

Analysis of the impact of real estate market evolution on fixed assets' capitalization in Romanian companies, based on the econometric model

Riana Iren RADU

rradu@ugal.ro

Iuliana Oana MIHAI

anghelio76@yahoo.com

Andrei Mirel FLOREA

floreaandrei@yahoo.com

Dunarea de Jos University of Galati, Romania

Abstract

The real estate market has known in the last years a constant expansion of about 20% / year, being actually in the real estate boom area, both in retail and corporate segments. The impact of this trend, at company's level, is quite insignificant, managing to put to use the fixed assets increase in the turnover. The companies included in the sample under study have registered turnover increases in the last two calendar years (2016 and 2017). This increase was put in relation to the increases in the Romanian economy in the fiscal year, to inflation increase and had been done in the conditions of the consumers' behavior migrating to a higher level. This consumption level is due to the national salary policies which have aligned the salary incomes from the budgetary system to the threshold obtainable in 2020. Based on the data reported by the economic agents in the financial statements, this study aims at objectively assessing the dynamic of changing the financial indicators in the context of the previously mentioned real estate boom. The financial rates analysis, in relation to fixed assets, is viewed through the ratio between effort and result, contributing to obtaining the preliminary table necessary for issuing the econometric model. The issued model will be of regression – comparative type and will be based on relative data, computed through multi-yearly weights for the economic increase indicators: profitability, liquidity and capitalization reported to the usage of capitalized fixed assets at the market value, changeable in the real estate boom period. The resulted values will be tested through statistical tests, in what concerns the statistical significance and data validity. A number of 25 statistical observations are entering in the construction of the model, collected from Romanian companies which obtained a turnover of minimum Euro 195 million.

Keywords: tangible non-current assets, real estate market, vulnerabilities, capital accumulations

1. Introduction

Tangible fixed assets are elements generating value through their productive characteristics, being recorded in the company's financial statements. The sustainability of the assets in accounting terms represents their integration in the economic and environmental area through all corresponding planes, including through protecting the interest of the shareholders.

The international experts (Lodhia and Hess, 2014; Mass, Schlegger and Crutzen, 2016) performed the sustainability analysis by reporting the managerial planes in relation to the social and environmental ones. The influence of fixed assets' value changes brings a superior regulating need at accounting standards level, especially in what concerns the control of transactions with fixed assets in the market (Gray, 2013). Lambertson (2005) argues the managerial stress in the presence of the frequent adjustments necessary to the transactions, while Ball and Osborne (2011) argues these disadvantages through social accounting, which is directly influenced by the transactions with assets. Uhlmann (2012) and Imoniana et al (2012) issued studies in this respect, where they disseminate the sustainable reporting in what concerns the accounting policies strictly regulated from social and environmental point of view. The accounting treatment of the transactions with assets, according to the authors

Imoniana, Soares and Domingos (2017), must supply trustful information on the environment and the trend of assets’ evolution, in what concerns the priority.

This concept represents the accurate delimitation (registration) of the asset’s destination according to its future usage, based on generally valid criteria, namely: possible from physical point of view, feasible from financial point of view and productive at maximum.

The impact analysis of usage in productive and service providing terms, the calculation of increasing relevant costs, information from specialty consultants and information from associations, patronages, national specialty councils and public entities must be included in the calculation of the utility characteristics (Publiaccountant, 2012).

2. Research methodology

The increase of the gross average salary in the reference period was of 16.78%, the increasing trend continuing also in 2018 with 32% more. The value of the average salary in the Romanian economy was EUR 592.55 at the level of 2015, EUR 689.49 in 2016 and in 2017 it has reached around EUR 900. The companies have faced repeated modifications of the Tax Code, affecting the managerially planed strategic directions and putting companies in difficult situations due to the increase of tax risk degree and to the measures adopted for achieving the compliance with the legislative changes.

The purpose of this study has been had in view for issuing the econometric model, namely the analysis of the impact of the real estate evolution on fixed assets capitalization in Romanian companies. To this sense, the following research objectives have been established:

- Effort / results analysis in order to evaluate the influence of fixed assets on the profitability and productivity indices;
- Quantification of capital accumulations resulting from using the fixed assets in the enterprises from the approached sample;
- Advantages and vulnerabilities analysis resulting from the exploitation of fixed assets in dynamics for 3 consecutive financial years, based on indices and rates;
- Calculation of the enterprise vulnerability scoring in relation to the real estate market evolution;
- Issuing the sustainability econometric model of economic increase in relation to the evolution of fixed assets between the value recorded in accounting and the market value.

The established objectives can be achieved following to the study based on the observation of the financial indices reported by the sample of 25 economical entities which were selected based on the following criteria:

- Companies which develop their activity in Romania;
- They have turnover of over Euro 190 million;
- Their assets usage rate in the turnover has positive results.

The established objectives can be reached following to the study based on observing the financial indices reported by the sample with 25 economic entities selected based on the following criteria:

- Fixed assets recovery yearly rate **AF/CA**;
- Fixed assets profitability yearly rate **AF/PB**;
- Rate for reflecting the assets in the capital accumulations **AF/CP**;
- Company’s fixed assets liquidity degree calculated according to the formula **GL=100%- AF/TA**

Where:

AF =fixed assets

CA= turnover

PB =gross profit
CP =ownership equity
TA= total assets
GL= liquidity degree

The resulting data are submitted to a statistical processing based on an econometric model, in order to evaluate their influence, through the elaboration of a Table of pros and cons. The vulnerability scoring will be calculated on them, with the purpose of comparing it with the increase rate of the real estate sector and Gross Domestic Product. The resulting trends will be compared in order to dimension the sustainability of the policy on fixed assets and on the way it can produce an economic increase, at the expectation level of the managers of the sampled entities.

The indicators taken into consideration for issuing the econometric model are found in table 1:

Table 1. Indicators taken into consideration for issuing the econometric model

Company	2017 AF/CA	2017 AF/PB	2017 AF/CP	2017 AF/TA
1	18.73%	606.76%	138.67%	68.04%
2	7.33%	967.72%	155.36%	37.35%
3	13.19%	-8978.11%	208.95%	63.34%
4	74.40%	824.83%	84.81%	58.32%
5	2.19%	45.77%	24.93%	7.70%
6	1.12%	20.66%	16.07%	4.55%
7	492.81%	1069.52%	91.98%	87.27%
8	3.20%	86.14%	35.43%	6.35%
9	4.73%	-339.85%	-34.06%	19.95%
10	188.90%	7143.50%	265.77%	95.65%
11	5.68%	-2389.52%	173.26%	25.28%
12	0.63%	20.48%	2.00%	1.18%
13	156.69%	6584.62%	86.35%	45.96%
14	0.00%	0.00%	0.00%	0.00%
15	3.76%	99.42%	37.24%	8.56%
16	0.01%	0.13%	0.08%	0.03%
17	121.09%	741.46%	176.44%	85.43%
18	0.02%	3.67%	-3.80%	0.10%
19	16.29%	2210.87%	175.34%	39.34%
20	272.27%	3242.03%	131.14%	82.68%
21	0.28%	2.87%	3.43%	1.11%
22	79.83%	850.66%	224.06%	79.50%
23	13.05%	421.18%	66.21%	32.68%
24	6.73%	-153.60%	126.80%	26.43%
25	80.65%	1595.79%	390.05%	83.29%
Company	2016 AF/CA	2016 AF/PB	2016 AF/CP	2016 AF/TA
1	16.40%	612.86%	129.71%	68.60%
2	6.73%	-399.32%	179.73%	31.95%
3	14.63%	2270.33%	224.14%	62.79%
4	76.06%	810.95%	92.50%	66.83%
5	2.15%	61.23%	29.75%	7.87%

6	0.84%	30.91%	17.16%	3.60%
7	555.08%	1591.28%	97.99%	92.35%
8	3.39%	94.37%	56.37%	6.99%
9	9.19%	-232.39%	-73.66%	22.81%
10	193.20%	11613.70%	290.22%	95.21%
11	6.47%	-286.48%	176.94%	21.71%
12	0.40%	20.73%	1.42%	0.81%
13	167.55%	1797.45%	89.99%	49.81%
14	0.00%	0.04%	0.03%	0.00%
15	4.17%	318.21%	42.18%	7.87%
16	0.01%	0.10%	0.08%	0.03%
17	120.72%	865.52%	166.23%	85.23%
18	0.03%	-2.34%	-3.05%	0.20%
19	15.83%	-1119.90%	240.93%	34.21%
20	256.96%	-5047.25%	140.17%	86.00%
21	0.19%	2.65%	3.22%	0.76%
22	89.84%	1123.54%	168.51%	80.95%
23	13.17%	928.47%	76.94%	35.44%
24	8.22%	-117.14%	137.24%	20.24%
25	83.50%	1263.08%	391.43%	83.05%
	2015	2015	2015	2015
Company	AF/CA	AF/PB	AF/CP	AF/TA
1	16.01%	625.87%	132.18%	66.50%
2	5.41%	1207.38%	114.75%	32.14%
3	11.77%	-416473.40%	453.34%	63.01%
4	73.03%	711.11%	94.69%	64.20%
5	1.96%	34.37%	22.76%	6.55%
6	0.90%	37.05%	20.40%	5.63%
7	536.94%	1579.36%	103.44%	94.80%
8	3.72%	81.50%	62.10%	6.75%
9	11.10%	-289.54%	-164.96%	26.47%
10	182.55%	5317.43%	420.57%	94.11%
11	8.19%	-572.60%	136.31%	25.77%
12	0.31%	10.52%	1.25%	0.68%
13	164.69%	1540.16%	98.37%	55.94%
14	0.00%	0.12%	0.04%	0.01%
15	4.37%	34.85%	34.01%	8.65%
16	0.01%	0.10%	0.07%	0.03%
17	149.98%	1577.26%	197.01%	87.07%
18	0.04%	3.78%	17.97%	0.14%
19	16.31%	464.60%	278.76%	31.54%
20	220.79%	1433.60%	138.53%	84.44%
21	0.13%	2.15%	2.58%	0.71%
22	101.58%	847.31%	172.92%	85.75%
23	14.06%	3080.12%	85.94%	40.63%
24	2.38%	-50.82%	-107.01%	10.50%
25	90.61%	1279.40%	403.43%	83.83%

The obtained data show the fact that the yearly rate of fixed assets recovery is greater than one in those three consecutive years studied for the entire sample. Its average value ranges between 64.67% (2015) and 62.54% (2017).

The yearly profitability rate of the fixed assets has both positive and negative values at the sample level, according to the financial results obtained by the companies.

In what concerns the reflection of fixed assets in capital accumulations, they have an average representation rate greater than 1, decreasing in the period under analysis from 108.78% to 103.06% (2015-2017).

The above shows the decreasing trend of their value above the average. The explanation consists in increasing the capitalization degree of companies in relation to fixed assets increase, especially by reducing the negative capital accumulations reflected at sample's minimal level (from -164.96% to -34,06%).

The calculation of relative weights based on the continuous expansion of the real estate market in the period after the last financial crisis, in relation to ownership equity of the financial year, weighted with the capital increase rate's average ($n/n-1$), is represented in table 2:

Table 2. Calculation of relative weights based on real estate market's continuous expansion

Company	2017 AF/CA*	2017 AF/PB*	2017 AF/CP*	2017 AF/TA*
1	20.77%	672.92%	153.79%	70.87%
2	8.12%	1073.25%	172.30%	40.53%
3	14.63%	-9957.15%	231.74%	66.38%
4	82.51%	914.78%	94.06%	61.52%
5	2.42%	50.76%	27.64%	8.70%
6	1.25%	22.91%	17.82%	5.16%
7	546.55%	1186.15%	102.01%	88.68%
8	3.54%	95.53%	39.29%	7.19%
9	5.25%	-376.91%	-37.77%	22.17%
10	209.50%	7922.48%	294.76%	96.18%
11	6.30%	-2650.09%	192.16%	27.89%
12	0.70%	22.72%	2.22%	1.35%
13	173.77%	7302.66%	95.77%	49.29%
14	0.00%	0.00%	0.00%	0.00%
15	4.17%	110.26%	41.31%	9.66%
16	0.01%	0.14%	0.09%	0.03%
17	134.29%	822.32%	195.68%	87.01%
18	0.02%	4.08%	-4.21%	0.12%
19	18.07%	2451.96%	194.46%	42.57%
20	301.96%	3595.57%	145.44%	84.51%
21	0.31%	3.18%	3.81%	1.27%
22	88.54%	943.42%	248.49%	81.60%
23	14.47%	467.11%	73.43%	35.69%
24	7.46%	-170.35%	140.63%	29.11%
25	89.44%	1769.81%	432.58%	85.07%
Company	2016 AF/CA*	2016 AF/PB*	2016 AF/CP*	2016 AF/TA*
1	16.95%	633.77%	134.13%	70.75%
2	6.96%	-412.94%	185.86%	34.20%
3	15.13%	2347.79%	231.79%	65.13%
4	78.65%	838.62%	95.66%	69.04%

5	2.23%	63.32%	30.77%	8.63%
6	0.87%	31.96%	17.75%	3.97%
7	574.02%	1645.58%	101.33%	93.04%
8	3.51%	97.59%	58.30%	7.68%
9	9.51%	-240.32%	-76.17%	24.65%
10	199.79%	12009.98%	300.12%	95.66%
11	6.69%	-296.25%	182.98%	23.49%
12	0.41%	21.43%	1.47%	0.90%
13	173.26%	1858.78%	93.06%	52.35%
14	0.00%	0.04%	0.03%	0.01%
15	4.31%	329.07%	43.62%	8.64%
16	0.01%	0.10%	0.08%	0.03%
17	124.84%	895.05%	171.90%	86.46%
18	0.03%	-2.42%	-3.15%	0.23%
19	16.37%	-1158.12%	249.15%	36.53%
20	265.72%	-5219.47%	144.96%	87.18%
21	0.20%	2.74%	3.33%	0.85%
22	92.90%	1161.88%	174.26%	82.47%
23	13.62%	960.15%	79.57%	37.80%
24	8.50%	-121.13%	141.92%	21.93%
25	86.35%	1306.18%	404.78%	84.43%
	2015	2015	2015	2015
Company	AF/CA*	AF/PB*	AF/CP*	AF/TA*
1	16.19%	632.90%	133.66%	68.59%
2	5.48%	1220.94%	116.04%	34.25%
3	11.91%	-421151.03%	458.43%	65.20%
4	73.85%	719.10%	95.75%	66.36%
5	1.98%	34.75%	23.01%	7.16%
6	0.91%	37.47%	20.63%	6.16%
7	542.97%	1597.10%	104.60%	95.25%
8	3.76%	82.42%	62.80%	7.37%
9	11.23%	-292.79%	-166.82%	28.37%
10	184.60%	5377.15%	425.30%	94.61%
11	8.28%	-579.03%	137.84%	27.63%
12	0.32%	10.64%	1.26%	0.75%
13	166.54%	1557.46%	99.48%	58.28%
14	0.00%	0.12%	0.04%	0.01%
15	4.42%	35.24%	34.39%	9.44%
16	0.01%	0.10%	0.07%	0.03%
17	151.66%	1594.98%	199.23%	88.10%
18	0.04%	3.82%	18.17%	0.16%
19	16.50%	469.82%	281.89%	33.63%
20	223.27%	1449.70%	140.09%	85.65%
21	0.14%	2.17%	2.61%	0.78%
22	102.72%	856.83%	174.87%	86.88%
23	14.22%	3114.71%	86.91%	42.95%
24	2.40%	-51.39%	-108.21%	11.43%
25	91.63%	1293.77%	407.96%	85.08%

Reference the reported data, the above described procedure shows the following results:

- The fixed assets recovery yearly rate is constantly unitary and on the rise as compared to the one reported on average of 7%. The provisioned rate interval ranges between 65.4% (2015) and 69.36% (2017), provided that, as opposed to the oscillatory trend of the reported rates, the trend determined through the above method is a linear, continuously increasing trend.
- From the point of view of the fixed assets profitability rates used in the operating activity, it is observed that there was an improvement in the productivity of 11.09% at the end of the analyzed period.
- The value of the total assets has improved, in relation to the fixed assets, by applying the method proposed, being reflected in increases of the total assets in average with 103.5% in the analyzed interval.

The model determined through the least-squares method in two phases, TSLS, has as dependent variable the yearly rate of fixed assets recovery under the influence of the increases from the real estate sector, with the regressors: fixed assets recovery yearly rate (calculated based on the numbers reported by the economic agents), fixed assets profitability rate (rate of reflecting the fixed assets in the capital accumulations) and the liquidity degree of the company's assets.

All regression variable indicators are calculated based on the financial information of the economic agents from the selected sample. The instrumented variables are the same mentioned indicators, except for the recovery yearly rate, but calculated under the impact of the real estate market's dynamics, with the note that the values taken in consideration are the average values which resulted from the calculation of the multiannual values reported to the number of years analyzed.

$$\hat{AFCA_E} = + 1.05*AFCA + 4.55e-07*AFPB - 0.000354*AFCP + 0.00319*AFTA$$

(0.00506) (2.71e-06) (0.00266) (0.0169)

n = 25, R-squared = 1.000

(standard errors in parentheses)

Model 1: TSLS, using observations 1-25

Dependent variable: AFCA_E

Instrumented: AFCA AFPB AFCP AFTA

Instruments: AFPB_E AFCP_E AFTA_E Firma

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
AFCA	1.04960	0.00505660	207.6	<0.0001	***
AFPB	4.55004e-07	2.70764e-06	0.1680	0.8682	

AFCP	-0.000354087	0.00265879	-0.1332	0.8953
AFTA	0.00318579	0.0169123	0.1884	0.8524

Mean dependent var	0.675988	S.D. dependent var	1.248840
Sum squared resid	0.000149	S.E. of regression	0.002661
Uncentered R-squared	0.999996	Centered R-squared	0.585704
F(4, 21)	1177183	P-value(F)	7.56e-56
Log-likelihood	193.2963	Akaike criterion	-378.5927
Schwarz criterion	-373.7172	Hannan-Quinn	-377.2404

Hausman test -

Null hypothesis: OLS estimates are consistent

Asymptotic test statistic: Chi-square(4) = 1.93708

with p-value = 0.747331

Test for normality of residual -

Null hypothesis: error is normally distributed

Test statistic: Chi-square(2) = 24.7116

with p-value = 4.30475e-006

Pesaran-Taylor test for heteroscedasticity -

Null hypothesis: heteroscedasticity not present

Asymptotic test statistic: z = 2.33637

with p-value = 0.019472

Weak instrument test -

Cragg-Donald minimum eigenvalue = 0.106874

Frequency distribution for uhat1, obs 1-25

number of bins = 7, mean = -0.00010467, sd = 0.00265875

interval	midpt	frequency	rel.	cum.
< -0.002589	-0.003757	2	8.00%	8.00% **
-0.002589 - -0.0002525	-0.001421	6	24.00%	32.00% *****
-0.0002525 - 0.002084	0.0009156	15	60.00%	92.00% *****
0.002084 - 0.004420	0.003252	1	4.00%	96.00% *
0.004420 - 0.006756	0.005588	0	0.00%	96.00%
0.006756 - 0.009092	0.007924	0	0.00%	96.00%
>= 0.009092	0.01026	1	4.00%	100.00% *

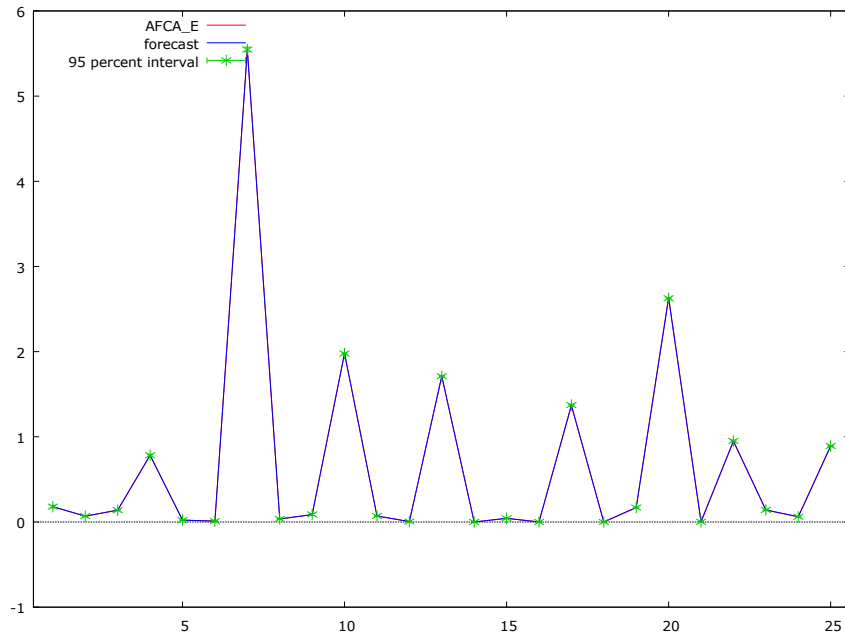


Figure 1 – Forecast analyses

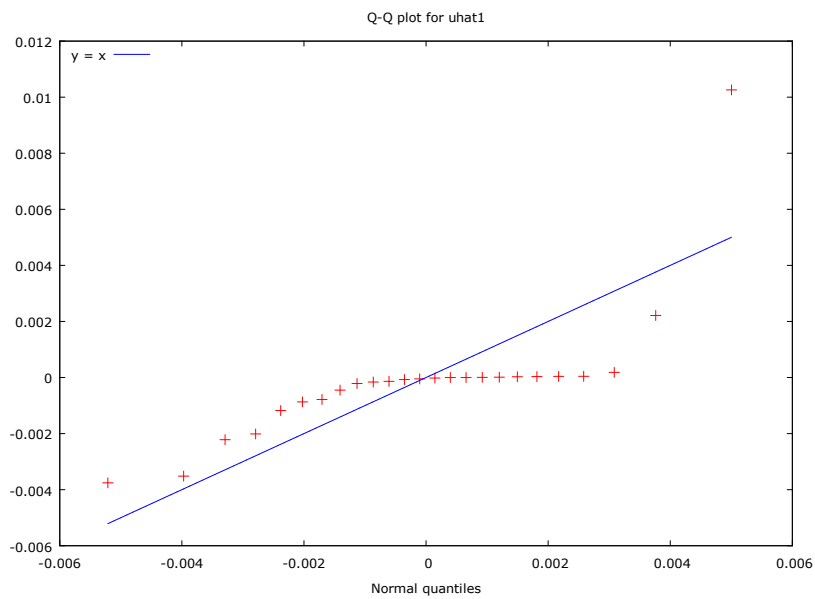


Figure 2 – Q-Q plot diagram

Test for null hypothesis of normal distribution:
 Chi-square(2) = 24.712 with p-value 0.00000

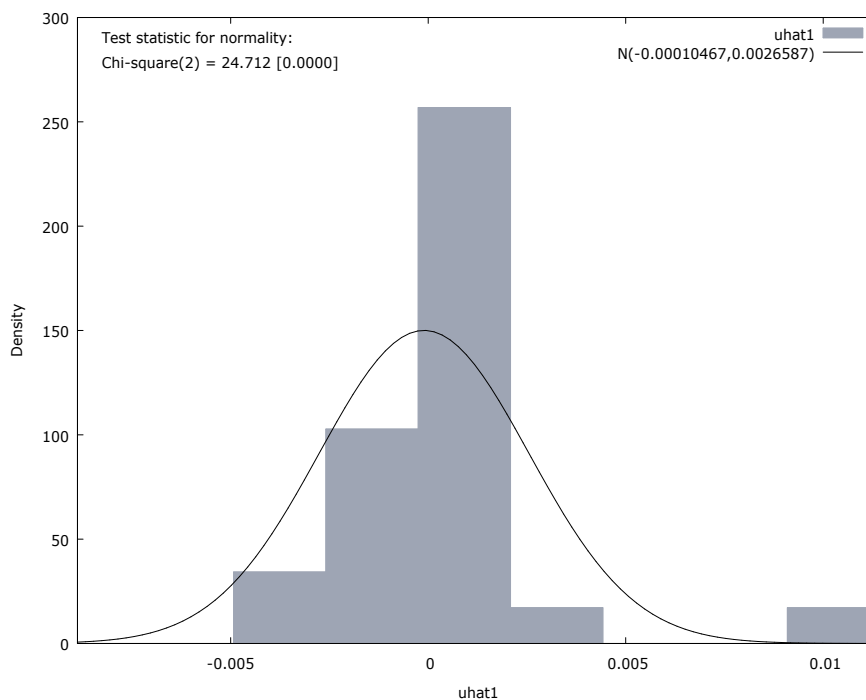


Figure 2 – Histogramic distribution

The model is representative from statistical point of view, the significant value being 100% and OLS hypotheses (null hypothesis) are estimated as being consistent, according to Hausman specification test (Figure 1-3).

The vulnerabilities table (table 3), reference to the evolution of the capital market, based on the financial rates of the fixed assets and reported to the real estate market trend, reveals the fact that the companies become more vulnerable on the analyzed segment in the context of a market in expansion.

Table 3. The vulnerabilities table

Vulnerability	2016/2015	2017/2016	Advantage
AF/CA	V	V	AF/CA
AF/PB	A	A	AF/PB
AF/CP	V	V	AF/CP
AF/TA	A	V	AF/TA

The vulnerability scoring (table 4) increases in average with 25%, i.e. approximately with the value of real estate market increase in the real estate boom period.

Table 4. Vulnerability scoring

Vulnerability	2016/2015	2017/2016	Advantage
AF/CA	104.03%	101.95%	AF/CA
AF/PB	-4.17%	97.16%	AF/PB
AF/CP	100.64%	103.25%	AF/CP
AF/TA	99.19%	100.66%	AF/TA

The presentation of the vulnerabilities scoring from the table above indicates that the most affected sectors are the depreciation in ownership equity of fixed assets, as compared to the real situation on the market, the decrease of fixed assets’ productivity during the operating

cycle (turnover) and the increase of the liquidity degree of total assets, based on sustainable economic increase and on depreciation of fixed assets.

3. Conclusion

As the economic increase generated by the increase in the Gross Domestic Product has not been capitalized and considering the trading opportunities at higher quotas (based on actual market evolutions), corroborated with the aspects resulting from the above analysis, lead to the conclusion that the Romanian companies develop a higher risk degree which in the end can lead to bankruptcy or to diminishing entities' activity. They can take place even in sensitive places targeted by the real estate market which affects the business sustainable development. The model proposed has a novelty character and it can be used by the economic agents which want to develop their business based on a program, using managerial and social accounting in sustainable terms and with risk protection.

References

- Ball, A. & Osborne, S. P. (2011). Social accounting and public management: Accountability and the common good. Abingdon: Routledge;
- Gray, R. (2013). Environmental Social + Sustainability Accounting: Quo Vadis? J. of Accounting and organizations. 17(3), p.3-5;
- Imoniana, J. O., Soares, R.R., Domingos, L.C., (2017) A review of sustainability accounting for Emission Reduction Credit and compliance with emission rules in Brazil: A discourse analysis, Journal of Cleaner Production
- Imoniana, J. O.; Domingos, L.C.; Soares, R. R & Tinoco, J. E. P. 2012. Stakeholders engagement in sustainability development and reporting: Evidence from Brazil. African J. of Business Management, 6, p.10634-10644;
- Lamberton, G.(2005. Sustainability Accounting: A brief history and conceptual framework. Accounting Forum. 29(1), p.7-26;
- Lodhia, S. & Hess, N. 2014. Sustainability accounting and reporting in the mining industry: current literature and directions for future research. J. Clean. Prod. 84, p.43-50;
- Maas, K., Schaltegger, S. & Crutzen, N. 2016. Integrating corporate sustainability assessment, management accounting, control, and reporting. J. Clean. Prod. 136 (Part A), p.237-248.
- Publicaccountant, 2012. Business and the carbon price. Journal of the Institute of Public Accountants, Available <http://www.pubacct.org.au/features/business-and-thecarbon-price> Retrieved 5/06/2018.
- Uhlmann, V. O., Souza, M. M., Pfitscher, E. D., & Frey, I. A. (2012). Tratamento contábil dos créditos de carbono: uma análise à luz das normas do Comitê de Pronunciamentos Contábeis. Revista em Agronegócios e Meio Ambiente, 5(2), p.311-335.