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Estimation of the financial state of agrarian enterprises in Ukraine

Introduction

Development of the Ukrainian economy on market principles indissolubly related to increase of high-quality level of analysis of enterprises' financial state. During last years domestic and foreign methods of such state estimation are used in Ukraine, but the order of their application needs substantial improvement. Actuality of select theme of research is stipulated by abovementioned statements.

Methodology

Estimation of financial state of agrarian enterprises in Ukraine is conducted on the basis of comparison of actual (or expected) and normative values of wide circle of financial ratios (indexes). Financial ratios that are used for estimation of financial state of enterprises divided into three groups:
1. Assets' structure ratios.
2. Activity and profitability ratios.
3. Liquidity and coverage ratios.
Ratios of assets' structure include: depreciated cost of fixed assets, current assets to noncurrent assets, current assets' structure etc.
Ratios of activity and profitability include: capital turnover, current assets turnover, inventory turnover, receivable turnover as same as return on assets, profit margin, return on equity etc.
The group of liquidity and coverage ratios is presented such ratios as absolute, "acid test" (quick) and current liquidity ratios as same as equity ratio, equity to debt ratio, coverage of short-term and long-term debt ratios.
Banks must apply the official method of estimation of enterprise-borrower's financial state ratified by the Decision of the National bank of Ukraine. Official method is based on using of eight financial ratios (absolute, quick and

current liquidity; equity to debt, equity to assets, return on assets, return on sales and cash flow to debt).

Besides the official method, at the own discretion banks use other methods of estimation of enterprises' financial state. Nowadays computer technologies of such estimation are widespread.

Mentioned methods (models of estimation) are different by such characteristics as complexity and level of mathematical apparatus application. Methods based on probabilistic approaches, fuzzy-set theory etc. are widespread too.

Results

Two methods (models) of estimation of enterprises' financial state on the basis of their financial reports are pointed below.

Application of models is shown on example of two agrarian enterprises – LTD «Desna» and JSC «Agrostar plus». Necessary information about these enterprises is contained in their financial reports[1]. Most of figures are mentioned in balance sheets (Table 1).

Table 1
Brief balance sheets of LTD «Desna» and JSC «Agrostar plus», '000 UAH

Assets	Note	LTD «Desna»		JSC «Agrostar plus»	
		01.01.09	01.01.10	01.01.09	01.01.10
A	1	2	3	4	5
I. Noncurrent assets					
Intangible assets:					
depreciated cost	10	3	4	110	172
initial cost	11	5	7	196	274
accumulated depreciation	12	2	3	86	102
Incompleted construction	20			3617	4168
Fixed assets:					
depreciated cost	30	7765	9556	13764	16718
initial cost	31	10885	13459	19737	24323
accumulated depreciation	32	3120	3903	5973	7605

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[1] Balance sheets, profit and loss reports of the probed enterprises are made in accordance with standard forms ratified by the instruction of Finance Ministry of Ukraine.

Continuation of Table 1

A	1	2	3	4	5
Long-term biological assets:					
depreciated cost	35	777	905		
initial cost	36	780	909		
accumulated depreciation	37	3	4		
Other noncurrent assets	70			209	202
Total noncurrent assets I	80	8548	10465	17700	21260
II. Current assets					
Inventories	100	598	1559	6300	„835
Current biological assets	110	776	654		
Goods in process	120	750	1416	1133	1547
Finished goods	130	2181	1522	185	185
Wares	140	16	18	840	1030
Trade accounts receivable:					
net realisation cost	160	852	1446	5618	7690
initial realisation cost	161	852	1446	5618	7690
Other receivables	210	779	1092	3100	3802
Current financial investments	220			2016	2314
Cash and cash equivalents:					
national currency	230	249	424	2312	1689
foreign currency	240			778	2533
Other current assets	250	515	269	1010	1142
Total current assets II	260	6716	8400	23292	29787
III. Deferred charges	270	2	3	400	569
Total assets	280	15266	18868	40992	51616
Equity and Liabilities	Note	01.01.09	01.01.10	01.01.09	01.01.10
I. Equity					
Total equity I	380	8960	10448		33050
II. Support of such expenses and payments					
Total support of such expenses and payments II	430	44	84	943	1051
III. Long-term liabilities					
Total long-term liabilities III	480	3652	5659	2429	3996
IV. Short-term liabilities					
Total short-term liabilities IV	620	2608	2675	10114	12960
V. Deferred income	630	2	2	455	559
Total equity and liabilities	640	15266	18868	40992	51616

Source: Financial reports of LTD "Desna" and JSC "Agrostar plus".

44

Besides balance sheets, the profit and loss reports are informative providing to oncoming financial state analysis of the probed enterprises too (Table 2).

Table 2
Profit and loss brief reports of LTD «Desna» and JSC «Agrostar plus», '000 UAH

Item	Note	LTD «Desna»		JSC «Agrostar plus»	
		01.01.09	01.01.10	01.01.09	01.01.10
1	2	3	4	5	6
Sales proceeds (goods, works, services)	10	11053	9189	54117	42955
Net sales proceeds (goods, works, services)	35	9447	7854	45862	36403
Cost of goods (works and services) sold	40	7150	5964	39410	32201
Gross:					
profit	50	2297	1890	6452	4202
Net:					
profit	220	2025	1799	6752	4320
II. ELEMENTS OF OPERATING EXPENSES					
Item	Note	01.01.09	01.01.10	01.01.09	01.01.10
1	2	3	4	5	6
Depreciation	260	784		1648	1386
III. INDEXES CALCULATION					
Item	Note	01.01.09	01.01.10	01.01.09	01.01.10
1	2	3	4	5	6
Average annual quantity of common stocks	300			45000	40000
Dividends per one common stock (UAH)	340			35	30

Source: Financial reports of LTD "Desna" and JSC "Agrostar plus".

In 2000 the model of enterprise's estimation of financial state on the basis of balance sheets was developed by the Banking Department of the National Agrarian University of Ukraine.

The integral index of the financial state (I) changes from 0 to 100: the higher value of index, the better financial state of enterprise and vice versa, the lower value of index, the worse such state.

Depending on the value of integral index of financial state, every enterprise - potential borrower applys to appropriate group of risk: minimum (I > 90), moderate (80 < I < 90), middle (70 < I < 80), maximum (60 < I < 70) and impermissible (I < 60).

In accordance with the third version of model the integral index of the enterprise's financial state is determined on the basis of such ratios (Table 3).

Table 3
Ratios, their calculation and normative values

Ratio x_i	Calculation of ratio	Normative value of ratio
Absolute liquidity x_1	$\dfrac{\text{Cash and cash equivalents}}{\text{Short-term liabilities}}$	≥ 0,25
Quick liquidity x_2	$\dfrac{\text{Cash and cash equivalents + receivable}}{\text{Short-term liabilities}}$	≥ 0,5
Current liquidity x_3	$\dfrac{\text{Current assets}}{\text{Short-term liabilities}}$	≥ 2
Current assets to noncurrent assets x_4	$\dfrac{\text{Current assets}}{\text{Noncurrent assets}}$	≥ 1
Equity to total assets x_5	$\dfrac{\text{Equity}}{\text{Total assets}}$	≥ 0,5
Equity to debt x_6	$\dfrac{\text{Equity}}{\text{Short and long-term liabilities}}$	≥ 1

Source: [Kruchok S. 2003, pp. 129–131].

The sequence of integral index calculation is rotined below. In consideration of considerable difference between normative values of six ratios (from $x_1 > 0{,}25$ to $X_3 \geq 2$), these ratios can't be compared between themselves directly. Because of it, the mentioned above ratios should be presented by marks (table 4).

Limitation $M_i < 100$ means that if the appropriate ratio reaches optimum value, further increase of value of such ratio couldn't influence on increase of appropriate mark M_i. Limitation $0 \leq M_{5(6)} \leq 100$ means that value of $M_{5(6)}$ cann't be lower than 0 within any velue of equity.

Table 4
Equations of dependence between values of ratios and appropriate marks

Ratio	Mark
X_1	$M_1 = 320x_1 \leq 100$
X_2	$M_2 = 160x_2 \leq 100$
X_3	$M_3 = 40x_3 \leq 100$
X_4	$M_4 = 80x_4 \leq 100$
X_5	$0 \leq M_5 = 160x_5 \leq 100$
X_6	$0 \leq M_6 = 160x_6 \leq 100$

Source: [Kruchok S. 2003, pp. 129–131].

As a result of it, numerical values M_i depend on proper ratios x_i. That is, marks are representation of ratios, but differ from ratios by two characteristics: firstly, values of marks change from 0 to 100 and, secondly, as consequence of it, marks can compared between themselves directly. On the basis of it we can determine the integral index of enterprise's financial state by the following formula:

$$I = \frac{\sum\limits_{i=1}^{6} M_i}{6}$$

The proper calculations are mentioned in a table 5.

Table 5
Estimation of financial state of LTD «Desna» and JSC «Agrostar plus»

Ratio X_i	Normative value of ratio	LTD «Desna»				JSC «Agrostar plus»			
		Actual value of ratio		M_i		Actual value of ratio		M_i	
		01.01. 2009	01.01. 2010	01.01. 2009	01.01. 2010	01.01. 2009	01.01. 2010	01.01. 2009	01.01. 2010
X_1	> 0,25	0,0955	0,1585	30,56	50,72	0,3055	0,3258	97,76	100,00
X_2	> 0,5	0,7209	1,1073	100,00	100,00	1,1675	1,2125	100.00	100,00
X_3	> 2	2,5752	3,1402	100.00	100,00	2,3029	2,2984	92,12	91,94
X_4	> 1	0,7857	0,8027	62,68	64,22	1,3159	1,4011	100,00	100,00
X_5	> 0,5	0,5869	0,5416	93,90	86,66	0,6599	0,6403	100.00	100.00
X_6	> 1,0	1,4313	1,2261	100,00	98,09	2,1567	1,9492	100,00	100,00
Integral index				81,19	83,28			98,31	98,66
Upper limits for crediting, '000 UAH: •short-term[2]		1500,0	3050,0			3064,0	3867,0		
•long-term[3]		1565,5	1363,5			11836,0	17004,0		
•aggregate[4]		2746,0	2200,0			15906,0	17704,0		

Source: Own research.

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[2] Short-term limit is calculated by the following formula:
$L_{sh.crediting}$ = Current Assets – 2 Short-term liabilities ≥ 0
[3] Long-term limit is calculated by the following formula:
$L_{l.crediting}$ = 2,5 (Undivided profit – Accumulated depreciation) – Long-term liabilities ≥ 0
[4] Aggregate limit is calculated by the following formula:
$L_{ag.crediting}$ = Total Assets – 2 Total liabilities ≥ 0

We develop the universal method of estimation of financial state of legal entities-potential (actual) borrowers.

The normative values of ratios are mentioned in Table 6.

Table 6
Financial ratios, normative values and unit weights of such ratios

№	Ratio	Narmative value of ratio*	Unit weight of ratio under the process of estimation of enterprise's financial state to creditworthiness evaluation		
			Long-term	Short-term	General
1 1.1	Assets' structure ratios				
	Depreciated cost of fixed assets	> 0,5	20	*x*	10
1.2.	Current assets' structure	≥ 0,5/≥ 0,8	*x*	20	10
2 2.1	Activity and profitability ratios				
	Capital turnover	≥ 0,5/≥ 1,0	5	5	5
2.2	Return on assets	≥ 0,1	15	15	15
2.3	Profit margin	≥ 0,2/≥ 0,1	10	10	10
3 3.1	Liquidity and coverage ratios				
	Coverage of short-term debt	≥ 1,0	x	30	15
3.2	Coverage of long-term debt	≥ 0,5	30	x	15
3.3	Equity to total assets	≥ 0,5	20	20	20
	РАЗОМ	*x*	100	100	100

* Numerator shows normative values of ratios for agrarian enterprises
Source: [Kruchok N. 2009, pp. 20–23].

Indicated financial ratios are determined in this way:

Depreciated cost of fixed assets ratio ($R_{1.1}$)

$R_{1.1} = FA_d/FA_i$

where FA_d – fixed assets (depreciated cost) at date of estimation;

FA_i – fixed assets (initial cost) at date of estimation.

Structure of current assets ratio ($R_{1.2}$)

– for agrarian enterprises:

$$R_{1.2} = \frac{CA_1 + 0,8CA_2 + 0,7CA_3 + 0,4CA_4 + 0,3CA_5}{CA}$$

– for processing enterprises:

$$R_{1.2} = \frac{CA_1 + 0,8CA_2 + 0,7CA_3 + 0,65CA_4 + 0,6CA_5}{CA}$$

where CA_i– current asses due to proper class at date of estimation (1-st cl. – cash and cash equivalents, current financial investments; 2-nd cl. – notes payable, receivable; 3-rd cl. – finished goods and wares; 4-th cl. – goods in process, cuurent biological assets; 5-th cl. – inventories and other current assets.

CA– current assets at date of estimation.

Capital turnover ratio ($R_{2.1}$)

$$R_{2.1} = R/A$$

where R – revenue excluding VAT for the proper period; A – total assets at date of estimation.

Return on assets ratio ($R_{2.2}$)

$$R_{2.2} = NP/A$$

where NP – net profit for the proper period (loss (–)).

Profit margin ($R_{2.3}$)

$$R_{2.3} = NP/R$$

Coverage of sort-term debt ratio ($R_{3.1}$)

– for agrarian enterprises:

$$R_{3.1} = \frac{CA_1 + 0,8CA_2 + 0,7CA_3 + 0,4CA_4 + 0,3CA_5}{SL}$$

– for processing enterprises:

$$R_{3.2} = \frac{CA_1 + 0,8CA_2 + 0,7CA_3 + 0,65CA_4 + 0,6CA_5}{SL} \quad 5$$

where SL – short-term liabilities at date of estimation.

Coverage of long-term debt ratio ($R_{3.2}$)

$$R_{3.2} = (D + NP)/LL$$

where D – accumulated depreciation for the proper period;
LL – long-term liabilities at date of estimation.

Equity to total assets ratio ($R_{3.3}$)

$$R_{3.3} = E/A$$

where E – equity at date of estimation.

Dependence between the values of financial ratios and marks (on the basis of which the rating of enterprise is determined to estimation of enterprise's creditworthiness) is mentioned in Table 7.

Table 7
Dependence between values of financial ratios and marks

№	Ratio	Dependence between values of financial ratios and marks		
		Long-term	Short-term	General
1	$R_{1.1}$	$32\ R_{1.1} \leq 20$	x	$16\ R_{1.1} \leq 10$
2	$R_{1.2}$	x	$80\ R_{1.2} - 24 \leq 20^*$	$40\ R_{1.2} - 12 \leq 10^*$
			$80\ R_{1.2} - 48 \leq 20^{**}$	$40\ R_{1.2} - 24 \leq 10^{**}$
3	$R_{2.1}$	$8\ R_{2.1} \leq 5^*$		
		$4\ R_{2.1} \leq 5^{**}$		
4	$R_{2.2}$	$0 \leq 120\ R_{2.2} \leq 15$		
5	$R_{2.3}$	$0 \leq 120\ R_{2.3} \leq 10^*$		
		$0 \leq 80\ R_{2.3} \leq 10^{**}$		
6	$R_{3.1}$	x	$24\ R_{3.1} \leq 30$	$12\ R_{3.1} \leq 15$
7	$R_{3.2}$	$0 \leq 48 R_{3.2} \leq 30$	x	$0 \leq 24\ R_{3.2} \leq 15$
8	$R_{3.3}$	$0 \leq 32\ R_{3.3} \leq 20$		

* for agrarian enterprises; ** for processing enterprises
Source: [Kruchok N. 2009, pp. 20–23].

In accordance with the level of financial state enterprises are divided into 6 classes (Table 8).

Table 8
Classes and ratings of enterprises

№	Mark	Class	Level of rating
1	≥ 90	1	High
2	80–99.9	2	Upper middle
3	70–79.9	3	Middle
4	60–69.9	4	Under middle
5	50–59.9	5	Low
6	< 50	6	Unsatisfactory

Source: [Kruchok N. 2009, pp. 20–23].

Such dividing of enterprises into classes facilitates financial institutions and investors to estimate financial state of enterprises. The calculation of class and rating determination of the probed enterprises is below mentioned (Table 9).

Table 9

Estimation of class and rating of LTD «Desna» and JSC «Agrostar plus»

at 01.10.2010

Ratio x_i	Normative value of ratio	LTD «Desna»		JSC «Agrostar plus»	
		Actual value of ratio	M_i	Actual value of ratio	M_i
$R_{1.1}$	> 0,5	0,7134	10,00	0,7100	10,00
$R_{1.2}$	> 0,5/> 0,8	0,5965	10,00	0,5843	10.00
$R_{2.1}$	> 0,5/> 1,0	0,6019	4,81	0,5858	4,69
$R_{2.2}$	> 0,1	0,1178	14,14	0,1073	12,88
$R_{2.3}$	> 0,2/> 0,1	0,1958	7,83	0,1832	7,33
$R_{3.1}$	> 1,0	1,5360	15.00	1,8348	15,00
$R_{3.2}$	> 0,5	0,5715	13,72	0,4964	11,91
$R_{3.3}$	> 0,5	0,5869	18,78	0,5537	17,72
Σ	–	–	94,28		89,53

Source: Own research.

Consequently, in accordance with this method the financial state of LTD «Desna» is high level of rating while JSC «Agrostar plus» – uppermiddle level of rating. As a result of such estimation we can draw the following conclusion: the financial states of the probed enterprises are attractive for creditors and investors.

Conclusions

Conducted researches reveal that in Ukraine modern approaches of enterprises' financial state estimation are widespread. Numerous methods of such estimation including methods, considered above, are developed on the bases of these approaches. Simultaneous application of two and more methods ensures reliability of financial state estimation of enterprises substantially. In case of closely results of estimation obtained by using different methods, the appraiser can make sure that the results of such estimation are correct.

In case of divergence of the results obtained by using different methods, the appraiser can find out reasons of such divergence paying attention to importance of those financial ratios that activate this divergence. It is one of the instruments for search of reliable conclusions.

The conducted researches allow to ground the following recommendations:

1. Development of methodological and methodical principles of enterprises' financial state estimation as same as spreading of application of these methods are exceedingly actual.

2. Adaptation of foreign methods to the specific Ukrainian financial and economic conditions is significant.

3. Under the process of enterprises' financial state estimation it is necessary to apply mathematical methods, in particular statistical methods, fuzzy-set theory, probabilistic approaches etc. as same as computer technologies.

Literature

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Ocena sytuacji finansowej przedsiębiorstw rolniczych na Ukrainie

Streszczenie

Przedstawiono rozwój oceny sytuacji finansowej przedsiębiorstw na Ukrainie. Wyjaśniono niektóre metodyki takiej oceny. Wskazano konieczność rozwoju metodologicznej oraz metodycznej bazy analizy finansowej, a także adaptacji metodyk zagranicznych do konkretnych warunków finansowych i ekonomicznych na Ukrainie.

Określono podstawowe kierunki dalszej poprawy jakości oceny sytuacji finansowej przedsiębiorstw oraz zwrócono uwagę na konieczność szerszego zastosowania odpowiednich metodyk.

Poprawa jakości oceny finansowej przedsiębiorstw uzależniona jest od szerokiego stosowania aparatu matematycznego, w tym statystyki matematycznej, teorii zbiorów rozmytych, teorii prawdopodobieństwa, a także technologii komputerowych.