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Cibotaru, Vitalie and Neumann, Rainer and Cuhal, Radu and Ungureanu, Mihai

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IDENTIFYING THE EXCHANGE RATE REGIME IN THE REPUBLIC OF MOLDOVA

Vitalie CIBOTARU, PhD, Graduate School of Economics, Osaka University, Japan
Rainer NEUMANN, PhD, Berliner Bank, Germany
Radu CUHAL, PhD, NBM, Moldova
Mihai UNGUREANU, senior economist, NBM, Moldova

Abstract

It has been noted that there is an inconsistency between Moldova's monetary authorities' declared pursuit of price stability and the de facto exchange rate peg. This paper looks into the exchange rate regime of the Moldovan leu (MDL) aiming to identify the de facto regime, to test whether it can be described by a basket peg (and, if so, to determine the composition of this basket), and whether the regime has been stable over time (and, if not, to detect and date regime shifts). The methodologies used in our analysis include the celebrated Frankel-Wei regression, a Kalman filter algorithm and empirical fluctuation process. We show that MDL generally follows a peg to USD with varying implicit weight and fluctuation bands.

The paper is organized as follows. Section 1 provides an insight into the exchange rate regime of Moldova by identifying the main trends and developments in its foreign exchange market. Section 2 reviews the economic literature on exchange rate regime identification. Section 3 describes the data used in the analysis. Section 4 explains the methodologies. Section 5 provides an interpretation of the results obtained. Finally, Section 6 summarizes the main findings.

Key words: *price stability, exchange rate regime, inflation, currency basket.*

1. Exchange Rate Regime and Recent Developments in Moldovan Foreign Exchange Market

Being bound by the Law on the National Bank of Moldova (NBM) to focus on inflation, NBM maintains a floating exchange rate, though intervening from time to time to prevent or smooth out what it considers to be excessive fluctuations. The IMF classifies the Moldovan leu (MDL) as following a managed float "with no pre-determined path for the exchange rate", with monetary policy targeted at a monetary aggregate.

Although the notion of *official exchange rate* is widely used in Moldova, the exchange rates quoted daily by the National Bank represent a weighted average of the exchange rates on transactions that took place on the local exchange market during the previous business day as reported by commercial banks. These rates only serve as reference points for market participants, but can also provide a set of credible indicators for computations, planning, research etc.

NBM has been actively intervening in the exchange market either with the purpose of influencing the exchange rates, or in order to replenish the official reserves, which declined during the Russian crisis of 1998. The period before autumn 2008, was characterized by a raising supply of foreign currency coming from exports, foreign investment and remittances by Moldovan citizens working abroad. In order to smooth out excessive fluctuations of the exchange rate, NBM intervened on the foreign exchange market, using outright purchases, forward purchases and swaps, the main intervention currency being US dollar (transactions in other currencies were negligibly small). Even in 2006, when the Russian Federation suspended imports of wine from Moldova and doubled the price of natural gas delivered to Moldova, NBM was able to increase its reserves. Until September 2008, the MDL followed an appreciation trend against USD given the large sales of foreign currency coming through remittances and inflows of foreign investment, external loans and grants. The trend was reinforced by partial de-dollarization, i.e. conversion of foreign exchange denominated assets, primarily bank deposits, into MDL-denominated assets. Thus, there was an inconsistency between inflation targeting, which is prescribed by legislation, and pursuing an exchange rate peg, which actually took place.[1]

Starting from fall 2008 most of these trends reversed themselves: the sales of foreign currency declined (reflecting a decline in remittances), net inflow of foreign investments turned into a net outflow (reflecting the global crisis), and as a consequence re-dollarization of the economy takes place. It should be noted that after September 2008, as a result of the global financial crisis, the currencies of all neighbouring countries depreciated against the USD, while MDL did not begin to depreciate until early 2009. Under these circumstances, NBM has been intervening by selling US dollars in order to smooth out the depreciation trend. By the end of the year, however, NBM had begun to use the deflationary pressure to increase foreign

[1] for a discussion of NBM activity in context of the general economic policy, see (International Monetary Fund, 2008, pp. 12-14)

exchange reserves. In 2010, NBM intervened on both sides of the market in order to smooth out the fluctuations of exchange rate.

Another notable tendency that has persisted over the last decade is the rising role of the euro in transactions on the local forex market, as well as in foreign exchange denominated bank deposits and loans. Between 2001 and 2009 the share of the euro in local exchange market turnover rose from 7.3% to 39.8% while that of the US dollar dropped from 86.5% to 57.0%. By the end of 2009 the euro had reached 70.2% of total foreign currency denominated bank deposits.

2. A Brief Overview of the Literature

The collapse of the Bretton-Woods system and the subsequent debate about the merits of floating versus fixed exchange rates led to the emergence of a vast economic literature on exchange rate regimes. The existing state of knowledge that comes out of the literature can be summarized according to the following three questions:

- Regime identification - what de facto exchange rate regime does a country follow in a particular period of time?
- Regime stability - does it change over time?
- Structural breaks - how can the changes be detected, dated and measured?

2.1 Identifying de facto regime

Studies that attempt to classify exchange rate arrangements fall into two types: (1) those which focus on exchange rate variability, and (2) those which focus on exchange rate co-movements. Studies that fall into the first group have classified the degree of flexibility of exchange rate regimes and offered *de facto* classifications, fitting regimes into their “true" categories. Important examples of such classifications include Ghosh et al. (2002), Shambaugh (2004), Reinhart and Rogoff (2004), Levy-Yeyati and Sturzenegger (2005) to cite just some. They reveal discrepancies between “de jure" and “de facto" exchange rate regime in many countries. However - as noted in Bénassy-Quéré et al. (2006) - different authors applied different methodologies, and thus the results of these classifications contradict each other and the “de jure" classification. This strand of research shares a common limitation in that the *numerate* currency (usually, the U.S. dollar) - used to define the value of the currency in question - is determined exogenously, i.e. imposed by the researcher.

Studies pertaining to the second group focused on finding correlation between co-movements of different currencies. These works are based on a simple linear regression model introduced by Frankel and Wei (1994) seeking to estimate the implicit weights of candidate anchor currencies (such as USD, JPY, Euro and other major currencies) in the basket. This model is often referred to as the Frankel-Wei model, or approach. Other examples of the Frankel-Wei approach can be found in Bénassy-Quéré et al. (2006), Frankel (2009). The limitation of the second group of studies is that, while inferring the anchor currency or basket of currencies, they fail to measure the stability of this anchor. Some later works employ both measures of exchange rate regime, and even combine them (for a model incorporating both methodologies, see, for example, Frankel and Wei (2007)).

2.2 Regime stability

The next question to be answered is whether the exchange rate regime (defined by the weights of anchor/basket currencies and/or by the degree of flexibility) is stable. Various methods can be applied to test the stability of the regime in operation, including - but definitely not limited to - (1) running rolling regressions, (2) regressions of separate intervals and (3) Kalman-type filtering of implicit weights.

Rolling, or recursive, regression is a procedure of repetitively computing parameter estimates over fixed-length intervals (so-called “rolling window") through the whole sample period. The resulting estimates actually assess not the “true" parameters themselves, but the moving average of these parameters. Among studies of exchange rate regimes employing rolling regression one could name McKinnon and Schnabl (2004) for 9 Asian currencies, Cavoli and Rajan (2006) for Indian rupee, and Ogawa and Kudo (2007) for 14 Asian currencies.

If the sample period is marked by events that are likely to cause structural disruptions, then the entire period is split into smaller sub-periods and regressions are run separately for each sub-period. Examples of such events include an announcement of devaluation or a financial crisis and can be found in Cavoli and Rajan (2005), Frankel and Xie (2010).

Another popular method of testing the stability of basket weights over time is based on space-state modelling and Kalman filters (Kalman (1960)). In this method, a certain part of the Frankel-Wei model is allowed to follow a dynamic process, described by the so-called *transition* or *state equation*. For instance, the exchange rate in question can follow an autoregressive path, thus modelling a crawling peg against a single currency (like in Moosa (2008)), or the weights of the anchor currencies can follow an autoregressive path, thus allowing for smooth changes in the basket structure (like in Ogawa and Sakane (2006)).

2.3 Detecting structural breaks

A classical test of structural changes belongs to Chow (1960). However, the applicability of this test is limited to problems with a pre-determined point (i.e. date) of structural break. Cases, in which the date of structural break is not known in advance, call for different testing techniques. One group of such techniques comprises *F*-statistics, developed to test for the existence of one break when its exact location is not known. Another group are the tests based on cumulative sums (*CUSUM*) or moving sums (*MOSUM*) of least-square residuals, especially designed for statistical change detection. An example of procedure for estimating the break dates, based on the sum of squared residuals in the ordinary least squares framework, can be found in Bai and Perron (2003).

A completely different approach to the problem of identifying the locations of structural breaks lead to the employment of regime switching models, also referred to as *hidden Markov models* (or *chains*). This approach, originally developed by Hamilton (1989) and Engel and Hamilton (1990), and followed in a number of subsequent works, treats the break points (or the duration of each regime) as random variables and not deterministic events. This is why the breaks are estimated in terms of probability of transition from one state (exchange rate regime) to another one. A specific feature of this approach is that the number of breaks is exogenous - given *a priori* and not determined by the model.

All these approaches look at parameters (weights of basket currencies) only, so that only a change in basket structure is considered a regime shift. In reality, a change in the fluctuation band should also be considered. In this paper we follow the approach taken by Zeileis et al. (2010b) - a regression model that includes variance as a full parameter is estimated by maximum likelihood (*ML*) methods.

3. Data description

The present study employs daily (5-day week, Monday to Friday, excluding holidays) data on the exchange rate of Moldovan leu against the US dollar, Euro, Romanian leu, Russian ruble and Ukrainian hryvnia (for their IMF classification, see Table 1). They cover the period from November 31, 2005 to November 30[2], 2010, and are obtained from the web-site of the National Bank of Moldova[3]. The bilateral exchange rates between the basket candidates and the cash currency are computed as cross-rates of the respective currencies in terms of MDL. The choice of the period is determined by data availability.

Table 1: Candidate currencies and their IMF classification

Currency	Exchange rate arrangement	Monetary policy framework
MDL	Managed floating with no pre-determined path for the exchange rate	Monetary aggregate target
ROL	Exchange rates within crawling bands	Exchange rate anchor
RUR	Managed floating with no pre-determined path for the exchange rate	No explicitly stated nominal anchor
UAH	Other conventional fixed peg arrangements[4]	Against a single currency

Source: IMF

Four currencies were used as cash: AUD, CHF, JPY and SDR. The overall characteristics of data series are very similar among remote currencies (for example, in terms of standard deviation, skewness and kurtosis), while SDR behaved

[2] They can be updated to present, which would add a couple of months to the five-year period
[3] http://www.bnm.md
[4] Fixed peg dropped in May 2008

differently. This is why, while most computations were performed in four variants, only one, the CHF-based, variant is reported. Descriptive statistics for the exchange rate of MDL and the candidate currencies is presented in Table 2.

Table 2: Summary Statistics, using the observations 2005/12/01-2010/11/30 (T = 1304), numeraire: CHF

Variable	Mean	Median	Minimum	Maximum
dlog(MDL/CHF)	-0.000162525	0.00000	-0.0585855	0.0490655
dlog(USD/CHF)	-0.000205492	0.00000	-0.0577380	0.0495559
dlog(EUR/CHF)	-0.000122528	0.00000	-0.0263092	0.0345140
dlog(RUR/CHF)	-0.000271710	0.00000	-0.0453926	0.0415648
dlog(ROL/CHF)	-0.000248152	0.00000	-0.0547658	0.0347819
dlog(UAH/CHF)	-0.000557000	0.00000	-0.162692	0.201137
Variable	Std. Dev.	C.V.	Skewness	Ex. kurtosis
dlog(MDL/CHF)	0.00741475	45.6222	-0.436013	7.83965
dlog(USD/CHF)	0.00718148	34.9477	-0.182145	8.07215
dlog(EUR/CHF)	0.00410041	33.4651	-0.0394786	8.58042
dlog(RUR/CHF)	0.00628769	23.1412	-0.552588	8.26906
dlog(ROL/CHF)	0.00708952	28.5693	-0.942009	6.94112
dlog(UAH/CHF)	0.0152032	27.2948	-0.609505	55.2554

Source: NBM, Calculation E-views

4. The model

4.1 Regime identification

In order to identify the implicit weights in the possible basket peg, a Frankel-Wei model was applied. It is a linear regression where the rate of return (log-differences) of a given currency is related to the returns of reference currencies, such the U.S. dollar, the Euro, and the yen. Recent examples of this approach include Frankel and Wei (2007), Zeileis et al. (2010b) [Numeraire] where y is the log-return of the currency in question in terms of so-called *numeraire(cash)* currency k, β_0 is the

$$y_k(t) = \beta_0 + \sum_{i=1}^{n} \beta_i \cdot x_{i,k}(t) + \epsilon(t) \qquad (1)$$

average rate of depreciation, x_i are the candidate currencies for the basket peg, and $\beta_{i(i>0)}$ are the implied weights of these currencies.

If β_0 is significantly different from zero, it can signal a crawling peg. If one of the other β-s is significantly not different from unity, it's an indication of a unitary peg to the respective currency x_i. If none of them is significantly different from zero, then the currency *y* is a floating currency. In other cases currency *y* is said to be pegged to a basket.

The result heavily depends on the choice of cash currency. For reliable results cash should not be correlated with the model variables. Typical choices of cash are basket currencies, so-called *remote* currencies (freely floating currencies, unlikely to be included in the basket) and real prices. We use four currencies as the cash currency: a basket currency (SDR) and three remote freely floating currencies (CHF, AUD and JPY). Another option is to use a real basket, e.g. CPI, but since such data is not available on daily basis, we can not take advantage of the daily data on exchange rates. The list of candidate currencies for the basket includes currencies used in international payments (the U.S. dollar and the Euro), and currencies of neighbours and main trading partners (Romanian leu, Russian ruble and Ukrainian hryvnia).

Thus, the general model (1) becomes

$$d\log\frac{MDL}{CHF} = \beta_0 + \beta_1 \cdot d\log\frac{USD}{CHF} + \beta_2 \cdot d\log\frac{EUR}{CHF} + \beta_3 \cdot d\log\frac{ROL}{CHF} + \beta_4 \cdot d\log\frac{RUR}{CHF} + \beta_5 \cdot d\log\frac{UAH}{CHF} + \epsilon \quad (2)$$

for the case of CHF used as cash.

A note on the Ukrainian currency: Ukraine underwent a serious change in its exchange rate regime, which required special treatment of the respective variable in the Frankel-Wei model. From April 21, 2005 to May 21, 2008 the exchange rate of Ukrainian hryvnia was fixed in terms of US dollar at 1 USD = 5.05 UAH, and was floating in the subsequent period. It means that two variables - *dlog*(USD/CHF) and *dlog*(UAH/CHF) - were perfect collinear in the first sub-period. In order to avoid multicollinearity and associated invalidity of parameter estimates, two regressions were run: the first excluded UAH from the model and covered the first sub-period (December 1, 2005 to May 21, 2008); the second one included UAH and covered the second sub-period (May 22, 2008 to November 30, 2010). The results of these two regressions are presented in Tables 3 and 4.

Table 3: Results of the Frenkel-Wei regression, 2005/12/01-2008/05/21
Dependent variable: dlog(MDL/CHF)
HAC standard errors

	Coefficient	Std. error	t-ratio	p-value	
const	0.000320096	9.18569e-05	3.4847	0.0005	***
dlog(USD/CHF)	0.937470	0.0276439	33.9123	0.0000	***
dlog(EUR/CHF)	-0.0433231	0.0358396	-1.2088	0.2272	
dlog(ROL/CHF)	0.0129818	0.0107667	1.2057	0.2284	
dlog(RUR/CHF)	0.0938480	0.0461921	2.0317	0.0426	**
R-squared		0.957304			

Source: NBM, calculation E-Views
Note: Regression is ordinary least squares. UAH is excluded from dependent variables. The Swiss franc is used as numeraire. This sub-period comprises 645 observations. *** - statistically significant at the 99 percent level, ** - statistically significant at 95 percent level.

Table 4: Results of the Frenkel-Wei regression, 2008/05/22-2010/11/30 (T = 659)
Dependent variable: dlog(MDL/CHF)
HAC standard errors

	Coefficient	Std. error	t-ratio	p-value	
const	-0.000245990	0.000219518	-1.121	0.2629	
dlog(USD/CHF)	0.982246	0.0179140	54.83	1.41e-246	***
dlog(EUR/CHF)	-0.00247823	0.0311975	-0.07944	0.9367	
dlog(ROL/CHF)	0.00195484	0.0153824	0.1271	0.8989	
dlog(RUR/CHF)	0.0138570	0.0265583	0.5218	0.6020	
dlog(UAH/CHF)	0.00475704	0.00327540	1.452	0.1469	
R-squared		0.880691			

Source: NBM, calculation E-Views
Note: Regression is ordinary least squares. Dependent variables include all candidate currencies. The Swiss franc is used as numeraire. This sub-period comprises 659 observations. *** - statistically significant at the 99 percent level.

4.2 Regime stability

In order to ascertain whether the parameters obtained from the Frankel-Wei model were stable over the entire period, we introduce an additional equation, which allows the weights to vary over time in an autoregressive manner:

$$\beta_{i,t} = \beta_{i,t-1} + \eta_{i,t} \tag{3}$$

where *i* represents each of the potential anchor currencies. Thus a state-space model is constructed, with eq. (1) being the *signal* and eq. (3) being the *state* equation.

In order to extract the dynamics of the implicit currency weights, the state-space model was first estimated by means of minimal (log) likelihood (the results from the estimation are presented in Table 5). Once all the system parameters are estimated, the Kalman filter is applied and the “true", but otherwise unobservable, weights are obtained.

Table 5: Maximum likelihood (cash: Swiss franc), using observations 2005/12/01-2010/11/30 (T = 1304)

	Coefficient	Std. error	z-statistic	prob.	
const	-12.095578	8.330955e-03	-1451.883724	0.0000	***
	Final state	Root MSE	z-statistic	prob.	
beta USD	0.977940	0.013559	72.122418	0.0000	***
beta EUR	0.002064	0.026316	0.078424	0.937491	
beta ROL	-0.0050470	0.0050469	0.3701431	0.71127589	
beta RUR	-0.0076508	0.0161971	-0.4723579	0.6366714	
beta UAH	0.0058523	0.0051992	1.1256174	0.2603275	

Source: NBM, calculation E-Views
Note: *** - statistically significant at the 99 percent level.

In this context, the Kalman filter is a recursive method of estimating the “true" value of currency weights at date *t*, given the information (the mean and the covariance, obtained by ML in the previous step) available at date (t-1).

4.3 Structural breaks

We follow the approach taken by Zeileis et al. (2010b). In the first step a regression model that includes variance as a full parameter is estimated by maximum likelihood (*ML*) method. The estimating functions for parameters are:

$$\psi_\beta(y, x, \beta) = (y - x^T\beta)x \quad (4a)$$

$$\psi_\sigma^2(y, x, \beta, \sigma^2) = (y - x^T\beta)^2 - \sigma^2 \quad (4b)$$

To detect a structural break, the initial exchange rate regime should be estimated. For this purpose, the regression is run on a short sub-period and the parameters of this regime (the currency weights and the variance (standard deviation of σ)) are captured.

In the second step, an *empirical fluctuation process* is constructed, reflecting the deviations from the estimating functions (set to be zero in ML estimation). The same fluctuation process is extrapolated over the remaining sub-period. A change in any parameter, including the variance, leads to a deviation of the *efp* from zero. A statistical test is developed in order to verify whether a change in parameter, and hence a change in the regime (structural break), is significant.

Finally, setting a minimal duration of one regime, it is possible to determine the optimal number of regimes during the sample period and to estimate the probable dates (and confidence intervals) of regime changes. The dates of the regime changes are determined based on the Bayesian information criterion.

5. Regression results

The results of the Frankel-Wei regressions are presented in Tables 3 and 4. In the first sub-period, two potential anchor currencies proved to have weights significantly different from zero: the US dollar with a 0.937 weight and the Russian ruble with 0.094. This is an indication of exchange rate pegging on the part of the Moldovan leu. However, the weights do not sum up to a unity, which means that the peg is not tight, but allows for some deviation. R-squared of 0.957 is another signal of the existing fluctuation band. This result is surprising, because we find an insignificant weight of the Euro, the currency of many of Moldova's important trading partners as well as an important means of international payments for Moldova.

In the second sub-period, when the Ukrainian monetary authorities allowed UAH to fluctuate again, UAH was included into our model, but did not exhibit any significant weight. Neither did the Russian ruble, while the weight of the US dollar, the only significant currency, rose to 0.982. The overall strength of the model declined, however, with R-squared falling to 0.88.

The application of the Kalman filter has uncovered instability in the implicit weights of the potential anchor currencies. Large fluctuations in the weights of all currencies observed at the beginning of the sample period is probably due to the absence of initial data (with diffuse prior data, the filter "calibration" takes some time), so results for the first month or two may need to be disregarded.

After the initial period of one or two months, the weight of the US dollar remained close to or above unity until mid-2008, when it fell to the range of 0.9-0.95. By the end of 2009 it had increased again and remained around 0.97 to the end of the sample period. The Russian ruble reflected this movement - its weight was close to or below zero until mid-2008, when it sharply increased to about 0.1. By the end of 2009 it had gradually declined and then fluctuated around zero through the end of the sample period. The weights of the remaining three currencies gravitated around zero, which is consistent with the results from the Frankel-Wei model. These results seem to hold regardless of the chosen cash. They all show that the results are quite robust to the choice of cash.

The strategy to test for identifying the regime shift was applied as follows: to estimate the parameters of the initial exchange rate regime, a period of four months (December 1, 2005 to March 31, 2006) was chosen. The results from this regression are summarized in Table 6. We can see that only the USD coefficient is significantly different from 0 (but not significantly from 1), thus signalling a very tight peg to USD during these four months. The R-squared of the regression is 0.997 given the extremely low standard deviation of σ = 0.03.

Table 6: Parameter estimates for the initial exchange rate regime, using observations 2005/12/01-2006/03/31 (T = 87)

Coefficient	Estimate	Std. error	t-value	prob.	
(Intercept)	-0.015501	0.003375	-4.593	1.61e-05	***
USD	1.019833	0.020342	50.135	0.0000	***
EUR	-0.011086	0.028874	-0.384	0.702	
ROL	-0.008864	0.011094	-0.799	0.427	
RUR	-0.011456	0.019986	-0.573	0.568	
UAH	-0.011412	0.012326	-0.926	0.357	
Residual standard error: 0.03029 on 80 degrees of freedom					
Multiple R-squared: 0.9969			Adjusted R-squared: 0.9967		

Source: NBM, calculation E-Views

Note: *** - statistically significant at the 99.9 percent level.

If we compare this result to the average weights for the entire period and to the results of the Kalman filter model, it becomes clear that this four-month period is not typical, that the regime is very likely to change soon, and that multiple breaks will be detected.

Then, an empirical fluctuation process was constructed for this period. For this, on every observation date the stability of parameter was tested, and test scores obtained. *efp* is the resulting time series, capturing deviations from the null hypothesis of parameter stability. This and all remaining computations were performed in R language using fxregime software package.[5]

Next, this process is extended to cover one year and the critical values (the boundaries) of test scores are calculated. As expected, in less than two months the variance of most parameters increase and approach the theoretical boundaries (variance of ROL and variance of σ even crossing the upper boundary). All these suggest that a transition to a much softer peg is taking place.

The number and dates of breakpoints are reported in Table 7. Two structural breaks are detected, and thus three distinct regimes are identified within a one-year period. The first break is likely to have taken place between the 8th and 19th of May, 2006, with May 18 being the most probable date. The second one is dated by June 15, with the 90% confidence interval between June 14 and June 26.

Table 7: Probable dates and confidence intervals of structural breaks between December 1, 2005 and November 30, 2006

Breakpoints at observation number:			
	5%	breakpoints	95%
1	112	120	121
2	139	140	147
Breakpoints at observation date:			
	5%	breakpoints	95%
1	2006-05-08	2006-05-18	2006-05-19
2	2006-06-14	2006-06-15	2006-06-26

Source: E-views

Finally, the segments enclosed between these dates are estimated by ordinary least squares and changes between regimes are clearly visible. During the first regime (Dec 1, 2005 to May 18, 2006) MDL was following a tight peg to US dollar, the weight of USD being 1.014244 and R-squared equal to 0.9979. In the second regime (May 19, 2006 to June 15, 2006) the peg was much more relaxed, MDL followed USD only to 0.98313 with R-squared of only 0.9508. The third period (June 16, 2006 to November 30, 2006) is a return to a tight peg - weight of USD is 1.0063857, and R-squared is 0.998.

6. Conclusions

[5] see software manual in Zeileis et al. (2010a)

The main conclusions are as follows:

a) Between December 2005 and November 2006, periods with different degrees of pegging of MDL and different implicit weights of currencies were observed. This confirms the IMF classification of Moldova's exchange rate regime as a managed float with no predetermined path for the exchange rate.

b) USD had a very large weight in MDL. This weight fluctuated from about 0.9 to over unary, but has always been significant.

c) The only other currency that was found to have a statistically significant weight in MDL, was the Russian ruble.

d) Surprisingly, despite the large share of euro-denominated transactions on Moldovan exchange market, and an even larger share of euro-denominated assets, the euro has never exhibited any statistically significant weight.

e) Taking into account changes in the variance of error term makes it possible to specify exchange rate regimes with more precision. In turn, this allows us to detect structural breaks by a larger number of parameters.

f) Such focus on exchange rates leads to concerns about NBM's commitment to price stability.

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