635	-5.309***	-5.031***	-1.206	-1.378	5.841***	5.633***
	(1.244)	(1.323)	(1.479)	(1.489)	(1.530)	(1.589)	(1.702)	(1.728)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	487	487	486	486	487	487	486	486

Notes. Regressions (1)-(4) correspond to random-effect logit regressions to estimate the decision to withdraw. Regressions (5)-(8) correspond to random-effect logit regressions to estimate the decision to keep the funds deposited. All the specification control for gender, age, risk aversion, and cognitive reflection. Robust standard errors are reported in parenthesis. Significance at *** p<0.01, ** p<0.05.

Table B3: Additional analysis for the effect of the priority account on the behavior of depositor 1.

Appendix B.3. Behavior of depositor 2

We follow the same approach as in Appendix Appendix B.2 to examine whether the results for depositor 2 in Table 5 are robust when we include the link 23 as an additional control in the regressions. The results are reported in Table B4. In line with our discussion in the main text, we find that the priority account helps in reducing the likelihood of withdrawal when depositor observes nothing or a withdrawal, but it does not affect the likelihood of keeping the funds deposited. There is also evidence that depositor 2 values the fact of being observed by depositor 3 when nothing is observed; in particular, depositor 2 is more likely to keep the funds deposited if she observes nothing and the link 23 exists.

	Frequency of withdrawal			Frequency of keeping the funds		
	Obs. No	Obs. With	Obs. Keep	Obs. No	Obs. With	Obs. Keep
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment (=1 if T_1)	-3.906***	-4.520***	0.426	0.0803	0.0718	-1.385
	(0.876)	(1.625)	(2.097)	(0.680)	(1.384)	(2.081)
L23	-0.646	-0.633	n.a.	1.026**	-0.0859	1.567
	(0.494)	(0.802)		(0.413)	(0.887)	(1.998)
Obs. Withdrawal						
Obs. Keeping						
Treatment * Obs With						
Treatment * Obs Keep						
Observed bank run	0.801	1.886***	1.919	-0.908	-2.791**	-1.705
	(0.493)	(0.723)	(1.637)	(0.510)	(1.269)	(1.299)
Constant	-2.377	0.286	0.497	3.587	2.492	0.337
	(2.012)	(2.916)	(10.73)	(2.401)	(4.647)	(10.01)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	453	157	158	453	157	158

Notes. Regressions (1)-(3) correspond to random-effect logit regressions to estimate the decision to withdraw. Regressions (4)-(6) correspond to random-effect logit regressions to estimate the decision to keep the funds deposited. We do not include the link 23 in regression (3) because all depositors 2 who observe that depositor 1 kept her funds deposited decided to keep the funds as well if they were linked to depositor 3. All the specification control for gender, age, risk aversion, and cognitive reflection. Robust standard errors are reported in parenthesis. Significance at *** p<0.01, ** p<0.05.

Table B4: Additional analysis for the effect of the priority account on the behavior of depositor 2.