

**Anatomy of a bank panic in an opaque banking sector:
who sees what why.**

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Abstract

In this paper we analyze the connection between bank malfeasance and bank-run in the presence of an exogenous regulatory shock. We use unique transaction level data on wire transfers, which allows us to study the behavior of individual depositors during the bank panic that happened in Russia in 2004. We use monthly bank reports to the Central bank to construct two novel measures of bank malfeasance: offshore banking and money laundering. We consider the interplay between these measures of bank malfeasance, other measures of bank quality with withdrawal of funds by different groups of depositors during and after the bank panic. We find that sophisticated market participants (non-financial companies and banks) that have a business relationship with a given bank seem to be able to deduce its involvement in suspicious offshore operations and act on this information during the bank panic, in addition other banks seems also to observe individual bank's involvement in suspicious money laundering schemes. We further document an interesting heterogeneity in their responses: depositors who are themselves less transparent (or are engaged more in offshore operations themselves) seem to increase their transfers to offshore active while more transparent depositors seem to sharply increase the withdrawal of funds from offshore active banks during and after the bank panic. We also see some evidence of flight to safety on a part of non-financial companies and banks, as they are more likely to transfer funds into banks with higher pre-crisis capital adequacy ratios. We find that this measure, which is observable by all market participants, is of less importance for the behavior of deposit-holders who have strong business relationship with a given bank.

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1. Introduction

Financial panics and contagious bank-runs, in particular, are not very common phenomena but their impacts tend to be quite severe for the affected banks and countries, which makes it critical to understand their nature and determinants. Studying the effects of bank runs empirically is challenging since usually a bank run is caused or at least accompanied by some macroeconomic financial shock. In this regard it is quite difficult to disentangle the impact of bank run per se from that of the underlying macroeconomic shock.

In this paper we study a rare natural experiment when bank panic was caused by improper release of information by the Central Bank of Russia (CBR). Namely, in May 2004 CBR revoked the license of one midsize bank for alleged money laundering and announced plans to close several more banks for such activities but stopped short of providing the actual list of banks under consideration. An ensuing panic obliterated deposits and created liquidity problems in many private banks in Russia. Even the third largest private Russian bank, Alpha-Bank, came under attack. This was a clear case of information-induced bank panic. There were little concerns about individual banks' fundamentals such as loans portfolios or securities holdings, there were no aggregate macroeconomic shocks to the banking system. Another notable feature of this experiment is that all deposits during this episode (interbank, corporate, and household) were completely uninsured. Thus, our results are less likely to be contaminated by the moral hazard effects associated with the presence of the deposit insurance.

In our paper we use this unique shock to analyze the behavior of different groups of depositors during the bank panic. We are interested to analyze whether suspicious bank operations are visible to different types of depositors. More generally we want to understand which bank characteristics are taken into account and by what group of depositors in their decision to withdraw deposits. We look separately at the impact on demand deposits held in a given bank by the following three groups of depositors that are likely to differ in their access to and correct interpretation of bank level information: other banks, non-financial companies, and households.

In our paper we utilize novel individual transaction level dataset and other administrative data to analyze the behavior of different groups of depositors and correlate that behavior with different measures of bank malfeasance and performance. We utilize Central Bank of Russia data to construct measures of individual bank involvement in suspicious offshore activities and cash-only transactions. We also use information from Central Bank database and Banks-Rate agency to

construct standard measures of bank financial performance and soundness such as capital adequacy ratios, return on assets, size, etc. We then relate these measures with behavior of different groups of depositors to see which deposit-holding bank's characteristics are associated with sharp withdrawal of funds and by what groups of depositors during and after the bank panic period. To the best of our knowledge ours is the first study to utilize such detailed microdata for the behavior of individual agents during the bank panic.

We find that most informed groups of depositors: non-financial companies and other banks having business relationship with a given bank seem to observe offshore operations of at this bank and act on this information during banking panic. We further find a very interesting heterogeneity in such informed depositors' behavior. Depositors who themselves are less transparent (either evade taxes or/and conduct a lot of offshore operations) transfer funds into offshore active banks while at the same time more transparent companies and banks withdraw funds from offshore active banks during and after the bank panic. Involvement in cash-only transactions (which we argue is indicative of money laundering schemes conducted by the bank) seems to be a relevant determinant for the behavior of other banks. Again we find that banks having business relationship with a given bank seems to evade banks involved in cash-only transactions.

We also find evidence of flight to safety on a part of less informed agents, i.e. those who do not necessarily have strong business ties with a given bank, as during and after the bank panic they increase transfer of funds into banks with high pre-crisis capitalization levels. Notably, capital adequacy ratios, which are observable to all market participants, are less important determinants of behavior for informed investors, which have strong business ties to a given bank.

Overall our results provide a rare glimpse in the anatomy of a bank run in the economy riddled with agency and regulatory compliance problems.

The rest of the paper proceeds as follows: in Section 2 we describe institutional background behind our study, Section 3 provides description of datasets used and measures constructed, Section 4 contains empirical results, Section 5 concludes.

2. Background: Reputation-based panic in the Russian banking sector in the summer of 2004.

The focus of our study, a reputation-based bank confidence crisis in the Russia, was triggered by the regulatory attempt to clean out the banking system from financial intermediaries

involved in suspicious, semi-legal or outright illegal operations, mostly in the area of capital flight to offshore jurisdictions and/or money laundering facilitation operations.

The clean-up attempt was closely associated with the initial stages of the *de novo* deposit insurance system introduction in Russia. Following the final adoption of the DIS legislation in December 2003, the regulator initiated a number of supervisory measures to enhance prudence and compliance in the banking sector in an attempt to reduce risk exposures of the newly established insurance fund and to screen out banks for mandatory deposit insurance membership². Under the original DIS legislation, banks had to apply for the DIS system acceptance by July 1, 2004 and, following the rigorous on-site examinations, the regulators planned to start issuing deposit insurance acceptance decisions in the early fall of 2004, on the case-by-case basis.

Before the application deadline, the central banks began to enforce the anti-money laundering legislation by closing down Sodbiznesbank, a privately-controlled domestic bank, in May 2004. Notably, this was the very first incidence of closing seemingly solvent bank solely due to the violation of the anti-money laundering legislation. Shortly after that, another bank, Credittrustbank, was promptly closed down for similar accusations. Furthermore, a high-ranked representative of the Central Bank made a public statement on a regulatory intent to proceed with a policy of closures of banks involved in suspicious activities. Since no specific list of such banks was announced, the depositors began to guesstimate the probability of their banks' closures and to withdraw funds from banks they deemed as suspicious. The mass media outlets draw additional public attention to these events thus further triggering the rapidly expanding cascade of bank runs.

Since the DIS was not in effect at that time – all types of depositors, including interbank corporate and retail fund providers - start panicking and preemptively withdrawing their deposited funds. Available macro-level evidence suggests that interbank market was the first to react: as banks start to reevaluate their counterparty risk exposures and the probability of specific banks' closures, the interbank lending rate jumped and the banks' liquidity drained quickly. As early as in May, the turnover on the Russian interbank market dropped by 12.2% and then by another 13.3% in June. Simultaneously, the overnight ruble-denominated interbank lending rate jumped

² For more details of the DIS introduction in Russia, see empirical studies by Chernykh and Cole (2011) and Karas, Pyle and Schoors (2013). Tompson (2004) discusses institutional and legislative details of the process. The 2004 CBR Annual Banking Sector Report included a special Appendix that describes the situation in the Russian banking sector in May – July 2004.

from 2% to 3% APR in the first quarter of 2004 to a volatile 10% to 20% in the second quarter. [{GRAPH and refined description of interest rates HERE}](#)

The retail depositors' run started in June in some Moscow banks. Excluding Sberbank and VTB (two major state-controlled banks), the net withdrawals amounted to RUB 5.2 billion in June and RUB 18.1 billion in July. Starting from July, the runs contagion spread to regional banks. In July, aggregate net withdrawals in regional banks amounted to RUB 6.3 billion. The situation was recognized as dangerous when in early July the Guta-bank, a privately-controlled Moscow bank with a large regional branches network, suspended all repayments to retail depositors. Notably, the traditional macro-level deposit market indicators did not signal any turbulence as the total volume of deposits in the banking system remained relatively stable, suggesting the flight to safety and reallocation flows within this troubled deposit market. Overall, by various estimates from 20 to 27 banks have failed during this crisis episode due to bank run, regulatory closure and illiquidity issues.

To stabilize the situation and to calm down the bank run, liquidity crisis and depositor confidence crisis, the CBR introduced a number of emergency measures, including drastic reduction of the required reserve ratio from 7% to 3.5% (to improve banks' liquidity position) and the regulator-assisted acquisition of a failing private bank, Guta-bank, by a state-controlled VTB bank, thus sending a signal to the market that the central bank is ready to step in for any further required bails out. Most importantly, the original DIS legislation was promptly changed and the CBR issued temporal insurance guarantees for retail deposits in all active commercial banks during the period of the DIS introduction. The revised DIS law guaranteed deposit coverage for depositors of all banks, including those that would not become DIS members and that lost their license after December 27 2003, i.e. after initial DIS law was adopted. Following these nonconventional measures, the bank confidence crisis was essentially resolved. Since August 2004, the interbank market and the retail deposit market were back to normal and exhibited growth.

3. Data description

Our main question is to understand the determinants of a bank run by different groups of depositors. To accomplish this, we bring together several novel datasets from Russia to analyze the interplay between banks financial and non-financial characteristics and probability of the run on the bank from different groups of depositors.

As our main dataset we consider the population of all wire transfers that happened in Russia over 1999-2004. In this dataset we have information about individual transfers with specific fields for the sender, sender's banks where the wire originates, receiver, and the bank where receiver receives the funds. As a result, it allows investigating not only how a particular group of depositors behave, but also allows for differential response to deposit-holding bank characteristics by depositors from the same group on the basis of their own characteristics.

From this dataset we construct measures of flow of funds for individual agents to a given bank as the net sum of all wire transfers received by minus all wire transfers sent by a given agent (company, individual, other bank) at a particular bank in any fixed time period (week).

To avoid scale effects we normalize this measure either by total weekly turnover (sum of the funds sent and received) by a given agent through all banks. This measure effectively shows how sizeable are transfers into/out of a given bank compared to all wire transfer activity of a given economic agent in a given week. Alternatively we calculate another measure of wire transfers where normalization is done by assets of the deposit holding bank, the idea behind this measure is that we see how sizeable a weekly net transfer is for the deposit holding bank.

We are interested how such net transfers are affected during and after the banking panic and whether there are particular characteristics by the deposit holding bank that make it more prone to experience a withdrawal of funds during the bank panic and by what group of depositors.

We consider the following groups of bank level characteristics: a) measures of suspicious banking operations, b) bank financial indicators, c) bank non financial indicators.

We consider two indicators of bank suspicious operations. One is based on bank financial operations through opaque offshore financial centers. We utilize offshore fraction indicator developed by Chernykh and Mityakov (2015). This measure is based on mandatory bank reports to the Central Bank about balances and turnover on correspondent account of all Russian banks in all foreign countries. For a given Russian bank Chernykh and Mityakov (2015) define their offshore activity measure as a ratio of total turnover through correspondent accounts located in offshore jurisdictions to the total turnover through all foreign accounts.

In this paper we also introduce an alternative measure of bank malfeasance: ratio of cash turnover through bank teller windows to total bank assets, the idea being that cash is more likely to be used for semi- and illegal activities by bank's clients, and as a result bank itself. We interpret this score as the measure of bank involvement in money laundering activities. To calculate this

cash activity measure we utilize information from bank balance sheets monthly turnovers data (Forms 101 with turnovers) which are also reported to the Russian Central Bank by all Russian banks.

These two measures are available over 1999-2003, so in our study of the bank panic of 2004 we use means of those over 2003 as fixed characteristics of a given bank.

We take bank financial indicators from Banks-Rate database as well as from mandatory bank reports to the Central Bank. We consider measures of bank profitability (ROA), solvency (capital over assets ratio) and bank size in 2003. (we also control for contemporaneous bank size in all regressions).

Summary statistics for all variables used in our analysis are reported in Table (XXX to be completed).

4. Results

4.1. Transaction level evidence.

We are interested in investigating which bank characteristics are taken into account by individual depositors in their decision to withdraw money out of/ or transfer money into a given bank. To analyze this issue we look at the differential effect of different bank characteristics before, during and after the bank panic. Namely, we consider the following specification:

$$NetTR_{i,j,t} = f_t + \beta_1 RUN_t BC_i + \beta_2 ARUN_t BC_i + \beta_3 ERUN_t BC_i + \alpha BC_i + \gamma X_{i,t} + \epsilon_i \quad (1)$$

Here $NetTR_{i,j,t}$ is the net transfer by agent (company, individual, other bank) j into bank i in week t normalized either by total weekly turnover of agent j or by deposit holding bank i size (assets). BC_i is bank characteristic of interest: e.g. offshore measure, capitalization ratio etc. RUN_t is dummy variable for the period of bank panic (weeks 20-29 in 2004), $ARUN_t$ is dummy for aftershock period (weeks 30-41), and $ERUN_t$ is period after bank panic (after week 42). f_t Are time fixed effects. In some specifications we include individual depositor level fixed effects ϕ_i .

We estimate (1) for different groups of depositors: non-financial companies, individuals, and other banks. We focus on the following three bank i characteristics: offshore banking measure, measure of involvements in cash only transactions, and capital adequacy ratios. All these bank characteristics are measure in 2003 (i.e. before the bank panic period).

Tables 4 contains estimation results about the relationship between offshore operations of a given bank and net transfer of deposits by other banks. We find that there seems to be little connection between offshore operations of any give bank I and net transfer of funds by other banks

out of/into this bank. However, once we restrict the sample to banks that have strong business relationship in the form of correspondent accounts we find that during and after bank panic related banks are more likely to transfer funds into offshore active banks. There is also a very interesting heterogeneity in their responses. Using Braguinsky and Mityakov (2015) tax evasion measure we find that this effect is mostly driven by tax evading deposit-owning banks, while there is still little effect for more transparent banks. Thus, it seems that during and after the bank panic less transparent banks seems to transfer funds into offshore-active banks.

We explore those issues further in Table 4A where we divide deposit owning banks according to their own offshore operations activity. Again conditional on having a strong business relationship in the form of correspondent account, bank with higher involvement in offshore operations are more likely to transfer funds into offshore active banks during and after bank panic. At the same time banks with moderate involvement in offshore operations are likely to shy away from offshore active banks during the same timeframe.

In Table 7 we explore the similar relation between bank offshore operations and net transfer of funds by non-financial companies. Again for the full sample of companiesXbank observations we see very little connection between offshore operations of a given bank and non-financial companies. However, if we constrain our sample to company-bank observations with strong business connection (in this case we proxy such connection by whether non-financial company took any loan from a given bank in 2002-2003) we see that tax evading companies are more likely to transfer funds into and more transparent companies are more likely to transfer funds out of offshore active banks.

Finally, in columns 1 and 2 in Table 9 we explore the similar relation between offshore operations of a given bank and transfer of funds by individual entrepreneurs and individuals. We find that, as a whole, individuals are more likely to run away from offshore active banks during and after the bank panic. However, individuals who are connected by loan relationship with the bank are more likely to transfer funds into offshore active banks. The latter finding is probably not surprising given that individuals in those years rarely got loans from banks, so the sample of individuals and individual entrepreneurs who did get loans from the bank are likely to be bank insiders (top management, owners and members of their inner circle).

We then turn to the analysis of bank cash operations and propensity of its depositors to withdraw funds during and after the bank panic.

In Table 5 we look at cash operations of a given bank and net transfer of funds by other banks. We find that there is a negative relationship between bank involvement in cash-only transactions and net transfer of funds by other banks. This relation is again seems to be driven by more tax evading depositors. In Table 8 and columns 3-4 of Table 9 we explore the similar relation for non-financial companies and individuals but do not find much of an effect.

Finally, we find some evidence of flight to safety before and after the bank panic. In Table 6 we document a positive relations between 2003 capital adequacy ratios of a given bank and net transfer of funds by other banks. It is worth noting that such relation is observed for the whole sample of bank-bank pairs not only for the banks that have business connection in the form of correspondent accounts. If anything, the results are weaker for connected banks, potentially suggesting that publicly available information in the form of capital adequacy ratios is less important determinant of behavior for the banks that are already closely connected to each other.

In Table 9 we look at the similar effects for non-financial companies. We again find evidence of flight to safety on a part of non-financial companies, with the effect being smaller for companies that have loan relationship with a given bank. There is also an interesting heterogeneity in the responses with respect to non-financial companies' tax evasion scores. More transparent (less tax evading) companies seem to transfer funds into higher capitalization banks while for less transparent companies bank capitalization seems to be somewhat less important (in fact during the aftershock and after the bank panic period we see negative effects of capital adequacy ratios). For individual entrepreneurs and individuals in columns 5 and 6 in Table 10 we find surprisingly negative relationship between bank capitalization and transfer of funds.

Overall, we find that bank malfeasance in the form of offshore operations and involvement in cash-only operations is not observed by all market participants. Only banks and non-financial companies connected to a given bank seem to act on this information. This is in contrast to the response to bank capital adequacy ratios which seems to be observable by broad groups of depositors. We further find an interesting dichotomy in the response to offshore banking: banks and non-financial companies that are less transparent seem to intensify their relationship with offshore active banks during and after the bank panic, while more transparent entities seem to limit their ties to such offshore active banks at the same time. We further document flight to safety on part of non-financial companies and other banks, but as expected, capital adequacy ratios seems

to be more important for less informed investors (those who have less strong connections to a given bank).

5. Conclusion

In this paper we look at a unique regulatory shock: pure information induced bank panic which was triggered by unexpected Central Bank closure of one bank and announcement to clean the system of money laundering and offshore active banks.

Using unique administrative data we are able to provide a very detailed view of the ensuing bank panic. We find that malfeasance in the form of suspicious offshore operations and money laundering schemes seems conducted by a given bank to be detected by other banks provided that they have strong business ties with this bank in the form of correspondent accounts connection. We also find that non-financial companies connected to a given bank by means of a loan relationship also seem to observe offshore operations but not money laundering activities.

For offshore operations we also document a very notable heterogeneity in depositors' response: banks/non-financial companies that are themselves less transparent (either involved themselves in suspicious offshore/tax evasion schemes) increase the transfer of funds into offshore active banks during and after the bank panic, while more transparent establishments, if anything, seem to withdraw from such offshore active banks.

Finally, we present some evidence of flight to safety on a part of less informed market participants. During the bank panic non-financial companies and banks that do not have strong business ties with a given bank seem to increase the transfer funds to banks with higher pre-crisis capital adequacy ratios. Notably, capitalization is less important to market participants with close business ties to the bank.

Tables and Figures

Table 4: Offshore operations and net flows to a given bank by other banks.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Dependent variable: Net transfer/total turnover</i>						
Offshore X	-0.001	0.014**	-0.000	0.002	-0.007**	0.014***
1(after Run)	(0.003)	(0.006)	(0.003)	(0.009)	(0.003)	(0.005)
Offshore X	-0.001	0.018***	-0.000	0.004	-0.009**	0.017**
1(aftershock)	(0.003)	(0.007)	(0.003)	(0.007)	(0.004)	(0.007)
Offshore X	0.000	0.010*	-0.003	0.005	-0.002	0.006
1(Run)	(0.002)	(0.005)	(0.002)	(0.006)	(0.002)	(0.004)
Offshore X	0.008*	-0.004	0.020***	-0.004	-0.008	0.003
	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Observations	897,080	189,880	274,342	67,397	483,400	100,410
R-squared	0.119	0.314	0.078	0.286	0.080	0.308
Correspondent relation	Any	Yes	Any	Yes	Any	Yes
Deposit owner tax evasion	Any	Any	Low	Low	High	High
<i>Panel B: Dependent variable: Net transfer/deposit holding bank assets</i>						
Offshore X	-0.668	0.569	-1.551	-1.910	-0.992	1.603
1(after Run)	(0.569)	(1.760)	(0.949)	(2.415)	(0.784)	(2.751)
Offshore X	-1.376**	-0.735	-2.845***	-2.203	-1.663*	-0.310
1(aftershock)	(0.612)	(1.831)	(1.081)	(2.892)	(0.985)	(3.000)
Offshore X	0.103	0.263	-1.396	-0.988	0.497	0.825
1(Run)	(0.599)	(1.297)	(1.058)	(2.662)	(0.783)	(2.130)
Offshore X	-0.561	-0.547	4.508***	-1.271	-3.407***	-0.224
	(0.775)	(1.593)	(1.320)	(1.771)	(1.179)	(2.026)
Observations	897,080	189,880	274,342	67,397	483,400	100,410
R-squared	0.035	0.210	0.033	0.157	0.033	0.221
Correspondent relation	Any	Yes	Any	Yes	Any	Yes
Deposit owner tax evasion	Any	Any	Low	Low	High	High

Notes: Dependent variable is ratio of weekly net transfer by a given deposit owning bank to a particular deposit holding bank divided by total weekly turnover of deposit owning bank (panel A), or divided by total bank assets of deposit holding bank. Sample covers weeks of Jan 2004-Dec 2004. 1(Bank Run) is a dummy variable for (weeks 20-29), 1(aftershock) is a dummy for weeks (30-41), and 1(After Run) is a dummy for weeks 41+. Offshore is a fraction of foreign operations undertaken by a given deposit holding bank that goes through non-transparent offshore zones. Non transparent offshore zones are defined by Russian Central Bank list of offshore localities in 2003. Tax evasion of deposit owning bank is tax evasion measure of Moscow based entities developed by Braguinsky and Mityakov (2015). Low tax evasion indicates sample of banks below the median tax evasion score (specifications (3) and (4)), high tax evasion indicates a sample of banks above the median tax evasion scores (specifications (5) and (6)). Correspondent relation is equal to “Yes” if banks have correspondent accounts in each other. All specifications are estimated by OLS with robust standard errors, clustered at the deposit-holding bank level. ***, **, And * indicate statistical significant at 1%, 5%, and 10% respectively.

Table 4A: Offshore operations and net flows to a given bank by other banks.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	<i>Panel A: Dependent variable: Net transfer/total turnover</i>					
Offshore X	0.000	-0.005*	-0.023***	-0.006	-0.031**	0.048**
1(after Run)	(0.002)	(0.003)	(0.008)	(0.011)	(0.014)	(0.019)
Offshore X	0.001	-0.007*	-0.030***	0.013	-0.033*	0.035**
1(aftershock)	(0.002)	(0.004)	(0.010)	(0.012)	(0.017)	(0.016)
Offshore X	-0.002	-0.004	-0.006	0.002	0.005	0.018
1(Run)	(0.002)	(0.003)	(0.004)	(0.007)	(0.012)	(0.016)
Offshore X	0.026***	0.012***	-0.066***	-0.006	-0.199***	0.022
	(0.004)	(0.005)	(0.015)	(0.010)	(0.021)	(0.017)
Observations	254,803	77,530	102,291	23,453	51,425	10,322
R-squared	0.010	0.006	0.035	0.013	0.178	0.026
Correspondent relation	Any	Yes	Any	Yes	Any	Yes
Deposit owner offshoring	<=20%	<=20%	20%-50%	20%-50%	>=50%	>=50%
VARIABLES	<i>Panel B: Dependent variable: Net transfer/deposit holding bank assets</i>					
Offshore X	-0.188	-1.030	-6.395**	-6.014	-0.254	3.630
1(after Run)	(0.939)	(1.506)	(2.797)	(6.993)	(3.729)	(11.963)
Offshore X	-1.749**	-2.295*	-10.180***	-10.273	6.380*	5.093
1(aftershock)	(0.821)	(1.318)	(3.372)	(9.401)	(3.760)	(7.267)
Offshore X	-0.630	-0.737	-2.992	-5.586	7.762**	10.951
1(Run)	(0.755)	(1.737)	(1.993)	(5.261)	(3.401)	(8.810)
Offshore X	5.483***	1.313	-14.430***	-0.463	-54.057***	7.960
	(1.136)	(1.746)	(4.280)	(5.136)	(5.820)	(6.451)
Observations	254,803	77,530	102,291	23,453	51,425	10,322
R-squared	0.006	0.054	0.027	0.080	0.132	0.089
Correspondent relation	Any	Yes	Any	Yes	Any	Yes
Deposit owner offshoring	<=20%	<=20%	20%-50%	20%-50%	>=50%	>=50%

Notes: Dependent variable is ratio of weekly net transfer by a given deposit owning bank to a particular deposit holding bank divided by total weekly turnover of deposit owning bank (panel A), or divided by total bank assets of deposit holding bank. Sample covers weeks of Jan 2004-Dec 2004. 1(Bank Run) is a dummy variable for (weeks 20-29), 1(aftershock) is a dummy for weeks (30-41), and 1(After Run) is a dummy for weeks 41+. Offshore is a fraction of foreign operations undertaken by a given deposit holding (deposit-owning) bank that goes through non-transparent offshore zones. Non transparent offshore zones are defined by Russian Central Bank list of offshore localities in 2003. Correspondent relation is equal to “Yes” if banks have correspondent accounts in each other. All specifications are estimated by OLS with robust standard errors, clustered at the deposit-holding bank level. ***, **, And * indicate statistical significant at 1%, 5%, and 10% respectively.

Table 5: Cash Operations and net flows by other banks

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	<i>Panel A: Dependent variable: Net transfer/total turnover</i>					
Cash dummy X	0.002	-0.005**	0.001	0.001	0.003*	-0.005*
1(after Run)	(0.002)	(0.002)	(0.001)	(0.003)	(0.001)	(0.003)
Cash dummy X	0.001	-0.007***	0.001	-0.000	0.002	-0.006**
1(aftershock)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)
Cash dummy X	0.002	-0.003	0.001	0.004	0.001	-0.004**
1(Run)	(0.001)	(0.002)	(0.001)	(0.003)	(0.001)	(0.002)
Cash dummy X	-0.007***	-0.005**	0.003	-0.003*	0.002	-0.010***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Observations	978,195	200,224	300,012	71,385	523,860	106,387
R-squared	0.107	0.312	0.066	0.284	0.070	0.308
Correspondent relation	Any	Yes	Any	Yes	Any	Yes
Deposit owner tax evasion	Any	Any	Low	Low	High	High
VARIABLES	<i>Panel B: Dependent variable: Net transfer/deposit holding bank assets</i>					
Cash dummy X	0.086	-0.578	0.118	-0.243	0.604*	-0.530
1(after Run)	(0.226)	(0.590)	(0.400)	(0.819)	(0.332)	(0.881)
Cash dummy X	-0.186	-1.386**	-0.544	-1.702*	0.290	-1.165
1(aftershock)	(0.229)	(0.588)	(0.404)	(0.898)	(0.361)	(0.870)
Cash dummy X	-0.061	-0.845*	-0.413	-1.085	0.173	-0.643
1(Run)	(0.181)	(0.470)	(0.319)	(0.748)	(0.233)	(0.631)
Cash dummy X	-1.241***	-3.474***	-0.730	-3.005***	-1.511***	-3.899***
	(0.311)	(0.743)	(0.551)	(0.758)	(0.493)	(0.924)
Observations	978,195	200,224	300,012	71,385	523,860	106,387
R-squared	0.040	0.231	0.041	0.192	0.034	0.241
Correspondent relation	Any	Yes	Any	Yes	Any	Yes
Deposit owner tax evasion	Any	Any	Low	Low	High	High

Notes: Dependent variable is ratio of weekly net transfer by a given deposit owning bank to a particular deposit holding bank divided by total weekly turnover of deposit owning bank (panel A), or divided by total bank assets of deposit holding bank. Sample covers weeks of Jan 2004-Dec 2004. 1(Bank Run) is a dummy variable for (weeks 20-29), 1(aftershock) is a dummy for weeks (30-41), and 1(After Run) is a dummy for weeks 41+. Cash dummy is a dummy for cash only transactions to exceed 40% of bank total assets, measured in 2002-2003. Tax evasion of deposit owning bank is tax evasion measure of Moscow based entities developed by Braguinsky and Mityakov (2015). Low tax evasion indicates sample of banks below the median tax evasion score (specifications (3) and (4)), high tax evasion indicate a sample of banks above the median tax evasion scores (specifications (5) and (6)). Correspondent relation is equal to “Yes” if banks have correspondent accounts in each other. All specifications are estimated by OLS with robust standard errors, clustered at the deposit-holding bank level. ***, **, and * indicate statistical significant at 1%, 5%, and 10% respectively.

Table 6: Bank capital adequacy in 2003 and net transfer to a given bank

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	<i>Panel A: Dependent variable: Net transfer/total turnover</i>					
Capital 2003	0.030***	0.018*	0.043***	0.010	0.023**	0.015*
1(after Run)	(0.008)	(0.009)	(0.010)	(0.007)	(0.010)	(0.008)
Capital 2003	0.016**	0.021*	0.033***	0.016**	0.004	0.017
1(aftershock)	(0.007)	(0.011)	(0.009)	(0.007)	(0.009)	(0.011)
Capital 2003	0.016***	0.014*	0.020***	0.005	0.002	0.008
1(Run)	(0.005)	(0.008)	(0.006)	(0.005)	(0.005)	(0.007)
Capital 2003	-0.020*	-0.016*	-0.049***	-0.009	-0.034***	-0.008
	(0.010)	(0.009)	(0.013)	(0.007)	(0.011)	(0.008)
Observations	995,327	201,316	304,739	71,824	531,955	106,991
R-squared	0.104	0.311	0.066	0.283	0.070	0.304
Correspondent relation	Any	Yes	Any	Yes	Any	Yes
Deposit owner tax evasion	Any	Any	Low	Low	High	High
VARIABLES	<i>Panel B: Dependent variable: Net transfer/deposit holding bank assets</i>					
Capital 2003	3.490	-0.147	4.545	-7.363	4.131	4.038
1(after Run)	(2.124)	(3.331)	(3.196)	(4.497)	(3.408)	(4.819)
Capital 2003	1.682	2.205	3.085	-4.730	1.773	5.797
1(aftershock)	(1.631)	(3.170)	(3.178)	(4.745)	(2.584)	(4.285)
Capital 2003	1.916**	4.667*	0.114	-1.694	1.818	7.128**
1(Run)	(0.937)	(2.486)	(1.919)	(3.981)	(1.405)	(3.289)
Capital 2003	-0.683	10.207***	0.482	14.859***	1.455	8.689*
	(1.876)	(3.699)	(3.654)	(4.762)	(2.944)	(4.450)
Observations	995,327	201,316	304,739	71,824	531,955	106,991
R-squared	0.041	0.231	0.044	0.194	0.035	0.240
Correspondent relation	Any	Yes	Any	Yes	Any	Yes
Deposit owner tax evasion	Any	Any	Low	Low	High	High

Notes: Dependent variable is ratio of weekly net transfer by a given deposit owning bank to a particular deposit holding bank divided by total weekly turnover of deposit owning bank (panel A), or divided by total bank assets of deposit holding bank. Sample covers weeks of Jan 2004-Dec 2004. 1(Bank Run) is a dummy variable for (weeks 20-29), 1(aftershock) is a dummy for weeks (30-41), and 1(After Run) is a dummy for weeks 41+. Capital 2003 is deposit holding bank capital to total assets ration measures in 2003. Tax evasion of deposit owning bank is tax evasion measure of Moscow based entities developed by Braguinsky and Mityakov (2015). Low tax evasion indicates sample of banks below the median tax evasion score (specifications (3) and (4)), high tax evasion indicates a sample of banks above the median tax evasion scores (specifications (5) and (6)). Correspondent relation is equal to “Yes” if banks have correspondent accounts in each other. All specifications are estimated by OLS with robust standard errors, clustered at the deposit-holding bank level. ***, **, And * indicate statistical significant at 1%, 5%, and 10% respectively.

Table 7: Bank offshore operations and tax evasion of deposit holding companies

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Net transfer over total company weekly turnover					
Offshore X	-0.000	-0.004	-0.003	-0.056	0.002	0.030
1(After Run)	(0.007)	(0.025)	(0.005)	(0.036)	(0.008)	(0.033)
Offshore X	0.004	0.008	0.002	-0.038	0.005	0.034
1(Aftershock)	(0.006)	(0.018)	(0.004)	(0.027)	(0.007)	(0.022)
Offshore X	-0.002	0.000	-0.003	-0.036	-0.001	0.018
1(Run)	(0.004)	(0.015)	(0.003)	(0.022)	(0.005)	(0.019)
offshore	0.063***	0.115***	0.059***	0.067*	0.067***	0.225**
	(0.015)	(0.044)	(0.011)	(0.036)	(0.019)	(0.101)
Observations	11,843,042	64,464	4,945,838	27,525	6,897,204	36,939
R-squared	0.164	0.605	0.160	0.618	0.165	0.593
Loan connection	Any	Yes	Any	Yes	Any	Yes
Deposit holder tax evasion	Any	Any	Low	Low	High	High
VARIABLES	(19)	(20)	(21)	(22)	(23)	(24)
	Panel B: Net transfer over holding bank assets					
Offshore X	0.070***	0.062	0.065***	-0.361	0.074**	0.362
1(After Run)	(0.026)	(0.249)	(0.024)	(0.391)	(0.029)	(0.316)
Offshore X	0.051***	0.059	0.049***	-0.311	0.052***	0.277
1(Aftershock)	(0.017)	(0.185)	(0.018)	(0.321)	(0.019)	(0.238)
Offshore X	0.025***	-0.065	0.020**	-0.479	0.028**	0.156
1(Run)	(0.009)	(0.159)	(0.009)	(0.310)	(0.012)	(0.204)
offshore	0.074*	0.893	0.064	0.041	0.083*	2.763***
	(0.041)	(0.667)	(0.040)	(0.830)	(0.044)	(0.971)
Observations	11,843,042	64,464	4,945,838	27,525	6,897,204	36,939
R-squared	0.127	0.428	0.158	0.420	0.101	0.438
Loan connection	Any	Yes	Any	Yes	Any	Yes
Deposit holder tax evasion	Any	Any	Low	Low	High	High

Notes: Dependent variable is ratio of weekly net transfer by a given deposit owning non-financial company to a particular deposit holding bank divided by total weekly turnover of deposit owning bank (panel A), or divided by total bank assets of deposit holding bank. Sample covers weeks of Jan 2004-Dec 2004. 1(Bank Run) is a dummy variable for (weeks 20-29), 1(aftershock) is a dummy for weeks (30-41), and 1(After Run) is a dummy for weeks 41+. Offshore is a fraction of foreign operations undertaken by a given deposit holding bank that goes through non-transparent offshore zones. Non transparent offshore zones are defined by Russian Central Bank list of offshore localities in 2003. Tax evasion of deposit owning non-financial companies is tax evasion measure of Moscow based entities developed by Braguinsky and Mityakov (2015). Low tax evasion indicates sample of companies below the median tax evasion score (specifications (3) and (4)), high tax evasion indicates a sample of companies above the median tax evasion scores (specifications (5) and (6)). Loan relation is equal to “Yes” if a company borrowed funds from the deposit holding bank in 2002-200. All specifications are estimated by OLS with robust standard errors, clustered at the deposit-holding bank level. ***, **, and * indicate statistical significant at 1%, 5%, and 10% respectively.

Table 8: Bank cash only transactions and tax evasion of deposit holding companies

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Panel A: Net transfer over total company weekly turnover					
Cash dummy X	0.000	-0.001	-0.001	0.005	0.001	-0.004
1(After Run)	(0.004)	(0.016)	(0.003)	(0.017)	(0.006)	(0.020)
Cash dummy X	0.001	0.003	-0.000	0.014	0.002	-0.004
1(Aftershock)	(0.005)	(0.011)	(0.003)	(0.013)	(0.006)	(0.014)
Cash dummy X	0.004	-0.012	0.001	-0.014	0.005	-0.011
1(Run)	(0.003)	(0.007)	(0.002)	(0.011)	(0.004)	(0.009)
Cash dummy	-0.009	-0.020	-0.001	-0.011	-0.015*	-0.031
	(0.007)	(0.018)	(0.005)	(0.024)	(0.009)	(0.027)
Observations	12,578,168	75,639	5,252,730	31,056	7,325,438	44,583
R-squared	0.149	0.605	0.147	0.618	0.150	0.592
Loan connection	Any	Yes	Any	Yes	Any	Yes
Deposit holder tax evasion	Any	Any	Low	Low	High	High
	(19)	(20)	(21)	(22)	(23)	(24)
VARIABLES	Panel B: Net transfer over holding bank assets					
Cash dummy X	0.017	0.199*	0.015	0.179	0.018	0.222
1(After Run)	(0.016)	(0.106)	(0.015)	(0.126)	(0.017)	(0.149)
Cash dummy X	0.016	0.191*	0.014	0.275**	0.017	0.136
1(Aftershock)	(0.011)	(0.098)	(0.012)	(0.137)	(0.012)	(0.127)
Cash dummy X	0.012*	0.005	0.009	-0.109	0.015**	0.077
1(Run)	(0.007)	(0.085)	(0.008)	(0.125)	(0.008)	(0.110)
Cash dummy	-0.008	-0.684***	-0.008	-0.753**	-0.008	-0.605*
	(0.019)	(0.253)	(0.019)	(0.382)	(0.019)	(0.328)
Observations	12,578,168	75,639	5,252,730	31,056	7,325,438	44,583
R-squared	0.125	0.441	0.150	0.436	0.105	0.443
Loan connection	Any	Yes	Any	Yes	Any	Yes
Deposit holder tax evasion	Any	Any	Low	Low	High	High

Notes: Dependent variable is ratio of weekly net transfer by a given deposit owning non-financial company to a particular deposit holding bank divided by total weekly turnover of deposit owning bank (panel A), or divided by total bank assets of deposit holding bank. Sample covers weeks of Jan 2004-Dec 2004. 1(Bank Run) is a dummy variable for (weeks 20-29), 1(aftershock) is a dummy for weeks (30-41), and 1(After Run) is a dummy for weeks 41+. Cash dummy is a dummy for cash only transactions to exceed 40% of bank total assets, measured in 2002-2003. Tax evasion of deposit owning non-financial companies is tax evasion measure of Moscow based entities developed by Braguinsky and Mityakov (2015). Low tax evasion indicates sample of companies below the median tax evasion score (specifications (3) and (4)), high tax evasion indicates a sample of companies above the median tax evasion scores (specifications (5) and (6)). Loan relation is equal to "Yes" if a company borrowed funds from the deposit holding bank in 2002-200. All specifications are estimated by OLS with robust standard errors, clustered at the deposit-holding bank level. ***, **, And * indicate statistical significant at 1%, 5%, and 10% respectively.

Table 9: Bank capital adequacy and tax evasion of deposit holding companies

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Net transfer over total company weekly turnover						
Capital 2003 X	0.038***	0.006	0.021**	0.053	0.050***	-0.026
1(After Run)	(0.013)	(0.026)	(0.009)	(0.036)	(0.017)	(0.035)
Capital 2003 X	0.038***	0.019	0.023***	0.054	0.049***	-0.005
1(Aftershock)	(0.013)	(0.025)	(0.009)	(0.038)	(0.016)	(0.030)
Capital 2003 X	0.016*	0.046**	0.008	0.053*	0.021*	0.040*
1(Run)	(0.008)	(0.018)	(0.005)	(0.028)	(0.011)	(0.024)
capital_2003	-0.032	-0.006	-0.019	-0.105	-0.041	0.094
	(0.028)	(0.074)	(0.021)	(0.064)	(0.035)	(0.128)
Observations	12,689,335	77,044	5,295,553	31,639	7,393,782	45,405
R-squared	0.147	0.605	0.145	0.617	0.148	0.592
Loan connection	Any	Yes	Any	Yes	Any	Yes
Deposit holder tax evasion	Any	Any	Low	Low	High	High
VARIABLES	(19)	(20)	(21)	(22)	(23)	(24)
Panel B: Net transfer over holding bank assets						
Capital 2003 X	0.570***	-0.644**	0.526***	-0.421	0.601***	-0.790**
1(After Run)	(0.119)	(0.279)	(0.115)	(0.432)	(0.126)	(0.388)
Capital 2003 X	0.431***	-0.293	0.422***	-0.294	0.437***	-0.311
1(Aftershock)	(0.106)	(0.267)	(0.103)	(0.447)	(0.111)	(0.314)
Capital 2003 X	0.193***	-0.240	0.214***	-0.328	0.179***	-0.163
1(Run)	(0.041)	(0.203)	(0.047)	(0.342)	(0.040)	(0.264)
capital_2003	0.023	-2.299**	-0.026	-1.855	0.061	-2.636**
	(0.093)	(1.014)	(0.084)	(1.494)	(0.104)	(1.331)
Observations	12,689,335	77,044	5,295,553	31,639	7,393,782	45,405
R-squared	0.129	0.441	0.152	0.436	0.112	0.445
Loan connection	Any	Yes	Any	Yes	Any	Yes
Deposit holder tax evasion	Any	Any	Low	Low	High	High

Notes: Dependent variable is ratio of weekly net transfer by a given deposit owning non-financial company to a particular deposit holding bank divided by total weekly turnover of deposit owning bank (panel A), or divided by total bank assets of deposit holding bank. Sample covers weeks of Jan 2004-Dec 2004. 1(Bank Run) is a dummy variable for (weeks 20-29), 1(aftershock) is a dummy for weeks (30-41), and 1(After Run) is a dummy for weeks 41+. Capital 2003 is deposit holding bank capital to total assets ration measures in 2003. Tax evasion of deposit owning non-financial companies is tax evasion measure of Moscow based entities developed by Braguinsky and Mityakov (2015). Low tax evasion indicates sample of companies below the median tax evasion score (specifications (3) and (4)), high tax evasion indicates a sample of companies above the median tax evasion scores (specifications (5) and (6)). Loan relation is equal to "Yes" if a company borrowed funds from the deposit holding bank in 2002-200. All specifications are estimated by OLS with robust standard errors, clustered at the deposit-holding bank level. ***, **, And * indicate statistical significant at 1%, 5%, and 10% respectively.

Table 10: Net transfer by individuals

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Net transfer over total company weekly turnover					
Offshore X	-0.030**	0.471***				
1(After Run)	(0.014)	(0.110)				
Offshore X	-0.021*	0.109*				
1(Aftershock)	(0.011)	(0.056)				
Offshore X	-0.005	0.095				
1(Run)	(0.009)	(0.076)				
offshore	0.316***	0.525				
	(0.030)	(0.327)				
Cash dummy						
X			-0.012	-0.004		
1(After Run)			(0.011)	(0.029)		
Cash dummy						
X			-0.013	0.005		
1(Aftershock)			(0.010)	(0.014)		
Cash dummy						
X			-0.003	0.014		
1(Run)			(0.006)	(0.014)		
Cash dummy			-0.112***	0.384***		
			(0.024)	(0.047)		
Capital 2003						
X					-0.067**	0.037
1(After Run)					(0.026)	(0.085)
Capital 2003						
X					-0.037	0.117
1(Aftershock)					(0.023)	(0.085)
Capital 2003						
X					-0.012	0.018
1(Run)					(0.014)	(0.062)
capital_2003					0.462***	0.562**
					(0.050)	(0.227)
Constant	-0.063***	-0.115	0.064***	-0.681***	-0.047***	-0.493***
	(0.024)	(0.168)	(0.010)	(0.044)	(0.015)	(0.044)
Observations	2,298,909	2,765	2,524,818	5,151	2,553,874	5,310
R-squared	0.283	0.628	0.238	0.598	0.235	0.576
Loan relation	Any	Yes	Any	Yes	Any	Yes

Notes: Dependent variable is ratio of weekly net transfer by a given deposit owning individual to a particular deposit holding bank divided by total weekly turnover of deposit owning bank. Sample covers weeks of Jan 2004-Dec 2004. 1(Bank Run) is a dummy variable for (weeks 20-29), 1(aftershock) is a dummy for weeks (30-41), and 1(After Run) is a dummy for weeks 41+. Offshore is a fraction of foreign operations undertaken by a given deposit holding bank that goes through non-transparent offshore zones. Non transparent offshore zones are defined by Russian Central Bank list of offshore localities in 2003. Cash dummy is a dummy for cash only transactions to exceed 40% of bank total assets, measured in 2002-2003. Capital 2003 is deposit holding bank capital to total assets ration measures in 2003. Loan relation is equal to "Yes" if a individual borrowed funds from the deposit holding bank in 2002-200. All specifications are estimated by OLS with robust standard errors, clustered at the deposit-holding bank level. ***, **, and * indicate statistical significant at 1%, 5%, and 10% respectively.

Table 11: Net transfer by individuals

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Net transfer over holding bank assets					
Offshore X	0.026**	0.402**				
1(After Run)	(0.012)	(0.188)				
Offshore X	0.025***	0.103				
1(Aftershock)	(0.009)	(0.111)				
Offshore X	0.006	0.043				
1(Run)	(0.005)	(0.110)				
offshore	0.141***	1.046*				
	(0.023)	(0.606)				
Cash dummy						
X			-0.014**	-0.008		
1(After Run)			(0.006)	(0.050)		
Cash dummy						
X			-0.009*	0.020		
1(Aftershock)			(0.005)	(0.033)		
Cash dummy						
X			-0.003	0.046		
1(Run)			(0.003)	(0.037)		
Cash dummy			-0.060***	0.724***		
			(0.012)	(0.090)		
Capital 2003						
X					0.178***	0.068
1(After Run)					(0.049)	(0.175)
Capital 2003						
X					0.146***	0.031
1(Aftershock)					(0.036)	(0.142)
Capital 2003						
X					0.078***	-0.056
1(Run)					(0.024)	(0.156)
capital_2003					0.612***	-0.219
					(0.073)	(0.341)
Constant	0.072***	-0.241	0.079***	-1.445***	-0.078***	-0.861***
	(0.020)	(0.328)	(0.010)	(0.111)	(0.014)	(0.092)
Observations	2,298,909	2,765	2,524,818	5,151	2,553,874	5,310
R-squared	0.212	0.600	0.198	0.630	0.243	0.611
Loan relation	Any	Yes	Any	Yes	Any	Yes

Notes: Dependent variable is ratio of weekly net transfer by a given deposit owning individual to a particular deposit holding bank divided by total assets of deposit owning bank. Sample covers weeks of Jan 2004-Dec 2004. 1(Bank Run) is a dummy variable for (weeks 20-29), 1(aftershock) is a dummy for weeks (30-41), and 1(After Run) is a dummy for weeks 41+. Offshore is a fraction of foreign operations undertaken by a given deposit holding bank that goes through non-transparent offshore zones. Non transparent offshore zones are defined by Russian Central Bank list of offshore localities in 2003. Cash dummy is a dummy for cash only transactions to exceed 40% of bank total assets, measured in 2002-2003. Capital 2003 is deposit holding bank capital to total assets ration measures in 2003. Loan relation is equal to "Yes" if a individual borrowed funds from the deposit holding bank in 2002-200. All specifications are estimated by OLS with robust standard errors, clustered at the deposit-holding bank level. ***, **, And * indicate statistical significant at 1%, 5%, and 10% respectively.