

INFLUENCE OF LATVIAN COMMERCIAL BANKS' ASSETS ON ECONOMIC INDICATORS IN COUNTRY

Andrey Surmach, Inna Stecenko

Abstract: *In article is carried out an assessment of assets' influence of commercial banks on such important economic indicators as number of registered small and medium-sized enterprises in Latvia, unemployment rate and level of inflation. Using SPSS program authors carry out calculation of Spearman, Pearson and Kendall's correlation coefficients. Received results showed high interrelation between presented indicators.*

Keywords: *commercial banks, assets, small and medium business, unemployment, inflation, Latvia*

JEL classifications: *E44, G21*

1 INTRODUCTION

In modern economy of each country it is difficult to underestimate a role of banking system - banks carry out fundamental role in formation and realization of financial policy of the country. Bank is financial intermediary which is engaged in credits and advance payments" - Cern Cress. "Bank is an institute which temporarily raises spare cash from public and provides to other people as necessary"- R.P. Kent [1]. "Bank provides services to clients and, in turn, receives privileges in different forms". P.A. Samuelson. [2] "Bank is such institution which creates money only for money". W. Hok [3]. World economic crisis, exerted impact and on banking system of Latvia that in turn led to reduction of assets of commercial banks and a bankruptcy of many enterprises. According to authors' opinion, for stable development of financial policy in regions of Latvia, is necessary close interrelation between regional centers of power, enterprises of regions and commercial banks.

2 INFLUENCE OF COMMERCIAL BANKS ASSETS ON ACTIVITY IN REGIONS.

Using analysis of economic development in regions of Latvia, it is necessary to consider influence of assets of commercial banks on economic indicators of region. Economic activity of region and in general state, according to authors, is reflected proceeding from the number of the registered enterprises (MVB), unemployment rate (BL) and the rate of inflation (IL). For analysis authors used period for 2007 - 2016, taking into account financial crisis of 2007-2011 and post-crisis period since 2012-2016. (table 1).

Table 1. Economic indicators of Latvia during period since 2007 till 2016

Years	Quantity of registered enterprises thousands	Unemployment rate, %	Rate of inflation, %	Assets of commercial banks million euros
2007	61,4	6,6	10,1	31183,7
2008	73,2	7,0	15,3	33072,3
2009	72,9	12,3	3,0	30845,5
2010	75,8	20,4	-1,2	31256,5
2011	83,8	17,0	4,4	29775,7
2012	90,7	15,4	2,3	28784,4
2013	94,8	12,9	0	29192,3
2014	103,4	11,4	0,6	30814,9
2015	106,8	9,7	0,2	31937,7
2016	105,8	10,0	-0,4	30886,8

Source: csb.gov.lv[4].

For obtaining reliability we will carry out calculations by means of **Pearson, Spirmen and taa – Kendella** correlation methods

Pearson's coefficient of correlation characterizes existence of linear dependence between two values.

Are given two selections $x^m = (x_1, \dots, x_m)$, $y^m = (y_1, \dots, y_m)$; (1)

Pearson's coefficient of correlation is calculated by formula:

Where, \bar{x}, \bar{y} - selective averages x^m and, y^m, s_x^2, s_y^2 - selective dispersions $r_{xy} \in [-1;1]$. (2)

Pearson's coefficient of correlation is called also narrowness of linear communication:

- $|r_{xy}| = 1 \Rightarrow x, y$ are linearly dependent, (3)
- $r_{xy} = 0 \Rightarrow x, y$ are linearly independent (4) [5].

Spearmanrank coefficient correlation - measure of linear communication between random variables. Spearman's correlation is rank that is for assessment of force of communication are used not numerical values and ranks corresponding to them. Coefficient is non-variant in relation to any monotonous transformation of measurement scale.

Calculation of Spearman correlation:

Spearman coefficient of correlation is calculated by formula:

$$\rho = 1 - \frac{6}{n(n-1)(n+1)} \sum_{i=1}^n (R_i - S_i)^2, (5) \quad [1]$$

Where, R_i - observation rank x_i among x , S_i - observation rank y_i in among y .

Coefficient ρ accepts values from piece $[-1;1]$. Equality $\rho = 1$ indicates strict direct linear dependence, $\rho = -1$ return [5].

Coefficient of rank correlation τ - Kendall is an alternative to method of definition of Spearman correlation. It is intended for determination of interrelation between two rank variables.

Interpretation of results of calculation **coefficient of rank correlation τ - Kendall** is defined as difference of probabilities of coincidence and inversion in ranks.

For the same values of variables of value of coefficient of correlation r - Spearman will be always a little more, than values of **coefficient of rank**

correlation τ - Kendall whereas the significance value is identical or at correlation coefficient τ - Kendall will be little more.

Formula of **coefficient of rank correlation calculation τ - Kendall** differs from a formula of coefficient of correlation of R-Pearson, and can be expressed as:

$$\tau = \frac{P(p) - P(q)}{N \frac{(N-1)}{2}}, \quad (6)$$

, where $P(p)$ - number of coincidence, $P(q)$ - number of inversions, N - selection volume.

In *simplified view* formula of Kendall coefficient of correlation can be written down as:

$$\tau = \frac{4P}{N(N-1)} - 1, \quad (7)$$

In presence of connected ranks the formula changes taking into account amendment on connected ranks:

$$\tau = \frac{P(p) - P(q)}{\sqrt{\left[N \frac{(N-1)}{2} \right] - K_x} \sqrt{\left[N \frac{(N-1)}{2} \right] - K_y}}, \quad (8)$$

, where $P(p)$ - number of coincidence, $P(q)$ - number of inversions, N - selection volume, K_x - the amendment in touch variable X ranks, K_y - amendment in touch variable Y ranks

$$K_x = 0,5 \sum_i \int_i (\int_i - 1), \quad (9)$$

, where i - number of communications groups on X , \int_i - number of group is X

$$K_y = 0,5 \sum_i \int_i (\int_i - 1) , \quad (10)$$

, where i - number of communications groups on Y , \int_i - group Y number

Further we will carry out calculation of Pearson, tau-Kundell and Spearman coefficients of correlation base on the program of SPSS.

Table 2. Correlations of Pearson

		MVB firm	BL	IL	BA
MVB firm	Pearson Correlation	1	,032	-,649*	-,216
	Sig. (2-tailed)		,930	,042	,548
	N	10	10	10	10
BL%	PearsonCorrelation	,032	1	-,574	-,516
	Sig. (2-tailed)	,930		,083	,126
	N	10	10	10	10
IL%	PearsonCorrelation	-,649*	-,574	1	,496
	Sig. (2-tailed)	,042	,083		,144
	N	10	10	10	10
BA	PearsonCorrelation	-,216	-,516	,496	1
	Sig. (2-tailed)	,548	,126	,144	
	N	10	10	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

Source: developed by the authors

Pearson's correlation shows high level of dependence between number of firms in Latvia and unemployment rate - 0,93, between level of unemployed and inflation - 0,83, assets of commercial banks and number of enterprises 0,55.

Table 3. Calculation of correlation coefficients of Spearman and Kendall's tau

		MVB firm	BL%	IL%	BA
Kendall's tau_b	CorrelationCoefficient	1,000	-,111	-,467	-,067
	MVB firm Sig. (2-tailed)	.	,655	,060	,788
	N	10	10	10	10
	CorrelationCoefficient	-,111	1,000	-,244	-,467
	BL% Sig. (2-tailed)	,655	.	,325	,060
	N	10	10	10	10
	CorrelationCoefficient	-,467	-,244	1,000	,067
	IL% Sig. (2-tailed)	,060	,325	.	,788
	N	10	10	10	10
	CorrelationCoefficient	-,067	-,467	,067	1,000
	BA Sig. (2-tailed)	,788	,060	,788	.
	N	10	10	10	10
Spearman's rho	CorrelationCoefficient	1,000	,055	-,612	-,152
	MVB firm Sig. (2-tailed)	.	,881	,060	,676
	N	10	10	10	10
	CorrelationCoefficient	,055	1,000	-,430	-,552
	BL% Sig. (2-tailed)	,881	.	,214	,098
	N	10	10	10	10
	CorrelationCoefficient	-,612	-,430	1,000	,091
	IL% Sig. (2-tailed)	,060	,214	.	,803
	N	10	10	10	10
	CorrelationCoefficient	-,152	-,552	,091	1,000
	BA Sig. (2-tailed)	,676	,098	,803	.
	N	10	10	10	10

Source: developed by the authors base on the program of SPSS.

Kendell's tau correlation level shows high rate between number of enterprises in Latvia and commercial banksassets - 0,8, Spearman coefficient makes on similar indicator - 0,68. High level of Spearman correlation between level of unemployed and number of enterprises in Latvia. Strong interrelation is shown between level of unemployed and assets

of commercial banks across Spearman - 0,98 (!) and in conditions of stabilization of economy is important Spearman's correlations of dependence between level of assets of commercial bank and rate of inflation in country - 0,91 (!).

3 RESULTS

Thus, analysis which is carried out by author's means of Pearson's, Spearman and Kendall's taacorrelationcoefficients showed that assets of commercial banks of Latvia influence number of enterprises in the country that respectively exerts impact on unemployment rate and rate of inflation of the country.

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AUTHORS:

Andrey Surmach– mg.oec, PhD students of Baltic International Academy, Latvia, Riga, Lomonosova street 4, ansuinvest@gmail.com

Inna Stecenko - dr.oec., prof., Baltic International Academy, Latvia, Riga, Lomonosova street 4, inna.stecenko@bsa.edu.lv