6. THE MULTI-CRITERIA NODAL ANALYSIS OF THE SYSTEM OF COMPANIES RESIDENT IN ROMANIA

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Abstract

On the basis of the peculiarities of turnover structural distributions, identified as a result of research conducted on 1009 classified markets, the paper comparatively analyzes the structural distributions of the major economic indicators of the national system of companies. The choice of economic indicators took into account their significance in the economic stability and behavior of companies.

The conclusion of the paper is that the selected structural distributions fall into a class with the same features.

Keywords: nodal analysis, node companies, structural distributions, logarithmic regression, cumulative normalized regression, informational energy, informational correlation

JEL Classification: C40, L16

1. Foreword

Over the period 1993-2010, researches to identify the structural features of distributions of market shares of companies on a number of 1009 classified markets were conducted. The research findings were included into what I called *"the nodal analysis of systems companies"*. The main results of our approach were:

a. The structural distributions of turnovers of companies of the classified markets ($N \geq 30$) have the property that, in all cases, the s/m variation coefficients are above unit.

Also, in all cases, the asymmetry of these distributions is positive, $\overline{p_m} > \overline{p_{mediana}}$.

The result of the above unit value of the coefficient of variation is that all market shares below the average rate of the distribution are concentrated into *a single standard deviation interval*. Thus, on average, 90.64% of the companies have market shares concentrated in a single interval of standard deviation and 9.36% are distributed into a variable number of standard deviation intervals.

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The companies with lower than average market shares share had, on average, the following structure:

Table 1

Structure of the companies according to share of companies with lower than average market share

Company size (number of employees)	Share of companies with lower than average market share in the number of companies in the system, %
0 – 9	97.18
10 – 49	56.35
50 – 249	10.55
250 – 499	0.96
Over 500	2.28

In 2010, the turnover corresponding to the average market share was 0.48 million euro. In Table 2 we can see the asymmetry of distribution of the number of companies and of turnover relative to the average market shares.

Table 2

Asymmetry of distribution of the number of companies and of turnover relative to the average market shares

Indicator	Share of number of companies with lower than average market share, %	Share of turnover of companies with lower than average market share, %	Share of number of companies with higher than average market share, %	Share of turnover of companies with higher than average market share, %
Turnover*	90.64	11.70	9.36	88.30

* Values represent the averages of the period 1995-2008.

The significance of this type of asymmetry is that "*many companies sell very little, while very few companies sell very much*".

b. Identification, for a number of 553 classified markets in 2004 and 2008, of a general logarithmic regression equation of the Herfindahl concentration index (H) in relation to the share of the leader (CL) and the number of companies (N), of the form:

Regression Summary for Dependent Variable H

R = 0.98515038 R^2 = 0.97052126 Adjusted R^2 = 0.97041407

F(2.550) = 9053.8 $p < 0.0000$ Std. Error of estimate: s = 0.10481

log(H) =	*1.2367 log(Cl)*	*– 0.1641 log(N)*	*+ 0.1641*	(1)
St. Err.	[0.0168]	[0.0082]	[0.0166]	
t (550)	[73.7545]	[-20.1142]	[9.8558]	
p-level	[0.00]	[0.00]	[0.00]	

Three regression equations from among the three quantities (H, Cl, N) were also retained, taken by two:

Regression Summary for Dependent Variable H

R = 0.97408248 R^2 = 0.94883668 Adjusted R^2 = 0.94874382
F(1.551) = 10218.0 p < 0.0000 Std. Error of estimate: s = 0.13796

log(H) =	*1.4904 log(Cl)*	*– 0.0835*	(2)
St. Err.	[0.0147]	[0.0148]	
t (551)	[101.0863]	[-5.6533]	
p-level	[0.00]	[0.00]	

Regression Summary for Dependent Variable H

R = -0.82399308 R^2 = 0.67896459 Adjusted R^2 = 0.67838195
F(1.551) = 1165.3 p < 0.0000 Std. Error of estimate: s = 0.34558

log(H) =	*-0.6123 log(N)*	*+ 0.3342*	(3)
St. Err.	[0.0179]	[0.0054]	
t (551)	[-34.1368]	[6.1469]	
p-level	[0.00]	[0.00]	

Regression Summary for Dependent Variable Cl

R = -0.74508869 R^2 = 0.55515715 Adjusted R^2 = 0.55434982
F(1.551) = 687.6 p < 0.0000 Std. Error of estimate: s = 0.26587

log(Cl) =	*-0.3618 log(N)*	*+ 0.1373*	(4)
St. Err.	[0.0138]	[0.0418]	
t (551)	[-26.2229]	[3.2829]	
p-level	[0.00]	[0.00]	

The regression equations confirm the microeconomic theory according to which economic concentration increases with the leader's share, decreases with the increasing number of companies, and the tendency of leader's share is to decline with the increasing number of companies.

Analyzing the determinations of regression equations, the decisive influence of the leader's share on the Herfindahl index clearly reveals. An example is conclusive: in the case of the system of companies resident in Romania in 2012, reducing the leader's share by half (from 0.008975 to 0.01795) with the same number of 449,240 active companies results into 42.2% of the initial value of the H index, while on the other hand, reducing by half the number of companies maintaining the leader's share increases the H index by only 11.9%!

c. The distribution of the Hefindahl index values in the national system of companies resident in Romania has the values:

H_{100}/H higher than 90 %,

H_{N80}/H higher than 99 %.

These results determined the qualitative relevance between 1998 and 2012 of Top 100 Romania in terms of real economy, and the significant characterization of

economic performance of the ensemble of companies of the national system taking into account the companies covering 80% of turnover, called node companies.

d. Given the importance of the leader's market share in each classified market and the high variability of the H index values, two new indicators were proposed:

the normalized Rènyi entropy:

$$M = \frac{\ln(H) + \ln(n)}{\ln(n)} \tag{5}$$

the normalized degree of structural dominance of the leader:

$$Gdl = \frac{Cl^2 / H - 1/n}{1 - 1/n} \tag{6}$$

The tests on the 1009 classified markets showed that the average values of the two indicators amounted to 0.5, which allowed for the development of symmetrical 0-1 scales and of an universal matrix of competition distortion.

e. In terms of cumulative asymmetry of market shares distributions, the research showed that, on average, 10% of the active companies covered 80% of turnover of a given market. The first fraction of 10% of companies that we called the power decile (D0) has an overwhelming significance for the business environment of a given market.

In the system of companies resident in Romania, in the period 1995-2012 the share of companies covering 80% of turnover (ρ 80) was lower than 5%.

f. The first cumulative normalized logarithmic regression equation for the node companies was developed, of the form:

$$log\ (p_{cum\ \%}) = a\ log(p_{rang.cum.\ \%}) + b \tag{7}$$

where: $0 \leq a \leq 1$ and $0 \leq b \leq 2$.

The values a=0 and b=2 correspond to monopolies and the values a=1 and b=0 correspond to uniform distributions of market shares.

g. All the results concerning the peculiarities of structural distributions of the market shares regarding turnover have been tested and validated on the amount of world GDP in the period 1970-2010 in all countries of the world.

The objective of the current research is testing in order to validate the results of research on the major economic indicators of companies.

Microeconomic analyses performed for more than two decades showed unequivocally that the economic stability of a company depended, besides the turnover, on the overall profitability, the operating profitability, the outstanding payments and the financial expenditures. Therefore, the following quantities were selected as representative:

- Gross profit before taxes
- Gross loss
- Operating profit
- Operating loss

- Outstanding payments
- Financial expenditures.

The analyzed companies are part of the national system and the results refer to 2012. We must mention that all the conclusions of nodal analysis were made by processing the 1009 markets over the period 1995-2010. Therefore, especially relevant were the results that were obtained in 2012.

All data presented in the tables were processed by the author, on the basis of economic and financial balance sheets of the non-financial companies resident in Romania in 2012.

2. Results

a. Table 3 shows the average shares, the median shares, the standard deviations and the coefficients of variation for the selected indicators.

Table 3

Central tendency and variability measures for various indicators

Indicator	Share of average	Share of median	Standard deviation	Coefficient of variation, V
Turnover	0.0000022251	0.000000114134	0.0000579352	26.04
Gross profit	0.0000040554	0.000000274905	0.0001691594	41.73
Gross loss	0.0000049426	0.000000422105	0.0001044639	21.14
Operating profit	0.0000040569	0.000000299037	0.0001661049	40.94
Operating loss	0.0000049362	0.000000515993	0.0001076605	21.81
Outstanding payments	0.0000078080	0.000000301963	0.0001976962	25.32
Financial expenditures	0.0000052875	0.000000105014	0.0001231289	23.29

Conclusion: All economic quantities have structural features similar to the market shares of turnovers:

- The coefficients of variation are above unit and have the same order of magnitude,
- The asymmetry of distributions is positive.

In 2012, ***91.67***% of the total number of companies had lower than average market shares.

Table 4

Structure of the companies according to share of companies with lower than average market share

Company size (number of employees)	Share of companies with lower than average market share in the number of companies in the system, %
0 – 9	97.21
10 – 49	62.08
50 – 249	12.72
250 – 499	1.20
Over 500	1.15

In 2012, the turnover of the average market share was 0.54 million euro.

The asymmetry of distributions of economic indicators in relation to the average values of their share is shown in Table 5.

Table 5

Asymmetry of distribution of economic indicators

Economic indicator	Share of companies with P_i lower than P_{med}, %	Cumulated share of economic indicators values lower than the average, %	Share of companies with P_i higher than P_{med}, %	Cumulated share of economic indicators values higher than the average, %
Turnover	91.67	10.90	8.33	89.10
Gross profit	89.14	13.10	10.86	86.90
Gross loss	92.65	13.61	7.35	86.39
Operating profit	90.49	13.09	9.51	86.91
Operating loss	91.69	15.23	8.31	84.77
Financial expenditures	93.51	7.27	6.49	92.73
Outstanding payments	91.49	10.41	8.51	89.59

The significance of the above data is of paramount importance: the world of companies is characterized by a *strong asymmetry* of the values of fundamental economic indicators relative to their average values.

The principle according to which the system of resident companies in Romania is operating is that relative to the average values of fundamental economic indicators there is a contradiction: *many – barely*, versus *very few – greatly*.

Thus:

- Many companies sell poorly and very few companies sell a lot,
- Many companies accumulate a very low amount of gross profit and very few companies accumulate a large amount of gross profit,
- Many companies accumulate a very low amount of gross loss and very few companies accumulate a large amount of gross loss,
- Many companies accumulate a very low amount of operating profit and very few companies accumulate a large amount of operating profit,
- Many companies accumulate a very low amount of operating loss and very few companies accumulate a large amount of operating loss,
- Many companies accumulate a very low amount of financial expenditures and very few companies accumulate a large amount of financial expenditures,
- Many companies accumulate a very low amount of outstanding payments and very few companies accumulate a large amount of outstanding payments.

b. Tables 6 and 7 show the real values of the Herfindahl index, those calculated according to equation (1), as well as the check whether the real values fall within the calculated values, $Hc \pm 2s$.

Table 6

Real values of the Herfindahl index

Indicator	Number of companies	Leader's share	Real H
Turnover	449420	0.01795	0.00151070
Gross profit	246667	0.07285	0.00706241
Gross loss	202321	0.02360	0.00221281
Operating profit	246496	0.07418	0.00680508
Operating loss	202584	0.02943	0.00235305
Outstanding payments	128074	0.04835	0.00501342
Financial expenditures	189127	0.02375	0.00287259

Table 7

Real,computed, minimum and maximum values of the Herfindahl index

Indicator	H real	H calc	Hmin	Hmax	Framing
Turnover	0.001511	0.001186	0.000732	0.001921	Yes
Gross profit	0.007062	0.007415	0.004576	0.012015	Yes
Gross loss	0.002213	0.001896	0.001170	0.003073	Yes
Operating profit	0.006805	0.007584	0.004680	0.012289	Yes
Operating loss	0.002353	0.002492	0.001538	0.004038	Yes
Outstanding payments	0.005013	0.004970	0.003067	0.008053	Yes
Financial expenditures	0.002873	0.001932	0.001192	0.003131	Yes

Conclusions: All the values of the Herfindahl index calculated according to the regression fall within the $H_c \pm 2s$ limits. Thus, the logarithmic regression equation can be applied to other economic indicators beside turnover.

c. Table 8 reports the results of calculating the H100/H and Hnodes/H ratios for all the selected economic indicators.

Table 8

Values of H100/H and Hnodes/H ratios

Indicator	H	H_{100}	H_{nodes}	H_{100}/H, %	H_{nodes}/H, %
Turnover	0.001511	0.001417	0.001510	93.128	99.967
Gross profit	0.007062	0.006987	0.007062	98.936	99.990
Gross loss	0.002213	0.002069	0.002212	93.481	99.964
Operating profit	0.006805	0.006727	0.006804	98.854	99.990
Operating loss	0.002353	0.002226	0.002352	94.591	99.973
Outstanding payments	0.005013	0.004887	0.005012	97.470	99.963
Financial expenditures	0.002873	0.002706	0.002870	94.194	99.912

Conclusions: All the H100/H indicators have values exceeding 90%. Under these circumstances, the tops 100 of all the six indicators can provide quality images of the real economy in particular domains.

All the Hnodes/H indicators have values exceeding 99%. In such circumstances, the node companies of each indicator gain maximum economic relevance.

d. Table 9 presents the values of the M and Gdl coefficients for the six economic indicators.

Table 9

The values of the *M* and *Gdl*

Indicator	M	GDL
Turnover	0.501	0.213
Gross profit	0.601	0.751
Gross loss	0.500	0.252
Operating profit	0.598	0.809
Operating loss	0.505	0.368
Outstanding payments	0.550	0.466
Financial expenditures	0.518	0.196

Conclusions: It appears that gross profit and operating profit have higher values of the M coefficient and, especially, of the degree of structural dominance of the leader. Otherwise, with some observations on the values of degree of structural dominance of the leader, the M indicator values rest around 0.5.

The usefulness of introducing the degree of structural dominance of the leader is obvious. The rationale for introducing the two coefficients, M and Gdl, is demonstrated.

Subject:

e. The percentages of companies covering 80% ($\rho 80$) of the value of each selected economic quantity are shown in Table 10.

Table 10

The percentages of companies covering 80% of the value of each selected economic quantity

Indicator	Number of companies	Number of node companies	ρ_{80}, %
Turnover	449420	14227	3.1656
Gross profit	246667	10920	4.4270
Gross loss	202321	6594	3.2592
Operating profit	246496	11725	4.7567
Operating loss	202584	9573	4.7254
Outstanding payments	128074	4046	3.1591
Financial expenditures	189127	3080	1.6285

It is noted that all the values of the ρ 80 shares are lower than 5%.
Table 11 presents the six distributions by deciles of the selected economic indicators, together with the turnover deciles.

Table 11

Distributions by deciles of the selected economic indicators

Indicator	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9
Turnover	0.90596	0.04710	0.02020	0.01096	0.00655	0.00417	0.00265	0.00154	0.00074	0.00013
Gross profit	0.87863	0.05852	0.02761	0.01540	0.00898	0.00524	0.00302	0.00164	0.00076	0.00020

Gross loss	0.88617	0.04670	0.02481	0.01566	0.01045	0.00703	0.00460	0.00279	0.00141	0.00038
Operating profit	0.87388	0.06001	0.02849	0.01614	0.00961	0.00573	0.00332	0.00180	0.00082	0.00020
Operating loss	0.86301	0.05526	0.02998	0.01907	0.01278	0.00862	0.00565	0.00344	0.00173	0.00046
Outstanding payments	0.90933	0.04890	0.02072	0.01032	0.00542	0.00285	0.00146	0.00068	0.00027	0.00005
Financial expenditures	0.95195	0.02729	0.01022	0.00502	0.00270	0.00150	0.00081	0.00038	0.00011	0.00002

Table 12 presents the informational correlations matrix between the seven distributions.

Recall that the informational correlation coefficient is given by $r = \frac{\sum piqi}{\sqrt{\sum p_i^2 \sqrt{q_i^2}}}$ (8).

The informational correlation coefficient measures the closeness of two given distributions.

Table 12

Matrix of correlation coefficients

Indicator	Turnover	Gross Profit	Gross loss	Operating profit	Operating loss	Outstanding payments	Financial expenditures
Turnover		0.99983	0.99995	0.99978	0.99975	0.99999	0.99962
Gross profit	0.99983		0.99989	1.00000	0.99995	0.99985	0.99896
Gross loss	0.99995	0.99989		0.99986	0.99990	0.99993	0.99941
Operating profit	0.99978	1.00000	0.99986		0.99996	0.99980	0.99883
Operating loss	0.99975	0.99995	0.99990	0.99996		0.99974	0.99882
Outstanding payments	0.99999	0.99985	0.99993	0.99980	0.99974		0.99959
Financial expenditures	0.99962	0.99896	0.99941	0.99883	0.99882	0.99959	

Conclusion: It is noted that all the values of informational correlation coefficients are higher than 0.99. The remarkable similarity of distributions by deciles of the analyzed indicators clearly reveals.

f. Table 13 presents the cumulative normalized logarithmic regression equations for the node companies, as well as the validation of correctness of the obtained results.

Table 13

Regression reports

Turnover

Regression Summary for Dependent Variable Cumulated Share of Turnover

R = 0.97610732 R2 = 0.95278550 Adjusted R2 = 0.95278218

F(1.14225) = 2871E2 p < 0.0000 Std. Error of estimate: s = 0.02002

log(pcum. %) = 0.207496 log(prang cum. %) + 1.816304

St. Err.	[0.000387]	[0.000170]
t (14225)	[535.78]	[10693.76]
p-level	[0.00]	[0.00]

Gross profit

Regression Summary for Dependent Variable Cumulated Share of Gross Profit

R = 0.99071490 R2 = 0.98151602 Adjusted R2 = 0.98151432

F(1.10918) = 5798E2 p < 0.0000 Std. Error of estimate: s = 0.01063

log(pcum. %) = 0.178815 log(prang cum. %) + 1.798229

St. Err.	[0.000235]	[0.000113]
t (10918)	[761.42]	[15873.61]
p-level	[0.00]	[0.00]

Gross loss

Regression Summary for Dependent Variable Cumulated Share of Gross Loss

R = 0.95658757 R2 = 0.91505977 Adjusted R2 = 0.91504689

F(1.6592) = 71016.0 p < 0.0000 Std. Error of estimate: s = 0.02806

log(pcum. %) = 0.212759 log(prang cum. %) + 1.819321

St. Err.	[0.000798]	[0.000351]
t (6592)	[266.487]	[5179.578]
p-level	[0.00]	[0.00]

Operating profit

Regression Summary for Dependent Variable Cumulated Share of Operating Profit

R = 0.99185011 R2 = 0.98376665 Adjusted R2 = 0.98376526

F(1.11723) = 7104E2 p < 0.0000 Std. Error of estimate: s = 0.01063

log(pcum. %) = 0.190958 log(prang cum. %) + 1.785561

St. Err.	[0.000227]	[0.000113]
t (11723)	[842.87]	[15860.29]
p-level	[0.00]	[0.00]

Operating loss

Regression Summary for Dependent Variable Cumulated Share of Operating Loss

R = 0.95725065 R2 = 0.91632881 Adjusted R2 = 0.91632007

F(1.9571) = 1048E2 p < 0.0000 Std. Error of estimate: s = 0.02466

log(pcum. %) = 0.188416 log(prang cum. %) + 1.796089

St. Err.	[0.000582]	[0.000288]
t (9571)	[323.755]	[6229.744]
p-level	[0.00]	[0.00]

Outstanding payments

Regression Summary for Dependent Variable Cumulated Share of Outstanding Payments

R = 0.98310113 R2 = 0.966648783 Adjusted R2 = 0.96647954

F(1.4044) = 1166E2 p < 0.0000 Std. Error of estimate: s = 0.01762

log(pcum. %) =	*0.218944 log(prang cum. %) + 1.812001*	
St. Err.	[0.000641]	[0.000280]
t (4044)	[341.509]	[6467.070]
p-level	[0.00]	[0.00]

Financial expenditures

Regression Summary for Dependent Variable Cumulated Share of Financial Expenditures

R = 0.97871970 R2 = 0.95789226 Adjusted R2 = 0.95787858

F(1.3078) = 70020.0 p < 0.0000 Std. Error of estimate: s = 0.02410

log(pcum. %) =	*0.266252 log(prang cum. %) + 1.870906*	
St. Err.	[0.001006]	[0.000488]
t (3078)	[264.613]	[3832.299]
p-level	[0.00]	[0.00]

All correlation coefficients have values higher than 0.95, which gives a high determination to the calculated values.

Tables 14-20 show the values of the validation tests. All checks lead to the conclusion of consistency of results and, consequently, of the cumulative logarithmic regression equations.

Table 14

Cumulated values and ratio for turnover

Number of companies	Cumulated real value, %	Cumulated calculated value, %	Calculated/Real
100	26.1318658	29.7475382	1.138363
200	32.9722111	34.3489567	1.041755
400	40.1185264	39.6621334	0.988624
800	47.3948438	45.7971646	0.966290
1600	55.0677701	52.8811767	0.960293
3200	63.0857645	61.0609604	0.967904
6400	71.2106484	70.5060120	0.990105
Nodes	80.0002774	83.2172643	1.040212

Table 15

Cumulated values and ratio for gross profit

Number of companies	Cumulated real value, %	Cumulated calculated value, %	Calculated/Real
100	33.9834468	35.4240867	1.042392
200	39.4974069	40.0984274	1.015217
400	45.3875740	45.3895649	1.000044
800	52.2642092	51.3788877	0.983061
1600	59.4781406	58.1585241	0.977813
3200	66.9466929	65.8327589	0.983361
6400	74.4340134	74.5196376	1.001150
Nodes	79.9999980	81.9918253	1.024898

Table 16

Cumulated values and ratio for gross loss

Number of companies	Cumulated real value, %	Cumulated calculated value, %	Calculated/Real
100	32.105586	34.789568	1.083599
200	40.406226	40.317711	0.997809
400	49.008742	46.724290	0.953387
800	57.760304	54.148889	0.937476
1600	66.026796	62.753275	0.950421
3200	73.400035	72.724917	0.990802
6400	79.748473	84.281077	1.056836
Nodes	80.000837	84.818256	1.060217

Table 17

Cumulated values and ratio for operating profit

Number of companies	Cumulated real value, %	Cumulated calculated value, %	Calculated/Real
100	31.296434	33.096630	1.057521
200	36.785516	37.780513	1.027049
400	42.887455	43.127267	1.005592
800	49.964253	49.230702	0.985318
1600	57.530283	56.197903	0.976840
3200	65.460145	64.151114	0.980003
6400	73.375245	73.229874	0.998019
Nodes	79.999805	82.204846	1.027563

Table 18

Cumulated values and ratio for operating loss

Number of companies	Cumulated real value, %	Cumulated calculated value, %	Calculated/Real
100	31.724414	35.473471	1.118176
200	39.723173	40.422443	1.017604
400	47.497018	46.061855	0.969784
800	55.491300	52.488032	0.945879
1600	63.000343	59.810737	0.949372
3200	69.970467	68.155047	0.974054
6400	76.449747	77.663488	1.015876
Nodes	80.000041	83.784723	1.047309

Table 19

Cumulated values and ratio for outstanding payments

Number of companies	Cumulated real value, %	Cumulated calculated value, %	Calculated/Real
100	36.516277	37.113257	1.016348
200	43.829223	43.195427	0.985539
400	52.207948	50.274353	0.962964
800	60.736482	58.513382	0.963398
1600	69.399858	68.102634	0.981308
3200	77.455853	79.263386	1.023336
Nodes	80.002126	83.440662	1.042981

Table 20

Cumulated values and ratio for financial expenditures

Number of companies	Cumulated real value, %	Cumulated calculated value, %	Calculated/Real
100	33.697019	33.960011	1.007805
200	42.244822	40.843002	0.966817
400	51.674643	49.121033	0.950583
800	61.586298	59.076850	0.959253
1600	71.573100	71.050505	0.992698
Nodes	80.000127	84.585793	1.057321

3. Final Conclusions

Our research has shown unequivocally that all the conclusions drawn from the nodal analysis of systems companies in terms of turnover were checked for the main economic indicators of companies.

We may say that, from a conceptual perspective, the nodal analysis takes the status of multi-criteria nodal analysis, with all the implied practical consequences.

The research has special practical applicability meanings, being able to select priorities in the microeconomic analysis of each of the selected indicator, on which the economic stability of companies depends.

Behaviors over time of the main economic actors can be identified, with the possibility of achieving a portal with decisive implications in decision making processes at the macro and micro levels.

For information, we present the summary data for 2012 (Tables 21-23).

Table 21

The Values of Overall Economic Indicators of the National System of Companies in 2012

Economic indicator	Value, mill. EUR	Leader company	Value, mill. EUR
Turnover	243861.93	OMV Petrom	4370.38
Gross profit	14120.27	OMV Petrom	1028.61
Gross loss	9434.85	CFR Călători	222.67
Operating profit	15891.83	OMV Petrom	1178.80
Operating loss	7309.73	CFR Călători	215.11
Outstanding payments	22762.48	C.N. a Huilei	1100.67
Financial expenditures	11965.10	Rompetrol Rafinare	284.16

Table 22

Representative Values for Tops 100, the Number of Node Companies and Values of the Last Node Company

Economic indicator	Total Top, mill. EUR	Share in the system, %	Number of node companies	Value of the last node company of the indicator, mill. EUR
Turnover	63725.871	26.13	14227	1.788
Gross profit	4798.555	33.98	10920	0.131
Gross loss	3029.112	32.11	6594	0.121
Operating profit	4973.575	31.30	11725	0.142
Operating loss	2318.968	31.72	9573	0.066
Outstanding payments	8312.009	36.52	4046	0.604
Financial expenditures	4031.884	33.70	3080	0.462

Table 23

The Asymmetry of Economic Indicators Analyzed in Relation to their Average

No.	Economic indicator	Number of companies with economic indicator value lower than the average	Cumulated economic indicator value of the companies with economic indicator values lower than the average, Mill. EUR	Number of companies with economic indicator value higher than the average	Cumulated economic indicator value of the companies with economic indicator values higher than the average, Mill. EUR	Average economic indicator value, Mill. EUR
1	Turnover	412071	26577.13	37349	217284.80	0.543
2	Gross profit	223816	1813.29	22851	12306.98	0.057
3	Gross loss	187460	1283.66	14861	8151.19	0.047
4	Operating profit	223057	2080.12	23439	13811.70	0.064
5	Operating loss	185756	1113.32	16828	6196.40	0.036
6	Outstanding payments	117181	2369.25	10893	20393.23	0.178
7	Financial expenditures	176852	870.24	12275	11094.87	0.063

NOTE. All primary data presented in this paper are taken from the economic and financial balance sheets of the companies officially registered at the National Trade Register Office and the Ministry of Finance.

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