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CURRENCY SHIFTS AS A MARKET DISCIPLINE DEVICE: THE CASE OF THE RUSSIAN MARKET FOR PERSONAL DEPOSITS[3,4]

Market discipline in the personal deposit market is of great importance for regulators. In developing economies, which rely much and are dependent on the dollar and euro, changes in the currency structure of the deposits may be strategic and work as an additional disciplining mechanism. Our study sheds light on this mechanism of currency shifts in the Russian market for personal deposits. Using data on more than 900 Russian banks for 2005–2015, we provide evidence that less risky banks—at least in terms of capital adequacy and liquidity—demonstrate higher growth of both the volume and the share of deposits denominated in foreign currency, even when the exchange rate volatility component is extracted. This mechanism continued working during the financial crisis of 2008–2009.

Keywords: Market discipline, Personal deposits, Currency shifts, Russia
JEL: G21, G01, P2

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I. Introduction

Bank deposits are one of the traditional bank products exposed to the risk of bank default. If deposits are denominated in foreign currency, investors should assume the additional risks associated with exchange rate volatility. However the foreign currency denomination—as it is chosen by depositor—can be used as an additional instrument to hedge default risks. Thus in deposit markets where opening deposits in foreign currency—usually dollars or euros—and the transfer of deposited funds from one currency to another are allowed, are costless and are widespread, the deposit portfolio currency structure may be considered as a strategic decision of a depositor hedging the default risk. The currency shifts, therefore, may be added to the list of market discipline mechanisms.

Market discipline implies that banks' depositors change their financial strategies in response to increased risk-taking by their banks. If market participants have relevant information about their bank's riskiness—which has been stimulated by the disclosure guidelines of the Basel Committee on Bank Supervision, including Pillar III of Basel II—they can efficiently allocate their funds and manage the risks they face (Nier & Baumann 2006). Considering depositors, two mechanisms are usually analysed. Disciplining by price originates from the financial market efficiency theories. It implies that depositors require higher interest rates in riskier banks. According to the quantitative mechanism, the depositors reduce or withdraw their deposits as the bank's riskiness grows. Riskier banks face certain difficulties in attracting additional deposits even offering higher interest rates. One of the extensions of the quantitative disciplining discussions leads to the mechanism of maturity shifts. If the changes in quantity are not observed, this may be due to changes in the structure of the deposits. In particular, the depositors of risker banks switch from riskier long-term deposits to short-term or even on-call ones.

In this paper we continue developing the logic of shifts in deposit structure focusing on a mechanism of market discipline that has not been covered previously in the literature—the mechanism of currency shifts. It implies that more reliable banks attract more funds in foreign currency and show a higher foreign currency deposit share in total personal deposits. This mechanism is important for developing markets and banking systems in or after transition, as these economies are closely tied to the dollar or euro exchange rates, and those currencies are considered to be more stable and reliable than the national currencies.

Russia is a good example of an economy where currency shifts may be a disciplining mechanism. Figure 1 and

Figure 2 show the dynamics of volumes and interest rates in this market[5]. In recent years the share of personal deposits denominated in foreign currency grew to 30% in 2015. This was accompanied by the growth of the volume of these deposits (see Figure 1) even if we consider the volume cleaned from the influence of the exchange rate volatility, which caused the national currency to depreciate twofold (see

Figure 2). This trend is not disturbed by the slow, but persistent reduction of interest rates, which we observe for several years before the mid-2014 and—after a jump in the end of 2014—for the whole 2015.

Figure 1. Personal foreign currency deposits: total amount, share in total deposits, interest rates[6]

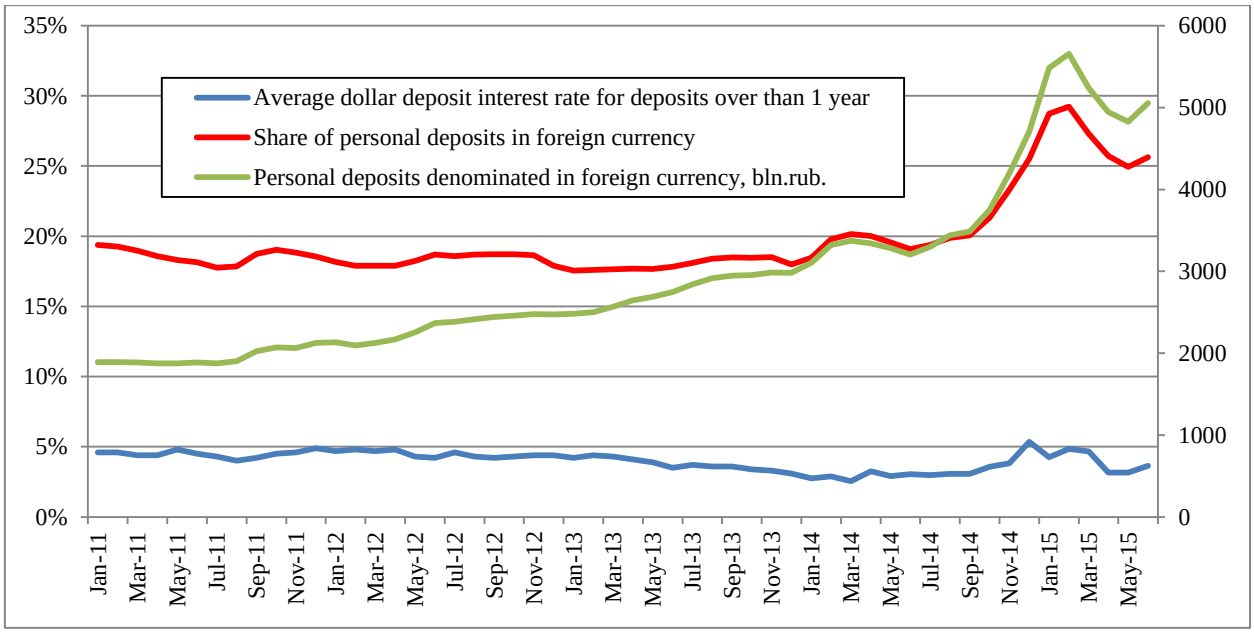
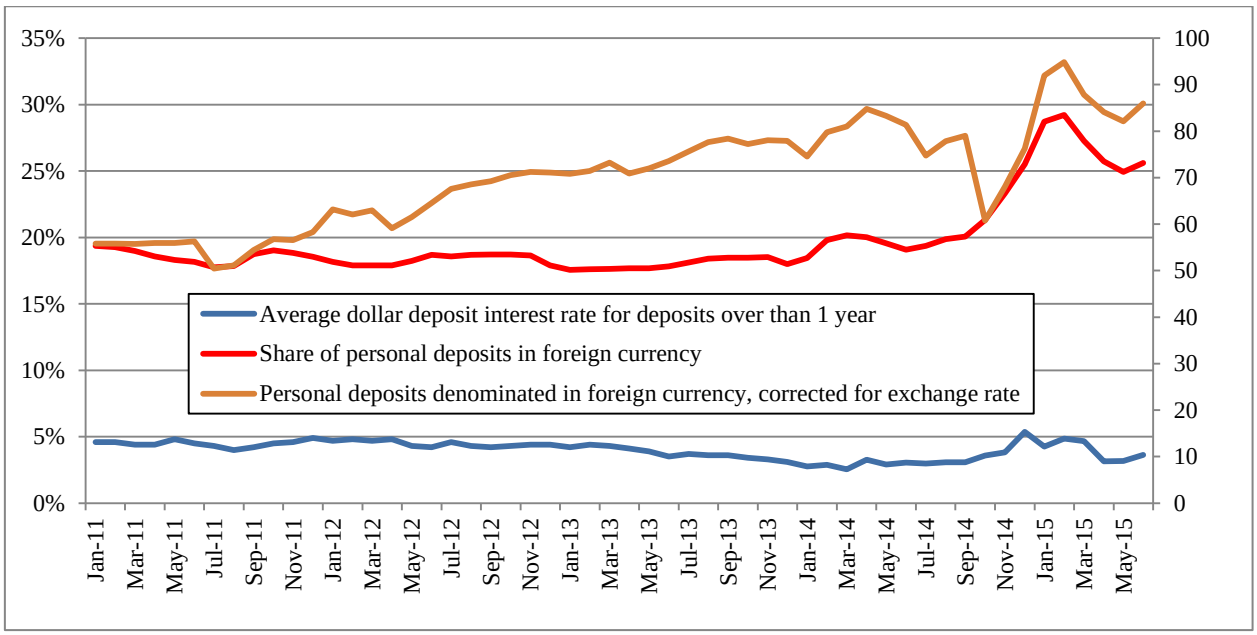


Figure 2. Personal foreign currency deposits: total amount, corrected for exchange rate[7]

[5] We show the dynamics for the interest rate for dollar deposits, for those in euro it is virtually the same
[6] Data source: the CBR
[7] Data source: the CBR



We assume that depositors open foreign currency deposits in reliable banks, ensuring double protection for their savings: they protect their funds from both the risk of national currency depreciation and the risk of bank failure. Moreover, this compensates lower returns on these deposits, because the foreign currency itself is constantly increasing in price. Thus, the purpose of this study is to find out whether the disciplinary mechanism of currency shifts works in the Russian market of personal deposits. To the best of our knowledge this is the first paper examining this mechanism.

Recent events in the Russian deposit market indicate that holders of foreign currency deposits face an additional risk appearing at the stage when the bank is going bankrupt. In late 2015 one of large Russian banks—Vneshprombank—start moving step by step towards bankruptcy. It was not allowed attract additional funds, then it was announced it would lose its license. In January, 2016, the Central Bank of Russian Federation (CBR) announced that the deposit insurance repayment will be made at the exchange rate at the date of the moratorium (which is normally the insurance case), rather than at the date of the revocation of the license, which caused losses to depositors of 8.2 rubles per deposited dollar. Another example of improper performance of risky banks with respect to deposits denominated in foreign currency was the bank Express-Volga, which was under restructuring by the regulators at the end of January 2016. It announced that holders of foreign currency deposits will be served only at the head office of the bank, whose offices are located in 14 regions of Russia. These cases provide additional support of our hypothesis that in Russia depositors prefer more reliable banks for their foreign currency savings.

The rest of the paper has the following structure. Section II briefly describes the literature on market discipline and deposit dollarization. Sections III and IV present the methodology and data used. Section V shows the results and Section VI concludes.

II. Literature

Our paper adds to two large bodies of literature. The first describes the peculiarities of market discipline in bank deposit markets in different countries. The second reveals the reasons for deposit dollarization in developing markets.

a. Market discipline

Empirical studies, focused on depositor sensitivity to bank risks, appeared in the beginning of 1990s. Market discipline gathered much attention in mid-2000s, when it was introduced as a separate Pillar in Basel II, implying that enhanced transparency is required to increase the efficiency of the banking markets and increase the stability of the whole banking system. Many studies are focused solely on disciplining by price. These papers mostly provide the evidence for US banks (see, for example, (Ellis & Flannery 1992)*;* (Hannan & Hanweck 1988), (Landskroner & Paroush 2008)). A considerable number of studies deal with the quantity mechanism of market discipline. Goldberg & Hudgins (1996), using data from 1986 to 1989, show that unsafe banks in the US revealed a declining share of uninsured deposits prior to bank liquidation, and those banks attracted less uninsured deposits in comparison to the solvent ones. In 2002 the authors used quarterly data from the US banking system from 1984 to 1994. Besides the fact that the functioning of market discipline was confirmed, the researchers concluded that even insured depositors are sensitive to bank risks (Goldberg & Hudgins 2002).

A large number of studies comprise both quantity- and price-based mechanisms of market discipline. Using the data on American banks from 1985 to 1995, Park (1995) states that higher bank risks make the deposit supply curve shift to the left, and the demand curve shift to the right. This makes banks with a higher probability of default offer higher interest rates and attract fewer deposits. He shows that the shift of the supply curve is more significant than the shift of the demand curve and, thus, a quantity-based mechanism has more impact on the new equilibrium than a price mechanism does. Depositor sensitivity to bank risks can be evidenced not only in the market of uninsured depositors but also in the market of insured depositors. Park & Peristiani (1998) show that for both mechanisms, using American quarterly data from 1986 to 1990, depositor unwillingness to keep money in an unreliable bank can be explained by the indirect drawbacks that arise during bank liquidation, for instance, waiting for insurance

compensation and the stress associated with the event.

There are many studies on market discipline in other countries including developing ones. Martinez Peria & Schmukler (2001) explain market discipline performance using the data on the Argentinian, Chilean and Mexican banking sectors in the 1980s and 1990s. They conclude that all depositors, including insured households withdraw their savings from banks in response to high risks. Murata & Hori (2006), taking as an example deposits market in Japan in the 1990s, reveal that deposit growth is negatively correlated with bank risk indicators, while interest rates show a positive correlation. Uchida & Satake (2009) confirm this conclusion and show that information disclosure on the financial characteristics of a bank enables depositors and creditors to have a disciplinary impact on bank management. Thus banks with higher volumes of deposits and more depositors are more efficient. Beyhaghi et al. (2014) studied the Canadian banking system and show that depositors are sensitive to liquidity level, to business structure and to the structure of bank expenses. The depositors of the largest banks, however, rely on state guarantees and, as a result, market discipline vanishes. Arnold et al. (2016) demonstrate market discipline functioning in the German banking sector in the period from 2003 to 2012. They state that despite the period of crisis and the implementation of complete insurance cover of deposits, depositors remained sensitive to the financial condition of the bank. Aysan et al. (2015) studied market discipline for Islamic banks in Turkey after the 2000 crisis. They show that there are both quantitative and price disciplining with the former being much more pronounced. Hou et al. (2016) show there is market discipline in Chinese bank deposits. In addition to the analyses of the impact of bank risk on deposit growth, and interest rates on deposits, the authors noticed that market discipline strengthened along with the development of the internet and the extensive use of electronic forms of accounting.

Demirgüç-Kunt & Huizinga (1999) evaluate market discipline using a large sample of countries from 1990 to 1999. First, they prove that in the majority of countries, depositors are sensitive to changing bank risk. Second, they showed that along with an increase of the volume of insured deposits and the enhancement of the state guarantees, market discipline decays. This is explained by incomplete trust or the absence of trust in the deposit insurance system, and by the difficulty in getting the insured amount back if a bank is liquidated.

There are also many papers dealing with market discipline in Russia. The first paper mentioning depositor sensitivity to bank risks in the Russian banking market is Hosono et al. (2004). They looked for the evidence of market discipline in 60 countries and found none in Russia. Karas et al. (2006), on the contrary, prove the existence of market discipline in Russia, showing that both firms and households reduced the number of deposits in banks that demonstrated high risk levels. Banks with high indicators of capitalization, liquidity and a high

quality loan portfolio experienced increased deposit inflow. Evidence of price-based disciplining is, however, weak. Ungan et al. (2008) also provide evidence for disciplining by quantity rather than by price in the Russian market for personal deposits. Karas et al. (2010) state that banks with a low level of capital adequacy show lower a regressive norm of deposit growth and higher deposit interest rates on deposits. Along with increasing deposit profitability starting from a certain interest rate, the supply curve of deposits has a back-bending. Finally, Karas et al. (2013) prove presence of both mechanisms of market discipline in Russia and state that firms are more sensitive to bank risks than households. When the deposit insurance system was introduced in 2004, market discipline on the part of firms remained the same and market discipline on the part of private individuals declined, as depositors were no longer afraid to lose their savings and were more likely to choose a bank with more attractive deposit conditions rather than to choose a more reliable bank with higher capital adequacy and liquidity. Peresetsky et al. (2007) focus on the price mechanism and analyse to what extent differences in deposit interest rates may be explained by the financial indicators of banks. They show that depositors can monitor the financial conditions of the banks and ask for higher returns from banks with riskier financial policy. This was undermined by the deposit insurance introduction, however (Peresetsky 2008).

There is a widespread opinion that there are only two mechanisms of market discipline, quantity-based and price-based. Nevertheless, some scholars suggest a more detailed classification. Examining market discipline in Russia, Semenova (2007) declares that depositors withdraw money from their accounts in response to a bank's low level of capital adequacy, a higher share of working capital and a higher share of loans in assets. Besides this quantity-based mechanism of market discipline, she describes maturity shifts as another important new tool of market discipline. Depositors react to the size of the bank and to the number of non-performing loans: along with the growth of bank assets, depositors prefer to open longer term deposits, whereas with an increasing number of non-performing loans, they tend to have shorter term deposits. Hence, the mechanism of maturity shifts presumes a shift of the time structure of deposits in favour of short-term deposits in banks with high risks. This mechanism is also mentioned in Murata & Hori (2006) for Japan.

We continue this line of literature, developing the set of quantity-based mechanisms. None of the studies mentioned examine another possibility of hedging risk using the shifts in deposit currency structure. That brings us close to another stream of literature, dealing with deposit dollarization.

b. Deposit dollarization

Dollarization denotes holding assets and liabilities denominated in foreign currency (Ize &

Yeyati 2003). The literature related to our paper is aimed at determining the economic and social incentives to hold deposits denominated in foreign currency, and the fundamental reasons for shifting from one currency into another. Many of them are cross-country studies. Agénor & Khan (1996) state that the main rationale for a choice between domestic and foreign currency are the foreign exchange rate and the expected parallel market volatility of the exchange rate. Moreover, they note that a shift to a foreign currency is sensible in the circumstances of high domestic inflation rate and weak government power. They provide an example of less-developed countries with hyperinflation and weaker government, whereas the majority of transactions take place off-market and typically in foreign currency. Honohan & Shi (2002) investigate the phenomenon of deposit dollarization using panel data from 58 developing economies. They show that higher volatility of domestic inflation positively influences the share of deposits in foreign currency whereas higher volatility of real exchange rate has the opposite effect on the share of currency deposits. Furthermore, they note that banks with a higher share of dollar deposits increase the supply of currency loans to hedge the exchange risk. Although some countries try to maintain a credible rate of national currency and a stable macroeconomic environment, the authors find there is a trend to increased use of foreign currency deposits in most economies. Ize & Yeyati (2003) show that the currency regime and inflation targeting have a major impact on the currency preferences of depositors. A floating exchange rate and maintaining stable inflation incentivises residents to keep their savings in domestic currency. And conversely, a fixed exchange-rate system in circumstances of high inflation leads to a shift to foreign currency. De Nicoló et al. (2005) support arguments that macroeconomic policy and institutional changes can affect the choice of the preferred deposit currency. The ratio of deposits in foreign currency positively correlates to inflation, domestic currency depreciation, the conjunctional correlation of both, and governmental regulation.

Other papers focus on the determinants of dollarization in particular countries. Using data from Argentina during the recession period of 2002–2003, Colacelli & Blackburn (2009) prove that dollarization can emerge with a low supply of domestic currency and minor exchange costs between currencies. Yinusa & Akinlo (2008) search for determinants of currency substitution using the data from Nigeria. They discover that capital account liberalization coupled with macroeconomic imbalances, such as exchange rate volatility, cause a shift in deposit currency structure. Foreign currency deposits are mostly held by agents to hedge against inflation and the risk of depreciation. The authors also point out that the individual parameters of an agent, such as the possession of a car, education level and occupation can also affect the agent's willingness to use an alternative currency. Ma & McCauley (2002) analyse dollarization in Chinese banks in early 2000s and focus on the Chinese stock market reform in 2001, when the Chinese

government allowed savings held in foreign currency to be invested in securities on stock exchange. This led to excess demand for dollars and a dollarization problem. Brown et al. (2015) scrutinise the relationship between inflation and dollarization on the basis of inter-regional data from the Russian banking system. They believe that inflation generates expectations of exchange rate growth and that this contributes to dollarization. The results show that households in regions characterized by higher inflation prefer to make their deposits in foreign currency, in comparison with those regions where price levels are more stable. Prean & Stix (2011) show how the financial crisis influenced people's trust in banks and in domestic currency using the example of the Croatian banking system. Due to expectations of high inflation and exchange rate volatility, the 2008 crisis induced a large demand for cash in foreign currency, despite the deposit insurance system.

Some scholars, however, discuss the positive side to dollarization. McKinnon (1963) points out that the co-existence of various monetary and financial areas allows an increase in the income of individual countries and solves the unemployment problem. A country's export and import profile can influence the choice in favour of foreign currency, despite the inflation level and domestic currency depreciation, but that does nothing to effect the macroeconomic situation deterioration. Considering Mexico, where foreign currency deposits emerged even prior to opening of the Mexican central bank in 1925, Ortiz (1983) argues that there is nothing bad about the dollarization of savings deposits, as depositors simply considered the dollar as a substitute to the peso and do not draw money out of the country. This allows the bank to deploy funds to finance the economy and to generate profit. Craig & Waller (2004) determine that dollarization is a widespread phenomenon in developing countries. In these countries a stable dollar is most frequently an exchange tool alongside a risky domestic currency, which is unsecured against a loss of purchasing power due to inflation or political instability. The authors have shown that with transition to the dollar instead of domestic currency, and with a fixed exchange rate social welfare will reach its maximum point.

So far the literature suggests that depositors prefer to save money in foreign currency due to expectations of high inflation or high exchange rate volatility. The price level within a country and the exchange rate can depend on the government's domestic and foreign policies. Some academics consider dollarization as the optimal resource allocation and the maximisation of social welfare, others argue that dollarization represents a major threat to the financial system of a country. Due to the high volatility of the exchange rate and high inflation in Russia, depositors may prefer to keep their savings in foreign currency. Choosing a solvent bank allows not only the preservation of the asset denominated in foreign currency, which is growing in value, but also obtaining the yield. So we argue that bank fundamentals may determine the depositors'

choice of the currency structure of their portfolio.

III. Methodology

To discover the mechanism of currency shifts we analyse the sensitivity of the growth of the foreign currency deposit share to bank risks. We presume that depositors react to increased risk-taking indicators by investing more in deposits denominated in foreign currency and, therefore, changing the currency structure more intensively. To support our results we also examine the traditional quantity-based mechanism of market discipline, but applied to deposits in foreign currency. We study the sensitivity of the growth rate of these deposits to banks riskiness. We also control for the deposit profitability, the currency exchange rate and overall macroeconomic conditions. We estimate the following regressions, dealing with the share growth (1) and deposit growth (2):

$$SGROWTH_{i,t} = \alpha_{si} + \mu_{s1} SGROWTH_{i,t-1} + \mu_{s2} SHARE_{i,t-1} + \beta_s BF_{i,t-1} + \gamma_s IR\_DIF_{i,t} + \omega_{s1} EXCH_{i,t} + \omega_{s2} EXCH_{i,t}^2 + \theta_s Macro_{i,t} + \varepsilon_{it} \quad (1)$$

$$DGROWTH_{i,t} = \alpha_{di} + \mu d_1 DGROWTH_{i,t-1} + \mu_{d2} DDEPOSIT_{i,t-1} + \beta_d BF_{i,t-1} + \gamma_d IR\_DIF_{i,t} + \omega_{d1} EXCH_{i,t} + \omega_{d2} EXCH_{i,t}^2 + \theta_d Macro_{i,t} + \delta_{it} \quad (2)$$

In (1) $SGROWTH_{i,t}$ stands for the growth rate of the share of deposits denominated in foreign currency in the total personal deposits of bank *i* in quarter *t*. $SHARE_{i,t-1}$ controls for the starting point for every bank, being the share of foreign currency deposits in the previous quarter.

In (2) $DGROWTH_{i,t}$ stands the growth rate of foreign currency deposits in bank *i* in quarter *t*. $DDEPOSIT_{i,t-1}$ controls for the starting conditions, being the amount of foreign currency deposits in the previous quarter.

Both share growth and deposit growth are cleaned of the influence of the exchange rate dynamics[8]. For the former we examine the share change due to the quantitative effect (changes in volumes of currency deposited), for the latter we use the growth of deposits measured in foreign currency, not in rubles.

In both equations the vector of the independent variables important for the market discipline is $BF_{i,t-1}$. It includes a number of risk measures in correspondence with the CAMEL model. We assume that depositors prefer deposits denominated in foreign currency in reliable

[8] According to the Russian accounting rules, foreign currency deposits are reported in rubles, using the current exchange rate. We eliminate this effect.

banks. So for less risky banks we expect to observe both higher share growth and deposit growth rates.

The vector of bank fundamentals includes the capital adequacy ratio (*H1*), the liquidity ratio (*H3*), the share of non-performing loans in total loans (*NPL*), return on equity (*ROE*) and bank size (*lnA*).

H1 is the ratio of the bank's capital to risk-weighted assets. It is calculated according to the methodology used by the CBR. A higher ratio signals a more stable bank. *H3* represents the current liquidity ratio, also measured according CBR guidelines, being the ratio of liquid assets to liabilities due in the next 30 days. Banks with a sustainable liquidity buffer are more reliable and, therefore, may be more attractive for foreign currency investments. According to CBR requirements, the minimum level for *H1* is 10%, for *H3* is 50%.

NPL is the share of non-performing loans and signals higher credit risks. Loans are qualified as non-performing when there are repayment arrears of more than 90 calendar days.

ROE represents the ratio of net income to shareholder equity and indicates bank's attractiveness to current and potential investors. High profitability indicators can have their roots in the high-risk financial and investment policy of a bank, which would have a negative effect on the share growth and deposit growth. On the other hand, higher return on equity can be deemed as a sign of the sound functioning of bank and having additional sources of funds to be channelled to bank reserves and capital.

We include the natural logarithm of assets which is a proxy for bank size. The majority of economists believe that size of a bank has a positive impact on the bank's reliability. However there is also the "too big to fail" hypothesis, which appears in the Russian banking market: large credit institutions carry out high-risk transactions, leveraging on their advantages (Gorelaya, 2015).

All bank fundamentals are incorporated with a 1 quarter lag as retail depositors are not able to instantly react to any change in bank risk. Banks need some time to disclose financial reports (approximately 4–6 weeks) and depositors require some time to interpret the bank's financial indicators and to determine their investment strategies.

Depositor decisions on the currency structure depend much on the interest spread between deposits denominated in foreign currency and those denominated in rubles. Higher spreads make foreign currency investments more attractive. To control for this effect we introduce the difference between the average interest rates for foreign currency and ruble deposits (*IR_DIF*). This is a supply-side effect, as the spread also reflects the bank's demand for foreign currency and, therefore, the supply of foreign currency deposits. Therefore, controlling

for the spread, we obtain the net (undistorted by the price effect) impact of bank's risk on quantitative variables.

We include the exchange rate to control for the effects caused by currency rate dynamics (*EXCH*). As the majority of the foreign currency deposits are denominated in US dollars or euros, we use the reverse exchange rate weighted by a dual currency basket. The cost of the dual currency basket in Russia is composed of euro and dollar exchange rate in a ratio 45 to 55 per cent respectively, according to the CBR guidelines. We presume that with an increase in exchange rate individuals prefer to make deposits in foreign currency. We also include the squared exchange rate to control for the outflow effect. Experience of financial crises shows that after a certain increase in the exchange rate individuals are incentivised to keep their savings in foreign currency in cash, outside the financial sector. This means that extremely weak national currency makes deposit growth and share growth lower due to the withdrawal of funds. This depositor behaviour is caused by their fear that the banks cannot meet their obligations on deposits in foreign currency in circumstances of extreme economic instability.

Despite the fact that we scrutinize different credit organizations in the framework of one country, we include the GDP (*Y*) and inflation (*INFL*) into the model. This gives the net impact of bank risks on the shift of deposit currency structure. A similar approach was used in a number of foreign studies. For instance, Disli et al. (2013) analysed how political connections affect the functioning of market discipline on a sample of the Turkish banking system. Data from banks in various cities used and the authors included inflation indicators. Park & Peristiani (1998) scrutinised the impact of bank default risks on deposits and their profitability by analysing large panel data from US banks. They included GDP per capita and the population in the US in their model. Finally, research on market discipline by Semenova (2007) takes into account a vector of macroeconomic factors which are independent of bank risks, but can affect depositor behaviour.

We do not, however, include macroeconomic indicators directly. The overall macroeconomic conditions in the quarter *t* are controlled by *Macro* which is the linear combination of the GDP and inflation, calculated by the principal component analysis. This avoids the correlation between exchange rate and inflation dynamics (see Table 1 for the PCA results). Higher values of *Macro* indicate higher inflation, lower GDP and, therefore, a worse economic situation in the country.

Table 1. PCA analysis for *Macro* variable

	PC1	**PC2**	**Kaiser-Meyer-Olkin measure of sampling adequacy**	**Correlation with *Macro***
Proportion	0.5358	0.4642		
Eigen Values	1.0716	0.9284		
Variable	**Eigen Vectors**			

Y	-0.7071	0.7071	0.5	-0.7560*
INFL	0.7071	0.7071	0.5	0.7560*

* significant at 5%-level

Besides the suggested basic models with regards to the currency shift mechanism of market discipline, it is crucial to consider depositor sensitivity to bank risk during the financial crisis of 2008–2009. To cover the crisis influence we modify our regressions in the following way:

$$SGROWTH_{i,t} = \alpha_{si} + \mu_{s1}SGROWTH_{i,t-1} + \mu_{s2}SHARE_{i,t-1} + (1 + Crisis) * (\beta_s BF_{i,t-1} + \gamma_s IR\_DIF_{i,t} + \omega_{s1}EXCH_{i,t} + \omega_{s2}EXCH_{i,t}^2 + \theta_s Macro_{i,t}) + \varepsilon_{it} \quad (3)$$

$$DGROWTH_{i,t} = \alpha_{di} + \mu d_1 DGROWTH_{i,t-1} + \mu_{d2}DDEPOSIT_{i,t-1} + (1 + Crisis) * (\beta_d BF_{i,t-1} + \gamma_d IR\_DIF_{i,t} + \omega_{d1}EXCH_{i,t} + \omega_{d2}EXCH_{i,t}^2 + \theta_d Macro_{i,t}) + \delta_{it} \quad (4)$$

Crisis is a binary variable equal to 1 during the financial crisis period from the first quarter of 2008 to the second quarter of 2009 and 0 otherwise.

We estimate regressions with the panel fixed effects methodology and Arellano-Bond linear dynamic panel-data estimation techniques.

IV. Data

We use the quarterly panel data for the period between the first quarter of 2005 and the second quarter of 2015.

Bank-level data for approximately[9] 900 Russian banks comes from the Mobile database (Information-analytical system "Banks and Finance" provided by Mobile agency).

Mobile is a large information database, which contains over 80 indicators of banking activity for each credit institution in Russia, based on the financial statements reported to the CBR. The calculation of indicators is based on the existing accounting system, which is a pivotal "coordination system" to reflect cash flows. The main objective of Mobile is to consolidate accounts into uniform indicators which represent measurable quantities.

Macroeconomic indicators come from the official CBR website and the databases of the Federal State Statistics Service. The CBR website is an open information source which provides data on bank activity. The database was used to determine indicators of the dual currency basket. The official website of the Federal State Statistics Service provides statistical data on the social,

[9] Depending on the particular quarter

demographic and economic development of Russia in a form of regularly updated tables and charts from post-soviet period to the present day. It includes data on the GDP and inflation rates.

Table 2 presents descriptive statistics for all the variables we use[10].

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SGROWTH	15488	1.036	0.322	0.000	4.746
DGROWTH	15466	-0.050	0.481	-9.953	0.999
SHARE	15466	0.232	0.214	0.000	0.980
DDEPOSIT	15488	2979982.000	21457351.508	0.000	871400000.000
H1	15488	20.462	12.836	0.000	98.000
H3	15488	92.833	40.390	0.000	299.000
NPL	15488	0.016	0.025	0.000	0.200
ROE	15487	0.049	0.543	-21.626	44.370
lnA	15488	15.999	1.871	01.10.9392	25.389
IR_DIF	15488	-0.018	0.022	-0.316	0.156
EXCH	15488	37.314	8.006	29.511	61.696
Macro	15488	-0.273	0.976	-1.611	2.231
Y	15488	13280.050	4127.065	5077.869	19930.010
INFL	15488	1.022	0.015	0.997	1.074

The median of the share of foreign currency deposits in all deposits during the studied period is 14.6 per cent, whereas the average share is 23.2 per cent. This indicates that the share of foreign currency deposits in the majority of banks is rather low, however, there is a small number of banks with low risk, where foreign currency deposits account for more than a quarter of all deposits.

Table 3 shows the pairwise correlations of the variables in our models. They are quite low, so we can put the variables together in the model.

Table 3. Correlation Matrix

	SHARE	*DDEPOSIT*	*H1*	*H3*	*NPL*	*ROE*	*lnA*	*IR_DIF*	*EXCH*	*Macro*
SHARE	1.00									
DDEPOSIT	0.01	1.00								
H1	0.14	-0.07	1.00							
H3	-0.00	-0.01	0.24	1.00						
NPL	-0.07	0.02	0.06	0.21	1.00					
ROE	-0.01	0.00	-0.01	0.00	-0.02	1.00				
lnA	0.08	0.34	-0.41	0.04	0.08	0.01	1.00			
IR_DIF	0.26	0.04	0.08	-0.09	-0.04	-0.00	0.04	1.00		
EXCH	-0.06	0.02	-0.04	0.27	0.11	-0.02	0.17	-0.28	1.00	

[10] We exclude outliers and observations with mistakes from our dataset. We do not include the banks with H1 higher than 100 or H3 higher than 300, or NPL higher than 20%, or average interest rate on ruble deposits higher than 0.5, or average interest rate on foreign currency deposits higher than 0.2.

Macro	0.10	-0.02	0.05	-0.17	-0.09	0.01	-0.13	0.26	-0.20	1.00

V. Results

Now we turn to the estimation results. Table 4 shows the results for regressions (1) and (2). Both the growth of foreign currency deposit share and the deposit growth are higher for more reliable banks in terms of higher capital adequacy. Another significant factor is liquidity: the share deposit growth is higher for the banks with a higher liquidity ratio. *ROE* shows a negative, but unstable, influence on the deposit growth, implying that the depositors keep the risk-return dilemma in mind and higher profitability is associated with higher perceived risks. All these taken together signal the functioning of currency shifts as a mechanism of the market discipline in the Russian market for personal deposits.

In addition, our results are in line with the existing literature, showing that better macroeconomic conditions (lower *Macro*) are associated with the flight to national currency in deposit structure and lower foreign currency deposit growth. The depositors are also sensitive to the exchange rate. Ruble depreciation (higher *EXCH*) is accompanied by an increased share of foreign currency deposits, but the deposit growth is lower as it becomes more expensive to invest in these.

Table 4. Currency Shifts (robust s.e. in parentheses)

VARIABLES	***SGROWTH***				***DGROWTH***			
	Panel fixed effects		Dynamic panels		Panel fixed effects		Dynamic panels	
	I	II	III	IV	V	VI	VII	VIII
$SGROWTH_{(t-1)}$			-0.000***	-0.001***				
			(0.000)	(0.000)				
$DEPGROWTH_{(t-1)}$							-0.001***	-0.001***
							(0.000)	(0.000)
$SHARE_{(t-1)}$		-0.427***		-4.773***				
		(0.037)		(0.350)				
$DDEPOSIT_{(t-1)}$						-0.000		-0.000*
						(0.000)		(0.000)
$H1_{(t-1)}$	0.001**	0.002***	0.022***	0.029***	0.001	0.001	0.007***	0.007***
	(0.001)	(0.001)	(0.004)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)
$H3_{(t-1)}$	0.000*	0.000*	0.000*	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$NPL_{(t-1)}$	-0.274	-0.312	0.549	0.865	-0.384	-0.381	-0.699	-0.693
	(0.221)	(0.216)	(0.674)	(1.053)	(0.306)	(0.306)	(0.827)	(0.534)
$ROE_{(t-1)}$	-0.001	-0.002	-0.008	-0.008	-0.002	-0.002	-0.004	-0.004**
	(0.002)	(0.002)	(0.007)	(0.008)	(0.002)	(0.002)	(0.002)	(0.002)
$lnA_{(t-1)}$	0.001	-0.011	-0.714***	-0.806***	0.024***	0.024***	-0.011	-0.003
	(0.007)	(0.007)	(0.108)	(0.107)	(0.009)	(0.009)	(0.036)	(0.024)
IR_DIF	-1.755***	-1.514***	-0.321	-0.235	-1.193***	-1.191***	0.221	0.224**
	(0.257)	(0.248)	(0.360)	(0.345)	(0.370)	(0.370)	(0.306)	(0.094)
EXCH	0.017***	0.027***	-0.034*	0.039	0.011	0.011	-0.043***	-0.041***
	(0.005)	(0.005)	(0.018)	(0.024)	(0.007)	(0.007)	(0.009)	(0.009)
$EXCH^2$	-0.000***	-0.000***	-0.000	-0.001***	-0.000***	-0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Macro	0.027***	0.033***	0.111***	0.160***	0.034***	0.034***	0.035***	0.034***

	(0.004)	(0.004)	(0.017)	(0.016)	(0.005)	(0.006)	(0.007)	(0.005)
Constant	0.713***	0.789***	13.678***	14.549***	-0.515***	-0.522***	1.146**	0.991**
	(0.100)	(0.103)	(1.694)	(1.838)	(0.145)	(0.147)	(0.523)	(0.430)
Observations	14,417	14,417	11,943	11,943	14,401	14,401	11,945	11,945
R^2_{within}	0.033	0.052			0.030	0.030		
Banks	750	750	725	725	750	750	725	725
χ^2					1002.79	1129.30	2432.04	5955.70

*** p<0.01, ** p<0.05, * p<0.1

Foreign currency deposit growth is higher in larger banks, but interestingly the proxy variable of bank size shows negative relationship with the growth of the foreign currency deposit share. This is due to the hypothesis that big banks with a huge credit portfolio could be described as "too big to fail" and they take more risks than the other market participants.

Now we turn to the results of the estimation of how the financial crisis affects the currency shift mechanism of market discipline.

The financial crisis of 2008 in Russia was accompanied by a fall in real incomes and high unemployment. These economic circumstances led to an increase of the number of bad loans. For instance, the ratio of non-performing loans to total bank assets increased from 1.5% to 3.6% between July 2007 and April 2008. That inevitably leads to deterioration in banks' own financial positions. All this should result in increased attention to bank risks and to higher depositor sensitivity.

Table 5 shows the results for regressions (3) and (4).

Table 5. Currency Shifts, Crisis Influence (robust s.e. in parentheses)

VARIABLES	***SGROWTH***				***DGROWTH***			
	Panel fixed effects		Dynamic panels		Panel fixed effects		Panel fixed effects	
	I	II	*III*	IV	V	*VI*	VII	VIII
$SGROWTH_{(t-1)}$			-0.000	-0.001				
			(0.000)	(0.000)				
$DEPGROWTH_{(t-1)}$							-0.001***	-0.001
							(0.000)	(0.000)
$SHARE_{(t-1)}$		-0.396***		-4.829				
		(0.037)		(0.000)				
$DDEPOSIT_{(t-1)}$						-0.000		-0.000
						(0.000)		(0.000)
$H1_{(t-1)}$	0.001**	0.002***	0.021	0.028	0.001	0.001	0.008	0.007
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.017)	(0.000)
*crisis** $H1_{(t-1)}$	-0.002	-0.002	-0.002	-0.004	-0.002	-0.002	0.011	0.002
	(0.002)	(0.002)	(0.000)	(0.000)	(0.002)	(0.002)	(0.177)	(0.000)
$H3_{(t-1)}$	0.000	0.000*	0.001	0.001	0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
*crisis** $H3_{(t-1)}$	-0.000*	-0.000**	-0.001	-0.001	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.000)
$NPL_{(t-1)}$	-0.158	-0.209	0.797	0.906	-0.316	-0.312	-0.668	-0.656
	(0.220)	(0.216)	(0.000)	(0.000)	(0.307)	(0.307)	(1.648)	(0.000)
*crisis**$NPL_{(t-1)}$	0.344	0.416	0.872	2.922	-0.220	-0.214	-3.022	1.597
	(1.327)	(1.326)	(0.000)	(0.000)	(0.927)	(0.927)	(133.204)	(0.000)
$ROE_{(t-1)}$	0.002	0.001	-0.027	-0.035	-0.001	-0.001	-0.026	-0.005
	(0.003)	(0.003)	(0.000)	(0.000)	(0.004)	(0.004)	(0.402)	(0.000)
*crisis**$ROE_{(t-1)}$	-0.008**	-0.008***	0.028	0.037	-0.004	-0.004	0.016	0.002
	(0.003)	(0.003)	(0.000)	(0.000)	(0.004)	(0.004)	(0.426)	(0.000)
$lnA_{(t-1)}$	0.004	-0.006	-0.707	-0.784	0.026***	0.026***	0.002	-0.005

	(0.007)	(0.007)	(0.000)	(0.000)	(0.009)	(0.009)	(0.682)	(0.000)
*crisis*lnA*$_{(t-1)}$	0.006	0.005	-0.096	-0.104	-0.004	-0.005	0.000	-0.028
	(0.010)	(0.010)	(0.000)	(0.000)	(0.007)	(0.007)	(0.000)	(0.000)
IR_DIF	-0.910***	-0.754***	0.284	0.001	-0.648*	-0.646*	0.316	0.413
	(0.248)	(0.244)	(0.000)	(0.000)	(0.378)	(0.378)	(11.700)	(0.000)
*crisis*IR_DIF*	-4.227***	-4.053***	-7.215	-4.440	-4.506**	-4.511**	-7.640	-2.899
	(1.039)	(1.001)	(0.000)	(0.000)	(1.895)	(1.895)	(40.509)	(0.000)
EXCH	-22.433***	-21.104***	-24.250	0.000	-4.044	-4.007	0.000	-15.702
	(4.174)	(4.113)	(0.000)	(0.000)	(6.978)	(6.979)	(0.000)	(0.000)
*crisis*EXCH*	0.002	0.009*	-0.069	-0.028	0.004	0.004	-0.043	-0.047
	(0.005)	(0.005)	(0.000)	(0.000)	(0.008)	(0.008)	(0.201)	(0.000)
$EXCH^2$	1.329***	1.245***	1.499	-0.000	0.238	0.237	-0.037	0.959
	(0.251)	(0.247)	(0.000)	(0.000)	(0.420)	(0.420)	(0.208)	(0.000)
*crisis*EXCH*^{2}	-0.000*	-0.000***	0.000	-0.000	-0.000*	-0.000*	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
Macro	-0.020***	-0.018***	-0.021	0.002	-0.003	-0.003	0.001	-0.014
	(0.004)	(0.004)	(0.000)	(0.000)	(0.006)	(0.006)	(0.004)	(0.000)
*crisis*Macro*	0.012***	0.017***	0.099	0.132	0.027***	0.027***	0.034	0.035
	(0.004)	(0.004)	(0.000)	(0.000)	(0.007)	(0.007)	(0.058)	(0.000)
crisis	0.157***	0.149***	0.028	-0.038	0.046	0.046	0.013	0.110
	(0.031)	(0.030)	(0.000)	(0.000)	(0.038)	(0.038)	(0.613)	(0.000)
Constant	0.980***	1.086***	14.287	15.641	-0.392**	-0.400**	0.955	1.163
	(0.104)	(0.107)	(0.000)	(0.000)	(0.169)	(0.170)	(7.424)	(0.000)
Observations	14,417	14,417	11,943	11,943	14,401	14,401	11,945	11,945
R^2_{within}	0.058	0.074			0.034	0.034		
Banks	750	750	725	725	750	750	725	725
χ^2							28310.39	

*** p<0.01, ** p<0.05, * p<0.1

Our results suggest, however, that the currency shift mechanism was virtually untouched by the crisis, and this is in line with the results for many transition countries and traditional market discipline mechanisms (Hasan et al. 2013). The deposit share growth for foreign currency deposits is still higher for banks with higher capital adequacy; there is still an unstable negative relationship for bank profitability. Sensitivity to liquidity is reduced; this being a weak signal of market discipline deterioration. However, we observe that during the financial crisis depositors still transferred their deposits into foreign currency in reliable banks.

Our results show higher sensitivity to the country-level variables including the exchange rate and macroeconomic conditions. Moreover, the significant positive effect of a worse economic situation discovered at the previous stage appears to be driven by the crisis quarters. The quarters with higher inflation and lower GDP are characterized by depositors switching to the deposits denominated in foreign currency.

We checked for the robustness of our results by changing the number of bank fundamentals to simpler ones. As retail depositors are usually considered unsophisticated, they may show more sensitivity to the measures that are simpler than the CBR requirements. We replaced the capital to risk-weighted ratio with the capital to assets ratio (*CA*). We introduced the share of liquid assets in total assets as an alternative measure of liquidity (*LIQ*). Finally we use return on assets (*ROA*) instead of *ROE*. Table 6 shows the descriptive statistics for these new variables.

Table 6. Descriptive Statistics for Additional Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
CA	15487	0.1329	0.0886	0.0001	1.0169
LIQ	15487	0.2667	0.6586	0.0036	31.0574
ROA	15486	0.0053	0.0118	-0.2030	0.3146

Using the new data we estimated (1)–(4). The results are presented in Table A 1 and Table A 2 in the Appendix. To a certain extend they support our previous results showing some sensitivity to capital adequacy. In some specifications the share of non-performing loans appears to be significant: banks with better loan portfolio quality demonstrate a higher growth of the share of foreign currency deposits. We also obtained the same effects for exchange rate and macroeconomic conditions.

VI. Conclusion

Instability in the financial markets and fast and significant changes of regulation increase the importance of the market powers which can complement the formal institutions and rules in their attempt of increasing the efficiency of risk management and stability. Market mechanisms in the deposit markets are of great importance for regulators as sensitivity to risk may ensure effective fund distribution or—if not working properly—put the whole banking system under the threat of severe bank panics. Our study sheds some light on a new mechanism of market discipline, especially important for developing economies, which rely much and are dependent on the dollar and euro – the currency shifts. Using data on the Russian market for personal deposits from 2005 to 2015, we provide evidence that less risky banks—at least in terms of capital adequacy and liquidity—demonstrate higher growth of both the volume and the share of deposits denominated in foreign currency, even when we extract the exchange rate effect from these indicators. This mechanism continued during the financial crisis of 2008–2009. Robustness checks show that the credit risks can also result in currency shifts.

At the same time we control for the macroeconomic indicators being—as the vast literature on deposit dollarization suggest—among the main determinants of depositor preferences. We put our results in line with this literature: worsening economic conditions make depositors turn to foreign currency in their portfolio, especially during crises, which also makes them more sensitive to exchange rate volatility.

Our results add to the existing literature on market discipline and dollarization, suggesting another way depositors deal with the riskiness of their banks. The new mechanism

could serve as a complement to existing quantitative, price mechanisms as well as to the mechanism of maturity shifts in the Russian market for personal deposits.

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APPENDIX

Table A 1. Currency Shifts, Robustness Checks (robust s.e. in parentheses)

VARIABLES	*SGROWTH*				*DGROWTH*			
	Panel fixed effects		Dynamic panels		Panel fixed effects		Dynamic panels	
	I	II	III	IV	V	VI	VII	VIII
$SGROWTH_{(t-1)}$			-0.000	-0.001***				
			(0.000)	(0.000)				
$DEPGROWTH_{(t-1)}$							-0.001***	-0.001***
							(0.000)	(0.000)
$SHARE_{(t-1)}$		-0.463***		-20.387***				
		(0.034)		(1.249)				
$DDEPOSIT_{(t-1)}$						-0.000		-0.000
						(0.000)		(0.000)
$CA_{(t-1)}$	-0.028	-0.043	7.062***	4.760***	-0.125	-0.124	-0.040	-0.018
	(0.073)	(0.073)	(0.791)	(1.660)	(0.123)	(0.123)	(0.239)	(0.267)
$LIQ_{(t-1)}$	-0.005	-0.005	-0.172**	-0.327**	-0.003	-0.003	-0.032	-0.032
	(0.004)	(0.004)	(0.072)	(0.149)	(0.008)	(0.008)	(0.020)	(0.020)
$NPL_{(t-1)}$	-0.431**	-0.434**	4.016**	10.489***	-0.462	-0.461	0.709	0.703
	(0.188)	(0.187)	(1.662)	(3.183)	(0.285)	(0.285)	(0.521)	(0.761)
$ROA_{(t-1)}$	0.608	0.494	-2.369**	-8.869***	0.055	0.055	-2.445***	-2.461**
	(0.384)	(0.390)	(1.081)	(2.296)	(0.556)	(0.557)	(0.848)	(0.970)
$lnA_{(t-1)}$	-0.009	-0.026***	-0.641***	-1.484***	0.012	0.012	-0.124**	-0.118*
	(0.007)	(0.007)	(0.099)	(0.303)	(0.009)	(0.009)	(0.052)	(0.061)
IR_DIF	-2.546***	-2.259***	-4.052**	-2.485	-1.736***	-1.736***	0.214	0.218
	(0.232)	(0.222)	(2.049)	(1.527)	(0.325)	(0.325)	(0.269)	(0.300)
EXCH	0.028***	0.044***	-0.310***	0.278***	0.023***	0.023***	-0.049***	-0.048***
	(0.004)	(0.005)	(0.027)	(0.047)	(0.006)	(0.006)	(0.009)	(0.009)
$EXCH^2$	-0.000***	-0.001***	0.003***	-0.003***	-0.000***	-0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Macro	0.040***	0.046***	0.102***	0.295***	0.038***	0.038***	0.035***	0.035***
	(0.004)	(0.004)	(0.028)	(0.048)	(0.005)	(0.005)	(0.007)	(0.008)
Constant	0.657***	0.702***	17.968***	23.230***	-0.562***	-0.567***	3.200***	3.092***
	(0.110)	(0.112)	(1.622)	(5.087)	(0.150)	(0.152)	(0.861)	(0.984)
Observations	19,338	19,338	16,641	16,641	19,316	19,316	16,645	16,645
R^2_{within}	0.040	0.061			0.026	0.026		
Banks	769	769	734	734	769	769	734	734
χ^2			457.78	319.32			2802.42	882.15

*** p<0.01, ** p<0.05, * p<0.1

Table A 2. Currency Shifts, Crisis Influence, Robustness Checks (robust s.e. in parentheses)

VARIABLES	*SGROWTH*				*DGROWTH*			
	Panel fixed effects		Dynamic panels		Panel fixed effects		Panel fixed effects	
	I	II	*III*	IV	V	*VI*	VII	VIII
$SGROWTH_{(t-1)}$			0.000	-0.000				
			(0.000)	(0.000)				
$DEPGROWTH_{(t-1)}$							-0.001***	-0.001***
							(0.000)	(0.000)
$SHARE_{(t-1)}$		-0.408***		-21.196				
		(0.033)		(0.000)				
$DDEPOSIT_{(t-1)}$						-0.000		-0.000
						(0.000)		(0.000)
$H1_{(t-1)}$	-0.006	-0.018	3.665	0.155	-0.125	-0.124	-0.038	-0.025
	(0.070)	(0.070)	(0.000)	(0.000)	(0.126)	(0.127)	(0.297)	(0.786)
crisis H1*$_{(t-1)}$	0.257	0.206	43.352	-26.279	0.273	0.272	0.392	0.398
	(0.194)	(0.190)	(0.000)	(0.000)	(0.191)	(0.191)	(0.431)	(18.425)
$H3_{(t-1)}$	-0.002	-0.003	-0.132	-0.455	-0.002	-0.002	-0.026	-0.026
	(0.003)	(0.003)	(0.000)	(0.000)	(0.007)	(0.007)	(0.020)	(0.088)
crisis H3*$_{(t-1)}$	-0.046	-0.050	2.889	-3.779	-0.058	-0.058	-0.147	-0.150
	(0.046)	(0.047)	(0.000)	(0.000)	(0.050)	(0.050)	(0.716)	(9.311)
$NPL_{(t-1)}$	-0.247	-0.272	5.691	7.584	-0.378	-0.377	0.546	0.540
	(0.186)	(0.184)	(0.000)	(0.000)	(0.291)	(0.292)	(0.840)	(2.042)
*crisis*NPL*$_{(t-1)}$	0.495	0.449	-18.212	-122.409	-0.493	-0.493	15.184***	15.188
	(0.952)	(0.946)	(0.000)	(0.000)	(0.851)	(0.851)	(4.371)	(25.041)
$ROE_{(t-1)}$	0.451	0.324	-1.359	-6.133	-0.038	-0.037	-2.575**	-2.585
	(0.380)	(0.385)	(0.000)	(0.000)	(0.568)	(0.568)	(1.267)	(1.700)
*crisis*ROE*$_{(t-1)}$	1.377	1.846	-56.213	194.607	0.547	0.545	11.728	11.719
	(1.748)	(1.783)	(0.000)	(0.000)	(1.459)	(1.458)	(24.629)	(282.461)
$lnA_{(t-1)}$	-0.005	-0.018**	-1.024	-2.001	0.015	0.015*	-0.127*	-0.123
	(0.007)	(0.007)	(0.000)	(0.000)	(0.009)	(0.009)	(0.066)	(0.243)
*crisis*lnA*$_{(t-1)}$	0.010	0.010	1.222	0.998	0.006	0.006	0.061	0.060
	(0.009)	(0.008)	(0.000)	(0.000)	(0.007)	(0.007)	(0.151)	(1.427)
IR_DIF	-1.363***	-1.194***	-0.412	-1.514	-1.132***	-1.132***	0.359	0.359
	(0.196)	(0.194)	(0.000)	(0.000)	(0.340)	(0.340)	(0.424)	(0.367)
*crisis*IR_DIF*	-4.852***	-4.707***	-121.931	-151.010	-3.268**	-3.268**	1.829	1.818
	(0.988)	(0.965)	(0.000)	(0.000)	(1.405)	(1.405)	(31.698)	(24.174)
EXCH	0.008*	0.021***	-0.001	0.616	0.012	0.012	-0.055	-0.054
	(0.005)	(0.005)	(0.000)	(0.000)	(0.007)	(0.007)	(0.131)	(0.183)
*crisis*EXCH*	1.126***	1.052***	-1.672	0.125	0.421	0.420	1.679	1.668
	(0.201)	(0.198)	(0.000)	(0.000)	(0.289)	(0.289)	(15.783)	(21.267)
$EXCH^2$	-19.169***	-17.954***	0.000	0.000	-7.285	-7.275	-28.842	-28.658
	(3.327)	(3.278)	(0.000)	(0.000)	(4.793)	(4.794)	(264.825)	(370.284)
*crisis*EXCH*^{2}	-0.000***	-0.000***	-0.001	-0.007	-0.000***	-0.000***	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.002)
Macro	-0.017***	-0.015***	0.024	-0.017	-0.006	-0.006	-0.025	-0.025
	(0.003)	(0.003)	(0.000)	(0.000)	(0.004)	(0.004)	(0.236)	(0.323)
*crisis*Macro*	0.017***	0.025***	0.159	0.376	0.029***	0.029***	0.039**	0.039
	(0.004)	(0.004)	(0.000)	(0.000)	(0.006)	(0.006)	(0.017)	(0.128)
crisis	0.152***	0.143***	2.287	3.955	0.071*	0.071*	0.172	0.173
	(0.027)	(0.027)	(0.000)	(0.000)	(0.038)	(0.038)	(2.217)	(3.324)
Constant	1.013***	1.049***	14.904	23.362	-0.374**	-0.379**	3.373	3.302***
	(0.110)	(0.111)	(0.000)	(0.000)	(0.162)	(0.163)	(2.863)	(0.831)
Observations	19,338	19,338	16,641	16,641	19,316	19,316	16,645	16,645
R^2_{within}	0.074	0.090			0.030	0.030		
Banks	769	769	734	734	769	769	734	734
χ^2	.	.	.	.	.	.	1179.85	85544.00

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