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MODELLING DYNAMICS OF THE UKRAINIAN AND CANADIAN BANKING SYSTEM'S ASSETS INFLUENCED BY FINANCIAL CRISIS

Ukrainian banking system's assets (UBSA) for each quarter starting from 01.07.98 (Q1) and ending with 01.04.2013 (Q60) have been normalized to the value of the Ukrainian banking system assets as of 01.07.98 (Table below).

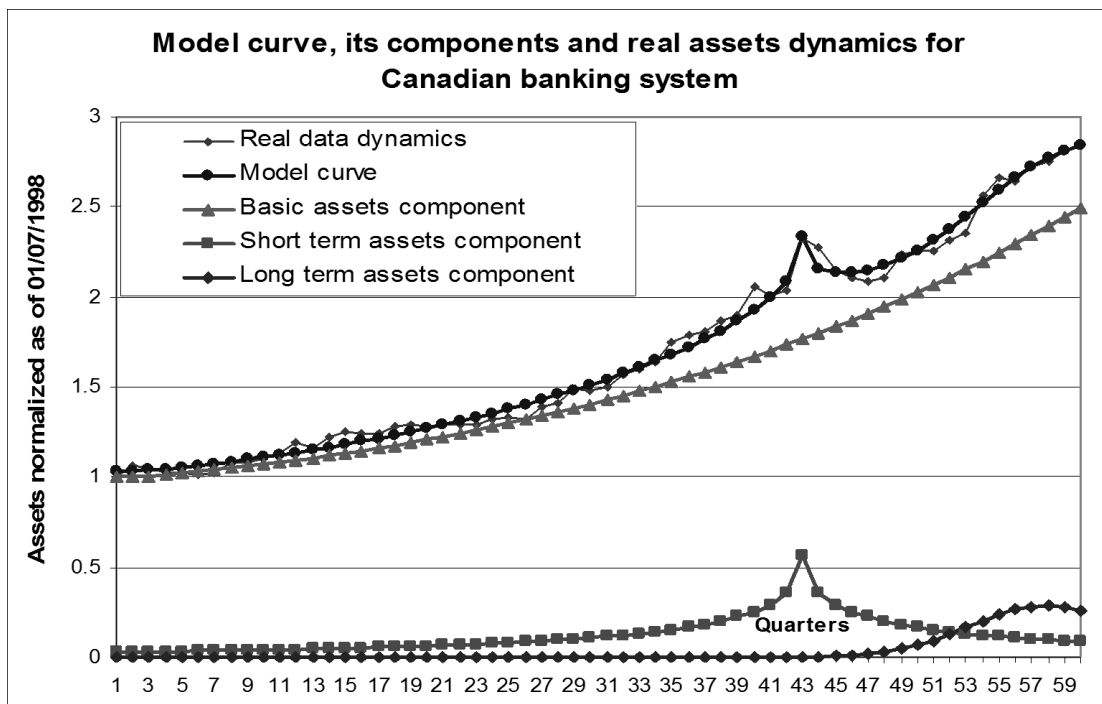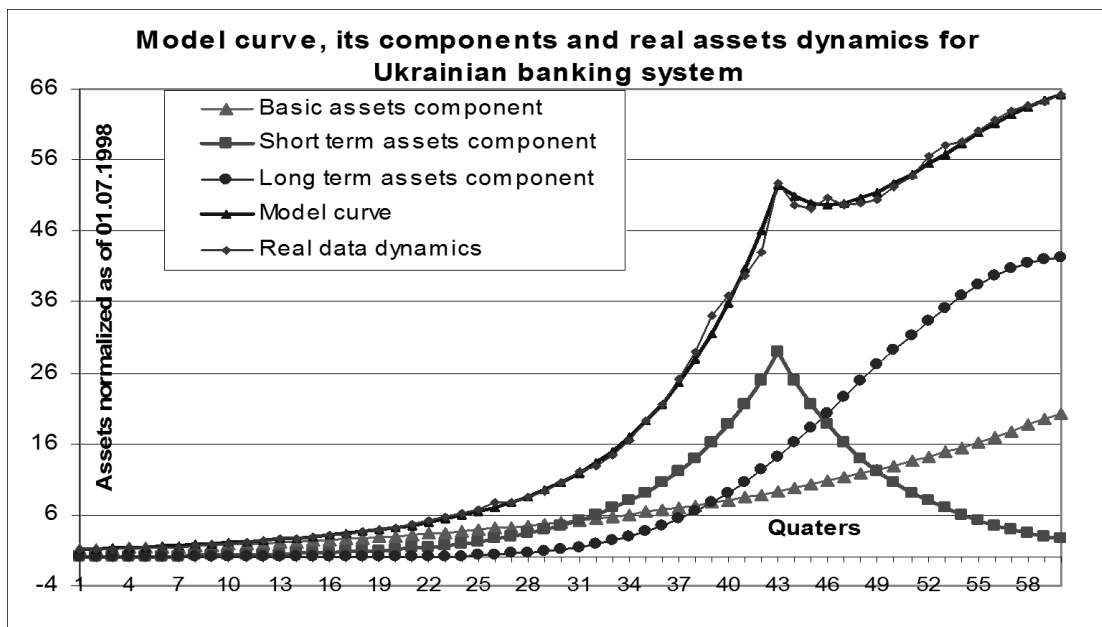|							
1	1,000000	16	3,033058	31	12,174454	46	50,658600
2	1,157483	17	3,200906	32	12,949059	47	49,718870
3	1,219787	18	3,573864	33	14,490084	48	49,805115
4	1,251081	19	3,857833	34	16,362863	49	50,390904
5	1,299898	20	4,259713	35	19,363831	50	52,226183
6	1,413524	21	4,805432	36	21,541753	51	53,625708
7	1,468954	22	5,115380	37	25,049879	52	56,639704
8	1,708543	23	5,705583	38	28,952767	53	58,050120
9	1,838737	24	6,113655	39	34,119081	54	58,582429
10	1,950833	25	6,798340	40	36,750905	55	60,011738
11	2,104963	26	7,690231	41	39,770855	56	61,616997
12	2,398589	27	7,647407	42	43,010818	57	62,864859
13	2,585100	28	8,604734	43	52,715091	58	63,607732
14	2,719387	29	9,387660	44	49,558574	59	64,161786
15	2,868420	30	10,453688	45	49,220536	60	65,183918

Canadian banking system's assets (CBSA) for the same 60 quarters have also been processed in the same manner. Both for UBSA and CBSA the author has found that mathematical model of the assets' dynamics, for the period stated above, could be represented as a superposition of three functions: Y_1 – "basic assets" component, Y_2 – "short-term assets" component, and Y_3 – "long-term assets" component.

$$Y_1 = K_1 e^{\left(\frac{x-A_1}{\beta_1}\right)^{\alpha_1}}, \ Y_2 = K_2 e^{-\left(\frac{/x-A_2/}{\beta_2}\right)^{\alpha_2}}, \ Y_3 = K_3 e^{-\left(\frac{/x-A_3/}{\beta_3}\right)^{\alpha_3}}.$$

For each of these functions (both for Ukraine and Canada cases) the author has calculated numerical values of parameters K, A, α and β (table below) and built

relevant curves (figures below). The resulting model curves and real data curves are also depicted on the figures.

Parameters	K	A	α	β
Functions	Ukrainian banking system			
Y_1	1,000000	1,00	0,885904	16,977860
Y_2	28,999900	43,00	0,978450	6,9003000
Y_3	42,290800	61,00	2,201100	17,300000
	Canadian banking system			
Y_1	1,000	1,00	1,392183	62,939610
Y_2	0,570	43,0	0,489000	4,580000
Y_3	0,288	57,9	2,000000	6,530000

Model curve, its components and real assets dynamics for Ukrainian banking system

Model curve, its components and real assets dynamics for Canadian banking system

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Correlation coefficients R for the real dynamics data and for model data are: $R = 0,999536$ for Ukraine and $R = 0,997074$ for Canada.

Irrespective of the differences between Ukrainian and Canadian banking systems the proposed model allows to forecast possible crisis of the assets dynamics by analyzing the rate of deviation of real data from the trend of the basic assets component.

The proximity of real data dynamics to the dynamics of the basic assets component for Canada witness the fact, that financial crisis in Canada was caused mainly by exogenous factors.

As for the Ukrainian banking system we can strongly suppose that the "depth" of Ukrainian financial crisis was mainly caused by endogenous factors: weak basic assets component and significant share of speculative and short-term capital allowed to inflow Ukrainian banking system before crisis.

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