Impact Factors Modeling of Households Deposit Dollarization in Ukraine

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Abstract

In the paper the households deposit dollarization (HDD) in Ukraine is considered. We determine the significance of factors influencing the change in the level of HDD. The data for modeling are taken from the site of the National Bank of Ukraine and the State Statistics Service of Ukraine for the period from January 2006 to December 2017.
Keywords: Deposit Dollarization, Devaluation, Interest rates, Exchange rates

1 Introduction

When we are looking into deposit dollarization, there is one simple truth to understand: there is an objective reality (i.e. in countries with unstable economies and weak local currencies) where economic agents consider foreign currency to be a reliable asset worth of investing money in (Duffy, Nikitin & Smith, 2006). Main reasons for deposit dollarization in emerging markets can be explained by hysteresis or ratchet effect due to high inflation, exchange rate volatility, interest rates volatility, etc. (Mongardini and Mueller, 1999, Honohan and Shi, 2002, Brown and Stix, 2014); currency risk premium (Honohan and Shi, 2002, Palley, 2003); money flow from abroad (Basso, Calvo-Gonzalez and Jurgilas, 2011; Versal and Stavytskyy, 2016); currency competition in value storing etc. Thus, dollarization of deposits inevitably appears in banking systems of emerging markets.

From the literature review, it becomes obvious that there are many factors that influence the decision of households to keep savings in one currency or another. At the same time, we decided to dwell on a more narrow issue. This is a problem of deposits keeping by households in foreign currency in banks. In particular, this question is interesting from the point of view of the structure of household deposits in local and foreign currencies in emerging markets.

Thus, the goal of our study is to determine the significance of factors influencing the

change in the level of household deposits dollarization (HDD) in Ukraine. In this regard, the most interesting is the model proposed by Neanidis and Savva, 2009. This model has the following form:

$$\Delta DD_{it} = \alpha_0 + \beta_1 \cdot erf_{it} + \beta_2 \cdot mbf_{it} + \beta_3 \cdot ec_{it} + \sum_{j=1}^{m} \gamma_j \cdot X_{j,it} + \varepsilon_{it}$$

According to this model, the dollarization of deposits depends on such factors as the exchange rate (erf), the monetary base (mbf), the error correction term related to the size of the desired dollarization (ec), and also such control variables as the interest rate differential, the rate of inflation, an index of asymmetry of exchange rate movements, an index of exchange rate intervention etc. It should also be noted that the proposed model allows assessing several countries at once.

In turn, we propose an alternative model based on the Neanidis and Savva (2009) model.

2 Methodology and data

We've changed the model of Neanidis and Savva in two main directions. Firstly, we've changed the approach to the calculation of HDD. In the classic version, HDD is calculated as the ratio of deposits in foreign currency to the total volume of deposits in both currencies. At the same time, the work of Versal, Stavytskyy (2016) explains the problems of this approach under sharp devaluation of the local currency. Accordingly, we propose to calculate HDD as a ratio of deposits in foreign currency to deposits in local currency. A similar approach is also used nowadays by IMF research staff (Mwase and Kumah, 2015). In Fig. 1, 2, the difference in approaches is obvious. In Fig. 1, which shows the results of the classic HDD calculation, its growth is evident with the devaluation of the local currency. In turn, a completely different HDD trend, if we exclude the impact of the exchange rate.

Figure 1: Classic HDD

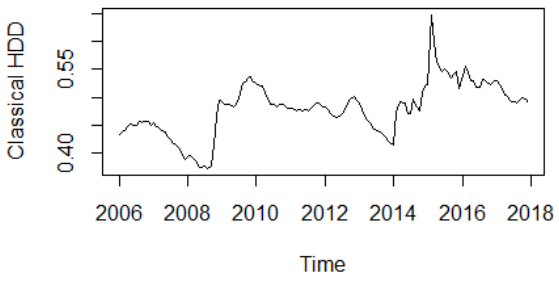
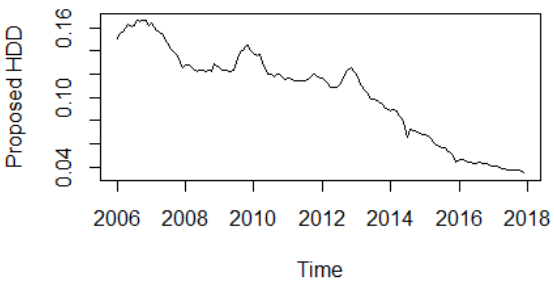


Figure 2: Proposed HDD



Secondly, we've reduced the number of variables, which makes the model applicable to one country. In particular, we've left in the model the most significant factors: the exchange rate, the monetary base, the difference in interest rates on deposits in local and foreign currencies, as well as the level of inflation. In addition, we added another important factor that affects the level of deposits in the banking system - wages.

The effect of the exchange rate on HDD may be different depending on the approach chosen for its calculation. If we take into account the classical approach, it is obvious that a direct link will manifest itself. At the same time, from an economic point of view, the opposite effect also possible. Thus, the growth of the foreign exchange rate for an import-dependent country can with high probability result in an increase in the prices of goods, which means that the households will be less able to save in any currency, i.e. the level of deposits in both foreign and local currency may decline. Another important factor is the peculiarity of deposit guarantee schemes. Ukraine is a vivid example. In Ukraine, the maximum amount of guarantee is expressed in local currency and is currently UAH 200 thousand, i.e. it's about USD 7700. Before the devaluation, the amount of guarantee covered USD 25 thousand dollars. This means that a part of the households has lost significant amounts of foreign currency deposits during the liquidation of banks in the last crisis. In tested models, we use the rate of growth of the exchange rate (*gerf*).

The impact of the monetary base on the HDD can also be ambiguous. On the one hand, an increase in the supply of money can stimulate savings in foreign currency; on the other hand, if an increase in the supply of money leads to inflation, the opposite impact is also possible. In tested models, we use the growth rate of the monetary base (*gmbf*).

The effect of the difference in interest rates on deposits in national currency (*dir*) and in foreign currency would seem to be exclusively inverse, i.e. the greater the difference, the smaller the HDD. In fact, it is not so obvious. In particular, the factor of trust plays a key role in emerging markets. Throughout the history of independent Ukraine, we can single out a few periods when the level of people's confidence in the local currency was high. This means that even if a very high interest rate is set for deposits in the local currency, the households may prefer deposits with a low interest rate, but in hard currency.

The level of inflation (CPI) can also have both a positive and negative impact on the HDD. This is explained by the fact that inflation expectations can push the population to store savings in foreign currency. At the same time, if the rate of inflation is very high, it can completely "eat up" income, which means that only a very small part will be converted into a hard currency.

In turn, such a factor as wage growth, on the one hand, can lead to the growth of HDD, if the rate of inflation is stable or less than the growth of wages. On the other hand, it can be the other way around. In tested models, we use the growth rate of wages (*gw*).

In this regard, we will test the following models:

$$HDD_i = \alpha_0 + \beta_1 \cdot gerf_i + \beta_2 \cdot gmbf_i + \beta_3 \cdot dir_i + \beta_4 \cdot CPI_i + \beta_5 \cdot gw_i + \varepsilon_i$$

Data for modeling are taken from the site of the National Bank of Ukraine and the State Statistics Service of Ukraine for the period from January 2006 to December 2017. Data are monthly.

2.1 Results

The results of estimated parameters are presented in table 1.

Table 1: Estimated values

Parameter	Estim. value	Std. Error	t value
α_0	0.1617318	0.0050433	32.069
β_1	-0.0706502	0.0423588	- 1.668
β_2	0.0866216	0.0895068	0.968
β_3	-0.0082190	0.0006089	-13.499
β_4	-0.0024468	0.0012103	-2.022
β_5	-0.0613168	0.0425139	-1.442

Residual standard error is equal to 0.02512 with 137 degrees of freedom. Multiple R-squared coefficient is $R^2 = 0.6042$,Adjusted R-squared is $R^2_{ad} = 0.5898$. F-statistic with 5 and 137 degree of freedom equals 41.83 and p-value: $<< 2.2 \cdot 10^{-16}$. Therefore, we can conclude that there is no reason to reject proposed model and the connection is significant.

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