



# **DI Fund Sufficiency Evaluation**

**Methodological Recommendations  
and DIA Russia Practice**

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**THE DEPOSIT INSURANCE CONFERENCE  
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# Two basic methods of evaluation of DI Fund sufficiency (in practice)

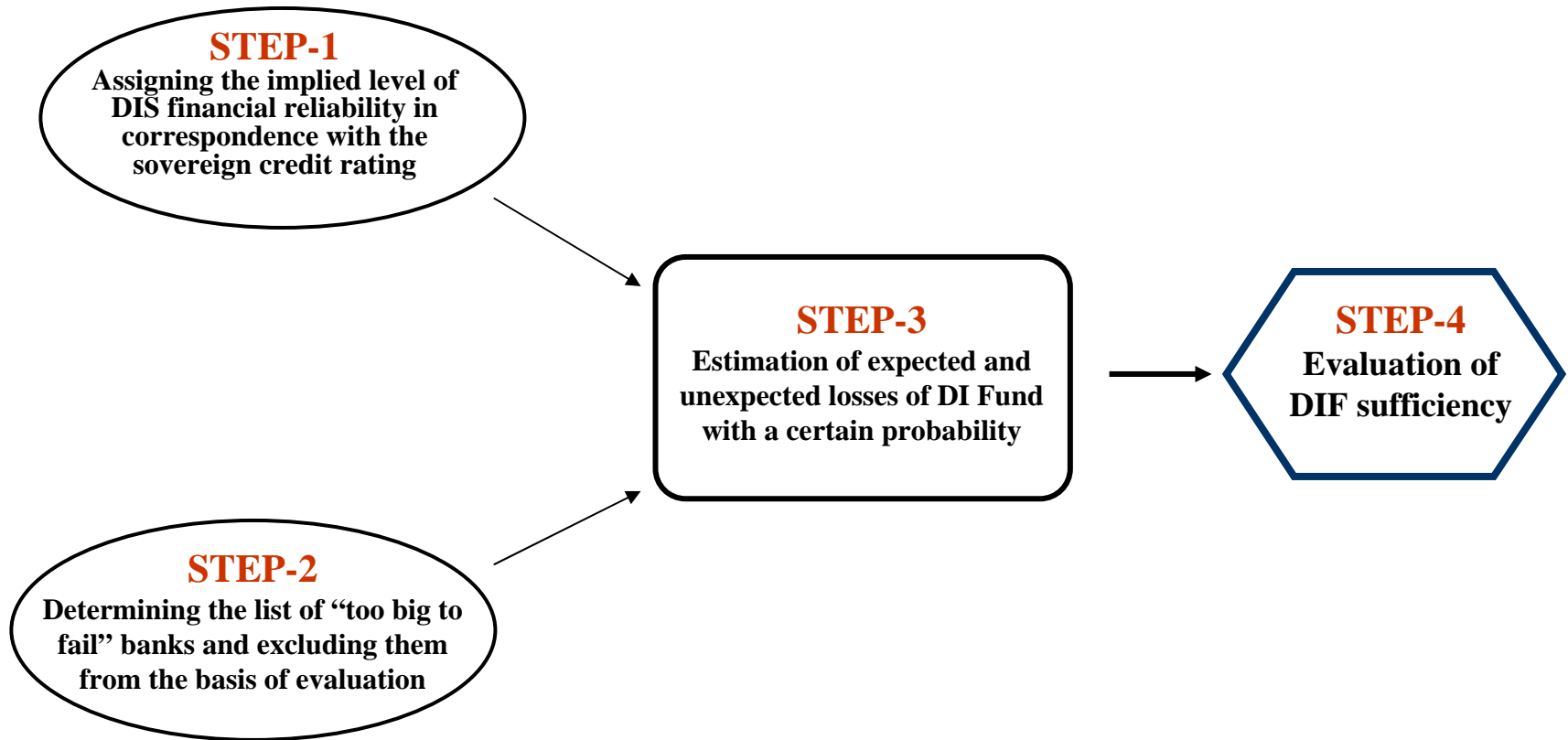
1. On the basis of expert opinions on sufficiency size of DI Fund (without estimation of *PD* of member banks and DI Fund cover losses)

*Ideas of some respected experts about «margin of safety» which the DI Fund should have*

2. On the basis of risk analysis

*Estimation of *PD* of member banks and DI Fund cover losses*

# 4 – STEP Procedure of estimation of DI Fund sufficiency



## STEP - 1

# Orientation on the implied level of DIS financial reliability

A general indicator of financial reliability  
is a credit rating

For Deposit Insurer it should be a modeling  
or so-called “implied” credit rating

Implied rating can be assigned by mapping  
procedure, which gives the correspondence  
between credit ratings and values of PD

# Correlation of credit rating and historical frequency of default on the example of DIA, Russia

Rating		Historical frequency of default, %	
		duration period, 1 year	duration period, 5 years
Standard & Poor's	A	0,06	0,60
	A-	0,07	0,73
	BBB+	0,15	1,74
	BBB	0,23	1,95
	BBB-	0,31	3,74
	BB+	0,52	5,41
	BB	0,81	8,38
	BB-	1,44	12,32
	B+	2,53	17,65
	B	6,27	23,84
	B-	9,06	29,44
	CCC – C	25,59	44,50

## **STEP - 2**

**excluding “too big to fail” banks  
from the estimation basis**

**When these banks meet difficulties, the State  
undertakes a set of special measures for their  
support**

**Excluding “too big to fail” banks from  
evaluation basis we decrease our deposit  
insurance liabilities by 67%**

## STEP - 3

# Approaches to estimations of expected (*EL*) and unexpected losses (*UL*) of DI Fund

$$CL = EL + UL$$

$$EL = \sum_i EAD_i \cdot PD_i \cdot LGD_i \quad - \quad \text{Expected Losses}$$

***EAD*** – insured deposits in a member bank

***PD*** – probability of default of a member bank

***LGD*** – share of non-recoverable resources from the bankruptcy estate of a liquidated bank

Value of *Unexpected Losses (UL)* does not have a simple analytical expression. The easiest way to estimate *UL* is to use statistical simulation method (Monte Carlo).

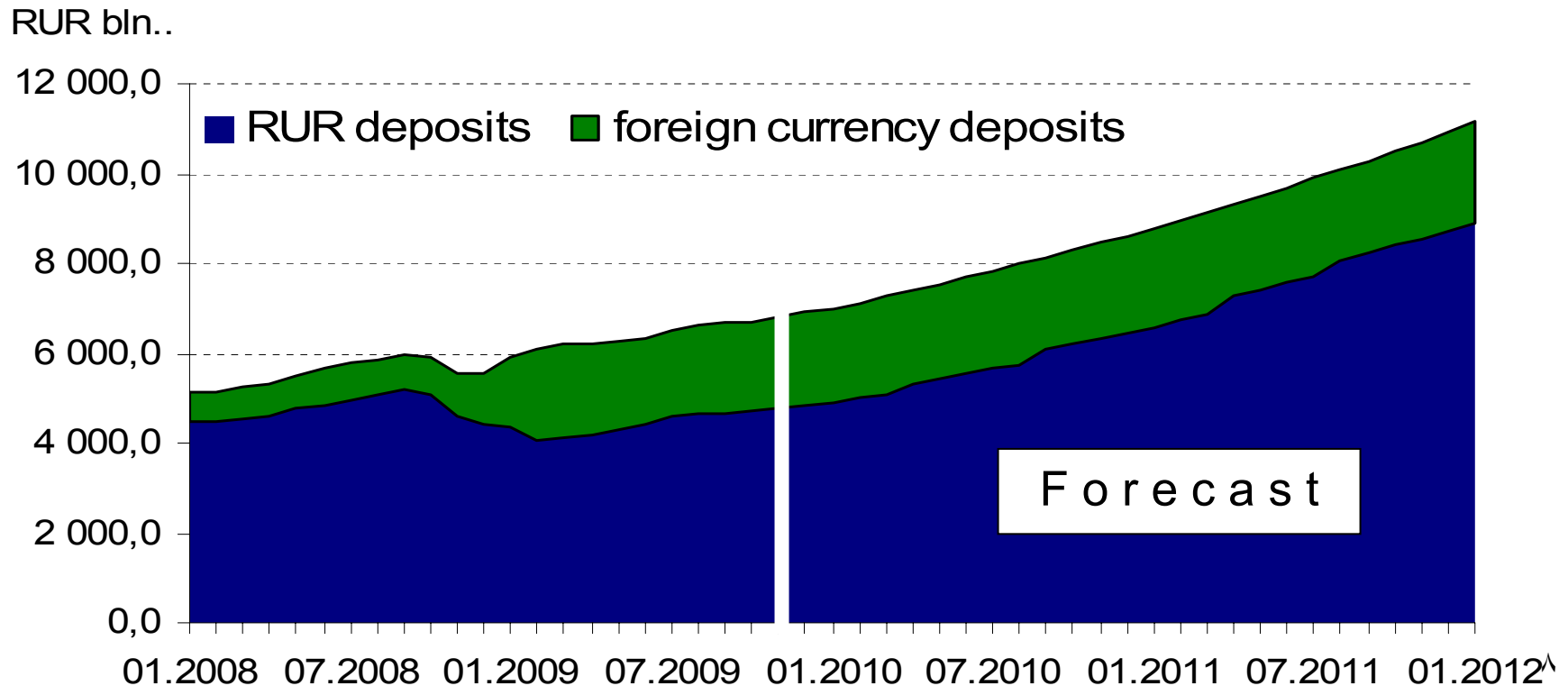
# Estimations of *EAD*

(insured deposits in a member bank)

$$EL = \sum_i EAD_i \cdot PD_i \cdot LGD_i$$

To assess the variable *EAD* - we analyze the dynamics of growth of household deposits (i.e. insured deposits in a member bank)

## Dynamics of growth of household deposits in 2008-2009



# Estimations of *LGD*

(share of non-recoverable resources from  
the bankruptcy estate of a liquidated bank )

$$EL = \sum_i EAD_i \cdot PD_i \cdot LGD_i$$

**To assess the variable *LGD* – we use collected  
statistical data from all bankruptcy cases**

Since 2004, the DIA, Russia has been fulfilling the functions of  
the bankruptcy trustee in 224 banks.

In 137 liquidation proceedings have come to the end, in 87 cases  
– are still in progress.

# Approaches to estimations of PD (probability of default of a member bank)

$$EL = \sum_i EAD_i \cdot PD_i \cdot LGD_i$$

Three main approaches to estimation  
of probability of default (PD)  
of member banks

1. On the basis of credit ratings of member banks  
(Standard Approach)
2. On the basis of econometrical models  
(Improved Approach)
3. On the basis of market-data models  
(Advanced Approach)

# PD estimation on the basis of econometrical model

The model of a binary choice suites best of all

$$PD(Y=1) = f(\beta_0 + \beta_1 * X_1 + \dots + \beta_k * X_k)$$

where

$f(..)$  – function of logistic distribution

$X_k$  – independent variables having an influence on the event of bank default

$\beta_k$  – coefficients

##	<i>Significant variables (<math>X_k</math>)</i>	value
1	<b>ROE (return on equity)</b>	-0,023
2	<b>capital adequacy</b>	-0,249
3	<b>interest cost of liabilities</b>	-0,036
4	<b>yield of promissory notes</b>	-0,039
5	<b>revenue performance of loan portfolio excl. promissory notes</b>	-0,566
6	<b>working credit</b>	-5,927
7	<b>liquidity cushion</b>	-0,264
8	<b>provisions for bad debts</b>	3,831
9	<b>liquid assets</b>	-0,041
10	<b>marketable securities (residents)</b>	-0,197

# PD estimation on the basis of market-data model

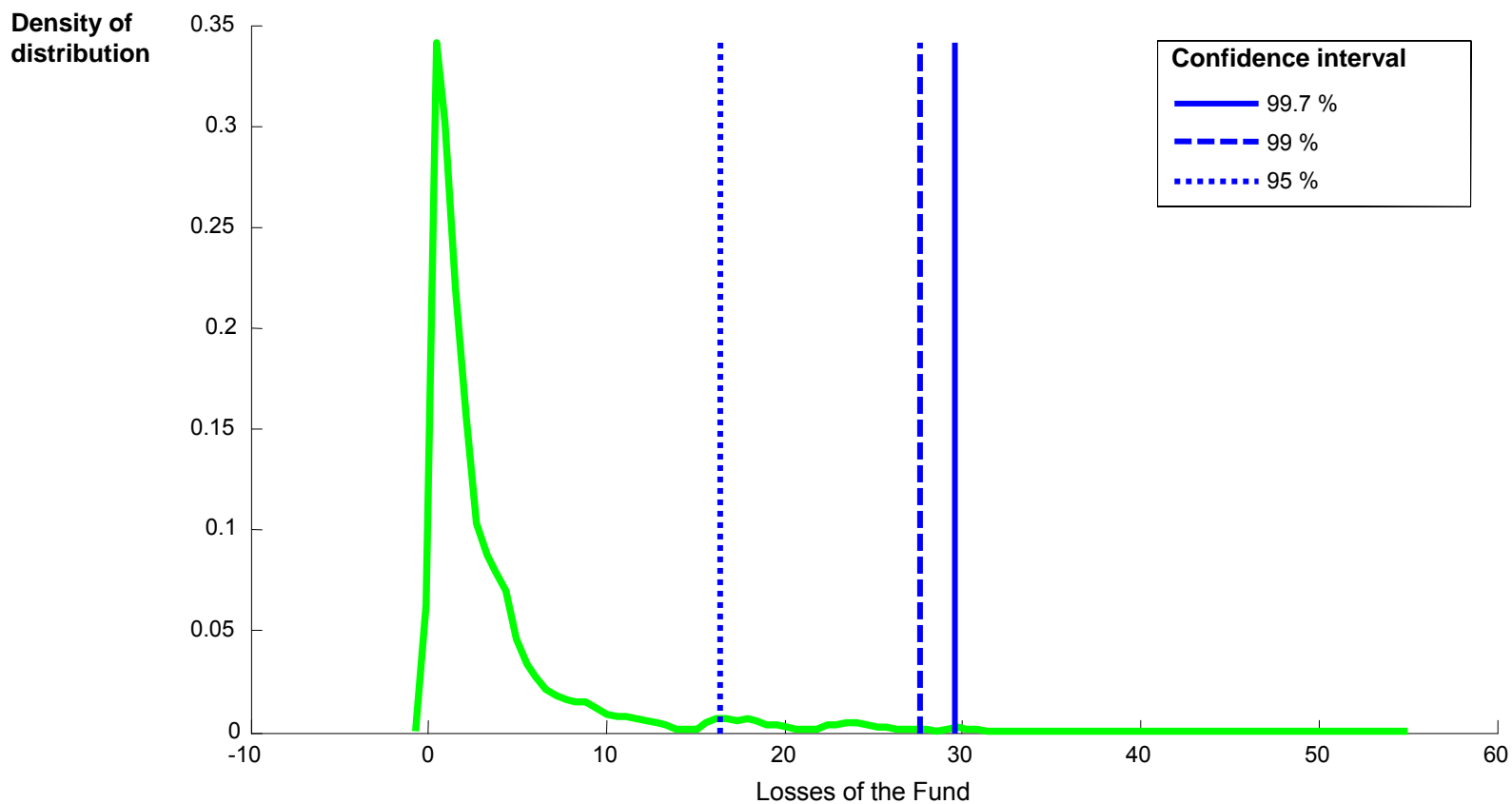
PD is estimated not on the basis of previous history of defaults of similar member banks but taking into consideration current state of each real member bank in current conditions of banking sector and economy as a whole

PD of largest banks which are the most dangerous can be adequately estimated only by market models

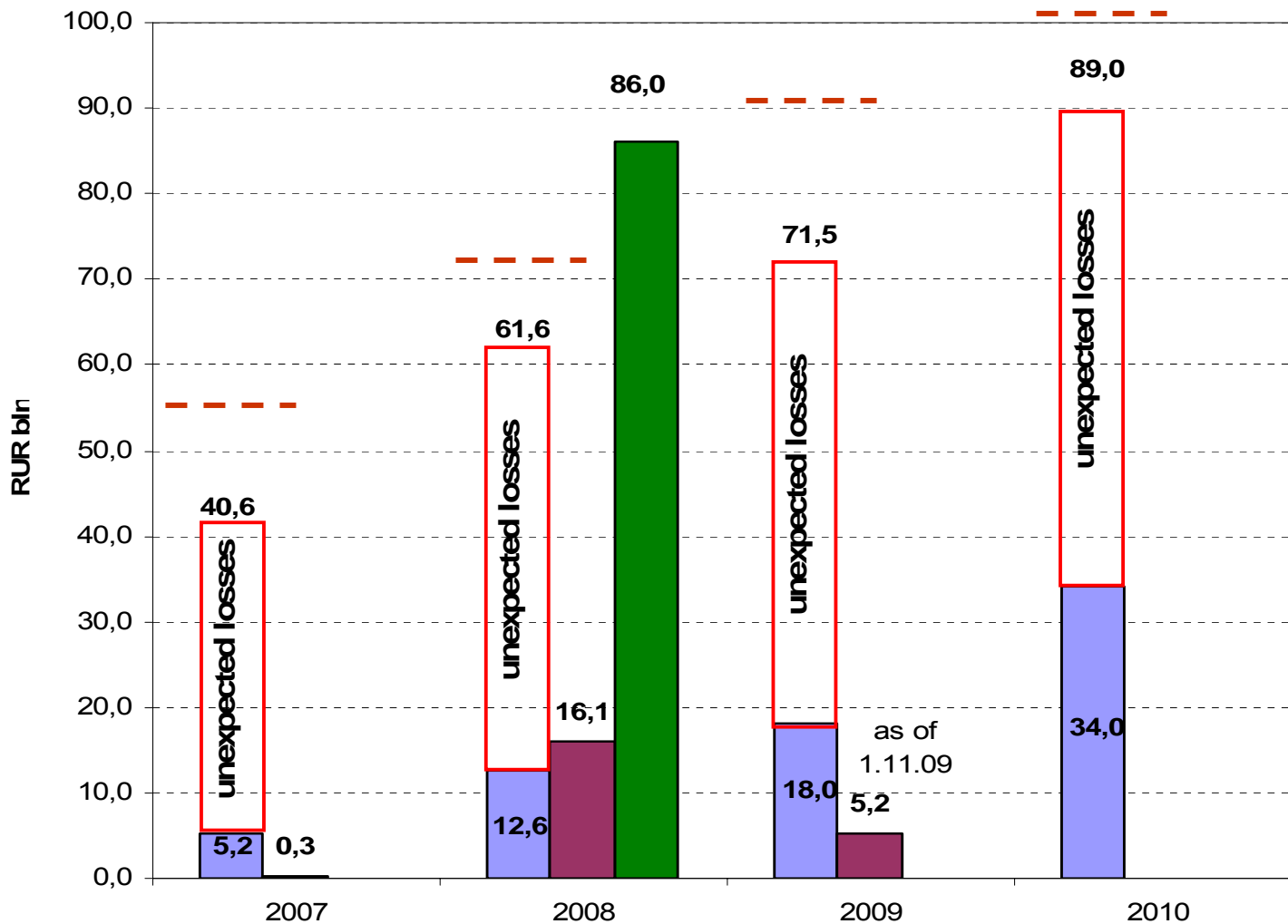
In practice, two main types of market-data models are the most developed:

- Structural Model - PDs are estimated on the basis of current market prices of shares issued by DIS members
- Reduced Form Model - PDs are estimated on the basis of current market prices of bonds, issued by DIS members

# Density of distribution of DI Fund losses



# Theory & Practice at Losses Estimation



----- 5%

■ forecasted expected losses 
 ■ incurred losses 
 ■ recalculated incurred losses