FINANCIAL DOLLARISATION IN UKRAINE: DETERMINANTS AND IMPLICATIONS FOR MACROPRUDENTIAL POLICY

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Abstract

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This thesis investigates the drivers of financial dollarisation in Ukraine and evaluates the effectiveness of macroprudential policy instruments at decreasing the share of assets denominated in foreign currency. A dataset of monthly frequency across the two periods, 2009-2014 and 2014-2025 is used, allowing to analyze the financial dollarization across two regimes: fixed exchange rate and floating exchange rate regimes. The empirical approach is a 2-step error-correction model with regime interactions, which allows to distinguish between long-run and short-run changes. Independent variables include the exchange-rate changes in levels, as well as expectations, price level, the interest rate differentials between UAH and FX deposits, differentiated reserve requirements on foreign-currency deposits, war-related shock controls and a constructed Public Sentiment Index (PSI) based on Google Trends data, which serves as a proxy for public trust in the National Bank of Ukraine and the credibility of monetary policy.

The results show that there exists a cointegrating relationship between the share of deposits held in foreign currency. However, in the short run, deposit

dollarisation in Ukraine is driven more by immediate policy incentives, exchange-rate movements and public sentiment rather then by gradual adjustment to long-run equilibrium. A higher UAH deposit premium is consistently associated with de-dollarisation, while differentiated reserve requirements appear effective before 2014 but become much weaker under the floating exchange-rate regime.

TABLE OF CONTENTS

LIST OF FIGURES iv

LIST OF TABLES v

LIST OF ABBREVIATIONS vi

AI USE DECLARATION vii

Chapter 1: INTRODUCTION 1

Chapter 2: LITERATURE REVIEW 5

Chapter 3: METHODOLOGY 17

Chapter 4: DATA DESCRIPTION 28

Chapter 5: ESTIMATION RESULTS 36

Chapter 6: CONCLUSIONS AND POLICY IMPLICATIONS 54

WORKS CITED 57

APPENDIX A: LIST OF KEYWORDS IN THE PSI CONSTRUCTION 61

APPENDIX B: ARDL ROBUSTNESS SUMMARY 62

APPENDIX C: ARDL ESTIMATION RESULTS 63

APPENDIX D: ECM ESTIMATION ON NEW DEPOSITS: HOUSEHOLDS, BY MATURITY 66

APPENDIX E: ECM ESTIMATION ON NEW DEPOSITS: CORPORATE, BY MATURITY 69

APPENDIX F: ECM ESTIMATION ON NEW DEPOSITS: ALL DEPOSITORS, BY MATURITY 72

LIST OF FIGURES

Number *Page*

Figure 1. Share of FX deposits in all deposits in Ukraine 1

Figure 2. Dynamics of the constructed PSI 30

Figure 3. Dynamics of actual and expected y-o-y inflation 32

Figure 4. Dynamics of actual and expected exchange rate, USD/UAH 32

Figure 5. Dynamics of the share of FX deposits and nominal exchange rate 33

Figure 6. Dynamics of new corporate deposits by maturity, log scale 34

Figure 7. Dynamics of new household deposits by maturity, log scale 35

Figure 8. Share of FX deposits in all new deposits 38

Figure 9. Ex-Ante UIP deviation 37

Figure 10. Dynamics of the error-correction term 43

LIST OF TABLES

Number *Page*

Table 1. Transmission channels in the estimation 26

Table 2. Macro variables and policy controls 28

Table 3. Descriptive statistics for the key continuous dataset variables 31

Table 4. ADF unit root tests for UIP-based variables, 12 lags 34

Table 5. Johansen trace test for UIP component variables 39

Table 6. ADF unit root tests for PPP-based variables, 12 lags 41

Table 7. ECM results for outstanding deposits 44

Table 8. ARDL robustness results (compact) 48

Table 9. ECM results for new deposits by depositor 50

LIST OF ABBREVIATIONS

ADF Augmented Dickey–Fuller

CESEE Central, Eastern and South-Eastern Europe

CPI Consumer Price Index

CV Critical Value

ECM Error Correction Model

ECT Error-Correction Term

ER Exchange Rate

FX Foreign Currency

IMF International Monetary Fund

LC Local Currency

MVP Minimum Variance Portfolio

NBU National Bank of Ukraine

PCA Principal Component Analysis

PPP Purchasing Power Parity

PSI Public Sentiment Index

SSSU State Statistics Service of Ukraine

UAH Ukrainian Hryvnia

UIP Uncovered Interest Rate Parity

USD United States Dollar

VAR Vector Autoregression

VECM Vector Error Correction Model

AI USE DECLARATION

During the preparation of this thesis, Generative AI (Grammarly) was used as a supplementary tool to support grammar correction and improvement of sentence clarity in Chapters I-VI of this thesis.

Any suggestions produced by the AI tool were critically evaluated and substantially modified by the author before being incorporated into the thesis. These tools was not used to generate research findings, produce literature summaries used directly in the thesis, create citations, or conduct any form of data analysis. All research questions, theoretical framing, methodology, analysis, interpretation of results, and conclusions were developed independently by the author. The author takes full responsibility for the originality, validity, and academic integrity of the work presented in this thesis.

Chapter 1

INTRODUCTION

Excess dollarisation, which may be in the financial form (large share of foreign currency (FX) loans and deposits), or in the form of currency substitution (using dollars or another FX for wages or purchases, particularly major ones) is a prevalent issue in a number of emerging economies, especially small open economies like Ukraine. Hake et al. (2014) demonstrate that not only is financial dollarisation a widespread issue, but its determinants also differ between market regions – particularly Latin America and Southern, Eastern and Central Europe.

Financial dollarization is particularly relevant to Ukraine due to the repeated episodes of sharp drops in currency value (such as periods of 2008–2009, 2014–2015 and 2022), and major geopolitical shocks. These episodes have coincided with abrupt shifts in deposit composition toward foreign currency, suggesting that dollarization in Ukraine is persistent, as illustrated by Figure 1

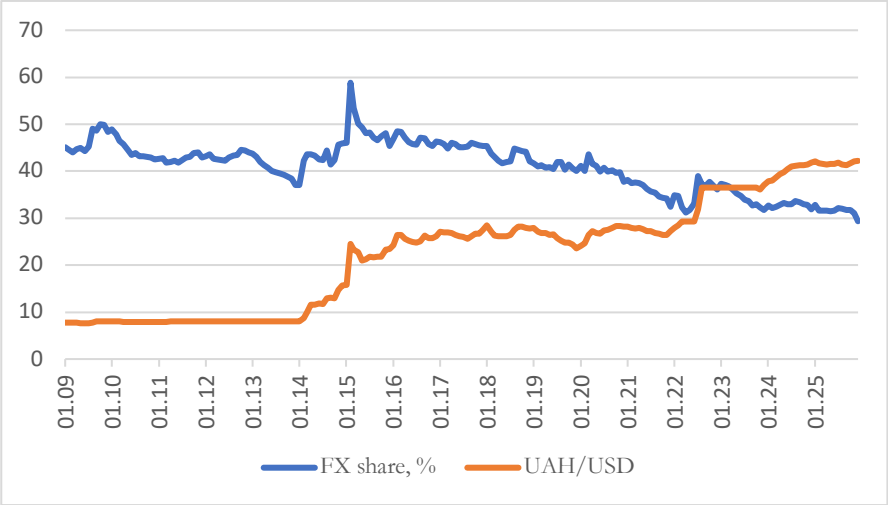


Figure 1: Share of FX deposits in all deposits in Ukraine

While dollarisation of deposits can be a natural hedge against local currency inflation, it can also have negative effects on the economy. For instance, Yeyati (2006) shows that it decreases the interest rate channel pass-through, weakening the ability of the central bank to carry out monetary policy. This study also demonstrates that highly dollarized economies are more vulnerable to exchange rate fluctuations and global banking crises. According to the presentation "Tendencies and perspective of development of the financial system of Ukraine" given in April of 2019 in Lviv, by NBU Deputy Chairman Solohub, "The level of dollarization of the Ukrainian economy remains quite high, especially in the public debt segment, which creates risks for macroeconomic stability. Therefore, the gradual de-dollarization of the economy is one of the main tasks of the NBU in the medium term." Excessive dollarization can be viewed as one that is above the level, indicated by the minimum variance portfolio approach – meaning, that it is driven by factors other, than investors' seeking to minimize the variance of returns to their portfolio. Therefore, estimating the efficiency of policy measures taken by the NBU is relevant to the development of policy recommendations to curb excessive dollarisation of Ukraine, especially given the current climate of uncertainty exacerbated by war shocks.

There is existing literature on the estimation of the natural level of dollarisation, for instance in Ukraine (Khvedchuk, 2019) and Georgia (Metreveli et al., 2025). There are also some papers studying the drivers of dollarisation in other countries, such as Turkey (Alpagut, 2024), Nigeria (Evans, 2025) and Uruguay (Vargas, 2023). However, to the best of my knowledge, there are no empirical studies aimed at defining the factors and policy implications of dollarisation in Ukraine.

My study would add to the current literature by 1) Estimating key factors of dollarisation in Ukraine, 2) Evaluating the effectiveness of policy measures taken by NBU to curb excess financial dollarization, and 3) Discussing policy

implications and providing recommendations based on the results of the performed analysis.

Starting from 2016, the NBU implemented a number of anti-dollarisation measures, including FX lending restrictions, liquidity regulations and macroprudential limits, such as currency-differentiated reserve requirements. I plan to look at how the sensitivity of dollarization to key macroeconomic and policy variables changed under the different exchange rate regimes: fixed exchange rate regime (pre-2014) and floating exchange rate regime (post-2014).

The economic intuition behind the research design is that financial dollarization is affected through a number of channels, such as uncovered interest rate parity (UIP) channel, expectations channel, exchange rate regime channel, regulatory policy channel, war-related uncertainty etc. In addition, deposit decisions are not driven solely by observable macroeconomic variables, but also by confidence and expectations. Consequently, distrust or negative public sentiment towards institutions may hinge the de-dollarisation process or even trigger precautionary shifts into foreign currency.

Therefore, the empirical model specification will be driven by the existing literature and then used is to test the following hypotheses:

- The sensitivity of financial dollarization to policy-variables is lower under the fixed rate regime then under the floating exchange-rate regimes;
- Prudential policy, particularly currency differentiated reserve requirements (as an observable policy tool directly targeting the relative attractiveness of FX deposits) decrease financial dollarization;
- Effectiveness of prudential policy in reducing dollarization depends on the credibility of monetary policy proxied by the public sentiment index

The results of this analysis may be relevant for the NBU, as understanding the drivers of deposit dollarization can help to determine whether existing policy

instruments, such as currency-differentiated reserve requirements are effective in reducing dollarization of the deposits, which was stated to be one of NBU's medium-term goals.

Chapter 2

LITERATURE REVIEW

This chapter provides an overview of the existing literature on dollarization, both theoretical and empirical. The first subsection of the chapter focuses on the different approaches to defining dollarization; the second and third review the benefits and costs of dollarization respectively. The fourth subsection is devoted to the two approaches to explaining dollarization: the minimum variance portfolio (MVP) and the equilibrium based approach, while the fifth subsection overviews the empirical approaches to estimating dollarization. Lastly, it positions this thesis in the literature.

2.1 Defining dollarisation

Dollarization is a longstanding characteristic of many emerging economies: persistent dollarization has been observed in Latin America, Asia, countries of Central and Eastern Europe. As a result, this phenomenon has been studies extensively both in the academic research, as well as in the policy-oriented working papers of central banks and international institutions such as IMF.

Various researchers use slightly different approaches to defining dollarization. "Full" or "official" dollarization refers to unilateral adoption of a foreign currency in financial transactions – one such example is Montenegro, which adopted the euro in 2002 without neither being a member of the European Union, nor having a monetary agreement with the EU. However, most papers approach dollarization as a de-facto, unofficial phenomenon of using a secondary (foreign) currency in financial operations as opposed to the official adoption of foreign currency as the main unit of legal tender.

According to Alpagut et al. (2024), dollarization can be defined as "widespread usage of a foreign currency in place of a local one". Calvo (1996) discusses several definitions: firstly, dollarization is viewed as a phenomenon of a currency substitution, where a foreign currency serves the function of a medium of exchange. A second, contrasting, approach is that dollarisation means a replacement of the domestic currency with a foreign one in its functions of store of value and unit of account, but not necessarily the medium of exchange. Catao and Terrones (2016) combine these two contrasting approaches and discuss a phenomenon of dollarization as a complex and gradual process, where a local currency is debased by a foreign one.

Khvedchuk (2019) breaks down the term "dollarization" into three concepts: financial dollarization, real dollarization and currency substitution – with each corresponding to a foreign currency replacing the local one in each of the three respective functions of money. Real dollarisation implies that a foreign currency is used for listing price (domestic currency fails as a unit of account); currency substitution refers to using foreign currency in transactions (domestic currency fails as a medium of exchange); and financial dollarization indicates usage of foreign currency for assets and liabilities.

Most empirical papers on dollarisation focus on financial dollarization in particular, as it can be quantitatively estimated. This thesis, in line with literature, uses the term "dollarization" to denote financial dollarization. In the literature, as well as in this thesis, the definition of dollarization is not limited to only using dollars as a secondary currency, but instead is treated as an umbrella term for the usage of US dollar, Euro, British pound or any other applicable currency. It is worth mentioning that US dollar is a currency in which, on average over 80% of FX assets in Ukraine are denominated, which implies the term "dollarization"

2.2 Benefits of dollarisation

According to the literature, while there is a number of drawbacks associated with dollarization, it can also generate some benefits, especially in economies with high or volatile inflation, weak monetary policy credibility and underdeveloped financial markets. One of the most commonly cited advantages is the role of dollarization as a risk-diversification tool. Thus, in environments characterized by inflation volatility and low public trust in the monetary system, holding assets in a foreign currency provides households and firms with a more stable and reliable store of values, which also protects their savings from domestic currency depreciation (Vargas, 2023).

Additionally, some researchers argue that dollarization can also contribute to financial deepening, although under specific conditions. For example, De Nicolo at al. (2003) state that in economies with high inflation, availability of foreign currency deposits may support the domestic financial system, as it encourages households and firms to keep their savings in domestic financial institutions, which may have been otherwise taken abroad.

Some earlier policy-oriented working papers have focused on the potential benefits of dollarization as it relates to international integration. For example, Balino et al. (1999) argued that dollarization can encourage a closer integration with the global financial markets, expose domestic financial institutions to more competition and provide a wider range of financial assets available to the local investors – households and firms.

A number of studies also show that dollarization may also have a potential "disciplining effect" on domestic policy makers. For example, Fischer (1982) shows that since dollarization implies reliance on a foreign currency, it may impose constraints on discretionary monetary policy. Therefore, this may help stabilize the inflation in economies with weak policy credibility. Calvo (2002)

provides a further discussion on this, stating that since emerging are already characterized by widespread dollarization, in both assets and liabilities, it may be less costly and more beneficial than typically assumed, especially if there is also high volatility of the nominal exchange rate.

Lastly, more recent studies demonstrate that some level of dollarization is unavoidable in open economies. For instance, Dalgic (2017) noted that foreign currency deposits in a foreign countries can also be considered as part of a broader phenomenon of dollarisation, as they serve as an insurance mechanism against the risk of exchange rate fluctuations, which encourages trade and acts as a hedge, especially when domestic financial instruments are limited or are underdeveloped. This is further supported by Khvedchuk et al. (2019), who show that there exists a natural level of dollarization, which is a level of foreign currency assets that is driven purely by risk considerations. That is, it is such a level of assets held in foreign currency that minimizes the variance to the returns of the investors' portfolio; Della Valle (2018) considered it an optimal level of dollarization in the open economies. However, it is important to note that the literature, such as Dalgic (2017) and Caravello (2023) -- consistently demonstrates that the benefits of dollarization are conditional to specific environments (with high and volatile inflation, low policy credibility).

2.3 Costs of dollarisation

While some potential benefits of dollarization are acknowledged in the literature, the costs associated with dollarization are overwhelmingly emphasized, especially if it is persistent and excessive.

One of such consistently emphasised costs is the increased financial fragility of the economy due to the currency mismatch. Vargas (2023) describes the mechanism by looking at the dollarization of debt: when the debts (or other

liabilities) are denominated in a foreign currency, while income, and in some cases, assets, remain in the domestic currency, households and firms become more susceptible to the exchange rate fluctuations, and this can also amplify the balance-sheet stress. Levy et al. (2006) show that balance sheet effects are tied to the broader crisis risk – depreciation episodes in a highly dollarized economy are often followed by a rise in non-performing loans, increased default risk and significant deteriorations in the balance sheets. Thus, instead of acting like a hedge against exchange rate shocks, dollarization may instead amplify them.

In several papers it is mentioned that dollarisation reduces the ability of the central bank to realise its policy, which can especially matter during crisis periods. Vargas (2023) highlights that in a highly dollarized economy, the effectiveness of a central bank as a lender of last resort is undermined. Therefore, there may be a need for a separate exchange rate or monetary policy to explicitly account for the foreign currency deposits. Catao et. al (2016) frame this issue in terms of financial stability – a currency mismatch in the banking system due to dollarization entails a gap between the share of foreign currency assets and liabilities. As a result, when exchange rate moves, banks may see significant income losses. In addition, under fractional reserve banking there is a possibility of operating under less-than-fully-backed FX deposits, which under certain conditions may trigger a bank run (Catao, 2016).

So, a major risk brought on by dollarization is that it can weaken monetary policy transmission. Since in highly dollarized economies a large share of both loans and deposits are denominated in a foreign currency, changes in interest rates would only affect a limited fraction of aggregate demand. This is further reiterated in Aleksic et al. (2008), and Levy and Yeyati (2006): both studies show that dollarization significantly weakens the inetrest rate channel of monetary policy transmission, which reduces central bank's ability to influence domestic consumption and investment decisions. This is further supported by Khvedchuk

et al. (2019), where the authors argue that excessive dollarization undermines the effectiveness of conventional monetary tools, especially in inflation-targeting regimes, such as Ukraine post-2014, where interest rate is a primary policy instrument.

In addition to the risks related the monetary and fiscal autonomy losses, dollarization may also amplify the effects of capital flow shocks. A highly dollarized economy is especially vulnerable to stops (and reversals) of capital flow shocks, since exchange rate fluctuations may increase the local currency value of FX debt, which is especially important if the external financing conditions become limited. According Castillo at al. (2024), capital outflow shocks are significantly more contractionary in highly dollarized economies, as opposed to non-dollarized ones. The mechanism is as follows: depreciation raises leverage and the external finance premium, which leads to contractions in credit, investment and output. Vargas (2023) similarly shows that dollarization increases the exposure of the economy to global financial cycles.

The literature also shows that there is an asymmetry between private and social incentives. While dollarization provides risk-hedging benefits for the households and firms, the aggregate outcome of the economy may suffer. A number of papers, such as Dalgic (2017) note that FX deposits act as an insurance against devaluation risk for individual agents. However, widespread deposit dollarisation increases systemic exposure to exchange rate fluctuations as well as probability of economy-wide crisis episodes. Similarly, Khvedchuk at al. (2019) argue that some level of dollarization is unavoidable in an open economy, but excessive dollarization has social costs that far outweigh the private benefits.

Last but not least, Calvo (1996) demonstrates that dollarization can become self-reinforcing and persistent, which created a policy trap. The authors describe the mechanism – currency substitution increases the elasticity of the demand for

money and inflation volatility, which weakens the effects of inflation stabilization efforts, and increases the "fear of floating". This idea is developed in a more recent paper: Castillo et al. (2024) have introduced the concept of "financial dollarization trap". The economic intuition is that monetary easing becomes contractionary because of the balance sheet effect; however, exchange rate stabilization requires procyclical tightening. Therefore, even once the economy achieves macroeconomic stabilization, dollarization might still perpetuate, and policy choices might still be constrained.

So, the analysis of the literature shows that while dollarization may have some conditional short-term benefits, it also is accompanied by substantial long-run costs, such as weakened monetary policy transmission, increased financial fragility, amplification of external shocks and constraints to the policy autonomy.

2.4 Approaches to explaining dollarisation

Given that there is a general consensus in the literature regarding the substantial costs associated with dollarization, the question becomes "why dollarization persists in economies, despite the associated costs?". Several analytical frameworks are used to explain the determinants of dollarization, with two approaches being prominent: 1) equilibrium-based models looking at expectations and long-run relationships between economic variables, and 2) portfolio-choice models focusing on risk minimization (such as MVP - Minimum Variance Portfolio).

2.4.1 Equilibrium and expectations-based approach

The first group of papers explains dollarization through the first approach – that it is an outcome shaped by macroeconomic factors, expectations, and policy credibility, instead of a response to short-term shocks. For example, this approach is used in Vargas (2023), where dollarization is modeled as a long-run

equilibrium relationship between foreign currency deposits (dependent variable), exchange rate dynamics, interest rate differentials, and expectations (independent variables). According to this approach, dollarization is a reflection of the forward-looking assessment of the macroeconomic risks by the agents, especially risks related to exchange rate and inflation fluctuations.

One of the key findings of Vargas (2023) is about the role of exchange rate expectations – the outcome of the model shows that the expectations of the deprecation impact dollarization more than the inflation expectations, which, in turn, were found to be relatively consistent even in periods of increased volatility. It could imply that dollarization is connected primarily with the portfolio and a balance sheet channel, rather than prices. This approach also emphasises the interaction between dollarization and monetary policy – according to Vargas (2023), it creates a feedback loop: weakened policy transmission reinforces exchange rate volatility, which in turn drives dollarization.

The economic intuition behind this model was formalized in a more recent paper by Castillo et al. (2024): the authors used a DSGE framework to demonstrate that monetary easing can become contractionary in a dollarized economy due to the balance sheet effects. The implication of this approach is that is that de-dollarization can not be achieved purely through stabilization measures, as it is tied to long-run expectations.

2.4.2 *Portfolio-choice approach*

A second group of papers (Ize and Yeati, 2006; Khvedchuk et al. 2019; Metreveli, 2025) looks at dollarization as a portfolio choice under risk and uncertainty, typically using the Minimum Variance Portfolio (MVP) approach. The MVP approach explains dollarization as agents' optimal allocation of assets between those denoted in local and foreign currency in such a way that minimizes the variance of real returns. According to this model, agents choose the currency

composition of their portfolio based on the volatility of exchange rate and inflation fluctuations. MVP assumes that when inflation volatility is higher relative to the exchange rate volatility, the agents will choose to keep a bigger fraction of their assets in a foreign currency, which would act as a natural hedge against domestic price instability. On the other hand, if the volatility of the exchange rate is higher, domestic currency assets would yield a more stable return and thus become more attractive.

One of the implications on the MVP model is that it allows to distinguish between "natural" and "excess" dollarization. Natural dollarization implies that there is some level of foreign currency assets that is driven purely by risk considerations. Excess dollarization, on the other hand, is a positive deviation from the natural level and could be driven by other factors, such as low public trust in institutions, policy distortions etc – this is the key point of Khvedchuk et. al (2019), where this model is applied to the Ukrainian system. The study estimates that the actual level of financial dollarizarion in Ukraine is higher than that of other Central and Eastern-European countries; in addition, the spread between the actual and the natural levels of dollarization in Ukraine exceeded that of Poland, Romania and Hungary in 2017. However, this model has an important limitation: by design, MVP abstracts from financial intermediation, banking behaviour and policy constraints. Basso et al. (2007) highlight this limitation, as their analysis has demonstrated that banks do play a significant role on the level of financial dollarization.

2.5. Estimating factors driving dollarisation

A substantial share of the literature on dollarization aims to empirically identify the key factors driving dollarization across different countries and time periods. A variety of methodologies have been used: cross-country panel regressions

(Hake et al., 2014), country-level time-series models (Vargas, 2023; Evans, 2025). Even though different methods are employed, several core determinants are observed across different papers.

Firstly, macroeconomic instability (particularly inflation) is one of such core determinants. Earlier empirical studies consistently show that inflation and inflation volatility as associated with financial dollarization due to risk hedging against domestic price fluctuations. For example, in De Nicolo et al. (2005), the authors show that financial dollarization promotes financial deepening specifically in economies characterized by high inflation. Thus, high inflation drives agents to hold their assets in a foreign currency. It is also important to note that several studies suggest that inflation stabilization alone is not sufficient for de-dollarization. So, while inflation is a generally established driver of dollarization, there are also other channels influencing it.

The dynamics of exchange rate (and its expectations) are a second core determinant. Vargas (2023) has shown that dollarization is cointegrated with exchange rate, expected depreciation and interest rate differentials. This means that these variables move together towards a long-run equilibrium. Also, Vargas (2023) demonstrates that it is specifically the expectations of the exchange rate fluctuations, rather than its actual levels that drive dollarization – which is in line with the theory that agents react to perceived future risks when forming their asset portfolios.

Interest rate differentials between foreign and local deposits and loans is another frequently studied variable. The economic intuition suggests that a higher interest rate on domestic currency deposits should decrease dollarization, as this would increase the returns on LC assets. However, the empirical evidence is mixed. A meta-analysis by Hake et al. (2014) estimated key factors driving loan dollarization in countries of Latin America and Central, Eastern and South-Eastern Europe

(CESEE). The results demonstrate that interest rate differentials play a more important role in Latin America rather than in CESEE, which suggests that dollarization in CESEE may be more supply-driven, as exchange rate volatility induces more lending in foreign currency. This means that in CESEE, loan dollarization is driven more by the fact that banks have access to foreign-denominated assets and tend to shift the exchange-rate risk to the borrowers, rather than borrowers preferring FX loans. Additionally, an earlier study provided evidence that the interest rate as well as access to foreign funding actually suggests decoupling of deposit and loan dollarization, which complicates how we interpret the effects of interest rates (Calvo, 1996).

Lastly, empirical studies frequently look at the effects of the policy frameworks and institutional trust. According to Catao (2016), switching to inflation-targeting regime, paired with macroprudential measures (such as differentiated reserve requirements and capital regulations) is associated with a decrease in both deposit and credit dollarization. This finding is also supported by Vargas (2023), where it is stated that a credible policy framework is necessary for a shift in a long-run dollarization equilibriums.

This thesis builds primarily on the equilibrium and expectations-based literature, with the aim being examining drivers of dollarization in Ukraine. Particularly, this study relies on Vargas (2023), by modeling deposit dollarization within a long-run cointegration framework and estimating short-run dynamics through an error-correction specification. Unlike cross-country panel studies, this analysis focuses exclusively on Ukraine and explicitly accounts for the 2014 exchange rate regime shift from pegged to floating. Additionally, it extends the existing literature by incorporating a proxy for public sentiment and evaluating the effectiveness of currency-differentiated reserve requirements as a targeted prudential instrument. By combining macroeconomic, policy, and expectations channels together with a regime-comparative framework, this thesis will

contribute new empirical evidence on the determinants of financial dollarization in Ukraine.

C h a p t e r 3

METHODOLOGY

The methodological approach in this study is twofold: first, to analyze the impact of the regime switch from pegged to floating exchange rate, a two-step error correction model is designed, following Engel and Granger 2-step approach. The goal is to estimate a long-run cointegrating relationship between macro variables and construct an error-correction term (ECT), the purpose of which is to capture deviations from the equilibrium. Then, a short-run dollarization equation in differences is estimated, which includes the lagged ECT, as well as additional policy and uncertainty variables, which allows for heterogeneity across the two regimes and also accounts for major war-related shocks, as presented in Hake (2014).

In economies characterized by high inflation and depreciation, the nominal exchange rate and domestic price level tend to move together over the medium and long run through exchange-rate pass-through, inflation persistence, and policy adjustment. So, even if each series is non-stationary on its own, economic logic suggests that their divergence cannot grow indefinitely. Large misalignments will trigger the price adjustment, further depreciation or policy responses that bring the system back toward a common path.

3.1 Long-run cointegration

3.1.1. Long run cointegration: UIP components

One approach to determining factors driving dollarization is a VECM equation, replicating Vargas (2023) is constructed. The cointegrating equation includes the share of deposits in foreign currency, exchange rate, 12-month-ahead

expectations of the exchange rate and the interest rate differential between the local and foreign currency deposits:

$$z_t = \begin{bmatrix} ln(share_t) \\ ln(er_t) \\ ln(er_exp_t) \\ intrate_diff \end{bmatrix} \quad (1)$$

These variables were chosing following Vargas (2023) methodology. Importantly, before estimating the long-run relationship, each of the variables need to be assessed using Augmented Dickey–Fuller tests. If the variables are found to be non-stationary in levels but stationary in first differences, then the Johansen trace test is then applied, to determine whether they share a cointegrating relationship. According to Vargas (2023), the relationship between dollarisation and the interest rate differential can be explained through the uncovered interest parity (UIP) condition, as presented in the equations below:

$$\mathrm{E}_t\left(\mathrm{ER}_{\{t+h\}}\right)\left(1 + \mathrm{i}_t^{\{US\}}\right) = ER_t(1 + \mathrm{i}_t) \quad (2)$$

where:

- $\mathrm{ER}_{\{t+h\}}$ – spot exchange rate,
- $\mathrm{E}_t\left(\mathrm{ER}_{\{t+h\}}\right)$ -- expected exchange rate at horizon *h*,
- i_t, $\mathrm{i}_t^{\{US\}}$ – deposit rates for domestic and foreign currency deposits respectfully

A log-linear approximation thus becomes:

$$E_t\left(\Delta ER_{\{t+h\}}\right) \approx i_t - i_t^{\{US\}} \quad (3),$$

Under UIP, the expected depreciation of the local currency should offset the interest rate advantage of holding deposits in local currency. So, movements of the interest rate differential, the exchange rate and exchange-rate expectations together impact the relative attractiveness of LC vs. FX deposits. Therefore, under these assumptions a higher domestic interest rate differential would lead to a positive UIP premium. This should, holding all else equal, lead to de-dollarization of deposits by increasing expected returns in local currency, while stronger depreciation expectations will shift portfolios toward FX deposits as a hedge. However, it is important to note that this condition only holds for the comparable risk levels across the two countries. Otherwise, the condition becomes

$$E_t\left(\Delta ER_{\{t+h\}}\right) + \rho_t \approx i_t - i_t^{\{US\}}, \quad (4)$$

where ρ_t is the risk premium for a given period. Therefore, a positive UIP premium might also include the compensation for additional (perceived) risk of local currency deposits. A significant limitation of this approach is due to the lack of data availability for the expectations for prior to July, 2014. Therefore, this approach does not allow for heterogeneity between the two exchange rate regimes. So, an alternative specification, based on the PPP framework is chosen

3.1.2: Long-run cointegration: PPP framework

As is mentioned in the previous subsection, the main long-run relationship used in this thesis will be based on the cointegration equation which uses an augmented PPP framework. The reasoning for choosing this framework is twofold: firstly, the literature on dollarisation repeatedly highlights that deposit dollarisation is affected my macroeconomic instability as well as inflation and depreciation risks and expectations (Ize and Levy-Yeyati, 2003; Urosevic et al., 2016). Secondly, literature focusing on the long-run macroeconomic relationships repeatedly finds that the PPP condition, according to which nominal exchange rate and relative price levels may share a long-run equilibrium (Taylor and Taylor, 2004; Rogoff, 1996).

Thus, the economic intuition suggests that over a long run, nominal exchange rate, domestic price level and foreign price level should not diverge indefinitely. In Ukrainian context persistent deviations from this relationship may mean that there is macroeconomic instability. This in turn affects the value of LC assets, which would incentibize agents to hold deposits in foreign currency.

So, the long-run system would be specified as:

$$y_t = \begin{bmatrix} ln(ER_t) \\ ln(P^{UA}{}_t) \\ ln(P^{US}{}_t) \\ ln(share)_t \end{bmatrix} \quad (5),$$

where $ln(share)_t$ is the natural log of the share of FX deposits in total deposits. If these variables are non-stationary in levels and stationary in first-differences (confirmed via ADF testing), the next step is to proceed to the Johansen trace test and order to establish where they share a long run equilibrium relationship.

If the trace test confirms a stationary linear combination of these variables, the long-run relationship can be estimated using the Johansen cointegration framework, as is shown in the equation below:

$$\ln(\text{share}_t) = \alpha + \beta_1 \ln(ER_t) + \beta_2 \ln(P_t^{UA}) + \beta_3 \ln(P_t^{US}) + \gamma D_t^{\text{float}} + u_t \quad (6)$$

To capture heterogeneity across exchange-rate regimes, the model includes the dummy:

$$float_t = \begin{cases} 1, \text{from Jan 2014 onward} \\ 0 \text{ otherwise} \end{cases} \quad (7)$$

Including this dummy allows the long-run relation to account for the structural break associated with the post-2014 change in the exchange rate regime from pegged to float. So, an error-correcting term is then constructed and it represents the estimated deviation from this long-run relationship:

$$ECT_t = \ln(\text{share}_t) - \alpha - \beta_1 \ln(ER_t) - \beta_2 \ln(P_t^{UA}) - \beta_3 \ln(P_t^{US}) - \gamma D_t^{\text{float}} \quad (8)$$

Financial dollarization reflects the currency preferences of agents – and these preferences may be influenced about their beliefs about macroeconomic stability (Dalgic, 2017). So, when exchange rate and price level deviate from their long-run equilibrium, it can be interpreted as a signal of instability, so and agents might adjust their portfolios towards foreign currency deposits as a hedge against this risk.

Thus, including an $\mathbf{ECT_{t-1}}$ term in the dollarization equation allows to test if the dynamics responds systemically to macro disequilibrium, with a significant coefficient suggesting that dollarization adjusts to it. An insignificant coefficient instead would suggest that short-run deposit behavior is driven more by immediate shocks and policy variables than by long-run macro misalignment. Given the 2009-2025 dataset, it is important to acknowledge an important limitation: we may encounter a statistically insignificant ECT due to the estimated cointegrating vector being sensitive to sample composition and breakpoints. In that case, the model still captures short-run dollarization dynamics through ΔER, policy instruments and public sentiment index.

3.2. Error-correction model

After the long-run relationship is estimated, the second step of the empirical strategy models short-run changes in deposit dollarization by including the error correcting from the long-run estimation. The dependent variable becomes the monthly change in the share of FX deposits, following Garcia-Escribano and Sosa (2010). This allows the model to distinguish between long-run macro-financial disequilibrium which is captured by the lagged error-correction term and short-run responses to exchange-rate movements, interest-rate incentives, prudential policy, public sentiment and war-related shocks.

Som ort-run dollarization equation is as follows:

$$\Delta share_{j,t} = \alpha + \lambda ECT_{\{j,\ t-1\}} + \Gamma' X_{j,t} + \varepsilon_{j,t}\,, \qquad (9)$$

where $\Gamma' \mathbf{X_t}$ represents the matrix of the short-run drivers, selected based on Hake (2014) and Vargas (2023). Subscript *j* indicates category of the share of FX

deposits (such as total, household, maturity). An expanded version of the dollarization equation could be specified as:

$$\begin{aligned}\Delta\text{share}_t = \alpha + \lambda\, ECT_{t-1} + \beta_1\, \Delta \ln E\, R_t + \beta_2\, (\Delta \ln E\, R_t \cdot \text{Float}_t) \\ + \theta_1\, \text{intrate_diff}_t + \theta_2\, (\text{intrate_diff}_t \cdot \text{Float}_t) + \phi_1\, \text{rr_fx}_t \\ + \phi_2\, (\text{rr_fx}_t \cdot \text{Float}_t) + \psi_1\, \text{PSI}_t + \psi_2\, (\text{PSI}_t \cdot \text{Float}_t) \\ + \kappa_1\, \text{net_remitt}_t + \kappa_2\, \text{fx_surrender}_t \\ + \kappa_3\, \text{settlement_strictness}_t + \kappa_4\, D_t \text{FXpurchase} \\ + \delta_1\, \text{war2014}_t + \delta_2\, \text{war2022}_t + \varepsilon_t\end{aligned} \tag{10}$$

where:

- Δshare_t is the monthly change in the share of FX deposits
- ECT_{t-1} is the lagged deviation from the PPP-based long-run equilibrium
- $\Delta \ln E\, R_t$ is the monthly change in the log USD/UAH exchange rate
- intrate_diff_t is the interest-rate differential between LC and FX deposits
- rr_fx_t is the is the difference in the reserve requirement measure for FX and LC deposits
- PSI_t is the synthetic Public Sentiment Index constructed from Google Trends data
- net_remitt_t is the net remittance inflows
- fx_surrender_t is the mandatory FX surrender requirement
- $\text{settlement_strictness}_t$ is the strictness of export-import settlement deadlines
- $D_t\text{FXpurchase}$ is the dummy variable capturing periods with additional FX purchase restrictions
- $\text{war2014}_t, \text{war2022}_t$ are the categorical variables for war-related shocks

Policy variables were selected following Vargas (2023). The selected variables are mostly standard for the studies in the area of dollarization. rr_fx_t variable is used to test the hypothesis that differentiated reserve requirements are an effective policy tool for decreasing dollarization. Float_t enters the regression via the interactions, which allows to test hypothesis that sensitivity of financial dollarization to policy measures (as well as other drivers) is different under the pegged and floating exchange rate regimes. The categorical variables of war2014 and war2022 are unique to the Ukrainian economy and history; however, such structural changes need to be controlled for, so that the estimations are not distorted. Additionally, the public sentiment index is a synthetically constructed variable specific to this study. However, the literature overwhelmingly suggests that the public trust in monetary authorities is a driver, which impacts dollarization. Therefore, it was included in this estimation via the proxy.

Robustness check include:

i. estimating the 2-step error-correction model across different specifications (on the FX shares calculated from the outstanding amounts on deposits as well as on new deposits; new deposit data is more granular and allows for separate estimations by the maturity as well as by depositor type – household, corporate or total);
ii. ARDL specification, estimated for outstanding deposits. ARDL allows for richer lag dynamics of both the dependent variable and the explanatory variable, which addresses the possibility that deposit dollarisation responds to explanatory variables with a delay rather than only contemporaneously

3.3 Public Sentiment Index construction

The construction of the PSI variable followed the methodology described by Brochado (2020). This methodology was used in a number of studies, such as

Awosusi (2025). Following the methodology, a series of keywords, both in Ukrainian and Russian, denoting lower public trust in were selected. The list of keywords is available in Appendix A. Google trends data on these series are measured on a relative scale, so they are not directly comparable – therefore, they need to be standardized and be put on a common scale:

$$z_{i,t} = \frac{x_{i,t} - \overline{x_i}}{s_i}, \tag{11}$$

where $x_{i,t}$is the raw Google Trends value for topic i in month t, x_i is the mean of the respective series and s_i is the standard deviation. This transformation ensures a zero mean, and, most importantly, prevents topics with larger variance from dominating in the aggregation.

Then, each topic in Ukrainian and Russian is combined in order to produce a single concept-level indicator (factor):

$$F_{k,t} = \frac{1}{J_k} \sum_{j \in k} z_{j,t} \tag{12}$$

where concept *k* contains *J* keyword series. In this case, J = 2, denoting series in Ukrainian and Russian for each concept *k* is used to define the factor for each concept. These factors create a vector F_t, with topic with low coverage (more than 40% missing observations) being dropped from aggregation. So, the retained vector of factors is

$$F_t = \left(F_{1,t}, F_{2,t}, \ldots, F_{K,t}\right)' \tag{13}$$

The Principle Component Analysis was then applied to construct is a single PSI value for each period:

$$PSI_t = \mathrm{w}_1' \mathrm{F}_\mathrm{t} \tag{14}$$

Here, w_1 is obtained from the eigenvector corresponding to the largest eigenvalue of the covariance matrix F_t, because it captures the largest share of common variation across the searches. The constructed PSI will then later be used as an explanatory variable. It allows to test the hypothesis that effectiveness of de-dollarization depends on the public perception of the credibility of monetary policy, as it enters the regression as a proxy for it.

3.4. Methodology overview

In conclusion, the selected Engel and Granger 2-step approach allows to empirically test how different theoretical channels of dollarization, as presented in Table 1 affect short-run changes in FX deposit shares while also accounting for deviations from long-run macroeconomic equilibrium:

Table 1. Transmission channels in the estimation

Channel	Enters estimation via	Interpretation
Exchange rate and relative-return channel	$\Delta\,\mathrm{lner}_\mathrm{t}$	Does depreciation pressure increase FX deposit share?
Exchange-rate regime channel	Interactions with $\mathrm{Float}_\mathrm{t}$	Are sensitivities different under floating exchange rate regime?

Table 1. Transmission channels in the estimation, continued

Channel	Enters estimation via	Interpretation
Exchange rate and relative-return channel	intrate_diff_t; UIP estimation	Do higher LC deposit rates reduce dollarisation?
Exchange rate and relative-return, expectations channels	er_exp_t in UIP estimation	Captures the effect of expectations under the UIP framework
Policy and regulatory channel	rr_fx_t	Do differentiated reserve requirements discourage FX deposits?
Public trust / credibility channel	PSI_t	Does (proxied) trust in monetary policy affect dollarization?
External inflows channel	net_remitt_t is	Do net remittance inflows affect the currency composition of deposits?
Policy and regulatory channel	fx_surrender_t	Do mandatory FX surrender requirements affect FX liquidity and incentives to hold FX deposits?
Policy and regulatory channel	$\text{settlement_strictness}_t$	Do stricter export-import settlement deadlines affect FX availability and deposit currency choice?
Policy and regulatory channel	$D_t\text{FXpurchase}$	Do additional FX purchase restrictions affect the accessibility or attractiveness of FX deposits?
War-related uncertainty channel	war2014_t and war2022_t	Captures war-related shifts

Chapter 4

DATA DESCRIPTION

The main part of the empirical analysis is conducted using monthly data covering the period between January, 2009 and December, 2025, excluding the first 2 months of full-scale invasion in the baseline model, as the drivers of human behavior during these months cannot be adequately captured by the model used. This time frame allows for comparison between the fixed exchange-rate regime (pre-2014) and the floating exchange-rate regime (post-2014). The secondary, UIP-component model specification is estimated using the same dataset, however, the period is shortened to July 2014 – December 2025 due to household expectations data, which is integral to the model, being available only since mid-2014. The UIP-component model is largely illustrative.

Firstly, this chapter provides an overview of the macro variables (see Table 2) as well as policy controls. Then, it describes the data on outstanding deposits and lastly it will focus on the dynamics of newly placed deposits.

Table 2: Macro variables and policy controls

Variable	Source	Construction / notes
ER_t	NBU official exchange-rate data	Monthly UAH/USD nominal exchange rate. Used in logs as
ER_exp_t	NBU HH expectations survey data	12-month-ahead expected UAH/USD exchange rate. Available only from July 2014, so it is used only in the UIP-component specification.

Table 2: Macro variables and policy controls, continued

Variable	Source	Construction / notes
inf_exp_t	NBU HH expectations survey data	Expected inflation
inf_t	NBU	Actual inflation
P_t^{UA}	SSSU	Seasonally adjusted Ukrainian CPI (used in logs in the PPP-based long-run equation)
P_t^{US}	FRED	Seasonally adjusted US CPI (also used in logs in the PPP-based long-run equation)
net_remitt_t	NBU B-o-P	Net remittance inflows
PSI_t	Google Trends	Constructed Public Sentiment Index
rr_fx_t	NBU reserve-requirement regulations	Reserve requirement differential for deposits in FX and LC; household and corporate estimations use the respective differentials
$fx_surrender_t$	NBU FX regulations, coonstructed	Mandatory FX surrender requirement, coded as the required share of FX proceeds to be sold
$settlement_strictness_t$	NBU FX regulations, constructed	Constructed from export-import settlement deadlines as (365 /settlement_days - 1); 365 days is 0 and higher values mean stricter settlement rules
$D_t FXpurchase$	NBU FX regulations	Dummy indicator for periods with additional FX purchase restrictions, especially wartime FX controls
war2014_t, war2022_t	Constructed manually	Categorical war-shock control. In regressions, separated into (war2014_t) and (war2022_t).
D_t^{float}	Constructed manually	Exchange-rate regime dummy equal to 1 under the floating-regime period and 0 otherwise. Used mainly through interaction terms.

The Pubic Sentiment index is based on the "negative searches" – that is, those conceptual topics that might indicate power trust in the NBU and overall stress,

such as inflation, devaluation, NBU restrictions, deposit insurance, deposit withdrawals. For each conceptual topic, the Ukrainian- and Russian-language series were averaged to form a single monthly "factor" series in order to reduce language-specific noise and cover a wider range of searches. Google Trends might contain missing observations for certain topics, especially in earlier periods or for low-volume searches. So, sparce topic series were dropped, following a rule of retaining only those topics, that contain 60% or more of non-missing observations. Then, Principal Component Analysis (PCA) was applied to the matrix of the vectors of retained topics, and PSI was defined as the first principal component, as it captures the largest share of common variation across these searches, and, therefore summarizes broad shifts in public perception. Higher the value of PSI in a given period correlate with periods of increased public concern or distrust (see Figure 2)

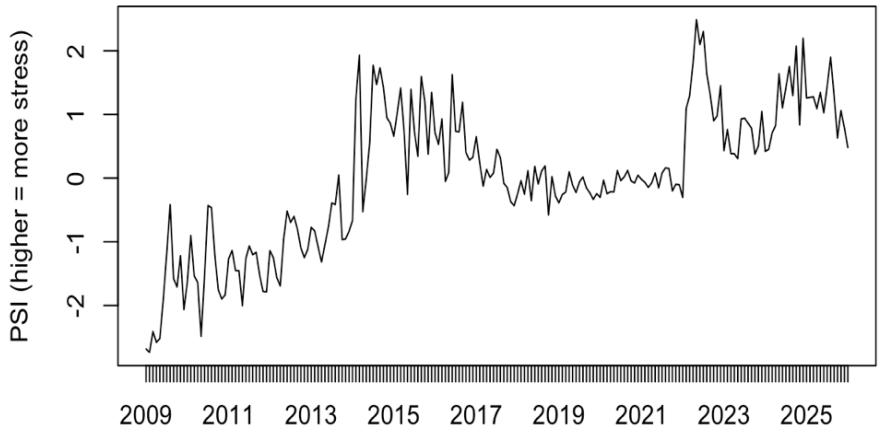


Figure 2: Dynamics of the constructed PSI

The spikes are observed in 2014-2015 (likely associated with the switch to the floating exchange rate regime, as well as with the overall instability (Annexation of Crimea, military action (Anti-Terrorist Operation) in Donetsk and Luhansk

regions) It is important to note that this measure takes into account relative popularity of the relevant search terms in all Google searches in that period, therefore, there is no period bias related to Internet penetration in the earlier periods of the study. The descriptive statistics of the key continuous variables (in levels) are presented in Table 3:

Table 3. Descriptive statistics for the key continuous dataset variables

Statistic	N	Mean	St. Dev	Min	Max
share_dep_fx	204	0.410	0.054	0.293	0.588
share_hh	204	0.448	0.066	0.328	0.648
inf_exp	138	12.454	4.181	4.512	22.891
er_exp	138	32.312	7.130	11.960	44.539
inf_level	204	12.207	11.561	-1.200	60.900
er_level	204	22.656	11.609	7.616	42.200
intrate_diff	204	8.599	2.029	3.025	12.592
psi	204	-0.002	-2.736	-2.736	2.490

The relation between the expected and actual exchange rate and y-o-y inflation, respectively, are illustrated by Figures 3 and 4:

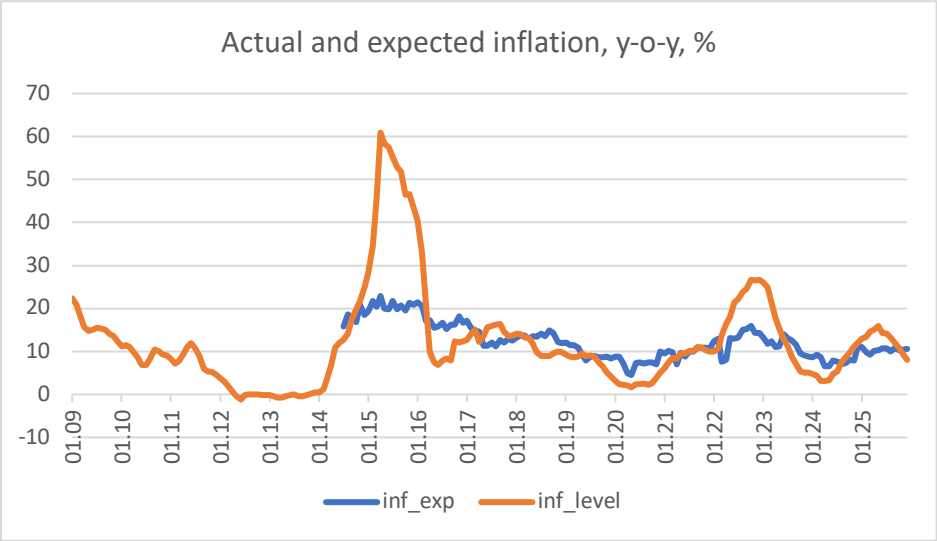


Figure 3: Dynamics of actual and expected y-o-y inflation.

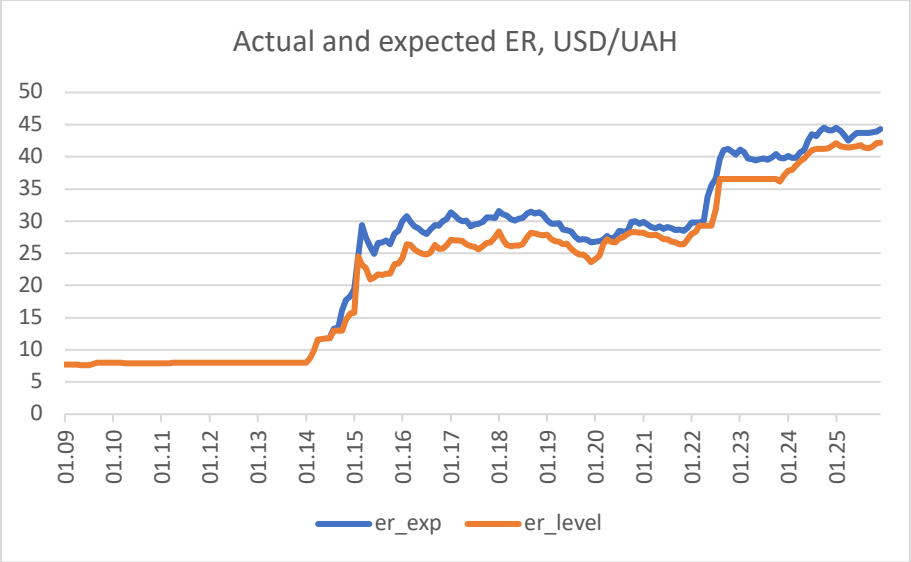


Figure 4: Dynamics of actual and expected exchange rate, USD/UAH

The graphs reveal a pattern of households observing exchange rate closely, which suggests a higher degree of responsiveness to the actual and expected exchange rate, rather than inflation, as a factor driving investment decisions.

Figure 5 illustrates the dynamics between the share of foreign currency deposits (both by any type of depositor and household-only deposits), along with the nominal exchange rate.

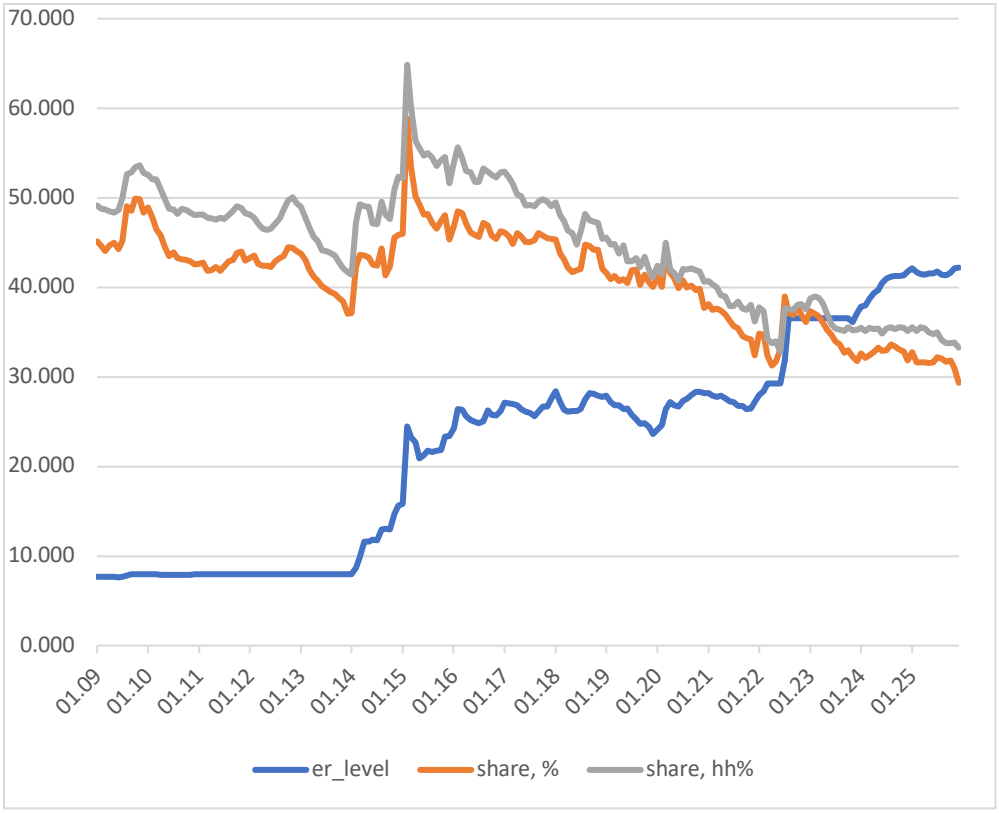


Figure 5. Dynamics of the share of FX deposits and nominal exchange rate

Unexpectedly, following a spike in 2014-2015, the share of FX deposits exhibits a declining trend, despite the increase in the levels of the nominal exchange rate. Thus, it is likely that factors other than the exchange rate are driving dollarization.

For the new deposits, they are grouped by depositor type and maturity. As with the outstanding deposits, household deposits refer to deposits placed by physical persons, while corporate deposits refer to deposits placed by legal entities. This dataset allows for a maturity breakdown: deposits with maturity under 1 year are treated as short-term, deposits with maturity from 1 to 2 years as medium-term, and deposits with maturity above 2 years as long-term. On-demand deposits are excluded from the maturity-based analysis because they do not represent a fixed-term placement decision, and are thus not comparable with term deposits.

The data shows that there is a clear preference for short-term deposits across both household and corporate depositors. Figures below present the total volume of newly placed deposits by maturity group on a log scale, separately for corporate (Figure 6) and household deposits (Figure 7).

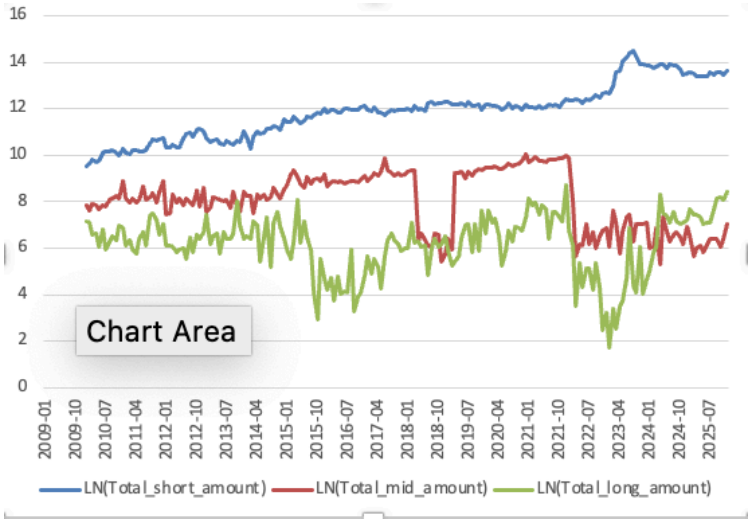


Figure 6: Dynamics of new corporate deposits by maturity, log scale

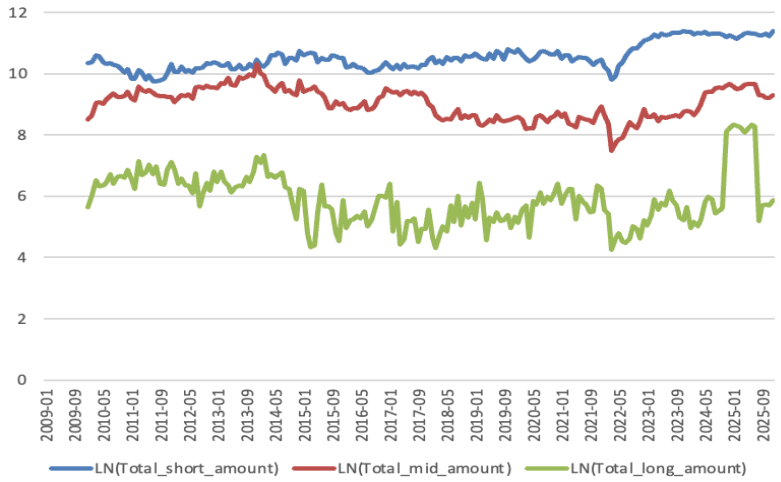


Figure 7: Dynamics of new household deposits by maturity, log scale

The volatility of new long term deposits suggests that the maturity-specific estimations, especially for the 2+ year category should be interpreted cautiously, as it may be especially sensitive to outliers. The overall dollarization patterns is largely the same as in the outstanding dataset, which is expected given the prevelant preference for short-term assets (Figure 8)

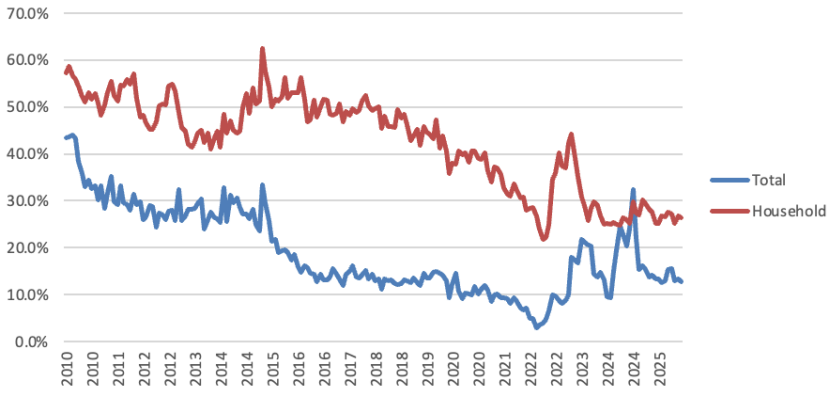


Figure 8: Share of FX deposits in all new deposits

Chapter 5

ESTIMATION RESULTS

This section reports the results of the estimations, as described in Chapter 3 and is split into two subsections. Subsection 5.1 presents the long-run relationships, namely the supplementary 1) UIP-component VECM and 2) the cointegrating relationship from of a main 2-step error-correction model. Subsection 5.2 presents the main ECM findings, both for the estimations modeling the dollarization of the outstanding deposits, as well as the dollarization of new deposits specifically. As a robustness check, an alternative ARDL specification was also estimated.

The main chosen empirical strategy separates

(i) long-run macroeconomic equilibrium between the nominal exchange rate and the domestic price level and

(ii) short-run changes in deposit dollarisation, which were modelled as a function of exchange-rate changes, policy variables, public sentiment, war shocks and heterogeneity across exchange-rate regimes.

5.1. Long-run relationships

5.1.2. UIP-components long-run relationship

According to the UIP condition, returns on the local currency assets should equal the returns on FX assets after accounting for the expected depreciation of local currency. Then, the UIP premium is the difference between the advantage of holding assets denominated in LC (as opposed to FX) and expected depreciation of local currency. So, if the UIP premium is positive, LC deposits offer returns

that outweigh the expected losses due to hryvnia depreciation, thus reducing dollarization. This channel could be one of the factors, due to which the share of dollarized deposits has been decreasing despite the fact that local currency has been depreciating. Figure 9 illustrates the estimated ex-ante UIP premium:

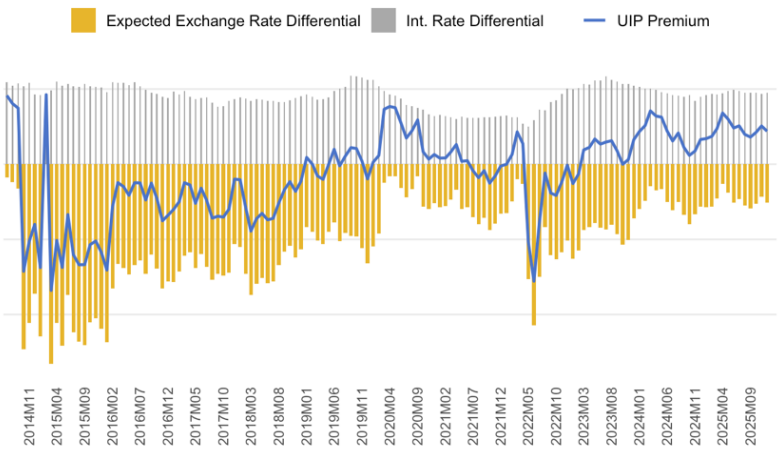


Figure 9: Ex-Ante UIP Deviation

An ex-ante estimation requires the data on the expectations of the exchange rate, so, it was limited to the 2014-2025 period only An interesting finding is that post-2019, the UIP premium has been largely positive, with the exception of several months at the beginning of 2020 (likely due to the onset of COVID-19 pandemic), and the beginning of 2022 (the full scale invasion). This coincides with the decreasing share of dollarized deposits over this period

In order to formally evaluate the relationship between the UIP components and dollarisation of deposits, a VEC model was estimated in order to obtain a cointegrating equation following Vargas (2023). Firstly, the ADF tests are conducted in order to check if the variables could be (I1). The results of the test

are presented in Table 4 and suggest that they can enter the Johansen trace test, as they are non-stationary in levels, but stationary in first differences:

Table 4: ADF unit root tests for UIP-based variables, 12 lags

Variable	Specification	Test Statistic	1% CV	5% CV	10% CV	Conclusion
lnshare = log(FX deposit share)	Level	2.531	-2.58	-1.95	-1.62	Do not reject unit root
	First Difference	-3.007	-2.58	-1.95	-1.62	Reject at 1%
lner = log(ER)	Level	1.122	-2.58	-1.95	-1.62	Do not reject unit root
	First Difference	-2.877	-2.58	-1.95	-1.62	Reject at 1%
lner_exp = log(expected ER)	Level	0.945	-2.58	-1.95	-1.62	Do not reject unit root
	First Difference	-3.535	-2.58	-1.95	-1.62	Reject at 1%
intrate_diff = LC–FX deposit rate differential	Level	-1.037	-2.58	-1.95	-1.62	Do not reject unit root
	First Difference	-2.482	-2.58	-1.95	-1.62	Reject at 5%

The series satisfy the requirements for cointegration testing, therefore, a Johansen trace test is conducted to check for the evidence of cointegration. Using a VAR with 2 lags (K = 2), the trace test strongly rejected the null of no cointegration, so this suggests that there exists a long-run relationship between the 4 variables. However, the cointegration of 1 is also rejected at both 1% and 5%, suggesting

that this system may have more than 1 long-run relationship, rather than a single cointegrating vector (see Table 5).

Table 5: Johansen trace test for UIP component variables

Hypothesis	Test Statistic	5% CV	1% CV	Decision at 5%	Decision at 1%
r = 0	104.76	53.12	60.16	Reject	Reject
r ≤ 1	58.45	34.91	41.07	Reject	Reject
r ≤ 2	23.11	19.96	24.6	Reject	Do not reject
r ≤ 3	4.95	9.24	12.97	Do not reject	Do not reject

These results confirm that there is long-period comovement. The cointegrating vector is presented for illustrative purposes in equation 15, however, since r>1, it is not a uniquely identified structural relationship, but rather one of the ways to represent it:

$$\ln share_t = -1.61 \ln ER_t + 1.00 \ln ER_t^{exp} - 0.22\text{IR_}diff_t + 1.08 \quad (15)$$

In this estimation, higher year-ahead exchange rate expectations are associated with higher dollarization, while a bigger difference between LC and FX returns on assets – with lower dollarization. Counterintuitively, current exchange rate has a negative coefficient, suggesting that in the long-run, dollarization of deposits

decreases with the depreciation of local currency, which is likely not a causal effect. Interestingly, this coincides with the findings in Vargas (2023). Another possible explanation could be as described in Basso (1999) – the banks are interested in holding similar share of FX assets and liabilities. While the depreciation of local currency, should, in theory, make FX deposits more attractive, the opposite is the case with FX loans. Thus, a lower share of FX loans then correlates with a lower share of FX deposits due to this effect.

Since this specification has significant limitations – namely that the estimation is limited to July 2014 and onwards (which does not allow for a differentiation between periods), as well as the rank suggesting 3 long-run cointegrating relationships, this thesis than estimates a PPP-based long-run equation which will be estimated across the full sample. Obtaining the error-correcting term from this equation will be the first step used in the 2-step error-correcting model.

5.1.2. PPP long-run relationship

As a first step, a cointegrating equation between $\mathrm{lnshare}_t^{FX} = \ln(\mathrm{FXShare}_t)$, $\mathrm{lner}_t = \log(\mathrm{ER}_t)$, $\mathrm{lnp}_t^{UA} = \ln(\mathrm{P}^{UA})$ and $\mathrm{lnp}_t^{US} = \ln\left(\mathrm{CPI}_t^{US}\right)$ is estimated using the Johansen's approach and then I construct the ECT_t, which will be used in the short-run dollarization equation. The economic intuition of such long-run relationship follows from the PPP framework, which connects the nominal exchange rate movements, with the domestic and foreign price levels. So, deviations from this would affect the value of local currency assets, which in turns incentivizes FX deposits. Prior to estimating the cointegrating equation, ADF tests were performed on both variables, both in levels and differences. The test for both the level and differenced variables used 12 lags, however, the level variables was estimated trend, while the first differenced variables – without a

deterministic component, following a visual inspection. The results of the test are presented in Table 6:

Table 6: ADF unity root test for PPP-based variables, 12 lags

Variable	Specification	Test Statistic	1% CV	5% CV	10% CV	Conclusion
lnshare = log(FX share)	Level	-1.76	-3.99	-3.43	-3.13	Do not reject unit root
	First Difference	-3.81	-2.58	-1.95	-1.62	Stationary at 1%
lner = log(ER)	Level	-2.83	-3.99	-3.43	-3.13	Do not reject unit root
	First Difference	-2.27	-2.58	-1.95	-1.62	Stationary at 5%
lnp_ua = log(UA CPI)	Level	-2.85	-3.99	-3.43	-3.13	Do not reject unit root
	First Difference	-2.19	-2.58	-1.95	-1.62	Stationary at 5%
lnp_us = log(US CPI)	Level	-2.08	-3.99	-3.43	-3.13	Do not reject unit root
	First Difference	-1.87	-2.58	-1.95	-1.62	Weakly stationary

As can be seen from Table 6, the results of the ADF test conducted on the levels of the variables show that the test-statistic are larger than the respective critical values, indicating that we cannot reject the null-hypothesis, namely that there is evidence of non-stationarity. The analysis of the differenced series of the allows us to reject the null hypothesis at 5% for all variables, except the US price level. In this case, results of the ADF test reveal weak evidence of stationarity – the null hypothesis can be rejected at 10%, but not at 5%. Following the literature, we proceed, stating that both series satisfy the requirements for cointegration testing.

Therefore, a Johansen trace test is conducted to check for the evidence of cointegration. Using a VAR with 2 lags (K = 2), the trace test rejected the null of no cointegration (r = 0) at the 5% level. So, there is evidence of cointegration relationship between the exchange rate, domestic price level foreign price level and the share of FX deposits. Thus, a cointegrating equation may be estimated.

Normalizing it on *log* share of FX deposits and setting $\mathbf{ECT_t}$ to 0, we get the implied long-run relation between these variables:

$$\ln(\text{FXShare}_t) = 0.35\ln(ER_t) - 0.36\ln(P_t^{UA}) - 0.77\ln(P_t^{US}) + 3.84 \quad (16)$$

The sample includes a major regime change (from pegged to floating exchange rate). So, the estimated relationship also allows for a 2014 intercept shift by break-adjusting the error-correction term:

$$ECT_t = \ln(\text{FXShare}_t) - 0.35\ln(ER_t) + 0.36\ln(P_t^{UA}) + 0.77\ln(P_t^{US}) - 3.78 + 0.02D_t^{float} \quad (17)$$

Using the estimated cointegrating vector, the error-correction term is constructed as a stationary measure of deviation from long-run equilibrium and its lagged value enters the short-run regression interpreted as macro "misalignment" from the previous month. The dynamics is presented in Figure 10



Figure 10. Dynamics of the break-adjusted ECT from the cointegrating relationship

So, the long-run analysis is used as the first step for the two-step error correction model. The UIP-based VECM confirms that UIP components (nominal exchange rate, exchange rate expectations and the interest rate differential) and dollarisation are cointegrated. However, this analysis is supplementary because of the sample size restriction and the existence of three cointegrating relationships within the same space, which poses additional constraints to the interpretation of the results. Thus, a PPP-based equation in used as the baseline, and the break-adjusted lagged ECT from it enters the short run ECM, representing the lagged deviation from the equilibrium

5.2. Error-correction model estimations

5.2.1. ECM: outstanding deposits

As the previous subsection established the long-run components and the respective error-correcting term, the ECM is used to estimate the change in the

share of FX deposits as a function of the lagged error correcting term, macro controls (such as exchange rate changes), interest rate differential, policy controls, public sentiment, war shocks as well as a regime interactions. As described in Chapter 3, two groups of estimations are conducted:

i) on the change in share of FX deposits in all deposits calculated from the data on outstanding amounts as of the end of the month;
ii) on the change in share of new FX deposits in new deposits, as of the end of the respective month

The first approach is generally used in the empirical literature (Vargas, 2023; Galac, 2012). The second approach allows to separate out specifically the decision to open new deposits. Moreover, due to the characteristics of the available data on new deposits, it allows for the analysis to be more granular, as it allows to differentiate by type of the depositor: (total, household and corporate) as well as by maturity (under 1 year, 1-2 years, 2+ years), while the analysis on the outstanding deposits allows for differentiation only between total (main) and household deposits (robustness). See Table 7 for the results of the estimation:

Table 7: ECM results for outstanding deposits

Variable	Δ share total: baseline (1)	Δ share total: strict (2)	Δ share HH: baseline (3)	Δ share HH: strict (4)
ECT lag	-0.004	-0.004	-0.008.	-0.003
	(0.005)	(0.005)	(0.004)	(0.006)
Δ log exchange rate	1.319***	1.300***	1.041***	1.068***
	(0.211)	(0.215)	(0.291)	(0.309)
Interest rate differential	-0.000106	-0.000105	-0.001*	-0.001*
	(0.000275)	(0.000309)	(0.000435)	(0.000553)
FX reserve requirement	-0.002***	-0.002**	-0.001*	-0.002**
	(0.000534)	(0.000724)	(0.000592)	(0.000594)

Table 7: ECM results for outstanding deposits, continued

Variable	Δ share total: baseline (1)	Δ share total: strict (2)	Δ share HH: baseline (3)	Δ share HH: strict (4)
Public sentiment index	0.007**	0.006**	0.007***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)
Net remittances	2.39e-07	5.15e-07	5.62e-07.	3.91e-07
	(3.69e-07)	(3.49e-07)	(3.18e-07)	(3.13e-07)
FX surrender requirement	0.002	0.009	0.010.	0.016**
	(0.007)	(0.007)	(0.006)	(0.006)
Settlement strictness	-0.003	-0.004*	-0.004.	-0.005*
	(0.002)	(0.002)	(0.002)	(0.002)
Δ FX purchase restrictions	-0.000744	-0.001	-0.001	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)
War dummy, 2014	-0.017*	-0.022*	-0.023**	-0.035***
	(0.008)	(0.009)	(0.007)	(0.010)
War dummy, 2022	-0.014	-0.020.	-0.017.	-0.028*
	(0.011)	(0.011)	(0.010)	(0.012)
Floating regime × Δ log exchange rate	-1.060***	-1.032***	-0.781**	-0.802*
	(0.217)	(0.221)	(0.296)	(0.314)
Floating regime × interest rate differential	0.000165	0.000329	0.000611	0.002.
	(0.000424)	(0.000467)	(0.000445)	(0.000796)
Floating regime × FX reserve requirement	0.001*	0.002*	0.000891	0.002**
	(0.000520)	(0.000813)	(0.000607)	(0.000583)
Floating regime × public sentiment index	-0.005*	-0.005*	-0.006*	-0.007**
	(0.002)	(0.003)	(0.002)	(0.003)
Constant	0.016**	0.017**	0.024***	0.028***
	(0.006)	(0.007)	(0.006)	(0.007)
Observations	190	187	190	187
R^2	0.542	0.556	0.605	0.615
Adjusted R^2	0.503	0.517	0.571	0.581

So, as a robustness check, a secondary model is estimated, with the dependent variable limiting the share of foreign currency deposits to those that are only held by households (physical entities). Models (1) and (2) use the difference in the share of FX deposits among all deposits as the dependent variable, with the strict model dropping the months of May and June of 2022 (in addition to the excluded months of March and April in the baseline model. Models (3) and (4) are conceptually the same as (1) and (2) respectively, with the only difference being that only household deposits are considered in the estimations. Importantly, a long-run cointegration equation is reestimated for the household-only model, such that the share of FX deposits of households enters the equation, from which, in turn, the household ECT is obtained. All of the estimations report Newey-West standard errors to account for autocorrelation and heteroscedasticity.

In both models, the ECT_{t-1} is negative but insignificant. This suggests that changes in deposit dollarisation are not systematically driven by correction toward the long-run exchange rate/price level equilibrium. It could mean the dollarisation dynamics is dominated by the immediate shocks and policy and sentiment variables rather than gradual macro misalignment. Additional limitation is that the 2009 - 2025 sample most definitely contains structural breaks (especially 2014 and 2022), and that can weaken measured error-correction if it exists in subsamples.

Depreciation is associated with higher dollarisation, with a big and statistically significant (at 1% estimate), which is expected. However, regime differences dampen the effect, but not reverse it. So, a 1% monthly depreciation is correlated with about a ~1.32 percentage points higher monthly change in the FX deposit share in the baseline and the household models respectively, which is economically sound: asset holders react to the depreciation by moving their savings into FX-denominated assets. However, after 2014, the interaction of

-1.06 implies that 1% LC depreciation is associated with 0.26 p.p. increase in dollarization. The estimate for the interest rate differential is negative and significant in both samples for the households-only model – this aligns with the theory that higher UAH deposit returns relative to USD returns are associated with de-dollarisation, but also suggests that corporate deposits are not as affected by the changes in the interest rate differential. The interaction term, however, is not significant, which could mean that the portfolio channel operates similarly across regimes.

Reserve requirements reduced dollarisation pre-2014, however, this efect weakens significantly post-2014 – so, under floating exchange rate regime reserve requirements become practically neutral. It could be that after adopting a floating regime, financial dollarisation becomes shaped more by risk and expectations rather than by a regulatory cost lever. Other prudential measures, such as settlement strictness or FX surrender requirements did not have a statistically significant effect at 5%.

PSI estimates reveal an unexpected finding: PSI coefficient is positive and significant, while the interaction is negative and significant, implying a regime-dependent relationship. Post-2014 is negative in both specifications, dampening but not fully reversing the effect. Meaning, pre-2014, an increase in negative public sentiment led to an increase in the change of share of foreign currency deposits, while post-2014 the trend is not so pronounced. In other words, nder the floating regime, smaller reaction to a higher PSI could possibly mean that high-stress periods may coincide with policy restrictions, constrained FX access or forced reallocation toward UAH instruments.

Overall, the secondary estimation confirms the earlier findings. The R^2 increases in the household-only model, implying that household deposits appear more responsive to stress and policy variables than aggregate deposits. One potential

concern with the ECM specification is contemporaneousness of some explanatory variable. However, the deposit data is published as of the last day of each month, so the monthly change in the share of FX deposits means that deposit decisions were accumulated over the month, rather then being an instant response. In addition, the error-correcting term enters the model with a lag. Regardless, as a robustness check, specifications with additional lags were estimated, however, the main conclusions did not change materially. Also, an ARDL model is estimated as a secondary robustness measure.

The justification for using the ARDL model is the following: firstly, it was estimated in Vargas (2023) as an additional robustness check, along with a dynamic OLS (DOLS). Secondly, it allows for a richer lag structure by default, and thus addresses the potential question of contemporaneous structure of the main 2-step ECM. See Table 8 for a compact version of ARDL robustness

Table 8: ARDL robustness results (compact)

Statistic	Total deposits	Household deposits
Bounds F-test	4.965	2.983
Bounds F-test p-value	0.0007	0.0916
Bounds t-test	-4.442	-2.961
Bounds t-test p-value	0.1555	0.6986
ARDL-ECM adjustment term	-0.155***	-0.090***
BG serial correlation p-value	0.1513	0.0460
Breusch–Pagan p-value	0.5069	0.0017
Jarque–Bera p-value	0.0014	0.0001

A full robustness summary, as well as the coefficients of the estimated model are reported in Appendix B and Appendix C respectfully. Overall, the results support the main ECM findings. For total deposits, the bounds F-test rejects the null of no level relationship, while for household deposits the evidence is weaker and is significant only at approximately the 10% level. An important difference is that the restricted ECM representation produces a negative and statistically significant adjustment term in both ARDL specifications. So, this suggests that if a richer lag dynamics is allowed, then deviations from the long-run relationship are corrected over time

5.2.2. ECM: new deposits

In the previous subsection, the analysis was done using outstanding deposits as the main datapoint used to calculate the dynamics of the FX share, and outstanding amount on deposits represents the stock of the deposits accumulated over time. As was mentioned, this is standard in the literature, but it combines current deposit decisions with the previously accumulated deposit composition, which may be especially persistent for all deposits, excluding the on-demad deposits. So, in order to capture current portfolio decisions this subsection estimates the ECM using the share of FX deposits among the new deposits. Moreover, because of how the NBU reports the deposit data, the new-deposit data allows for a more granular analysis by depositor type and maturity.

However, the main text will only focus on total, household, and corporate new deposits (see Table 9) while the maturity-specific results are reported in Appendices D, E and F (for household, corporate and total estimations respectfully).

Compared with the estimations on outstanding deposits, the explanatory power of the new-deposit models is generally lower, especially for corporate deposits.

Table 9: ECM results for new deposits by depositor

Variable	HH baseline	HH strict	Corp. baseline	Corp. strict	Total baseline	Total strict
Lagged dependent variable	-0.197* (0.082)	-0.196* (0.079)	-0.203. (0.104)	-0.198. (0.101)	-0.197* (0.082)	-0.196* (0.079)
ECT lag	-0.031* (0.016)	-0.039* (0.017)	-0.004 (0.006)	-0.004 (0.007)	-0.031* (0.016)	-0.039* (0.017)
Δ log exchange rate	-1.321 (2.537)	-1.424 (2.377)	-0.429 (1.926)	-0.531 (1.952)	-1.321 (2.537)	-1.424 (2.377)
Floating × Δ log exchange rate	1.612 (2.538)	1.699 (2.376)	0.625 (1.931)	0.734 (1.957)	1.612 (2.538)	1.699 (2.376)
Interest-rate differential	-0.0027 (0.0018)	-0.0042* (0.0018)	0.0007 (0.0010)	0.0006 (0.0012)	-0.0027 (0.0018)	-0.0042* (0.0018)
Floating × interest-rate differential	0.002 (0.002)	0.003* (0.001)	0.0006 (0.001)	0.001 (0.002)	0.002 (0.002)	0.003* (0.001)
FX reserve requirement	0.0023 (0.0027)	-0.0004 (0.0023)	-0.0001 (0.0021)	-0.0009 (0.0028)	0.0023 (0.0027)	-0.0004 (0.0023)
Floating × FX reserve requirement	-0.0028 (0.0026)	-0.0002 (0.0023)	-1.94e-05 (0.0020)	0.0010 (0.0029)	-0.0028 (0.0026)	-0.0002 (0.0023)
Public sentiment index	0.020*** (0.006)	0.024*** (0.006)	0.008 (0.006)	0.009 (0.007)	0.020*** (0.006)	0.024*** (0.006)

Table 9: ECM results for new deposits by depositor, continued

Variable	HH baseline	HH strict	Corp. baseline	Corp. strict	Total baseline	Total strict
Floating × public sentiment index	-0.009 (0.007)	-0.016* (0.008)	-0.008 (0.008)	-0.010 (0.009)	-0.009 (0.007)	-0.016* (0.008)
Net remittances, bn	-0.0015 (0.0010)	-0.0019* (0.0009)	-0.0004 (0.0010)	-0.0002 (0.0011)	-0.0015 (0.0010)	-0.0019* (0.0009)
FX surrender requirement	0.049*** (0.013)	0.051** (0.016)	-0.001 (0.012)	0.008 (0.017)	0.049*** (0.013)	0.051** (0.016)
Settlement strictness	-0.019*** (0.004)	-0.017*** (0.004)	-0.005. (0.003)	-0.006. (0.003)	-0.019*** (0.004)	-0.017*** (0.004)
Δ FX purchase restrictions	-0.002 (0.009)	-0.010 (0.008)	0.005 (0.007)	0.003 (0.007)	-0.002 (0.009)	-0.010 (0.008)
War dummy, 2014	-0.043** (0.013)	-0.060*** (0.013)	-0.019 (0.017)	-0.028 (0.025)	-0.043** (0.013)	-0.060*** (0.013)
War dummy, 2022	-0.021 (0.020)	-0.027 (0.018)	-0.016 (0.023)	-0.025 (0.026)	-0.021 (0.020)	-0.027 (0.018)
Constant	0.057*** (0.017)	0.081*** (0.017)	0.011 (0.014)	0.016 (0.019)	0.057*** (0.017)	0.081*** (0.017)
Observations	188	185	188	185	188	185
R^2	0.386	0.408	0.153	0.158	0.386	0.408
Adjusted R^2	0.329	0.352	0.074	0.078	0.329	0.352

Compared with the outstanding-deposit estimations, the R^2 of the new-deposit models is lower, especially for corporate deposits. This is likely due to the fact that new deposits only reflect the current deposit decisions and, therefore, are a lot more volatile, compared to the stock of the outstanding deposits. In addition, the household new deposits specification performs better than the total and corporate ones, suggesting that household deposit choices are more systematically related to the included macroeconomic, policy, and sentiment variables. Interestingly, net remittances have not been significant in any of the estimated models, whilst the literature generally includes them in the specification (Vargas 2023, Galac 2012)

An interesting difference between the outstanding and the new deposits models are the policy control variables. Firstly, FX reserve requirements are not significant for new deposits, suggesting that their effect is better reflected in the stock of outstanding deposits rather then in the immediate deposit placements. On contrast, settlement strictness is consistently negative and significant for household new deposits, which suggests tighter settlement restrictions are associated with lower household new-deposit dollarisation. This is an interesting finding, as it would be expected that it would be more economically meaningfull for businesses, as they are primarily affected by export/import rules. The FX surrender requirement has opposite signs for households and corporates: it is positive for household new deposits, but negative for corporate new deposits. The coefficient for the corporate new deposits is economically intuitive and expected, because surrender requirements directly affect firms' FX proceeds and liquidity management, while for households the coefficient may capture broader stress periods in which surrender rules were tightened.

Public Sentiment, as expected, appears to matter primarily for the households. So, worsening public sentiment is associated with a higher share of new household deposits placed in foreign currency, which supports the hypothesis

that the dollarization is at least partly driven by trust and confidence of the public in monetary authorities.

As for the macro variables and the interest-rate differential, the findings are mixed. ECT is statistically significant for household new deposits, but not for total, or corporate new deposits, meaning that the adjustment toward th long-run PPP-based equilibrium is more visible in household deposit placement than in total or corporate new deposit amounts. Contrary to the estimations based on the outstanding deposits, exchange rate changes is not statistically significant in the new-deposit specifications, which suggests that in the original model, the strong responses were at least partly due to the valuation effects. Lastly, the interest-rate differential has the expected negative sign for household new deposits, but only becomes statistically significant in the strict specification. In other words, a higher return premium on LC deposits is associated with a lower share of newly placed household deposits in FX, which is economically sound. However, that same relationship is not significant for corporate new deposits. This would imply that households respond more directly to relative deposit returns, while corporate deposits could be more affected by other (possibly unaccounted) factors, such as liquidity needs, operational constraints and FX-flow regulations

Chapter 6

CONCLUSIONS AND POLICY IMPLICATIONS

This study investigated the determinants of financial dollarization in Ukraine across the two exchange rate regimes, as well as periods of macroeconomic and geopolitical stress, with the aim to evaluate the effectiveness of policy instruments deployed by the NBU to curb excess dollarization.

Using a two-step error-correction framework, this thesis identified a long-run cointegrating relationship between the nominal exchange rate and the domestic price level and modelled the short-run dollarization dynamics as a function of exchange rate changes, interest rate differentials, currency differentiated reserve requirements, public sentiment and war-related shocks. The empirical results confirm the presence of a long-run relationship between the exchange rate and domestic prices, consistent with pass-through dynamics. However, short-run dollarization behaviour appears to respond primarily to policy incentives, expectations and structural shocks rather than to gradual adjustment toward macroeconomic equilibrium, as the estimate for the error-correcting term was not statistically significant.

The interest rate differential between LC and FX deposits was estimated to be an important dedollarisation channel, especially for household deposits. This means that a higher UAH deposit premium is generally associated with a lower FX deposit share, which is consistent with the general theory that better returns on LC assets reduce incentives to hold deposits in foreign currency. However, this effect is weaker or insignificant for corporate deposits, suggesting that corporate dollarisation may be driven more by liquidity needs, operational FX flows and regulatory constraints rather then by simple portfolio-return considerations.

On the other hand, the effectiveness of macroprudential policy is more mixed. The effect of differentiated reserve requirements declined under the floating exchange rate regime, as compared to the pegged one, disproving the second hypothesis. This suggests that NBU should treat this policy instrument as a complement to other available tools, rather than a reliable mechanism of de-dollarization by itself. Therefore, interest rate differential and expectations management are more effective tools for discouraging the dollarization of the assets.

The limitations of this study include the model choice: due to the statistical properties of the data, estimation of a VECM model, exactly following Vargas (2023) is not possible. Whilst the utilized two-step error correction model is closely related to the original VECM, it .it does not estimate the long-run cointegrating relationship and the short-run adjustment dynamics jointly within a full multivariate system. As a result of this, the model used in the thesis is more parsimonious. Thus, while it is a better option taking into account the available data, it cannot fully capture feedback effects in the system

Another limitation is the presence of the structural breaks in the relatively short sample: switch to the floating exchange rate regime, the beginning of the Anti-Terrorist Operation in 2014, the COVID-19 pandemic and the full-scale invasion. The ECM framework assumes a certain degree of parameter stability over time, which can be restrictive. While the regression accounts for these changes via dummies and interaction variables, it is not a full treatment of structural changes, but rather reduced form controls. Lastly, this thesis was focused only on the deposit dollarization side of the financial dollarization, and thus did not cover account for credit dollarization.

Lastly, some policy variables are constructed manually and capture the regulations imperfectly. For instance, the PSI is a proxy based on Google Trends data and

thus it should be interpreted more like an indicator of public concern rather than a direct measure of trust in the NBU

Overall, the results demonstrate that financial dollarization is not a purely mechanical response to exchange rate levels, but is also shaped by regime structure, policy tools and confidence in monetary authorities. In economies exposed to regime transitions and external shocks, durable de-dollarization requires not only macroeconomic stabilization, but also consistent policy signaling and institutional credibility

WORKS CITED

Alpağut, Serhat. 2024. "Money Supply, Inflation and Dollarization: An Analysis on Türkiye Using Fourier Models." *Uluslararası Ekonomi İşletme ve Politika Dergisi* 8 (1): 244–261. doi:10.29216/ueip.1456594.

Awosusi, Abraham Ayobamiji. 2025. "How Do Economic Policy Uncertainty, Climate Policy Uncertainty and US Monetary Policy Uncertainty Shape Investors' Sentiment in the Green Market?" *Applied Economics*, October, 1–19. doi:10.1080/00036846.2025.2567576.

Baliño, Tomás J. T., Adam Bennett, and Eduardo Borensztein. 1999. *Monetary Policy in Dollarized Economies*. IMF Occasional Paper 171. Washington, DC: International Monetary Fund.

Basso, Henrique S., Oscar Calvo-Gonzalez, and Marius Jurgilas. 2007. "Financial Dollarization: The Role of Banks and Interest Rates." ECB Working Paper 748. Frankfurt: European Central Bank.

Brochado, Ana. 2020. "Google Search Based Sentiment Indexes." *IIMB Management Review* 32 (3): 325–335. doi:10.1016/j.iimb.2019.10.015.

Calvo, Guillermo A. 2002. "On Dollarization." *Economics of Transition* 10 (2): 393–403. doi:10.1111/1468-0351.00117.

Calvo, Guillermo A., and Carlos A. Végh. 1992. "Currency Substitution in Developing Countries: An Introduction." IMF Working Paper WP/92/40. Washington, DC: International Monetary Fund. doi:10.5089/9781451845884.001.

Caravello, Tomás E., Pedro Martinez-Bruera, and Iván Werning. 2023. "Dollarization Dynamics." NBER Working Paper 31296. Cambridge, MA: National Bureau of Economic Research. doi:10.3386/w31296.

Castillo, Paul, Ruy Lama, and Juan Pablo Medina. 2024. "Escaping the Financial Dollarization Trap: The Role of Foreign Exchange Intervention." IMF Working Paper 2024/127. Washington, DC: International Monetary Fund. doi:10.5089/9798400280795.001.

Catão, Luis A. V., and Marco E. Terrones. 2016. "Financial De-Dollarization: A Global Perspective and the Peruvian Experience." IMF Working Paper WP/16/97. Washington, DC: International Monetary Fund.

Dalgic, Husnu C. 2024. "Financial Dollarization in Emerging Markets: An Insurance Arrangement." *International Economic Review* 65 (3): 1189–1219. doi:10.1111/iere.12686.

Della Valle, Guido, Vasilika Kota, Romain M. Veyrune, Ezequiel R. Cabezon, and Shaoyu Guo. 2018. "Euroization Drivers and Effective Policy Response: An Application to the Case of Albania." IMF Working Paper 18/21. Washington, DC: International Monetary Fund. doi:10.5089/9781484338728.001.

De Nicoló, Gianni, Patrick Honohan, and Alain Ize. 2003. "Dollarization of the Banking System: Good or Bad?" World Bank Policy Research Working Paper 3116. Washington, DC: World Bank.

De Nicoló, Gianni, Patrick Honohan, and Alain Ize. 2005. "Dollarization of Bank Deposits: Causes and Consequences." *Journal of Banking & Finance* 29 (7): 1697–1727. doi:10.1016/j.jbankfin.2004.06.033.

Engle, Robert F., and C. W. J. Granger. 1987. "Co-Integration and Error Correction: Representation, Estimation, and Testing." *Econometrica* 55 (2): 251–276. doi:10.2307/1913236.

Evans, Olaniyi. 2025. "Short-Run and Long-Run Determinants of Exchange Rate Fluctuations: A Tale of the Dollar and the Naira." MPRA Paper 124158. Munich: Munich Personal RePEc Archive.

Fischer, Stanley. 1982. "Seigniorage and the Case for a National Money." *Journal of Political Economy* 90 (2): 295–313. doi:10.1086/261057.

Galac, Tomislav. 2012. "Global Crisis and Credit Euroisation in Croatia." Working Paper W-33. Zagreb: Croatian National Bank.

García-Escribano, Mercedes. 2010. "Peru: Drivers of De-Dollarization." IMF Working Paper WP/10/169. Washington, DC: International Monetary Fund.

García-Escribano, Mercedes, and Sebastián Sosa. 2011. "What Is Driving Financial De-Dollarization in Latin America?" IMF Working Paper WP/11/10. Washington, DC: International Monetary Fund.

Hake, Mariya, Fernando López-Vicente, and Luis Molina. 2014. "Do the Drivers of Loan Dollarisation Differ between CESEE and Latin America? A Meta-Analysis." Banco de España Working Paper 1406. Madrid: Banco de España.

Ize, Alain, and Eduardo Levy-Yeyati. 2003. "Financial Dollarization." *Journal of International Economics* 59 (2): 323–347. doi:10.1016/S0022-1996(02)00017-X.

Khvedchuk, Kostiantyn, Valentyna Sinichenko, and Barry Topf. 2019. "Estimating a Natural Level of Financial Dollarization in Ukraine." *Visnyk of the National Bank of Ukraine*, no. 247: 38–44. doi:10.26531/vnbu2019.247.03.

Levy Yeyati, Eduardo. 2006. "Financial Dollarization: Evaluating the Consequences." *Economic Policy* 21 (45): 62–118. doi:10.1111/j.1468-0327.2006.00154.x.

Metreveli, Saba, Akaki Mosakhlishvili, Shalva Mkhatrishvili, Davit Tutberidze, and Tamta Sopromadze. 2025. "A Novel Minimum Variance Portfolio Approach

to Understanding Dollarization: Case of Georgia." NBG Working Paper 01/2025. Tbilisi: National Bank of Georgia.

Neanidis, Kyriakos C., and Christos S. Savva. 2009. "Financial Dollarization: Short-Run Determinants in Transition Economies." *Journal of Banking & Finance* 33 (10): 1860–1873. doi:10.1016/j.jbankfin.2009.04.017.

Rogoff, Kenneth. 1996. "The Purchasing Power Parity Puzzle." *Journal of Economic Literature* 34 (2): 647–668.

Solohub, Dmytro. 2019. "Tendentsii ta perspektyvy rozvytku finansovoi systemy Ukrainy [Trends and Prospects for the Development of Ukraine's Financial System]." Presentation, National Bank of Ukraine, Lviv, April 2019.

Taylor, Alan M., and Mark P. Taylor. 2004. "The Purchasing Power Parity Debate." *Journal of Economic Perspectives* 18 (4): 135–158. doi:10.1257/0895330042632744.

Urošević, Branko, and Ivana Rajković. 2016. "Dollarization of Deposits in the Short and Long Run: Evidence from CESE Countries." CESifo Working Paper 5745. Munich: CESifo.

Vargas, Mauricio, and Jesus Sanchez. 2023. "Taming Financial Dollarization: Determinants and Effective Policies — The Case of Uruguay." IMF Working Paper 2023/244. Washington, DC: International Monetary Fund. doi:10.5089/9798400258428.001.

APPENDIX A

LIST OF KEYWORDS IN THE PSI CONSTRUCTION

Factor	Ukrainian term	Russian term
Inflation concern	інфляція	инфляция
Devaluation concern	девальвація	девальвация
NBU restrictions	обмеження НБУ	ограничения НБУ
FX restrictions / limits	валютні обмеження	валютные ограничения
Deposit guarantee	гарантування вкладів	гарантирование вкладов
Deposit Guarantee Fund	ФГВФО	ФГВФЛ
Deposit withdrawal	зняти депозит	снять депозит
Exchange-rate concern	курс долара	курс доллара
Dollar purchase concern	купити долар	купить доллар
Default concern	дефолт	дефолт

APPENDIX B

ARDL ROBUSTNESS SUMMARY

Statistic	Total deposits	Household deposits
Selected ARDL order	(3, 3, 2, 1, 1, 0, 0, 2, 1, 0, 0)	(3, 2, 0, 2, 3, 0, 1, 2, 1, 0, 0)
Bounds F-test	4.965	2.983
Bounds F-test p-value	0.0007	0.0916
Bounds t-test	-4.442	-2.961
Bounds t-test p-value	0.1555	0.6986
ARDL-ECM adjustment term	-0.155***	-0.090***
BG serial correlation p-value	0.1513	0.0460
Breusch–Pagan p-value	0.5069	0.0017
Jarque–Bera p-value	0.0014	0.0001

APPENDIX C

ARDL ESTIMATION RESULTS

Variable	Total deposits	Household deposits
Constant	-0.105**	-0.031
	(0.034)	(0.032)
Dependent variable, lag 1	0.355***	0.556***
	(0.096)	(0.112)
Dependent variable, lag 2	0.114	0.186.
	(0.076)	(0.106)
Dependent variable, lag 3	0.376***	0.168*
	(0.088)	(0.066)
Log exchange rate	0.581***	0.513***
	(0.021)	(0.028)
Log exchange rate, lag 1	-0.384***	-0.394***
	(0.046)	(0.054)
Log exchange rate, lag 2	-0.094	-0.121.
	(0.059)	(0.071)
Log exchange rate, lag 3	-0.100*	
	(0.046)	
Interest-rate differential	0.002*	-0.0001
	(0.001)	(0.001)
Interest-rate differential, lag 1	0.0004	
	(0.001)	

Variable	Total deposits	Household deposits
Interest-rate differential, lag 2	-0.003**	
	(0.001)	
FX reserve requirement	-0.001	0.001
	(0.002)	(0.002)
FX reserve requirement, lag 1	-0.004.	-0.006*
	(0.002)	(0.002)
FX reserve requirement, lag 2		0.003**
		(0.001)
PSI	0.005	0.003
	(0.004)	(0.006)
PSI, lag 1	0.008***	0.005
	(0.002)	(0.004)
PSI, lag 2		0.007*
		(0.003)
PSI, lag 3		0.005*
		(0.002)
Net remittances	-0.000001	0.000001
	(0.000001)	(0.000001)
FX surrender requirement	-0.028*	0.036
	(0.011)	(0.023)
FX surrender requirement, lag 1		-0.044*
		(0.021)
Settlement strictness	-0.024***	-0.024***
	(0.005)	(0.004)

Variable	Total deposits	Household deposits
Settlement strictness, lag 1	0.007*	0.002
	(0.003)	(0.006)
Settlement strictness, lag 2	0.012.	0.016**
	(0.007)	(0.006)
Change in FX purchase restrictions	0.048***	0.047**
	(0.010)	(0.018)
Change in FX purchase restrictions, lag 1	-0.036***	-0.034**
	(0.008)	(0.012)
War dummy, 2014	-0.023.	-0.045***
	(0.012)	(0.012)
War dummy, 2022	-0.050*	-0.083**
	(0.020)	(0.026)

APPENDIX D

ECM ESTIMATION ON NEW DEPOSITS: HOUSEHOLDS, BY MATURITY

Variable	Short baseline	Mid baseline	Long baseline	Short strict	Mid strict	Long strict	Total baseline	Total strict
Lagged dependent variable	-0.157*	-0.323***	-0.469***	-0.180**	-0.335***	-0.471***	-0.197*	-0.196*
	(0.068)	(0.059)	(0.080)	(0.065)	(0.060)	(0.083)	(0.082)	(0.079)
ECT lag	0.001	-0.034**	-0.062***	0.002	-0.031**	-0.061**	-0.031*	-0.039*
	(0.003)	(0.011)	(0.018)	(0.003)	(0.010)	(0.020)	(0.016)	(0.017)
Δ log ER	-0.515	-0.903	9.421	-0.550	-1.419	9.271	-1.321	-1.424
	(2.193)	(1.892)	(8.305)	(1.998)	(1.985)	(8.302)	(2.537)	(2.377)
Floating × Δ log ER	0.860	1.147	-9.697	0.872	1.656	-9.531	1.612	1.699
	(2.195)	(1.889)	(8.319)	(1.999)	(1.979)	(8.312)	(2.538)	(2.376)
Interest-rate differential	-0.0029*	0.0008	-0.010	-0.0040**	-0.0019	-0.010	-0.0027	-0.0042*
	(0.0013)	(0.0045)	(0.010)	(0.0013)	(0.0045)	(0.011)	(0.0018)	(0.0018)

Variable	Short baseline	Mid baseline	Long baseline	Short strict	Mid strict	Long strict	Total baseline	Total strict
Floating × interest-rate differential	0.002 (0.001)	-0.003 (0.003)	0.005 (0.009)	0.002 (0.002)	-0.002 (0.003)	0.005 (0.011)	0.002 (0.002)	0.003* (0.001)
FX reserve requirement	0.0042 (0.0036)	-0.0004 (0.0034)	-0.022. (0.013)	0.0018 (0.0034)	-0.0025 (0.0032)	-0.023. (0.013)	0.0023 (0.0027)	-0.0004 (0.0023)
Floating × FX rr	-0.0043 (0.0034)	-0.0008 (0.0033)	0.020 (0.012)	-0.0023 (0.0033)	0.0007 (0.0032)	0.020 (0.013)	-0.0028 (0.0026)	-0.0002 (0.0023)
Public sentiment index	0.012. (0.007)	0.031** (0.012)	0.043* (0.022)	0.015* (0.008)	0.033** (0.012)	0.042* (0.021)	0.020*** (0.006)	0.024*** (0.006)
Floating × public sentiment index	-0.001 (0.008)	-0.021 (0.013)	-0.035 (0.034)	-0.005 (0.009)	-0.024. (0.014)	-0.033 (0.037)	-0.009 (0.007)	-0.016* (0.008)
Net remittances, bn	-0.0013 (0.0012)	-0.0021 (0.0021)	-0.0098 (0.0060)	-0.0019 (0.0011)	-0.0014 (0.0022)	-0.0083 (0.0059)	-0.0015 (0.0010)	-0.0019* (0.0009)
FX surrender requirement	0.047** (0.015)	0.040 (0.039)	0.285** (0.090)	0.040* (0.017)	0.030 (0.034)	0.276* (0.121)	0.049*** (0.013)	0.051** (0.016)
Settlement strictness	-0.016** (0.005)	-0.011 (0.011)	-0.009 (0.030)	-0.011* (0.004)	-0.005 (0.010)	-0.005 (0.037)	-0.019*** (0.004)	-0.017*** (0.004)

Variable	Short baseline	Mid baseline	Long baseline	Short strict	Mid strict	Long strict	Total baseline	Total strict
Δ FX purchase restrictions	-0.002 (0.009)	0.011 (0.018)	-0.119* (0.051)	-0.008 (0.009)	0.003 (0.019)	-0.120* (0.057)	-0.002 (0.009)	-0.010 (0.008)
War 2014	-0.027* (0.012)	-0.028 (0.022)	-0.138. (0.070)	-0.028. (0.015)	-0.040. (0.022)	-0.137 (0.101)	-0.043** (0.013)	-0.060*** (0.013)
War dummy,	-0.011 (0.022)	-0.005 (0.034)	0.066 (0.104)	-0.004 (0.021)	-0.010 (0.036)	0.059 (0.108)	-0.021 (0.020)	-0.027 (0.018)
Constant	0.038* (0.017)	0.045(0.035)	0.214* (0.083)	0.056** (0.018)	0.072* (0.036)	0.209* (0.098)	0.057*** (0.017)	0.081*** (0.017)
Obs	188	188	188	185	185	185	188	185
R^2	0.36	0.26	0.347	0.374	0.266	0.344	0.386	0.408
Adjusted R^2	0.3	0.191	0.286	0.315	0.196	0.281	0.329	0.352

APPENDIX E

ECM ESTIMATION ON NEW DEPOSITS: CORPORATE, BY MATURITY

Variable	Short baseline	Mid baseline	Long baseline	Short strict	Mid strict	Long strict	Total baseline	Total strict
Lagged dependent variable	-0.125	-0.303***	-0.418***	-0.124	-0.318***	-0.413***	-0.222.	-0.222.
	(0.080)	(0.079)	(0.074)	(0.081)	(0.080)	(0.076)	(0.121)	(0.120)
ECT lag	-0.003	-0.020**	-0.019*	-0.003	-0.020**	-0.022**	-0.004	-0.003
	(0.003)	(0.006)	(0.008)	(0.003)	(0.006)	(0.008)	(0.004)	(0.004)
Δ log exchange rate	-2.025	-1.699	7.410	-1.940	-2.868	8.282	-1.343	-1.175
	(2.066)	(11.957)	(12.483)	(2.009)	(10.208)	(12.661)	(2.205)	(2.082)
Floating × Δ log exchange rate	2.251	1.531	-6.157	2.170	2.794	-7.155	1.525	1.362
	(2.072)	(11.954)	(12.469)	(2.015)	(10.208)	(12.645)	(2.211)	(2.088)
Interest-rate differential	0.0002	0.018*	-0.0004	0.0003	0.023**	-0.0009	0.0013	0.0015
	(0.0008)	(0.0085)	(0.0084)	(0.0008)	(0.0074)	(0.0085)	(0.0013)	(0.0013)
Floating × interest-rate differential	0.0008	-0.024**	0.004	0.0006	-0.029***	0.004	0.0005	0.0002
	(0.001)	(0.009)	(0.010)	(0.001)	(0.008)	(0.011)	(0.002)	(0.002)

Variable	Short baseline	Mid baseline	Long baseline	Short strict	Mid strict	Long strict	Total baseline	Total strict
FX reserve requirement	-0.0024	-0.0058	-0.0035	-0.0016	0.012	-0.0056	-0.0002	0.0011
	(0.0036)	(0.014)	(0.015)	(0.0045)	(0.0098)	(0.018)	(0.0026)	(0.0031)
Floating × FX reserve requirement	0.0018	0.0046	-0.0027	0.0010	-0.014	-0.0017	0.0002	-0.0012
	(0.0032)	(0.014)	(0.014)	(0.0042)	(0.0097)	(0.018)	(0.0024)	(0.0030)
Public sentiment index	0.006	-0.033	-0.053	0.006	-0.052	-0.051	-0.004	-0.006
	(0.014)	(0.035)	(0.054)	(0.014)	(0.036)	(0.053)	(0.013)	(0.014)
Floating × public sentiment index	-0.016	0.035	-0.043	-0.015	0.068	-0.038	-0.002	0.0006
	(0.014)	(0.051)	(0.069)	(0.016)	(0.050)	(0.073)	(0.014)	(0.016)
Net remittances, bn	-0.0003	-0.0014	-0.012	-0.0002	0.0022	-0.018.	-0.0004	-0.0002
	(0.0012)	(0.0050)	(0.010)	(0.0013)	(0.0047)	(0.0097)	(0.0012)	(0.0012)
FX surrender requirement	-0.028.	-0.149	0.004	-0.027	-0.182*	-0.070	-0.030*	-0.031*
	(0.016)	(0.100)	(0.181)	(0.019)	(0.086)	(0.207)	(0.012)	(0.013)
Settlement strictness	0.003	0.054**	0.044	0.003	0.044*	0.063	0.002	0.001
	(0.004)	(0.019)	(0.055)	(0.004)	(0.019)	(0.058)	(0.003)	(0.004)
Δ FX purchase restrictions	0.001	0.102.	-0.019	0.003	0.139**	-0.023	0.005	0.008
	(0.008)	(0.061)	(0.091)	(0.009)	(0.050)	(0.097)	(0.006)	(0.007)
War dummy, 2014	-0.009	0.171*	0.137	-0.007	0.271***	0.175	0.006	0.012
	(0.016)	(0.078)	(0.101)	(0.020)	(0.055)	(0.118)	(0.015)	(0.019)

Variable	Short baseline	Mid baseline	Long baseline	Short strict	Mid strict	Long strict	Total baseline	Total strict
War dummy, 2022	-0.002	0.133	0.372.	-0.002	0.176.	0.429*	0.0006	0.003
	(0.018)	(0.104)	(0.215)	(0.020)	(0.093)	(0.211)	(0.017)	(0.020)
Constant	0.011	-0.202.	-0.114	0.007	-0.315***	-0.114	-0.012	-0.019
	(0.022)	(0.103)	(0.118)	(0.025)	(0.079)	(0.122)	(0.020)	(0.023)
Observations	188	188	182	185	185	179	188	185
R^2	0.109	0.188	0.3	0.106	0.201	0.306	0.111	0.112
Adjusted R^2	0.026	0.112	0.232	0.021	0.125	0.238	0.028	0.028

APPENDIX F

ECM ESTIMATION ON NEW DEPOSITS: ALL DEPOSITORS, BY MATURITY

Variable	Short baseline	Mid baseline	Long baseline	Short strict	Mid strict	Long strict	Total baseline	Total strict
Lagged dependent variable	-0.152.	-0.313***	-0.473***	-0.151.	-0.303***	-0.471***	-0.203.	-0.198.
	(0.083)	(0.053)	(0.072)	(0.083)	(0.049)	(0.072)	(0.104)	(0.101)
ECT lag	-0.003	0.0008	0.001	-0.003	-0.001	0.0007	-0.004	-0.004
	(0.006)	(0.005)	(0.001)	(0.006)	(0.005)	(0.001)	(0.006)	(0.007)
Δ log exchange rate	-1.169	-0.699	10.695.	-1.186	-1.108	10.398	-0.429	-0.531
	(2.906)	(3.371)	(6.353)	(2.921)	(3.315)	(6.328)	(1.926)	(1.952)
Floating × Δ log exchange rate	1.418	0.678	-10.299	1.442	1.136	-9.953	0.625	0.734
	(2.909)	(3.377)	(6.379)	(2.923)	(3.317)	(6.359)	(1.931)	(1.957)
Interest-rate differential	0.0008	0.0015	0.0041	0.0008	0.0025	0.0038	0.0007	0.0006
	(0.0010)	(0.0055)	(0.0053)	(0.0011)	(0.0062)	(0.0052)	(0.0010)	(0.0012)
Floating × interest-rate differential	0.0004	0.0008	0.003	0.0006	0.001	0.004	0.0006	0.001
	(0.001)	(0.005)	(0.005)	(0.002)	(0.005)	(0.006)	(0.001)	(0.002)

Variable	Short baseline	Mid baseline	Long baseline	Short strict	Mid strict	Long strict	Total baseline	Total strict
FX reserve requirement	-0.0014	0.0065	-0.0076	-0.0016	0.0064	-0.0081	-0.0001	-0.0009
	(0.0029)	(0.0051)	(0.011)	(0.0036)	(0.0052)	(0.012)	(0.0021)	(0.0028)
Floating × FX reserve requirement	0.0012	-0.0047	0.0056	0.0015	-0.0043	0.0073	-1.94e-05	0.0010
	(0.0027)	(0.0049)	(0.0092)	(0.0036)	(0.0048)	(0.012)	(0.0020)	(0.0029)
Public sentiment index	0.006	0.014	0.014	0.006	0.010	0.015	0.008	0.009
	(0.008)	(0.014)	(0.031)	(0.008)	(0.014)	(0.031)	(0.006)	(0.007)
Floating × public sentiment index	-0.009	0.0003	-0.037	-0.010	0.003	-0.042	-0.008	-0.010
	(0.009)	(0.018)	(0.044)	(0.010)	(0.018)	(0.049)	(0.008)	(0.009)
Net remittances, bn	-0.0004	-0.0007	-0.0065	-0.0002	0.0017	-0.0062	-0.0004	-0.0002
	(0.0011)	(0.0031)	(0.0054)	(0.0011)	(0.0021)	(0.0061)	(0.0010)	(0.0011)
FX surrender requirement	-0.005	-0.077	0.253*	0.002	-0.061	0.302*	-0.001	0.008
	(0.013)	(0.052)	(0.119)	(0.017)	(0.052)	(0.131)	(0.012)	(0.017)
Settlement strictness	-0.002	-0.003	-0.025	-0.004	-0.005	-0.039	-0.005.	-0.006.
	(0.003)	(0.012)	(0.028)	(0.004)	(0.012)	(0.031)	(0.003)	(0.003)
Δ FX purchase restrictions	0.0008	0.068*	-0.096	0.0005	0.065*	-0.094	0.005	0.003
	(0.008)	(0.029)	(0.065)	(0.009)	(0.031)	(0.068)	(0.007)	(0.007)

Variable	Short baseline	Mid baseline	Long baseline	Short strict	Mid strict	Long strict	Total baseline	Total strict
War dummy, 2014	-0.012	-0.022	-0.048	-0.017	-0.031	-0.081	-0.019	-0.028
	(0.015)	(0.021)	(0.064)	(0.021)	(0.031)	(0.078)	(0.017)	(0.025)
War dummy, 2022	-0.005	-0.106.	0.134	-0.011	-0.132*	0.105	-0.016	-0.025
	(0.019)	(0.062)	(0.129)	(0.021)	(0.058)	(0.128)	(0.023)	(0.026)
Constant	0.006	-0.009	0.025(0.068)	0.007	-0.023	0.045	0.011	0.016
	(0.016)	(0.047)		(0.019)	(0.051)	(0.070)	(0.014)	(0.019)
Observations	188	188	188	185	185	185	188	185
R^2	0.157	0.118	0.256	0.16	0.125	0.26	0.153	0.158
Adjusted R^2	0.078	0.035	0.187	0.08	0.042	0.189	0.074	0.078