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Comparative Analysis of the Indebtedness of Moroccan Companies Listed on the Stock Exchange during the Pre-COVID Period and the COVID-19 Crisis Period

EL HADDAD Mohamed Yassine[1], LACHHAB Mohamed[2]

[1]Professor at the Faculty of Economic and Social Legal Sciences-Agdal, Mohammed V-Rubat University, Laboratory of Studies and Research in Management Sciences
yassine.elhaddad[at]hotmail.com

[2]PhD student at the Faculty of Economic and Social Legal Sciences-Agdal, Mohammed V-Rubat University, Laboratory of Studies and Research in Management Sciences
lachhabmohamed1987[at]gmail.com

Abstract: ***This research paper aims to demonstrate whether the level of indebtedness of large companies listed on the Casablanca stock exchange (CSE), during the COVID-19 crisis, is different from that of the non-crisis period. To do this, we carried out a comparative study, for the two years 2019 and 2020, of the level of indebtedness of 44 companies listed on the CSE, on the basis of the debt ratio, and this through the two statistical tests, namely the Student's t test and the Mann-Whitney non-parametric test. These two tests showed that there is no difference in the level of indebtedness of these companies between the two periods 2019 and 2020.***

Keywords: Debt, COVID-19, Casablanca Stock Exchange, Moroccan companies.

1. Introduction

The pandemic of COVID-19 spread with a frightening rhythm, it confused in some months only all predictions of growth, job and debt. The world trade which had attained record levels on the eve of the pandemic of COVID-19 knew very strong falls and a record volatility. At worldwide level this health crisis considerably reduced the treasury of firms and leads the majority of the firms to use the banking debt tremendously. Certainly, the confinement set up in the most part of the countries has led to of the adverse effects on the capacity of production and sale of the firms and explains to a great extent the appeal in the debt of firms. In this new environment of health crisis, the complicacy of valuation for valuable aims of transfer and general taxation increases considerably.

Besides, the recent fall of financial performances puts in an obvious place mailmen's variety of capacity of debt and restructuring of debt which being perhaps less important before. During period meadow COVID, the debt of firms (up to a certain considered level as tolerable) was always considered as normal for a good functioning of their activity of working, however with the health crisis the needs of treasury of many firms (in most cases SMES) considerably increases procreating so a problem of survival making them search new resources augmenting thus their risk of vulnerability and insolvency. The pandemic of COVID-19 procreated an acceleration of the debt, particularly in savings in process of development, which comes to come along on top of an already rather following debt, where from the risk of over borrowing.

The level of debt of firms quoted in the stock exchange of Casablanca; at a time of crisis is it COVID-19 different during pre-COVID19 and during the COVID19 period?

2. Review of Literature

Sunithadevi et al. (2020) [1], demonstrated in a study based on a sample of 214 companies listed on the Indonesia Stock Exchange, that the leverage ratio and the short-term activity ratio have increased, but the liquidity ratio and the ratio of profitability decreased during the CVIV-19 pandemic. So they showed that there is no significant difference between the liquidity ratio and the debt ratio. However, the profitability ratio and the short-term activity ratio of public enterprises differ significantly before and during the CVIV-19 pandemic.

Akilimalintererwa, Joseph and Coming Kalimulukundji (2020) [2], have shown in a study based on a sample of 139 SMEs of the city of Bukavu in the Democratic Republic of the Congo, that despite the health crisis of COVID-19, these SMEs reimbursed their debts Contracted with financial institutions who difficulty, but unfortunately the refund was

[1] Sunitha Devi*, Ni Made Sindy Warasniasih, Putu Riesty Masdiantini, Lucy Sri Musmini, « The Impact of COVID-19 Pandemic on the Financial Performance of Firms on the Indonesia Stock Exchange », Journal of Economics, Business, and Accountancy Ventura Vol. 23, No. 2, August – November 2020, pages 226 – 242

[2] Joseph Akilimali Ntererwaet Venant Kalimu Lukundji, « Incidence of sanitary crisis of COVID-19 on indebted of Small and Medium Enterprises in Bukavu town », International Journal of Accounting, Finance, Auditing, Management and Economics, 1(2), 230-247.

not made in accordance with contractual closes. The results also reveal that the health crisis was at the origin of several problems preventing SMEs from working, namely: the closure of the borders, the confinement, the depreciation of the Congolese currency, the lack of foreign currency, etc.

Roberto Blanco et al. (2021) [3], have shown that the CVIV-19A crisis considerably increased the liquidity requirements of Spanish companies in 2020 and despite the fact that the State has put in place measures that have made it possible to facilitate the granting of credit to firms. They indicate that the sharp drop in profitability levels, associated with the growth of indebtedness, seems to have resulted in a marked increase in the proportion of vulnerable companies (ie those whose own funds are negative or The level of indebtedness is high), which would be more pronounced among SMEs and the most hit sectors affected by the CVIV-19 pandemic.

Kevin Krieger et al. (2021) [4], indicate that, on nearly 1, 400 companies, listed in the United States, paying dividends, 213 companies have reduced dividends and 93socates have fully omitted dividends in the second quarter 2020. In their study, the results of The regression indicate that net income and debt constitute the explanatory determining factors of the reduction of dividends of companies and that the omission of dividends has been about four times higher than during the period 2015-2020. That is to say before the pandemic.

However, it is apparent from their work that it is the most profitable companies (which seem amazing) and the most indebted companies (which is normal) which are most likely to completely omit the dividend payments during the pandemic period.

Michael Zheng (2022) [5], in his study on the impact of the CVIV-19 crisis on investment and business financing policies, found that companies suffer on average a genuine negative shock of the pandemic, But he also showed that companies with an abundant liquidity reserve before the crisis surpass companies that do not have it. The author finds that "if the crisis reduces the level of short-term borrowing funding, Companies with significant liquidity have many more short-term debts than businesses with low liquidity "[6]Indeed the author discovers in his analysis with some of the little liquidity weighted more in the long-term period in the post-crisis period, while businesses rich in liquidity have relatively fewer long-term debts.

Patrick Augustin et al. (2022) [7], found in their study, on a sample of 30 developed countries, a positive and significant sensitivity of the risk of sovereign default to the intensity of the propagation of the virus for governments to budget constraints. Their analysis suggests that financial markets penalize sovereigns with low budgetary room for maneuver, which affects their external impact resilience. By using net positions in insurance contracts against sovereign defects for 60 countries between 2008 and 2015, the authors have shown that the debt and size of a country account for more than 75% of country differences in net interests insured.

3. Methodology

3.1 Presentation of the sample

The study will focus on a sample of 44 companies listed on the Casablanca Stock Exchange. These companies mainly concern the secondary and tertiary sectors. This choice is justified by the fact that it is the only stock market companies whose information needed for our work is available. All companies listed on the Casablanca Stock Exchange and the purpose of our study are anonymous companies, their share capital is equal to or greater than 3, 000, 000 DH. As a result, the results obtained will only be valid for large companies and will not concern the very small and Moroccan SMEs.

The Sample of the Study	The Sample of the Study
CARTIER SAADA	MED PAPER
CENTRALE DANONE	AGMA
COSUMAR	AFMA
DARI COUSPATE	AUTO HAL
LESIEUR CRISTAL	AUTO NEJMA
OULMES	CTM
S/TE DU BOISSON	FENIE BROSSETTE
UNIMER	LABEL VIE
SNEP	SRMSA
AFRIQUIA GAZ	STOKVIS NORDAFRIQ
MAGHREB OXYGENE	TIMAR
TOTAL MAROC	IB MAROC
LYDEC	INVOLYS
NEXAN MAROC	M2M GROUP
TAQA MAROC	MAROC TELECOM
DLM	MICO DATA
SONASID	S2M
ALUMU DU MAROC	BALIMA
AFRIQUE INDUSTRIE	
CIMENT DU MAROC	
LAFARGE H, MAROC	
STROC	
CMT	
MANAJEM	
SMI	
COLORADO	

3.2 Measure of debt ratio

On the basis of the states of syntheses, namely the balance sheets, the above-mentioned companies we can obtain the debt ratio for each of them for the two years 2019 and 2020 using the following formula:

[3]Roberto Blanco, Álvaro Menéndezet Maristela Mulino, (2021) ; «Impact of the COVID-19 crisis on Spanish firms' financial vulnerability» ; Banco de España ; Documentos Ocasionales. N° 2119.
[4]Kevin Krieger, Nathan Mauck, Stephen W. Pruitt ; (2021) ; «The impact of the COVID-19 pandemic on dividends» ; Finance Research Letters ; Volume 42, October 2021.
[5]Michael Zheng ; (2022) ;«Is cash the panacea of the COVID-19 pandemic: Evidence from corporate performance» ;Finance Research Letters ; Vol. 45, March 2022.
[6]Michael Zheng ; (2022, Ibidem
[7] Patrick Augustin, Marti G. Subrahmanyam et Davide Tomio (2022);«In sickness and in debt: The COVID-19 impact on sovereign creditrisk» ; Journal of Financial Economics ; Volume 143, Issue 3, March 2022, Pages 1251-1274.

$$\text{Debt ratio} = \frac{\text{total debts}}{\text{total active}}$$

The debt ratio also called gearing ratio is a financial indicator that makes it possible to measure the level of indebtedness of a company, and therefore its solvency. This ratio is obtained by carrying out the relationship between the debts of a company (part of the liabilities held by the creditors) and the total amount of passive (share of the liabilities held by the partners and share of the liabilities held by the creditors).

The total of debts regroups dept of short middle and long term.

3.3 Tests statistics

We will use, in this study, the Student T test, which consists in testing the mean equality hypothesis of two samples whose distributions are normal, as well as the U of Mann-Whitney U which is the non-parametric alternative of the TEST T, this test makes it possible to test if two independent groups have been drawn from the same population.

$$t = \frac{m_A - m_B}{\sqrt{\frac{S^2}{n_A} + \frac{S^2}{n_B}}}$$

S^2 is the variance common to both groups. It is calculated by the following formula: The value T of Student is given by the following formula:

$$S^2 = \frac{\sum (x - m_A)^2 + (x - m_B)^2}{n_A + n_B - 2}$$

To find out if the difference is significant, it must first read in the Table T, the critical value corresponding to the alpha risk = 5% for a degree of freedom:

$$d.d.l = n_A + n_B - 2$$

Principles of the Mann-WHITNEY test:
When the distribution of values does not follow a normal, therefore dissymmetrical law, the study T of Student does not apply; Rather, the Mann-Whitney test should be used.

The Mann-Whitney test requires no property of the probability laws of the variables considered (in particular the normality hypothesis is not required), it is a non-parametric test. This test is mainly used to study if a Dichotomous nominal independent variable Influences an ordinal score variable.

It is proposed to construct a non-parametric statistical test to choose between the null hypothesis: H0: θ1 = θ2 (equality of medians in the parent populations) and one of the alternative hypotheses: H1: θ1 6 = θ2, h1: θ1 <θ2, h1: θ1>θ2.

- Null hypothesis: 'H0 = μA and μb are equal
- Alternative hypothesis: 'H1 = μA and μb are different'

As in each non-parametric test, and unlike the parametric tests, the calculation does not relate to the numerical values of the measurements of the representative samples of the populations, but on their ranks attributed following the classification of values in ascending order. It is thus freedom from the normality conditions of the distributions and the homogeneity of the variances essential to the reliability of the parametric tests.

We therefore start by classifying in ascending the set of measurements of the two studied groups, and then the sum of the ranks of each group (WA and WB) is calculated.

The mann / whitney (UA and UB) indices are deduced to detect the lowest of the U of the 2 groups:

$$U_a = W_a - \frac{1}{2} n_a (n_a + 1)$$

We test the significance of the smallest index u using the following formula which follows the law of probability of the reduced gap, provided that each group has a workforce at least equal to 10 measures (below, it is necessary to resort to At the U table that provides the lower u limit):

$$Z = \frac{U - \frac{1}{2} n_a . n_b}{\sqrt{n_a . n_b \frac{N+1}{12}}}$$

4. Result of the study

4.1 Descriptive statistics

Table 1: Descriptive Statistics

	Year	N	The Average	Standard deviation	Average standard error
Debt Ratio	2019	44	0, 48137616	0, 273941412	0, 041298222
	2020	44	0, 49195174	0, 327200137	0, 049327277

Developed table using software SPSS

Statistically, the average debt ratio for the year 2020 which is 0.49195174 is greater than that of 2019 which is 0.48137616, with a difference of 0.01057557.

The comparison tests, which will be used afterwards after verification of normality, will let us know if there is really a difference between the two years studied.

4.2 Verification of normality

4.2.1. Histogram of distributions

The histograms of the debt ratios of the two years 2019 and 2020 are as follows:

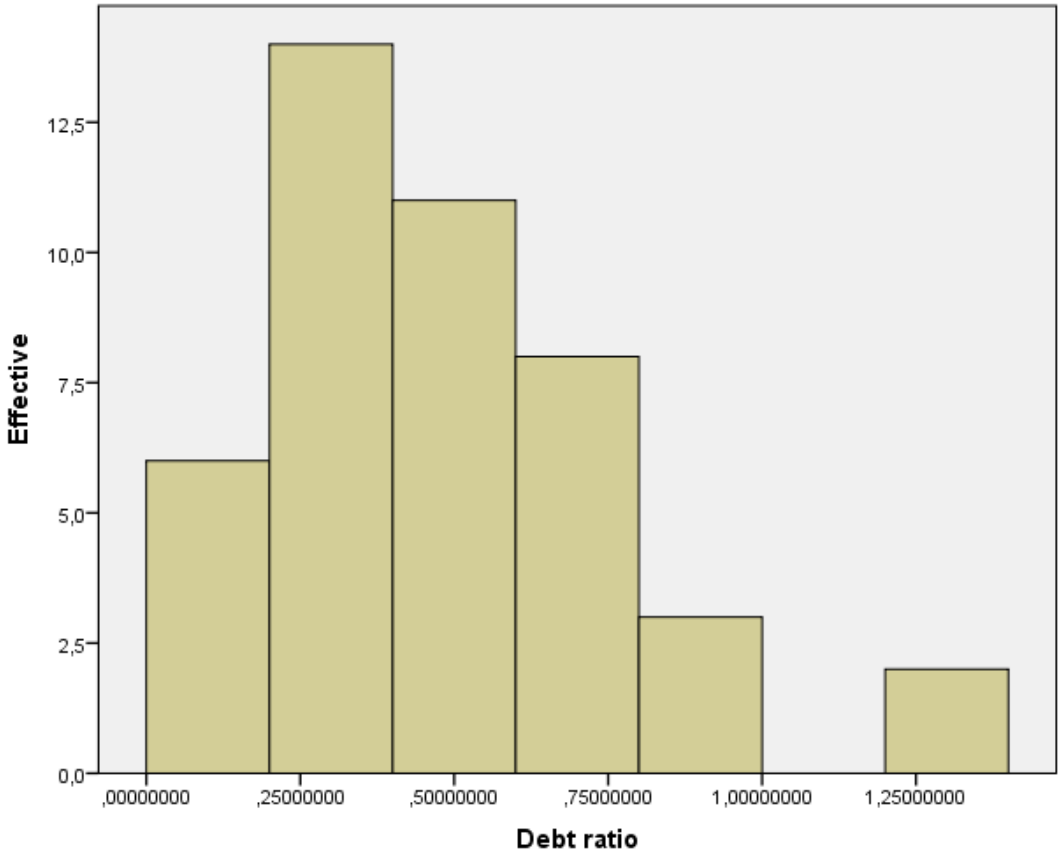

Figure 1: Histogram of the distribution of debt ratios in 2019
Figure elaborated using SPSS software

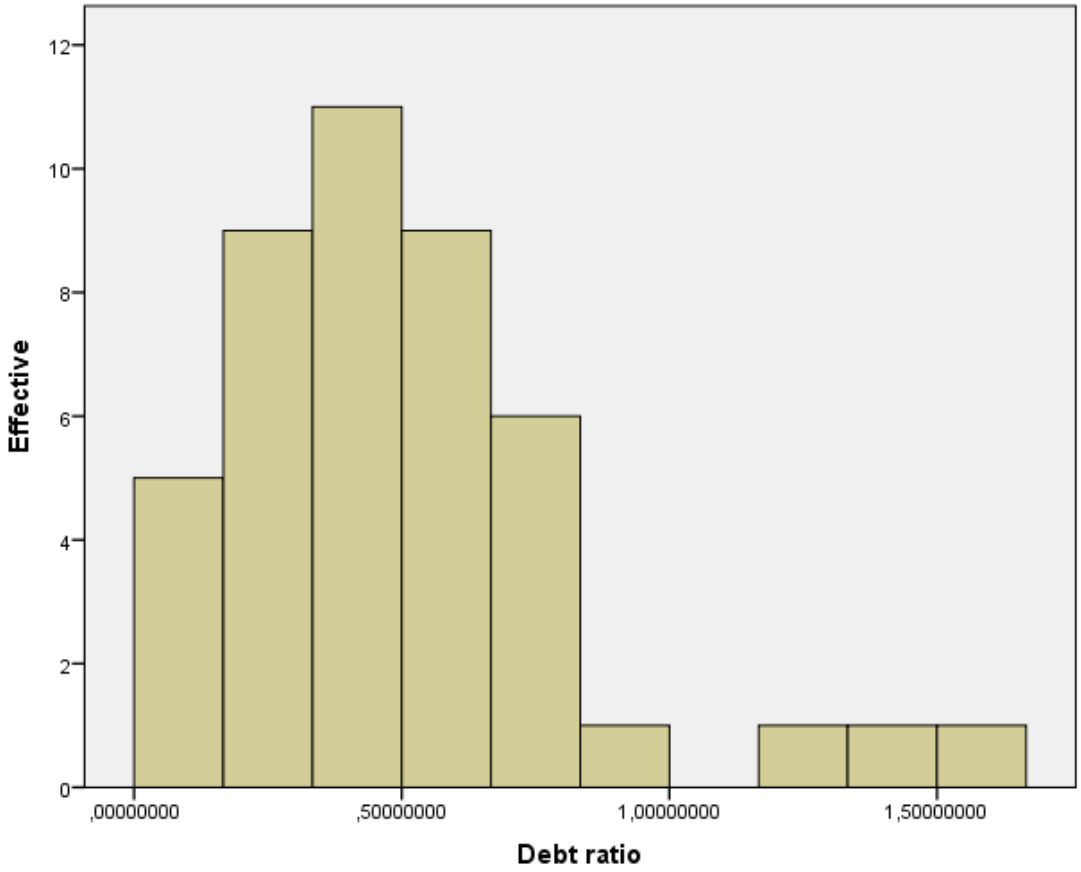

Figure 2: Histogram of the distribution of debt ratios in 2020
Figure elaborated using SPSS software

4.2.2 Normality tests

Table 2: Normal Tests

	year	Kolmogorov-Smirnov[a] [The Kolmogorov-Smirnov test is a hypothesis test used to determine if a sample follows a given law known by its continuous distribution function, or if two samples follow the same law]			Shapiro-Wilk [The Shapiro-Wilk test tests the zero hypothesis that a sample X1, ..., XN comes from a population normally distributed]		
		Statistical	ddl	Signification	Statistical	dof	Signification
DebtRatio	2019	0, 154	44	0, 011	0, 906	44	0, 002
	2020	0, 173	44	0, 002	0, 886	44	0, 000

a. Correction de signification de Lilliefors [The LillieFors test is a suitable normality test of the Kolmogorov-Smirnov test to test the null hypothesis that the data comes from a normal law when the parameters of the normal law are not known, it is to -Dire when neither the hope μ nor the standard deviation σ are known]
b. Dof: degree of freedom

Depending on the normal test, the Kolmogorov-Smirnov test and the Shapiro-Wilk test, the two distributions of the debt ratios for the two years 2019 and 2020 do not follow a normal law.

4.3 Student Test T

Table 3: Student Test T

		Levene test on equality of variances		Test-t for equality of averages						
		F	Sig.	t	ddl	Sig. (bilatérale)	Average difference	Difference type deviation	Trusted interval 95% of the difference	
									Lower	higher
DebtRatio	Hypothesis of equal variances	0, 431	0, 513	-0, 164	86	0, 870	-0, 01057557	0, 06433291	-0, 13846517	0, 11731401
	Hypothesis of uneven variances			-0, 164	83, 421	0, 870	-0, 01057557	0, 06433291	-0, 13852158	0, 11737043

Developed table using SPSS software

Interpretation of the results obtained:
The result of the Levevenest test of 0.513 far greater than 0.05 this means that the equality of variance hypothesis is accepted. On the other hand, the result of the Student T test is 0.87 this means that the zero hypothesis is accepted, the averages are equal.

4.4 The U Test of Mann Whitney

Table 4: Calculation of ranks

	Year	N	Medium rank	Sum of ranks
Debt Ratio	2019	44	44, 43	1955, 00
	2020	44	44, 57	1961, 00
	Total	88		

Developed table using SPSS software

Table 5: Mann-Whitney U Test

Test[a]	
	Debt Ratio
U de Mann-Whitney	965, 000
W de Wilcoxon	1955, 000
Z	-0, 025
Asymptotic meaning (bilateral)	0, 980
a. Grouping criterion: year	

That the null hypothesis is accepted. It also means that the distribution of the debt ratio is identical for the two years studied (COVID 19 pre-crisis and COVID crisis period 19).
Conclusion Elaborated using SPSS

Interpretation of the results obtained:
The result of Mann-Whitney's U test gives us coefficient of 0.98 which is far above 0.05 which means that the null hypothesis is accepted. It also means that the distribution of the debt ratio is identical for the two years studied (COVID 19 pre-crisis and COVID crisis period 19).

Conclusion

Elaborated using SPSS

Interpretation of the results obtained
The result of Mann-Whitney's U test gives us coefficient of 0.98 which is far above 0.05 which means in conclusion, the level of debt of companies listed on the Casablanca Stock Exchange has not been impacted by the CVIV-19 crisis. Indeed, according to the Student T test, the averages of the debt ratios of the two years 2019 and 2020, are equal, this result has been validated by the Mann-Whitney test which has shown that the distribution of the debt ratio is identical for the two periods (pre-COVID period and COVID period). This result we found is only valid for large companies. While the very small, small and medium-sized enterprises, have suffered problems at the funding levels, which has pushed the Moroccan state to take steps to support them, and this through several devices like "Damane Oxygen" which s. Address mainly to PCMS (very small and medium-sized enterprises), whose annual turnover does not exceed 200 million DH.

The companies listed on the Casablanca stock exchange were therefore resilient in the face of the health crisis, which was not the case of companies not listed and mainly MPCs for most companies and mainly SMEs [According to the Office of the High Commissioner, in April 2020 nearly 142,000 companies, or 57% of all companies, reported their activities definitively or temporarily. On this total 6.300 have ceased their activities definitively. By category of companies, TPEs account for 72%, SMEs 26% and large companies 2% of business shutdown temporarily or definitively] the risk Short-term creditworthiness is not dismissed because it is largely found in its roots in the debts accumulated during the confinement period, then the degradation of operating accounts and finally to the collapse of the markets.

Annex

Companies	DR (1)	LMTDR (2)	STDR (3)	T. P (4)	LMTD (5)	STD (6)	Total
CARTIER SAADA	0, 187880175	0, 088245899	0, 099634276	239013659, 2	21091975, 14	23813952, 94	44905928, 08
CENTRALE DANONE	0, 337288520	0	0, 33728852	3167894165	0	1068494336	1068494336
COSUMAR	0, 301095132	0, 000492321	0, 300602811	7860326294	3869802, 37	2362836178	2366705980
DARI COUSPATE	0, 211421258	0, 024748956	0, 186672301	390695952, 4	9669317, 12	72932112, 61	82601429, 73
LESIEUR CRISTAL	0, 466699021	0, 006196303	0, 460502718	3207225906	19872944, 55	1476936247	1496809191
OULMES	0, 584295547	0, 378375808	0, 20591974	2087871328	790000000	429933920	1219933920
S/TE DU BOISSON	0, 225130608	0, 062062599	0, 163068008	2801364303	173859950	456812897, 5	630672847, 5
UNIMER	0, 223318945	0, 123222636	0, 100096309	2496280527	307598267, 5	249868467	557466734, 5
SNEP	0, 323566695	0, 0583071	0, 265259595	1335142817	77848306, 18	354159442, 2	432007748, 4
AFRIQUIA GAZ	0, 658791444	0, 148099114	0, 510692329	7697593239	1140006742	3931101822	5071108564
MAGHREB OXYGENE	0, 503478902	0, 296451572	0, 207027329	440077801, 2	130461756, 2	91108131, 89	221569888, 1
TOTAL MAROC	0, 645157217	0, 176479676	0, 468677542	6383267542	1126516985	2991694140	4118211125
LYDEC	0, 236832859	0, 060334985	0, 176497874	21005754520	1267381890	3707471018	4974852908
NEXAN MAROC	0, 475864082	0, 001586272	0, 47427781	1245701537	1976021, 82	590808597	592784618, 8
TAQA MAROC	0, 490704288	0, 348841005	0, 141863283	9488772341	3310072882	1346108398	4656181280
DLM	0, 748273136	0, 097980611	0, 650292525	1554642742	152324846	1010972554	1163297400
SONASID	0, 478385462	0, 036077035	0, 442308427	2601408701	93851112	1150624991	1244476103
ALUMU DU MAROC	0, 228686982	0, 010530144	0, 218156838	932008466, 4	9814182, 9	203324020, 1	213138203
AFRIQUE INDUSTRIE	0, 161435474	0	0, 161435474	54702275, 87	0	8830887, 83	8830887, 83
CIMENT DU MAROC	0, 223991408	0, 042561051	0, 181430357	5946796653	253101912, 8	1078929442	1332031354
LAFARGE H, MAROC	0, 446830631	0, 35459357	0, 092237061	17963603148	6369778174	1656909954	8026688128
STROC	1, 029972750	0, 230540011	0, 799432739	596556477, 8	137530136, 8	476906779, 2	614436916
CMT	0, 349094142	0, 269103284	0, 079990858	1088788933	292996677, 4	87093160, 61	380089838
MANAJEM	0, 249411181	0, 196358504	0, 053052677	6360245813	1248888350	337428067, 7	1586316418
SMI	0, 167938109	0, 024154793	0, 143783316	1335451399	32257552	192015631	224273183
COLORADO	0, 386164898	0, 064383465	0, 321781433	537004648, 7	34574220, 22	172798125, 4	207372345, 6
MED PAPER	0, 695887839	0, 31070414	0, 385183699	299389937, 4	93021693, 08	115320123, 6	208341816, 7
AGMA	0, 714440856	0, 002077274	0, 712363582	331113841, 6	687814, 3	235873442, 2	236561256, 5
AFMA	0, 8238305570	0, 017901113	0, 805929444	645 294 920, 53	11 551 497, 33	520 062 176, 57	531613673, 9
AUTO HAL	0, 300657263	0	0, 300657263	2125362349	0	639005626, 3	639005626, 3
AUTO NEJMA	0, 283518562	0	0, 283518562	1355959109	0	384439576, 4	384439576, 4
CTM	0, 482030735	0, 184532465	0, 297498269	652592466, 6	120424496, 7	194145129, 4	314569626, 1
FENIE BROSSETTE	0, 580945925	0, 08966885	0, 491277075	597174694	53547967, 96	293378237	346926205
LABEL VIE	0, 694537837	0, 323261653	0, 371276185	6722779478	2173216804	2496007916	4669224720
SRMSA	0, 276213001	0	0, 276213001	391848020, 2	0	108233517, 4	108233517, 4
STOKVIS NORDAFR	0, 436170803	0, 137827487	0, 298343317	607091790, 5	83673935, 68	181121778, 3	264795714
TIMAR	0, 395777870	0, 010864088	0, 384913782	223332055, 6	2426299, 04	85963586, 24	88389885, 28
IB MAROC	0, 986360233	0, 263126556	0, 723233677	188419693, 3	49578225	136271467, 6	185849692, 6
INVOLYS	0, 165718169	0	0, 165718169	134557633, 6	0	22298644, 65	22298644, 65
M2M GROUP	0, 162951854	0	0, 162951854	280357442	0	45684764, 82	45684764, 82
MAROC TELECOM	0, 420903374	0, 066416795	0, 354486579	41371885	2747788, 00	14665778	17413566
MICO DATA	0, 365610821	0, 014188264	0, 351422556	365717361, 7	5188894, 65	128521330, 1	133710224, 7
S2M	0, 375618844	0, 019425271	0, 356193573	233750509	4540667, 00	83260429	87801096
BALIMA	0, 113299532	0, 054980780	0, 058318752	126550262, 4	6957832, 14	7380253, 38	14338085, 52

1) Debt ratio
2) Long and Medium Term Debt Ratio (DLMT / TP)
3) Short-term debt ratio (DCT / TP)
4) Total passive
5) Amount of long and medium term debts
6) Short-term debt amount

Table developed by ourselves from the data from the Casablanca Stock Exchange

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