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Empirical Approaches Regarding the Financial Performance of the US Companies

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Abstract: *The aim of the paper is to determine the factors which have a significant impact on the financial performance of US companies. Using a database consisting of the non-financial companies included in the S&P 500 Index, over the period 2004-2023, there are estimated multiple linear regression models with unbalanced panel data, incorporating fixed effects and random effects. The main results indicate that the global financial crisis led to a decline in the US companies' performance, contrary to the Covid-19 pandemic crisis which conducted to an increase in the performance of the US companies. Moreover, the S&P 500 companies could achieve higher financial performance by increasing the number of members on the board, the percentage of women members on the board, and the company net debt, and lowering the level of company taxation.*

1. INTRODUCTION

In the context of multiple crises, the issue of companies' performance becomes particularly important for research. Over the last two decades, the companies have been hit by two major crises, namely the global financial crisis and the Covid-19 pandemic crisis.

The paper analyzes whether these crises, alongside indicators reflecting the company indebtedness, tangibility, liquidity, taxation, age and size, and other variables characterizing the corporate governance, had a significant impact on the financial performance of the companies, measured as Return on Assets and Return on Equity. There were analyzed other empirical studies which showed both a positive and negative influence of the factors on the companies' performance. Consequently, there were estimated multiple linear regression models with unbalanced panel data, incorporating fixed effects and random effects, using a database consisting of the non-financial companies included in the S&P 500 Index, over 20 years, from 2004 to 2023.

The research results show that net debt, company age, CEO duality, board size, board gender diversity, and the Covid-19 pandemic crisis have a positive impact on the company's performance, while total debt, assets tangibility, taxation, company size, board meetings, and the global financial crisis negatively influences the financial performance of the S&P 500 companies. Moreover, company liquidity positively affects the Return on Assets and negatively influences the Return on Equity.

2. LITERATURE REVIEW

Previous empirical studies highlight both a positive and a negative influence of some factors on the companies performance. According to Boshnak et al. (2023), Harymawan et al. (2020), Kao et al. (2019), La Rocca et al. (2024), Sahoo et al. (2023), Ullah et al. (2020) and Wieczorek-Kosmala et

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al. (2021), indebtedness negative affects the companies performance, Ting et al. (2020) found out that indebtedness has a positive impact on the firm performance, while in the research conducted by Habibniya et al. (2022) the company indebtedness has a positive effect on return on equity and a negative effect on return on assets. The company indebtedness could be expressed in several ways, namely: total liabilities to total assets (Boshnak et al., 2023; Habibniya et al., 2022; Harymawan et al., 2020; Wieczorek-Kosmala et al., 2021), total equity to total assets (Habibniya et al., 2022), total debt to total assets (Kao et al., 2019; La Rocca et al., 2024; Ting et al., 2020; Ullah et al., 2020), total debt to total equity (Sahoo et al., 2023; Ting et al., 2020; Ullah et al., 2020).

Another important factor that could affect the company's performance is represented by the company size measured as the natural logarithm of total assets. The previous studies showed both a positive (Azeez, 2015; Boshnak et al., 2023; Habibniya et al., 2022; Harymawan et al., 2020; Kao et al., 2019; La Rocca et al., 2024) and a negative (Ullah et al., 2020) influence of the company size on the companies performance.

Corporate governance also plays an important role in ensuring company performance. Thence, board size has both a positive (Sahoo et al., 2023) and a negative (Azeez, 2015; Kao et al., 2019) impact on the financial performance of the companies, while board gender diversity only positively affects the firm performance (Boshnak et al., 2023; Sahoo et al., 2023).

Based on the results of the previous studies, there are considered nine research hypotheses:

Hypothesis 1: Indebtedness negatively influences the company performance (Boshnak et al., 2023; Habibniya et al., 2022; Harymawan et al., 2020; Kao et al., 2019; La Rocca et al., 2024; Sahoo et al., 2023; Wieczorek-Kosmala et al., 2021).

Hypothesis 2: Assets tangibility negatively influences the company performance (Harymawan et al., 2020).

Hypothesis 3: Liquidity negatively influences the company performance (Habibniya et al., 2022; Wieczorek-Kosmala et al., 2021).

Hypothesis 4: Company age positively influences the company performance (Azeez, 2015; Sahoo et al., 2023).

Hypothesis 5: Company size positively influences the company performance (Sahoo et al., 2023; Ting et al., 2020; Ullah et al., 2020).

Hypothesis 6: CEO duality positively influences the company performance (Azeez, 2015).

Hypothesis 7: Board size positively influences the company performance (Sahoo et al., 2023).

Hypothesis 8: Board independence positively influences the company performance (Kao et al., 2019; Ting et al., 2020).

Hypothesis 9: Board gender diversity positively influences the company performance (Boshnak et al., 2023; Sahoo et al., 2023).

3. RESEARCH METHODOLOGY

To analyze the factors influencing the performance, there were estimated several empirical models, integrate financial indicators along with indicators characterizing the corporate governance and variables for crisis periods.

The company's performance is represented by two financial indicators, namely Return on Assets (net income to total assets) and Return on Equity (net income to total equity). The independent variables are represented by: indebtedness (total debt to total assets, net debt to total equity), tangibility (tangible assets to total assets), liquidity (current assets to current liabilities), taxation (effective

tax rate), company age (number of years since establishment), company size (natural logarithm of total assets), CEO duality (1 if the CEO is also the Chairman, and 0 otherwise), board size (number of members on the board), board meetings (number of board meetings), non-executive members (the percentage of non-executive members on the board), board independence (the percentage of independent members on the board), board gender diversity (the percentage of women members on the board). There are also two variables to measure the impact that the global financial crisis and the COVID-19 pandemic crisis had on the companies' performance.

The empirical research is carried out on a sample of 442 non-financial companies included in the S&P 500 Index, over 20 years, from 2004 to 2023.

The descriptive statistics of the variables included in the empirical estimations are presented in Table 1.

Table 1. Descriptive statistics

Variable	Mean	Median	Minimum	Maximum	Std. Dev.
ROA	.0719	.0642	-.1038	.2403	.0686
ROE	.1944	.1580	-.3187	1.011	.2247
TDBT	.4212	.4079	0	1.1651	.2673
NETDBT	.6282	.4330	-2.7178	5.4352	1.368
TANG	.2709	.1689	.0192	.8966	.2508
LIQ	1.7913	1.4803	.4956	5.3203	1.0814
ETR	.2374	.2527	-.1680	.5306	.1429
FAGE	33.256	23	1	113	29.9262
FSIZE	23.1700	23.2486	20.0113	25.9597	1.3897
CEOD	.5504	1	0	1	.4975
BSIZE	10.6815	11	7	15	2.0151
BMEET	7.8130	7	4	16	2.9174
NONEXEC	.8583	.8824	.6667	.9333	.0684
INDEP	.8240	.8462	.5556	.9333	.0969
BGENDER	.1930	.1818	0	.6667	.1066
FIN	.1500	0	0	1	.3571
COVID	.1500	0	0	1	.3571

Source: Own computation

The mean value of the Return on Assets is 7.18%, while the mean value of the Return on Equity is 19.44%. The assets' tangibility varies from 1.92% to 89.66%, with an average value of 27.09%. Moreover, the companies included in the S&P 500 Index have a board of directors consisting of 7 to 15 members, while the board gender diversity is not too pronounced, the women members represent, on average, only 19.30% of the total board members.

To evaluate the relationship between variables, Table 2 presents the correlation matrix.

Table 2. Correlation matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)
(1) ROA	1.0000					
(2) ROE	0.6031	1.0000				
(3) TDBT	-0.3108	0.3746	1.0000			
(4) NETDBT	-0.2314	0.2820	0.7131	1.0000		
(5) TANG	-0.0547	-0.0230	0.0661	0.1278	1.0000	
(6) LIQ	0.3777	-0.0518	-0.4292	-0.3703	-0.1683	1.0000
(7) ETR	-0.0703	-0.0701	-0.0530	-0.0162	0.1350	-0.0846

(8) FAGE	0.0062	0.0843	0.1134	0.0858	0.0030	-0.1249
(9) FSIZE	-0.3275	-0.0742	0.2828	0.2078	0.1414	-0.3974
(10) CEOD	-0.0954	-0.0078	0.0908	0.0407	0.0565	-0.1529
(11) BSIZE	-0.1858	0.0228	0.2579	0.2076	0.0777	-0.2487
(12) BMEET	-0.1996	-0.0959	0.1492	0.1212	0.0039	-0.1251
(13) NONEXEC	-0.1623	0.0416	0.2595	0.1772	-0.0228	-0.1477
(14) INDEP	-0.1301	0.0229	0.2028	0.1373	-0.0390	-0.1086
(15) BGENDER	-0.0256	0.1459	0.2102	0.1553	-0.0480	-0.2087
(16) FIN	0.0003	-0.0433	-0.0858	-0.0530	0.0444	-0.0017
(17) COVID	0.0302	0.1002	0.0932	0.0758	-0.0050	-0.0687
Variable	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
(7) ETR	1.0000					
(8) FAGE	-0.0362	1.0000				
(9) FSIZE	-0.0596	0.1475	1.0000			
(10) CEOD	0.0477	0.2409	0.1838	1.0000		
(11) BSIZE	0.0023	0.2591	0.5096	0.1272	1.0000	
(12) BMEET	-0.0420	0.0511	0.2429	0.0522	0.1503	1.0000
(13) NONEXEC	-0.0546	0.1713	0.3113	0.2094	0.2322	0.0895
(14) INDEP	-0.1170	0.1615	0.2320	0.1968	0.1017	0.0993
(15) BGENDER	-0.1720	0.1729	0.2936	0.0766	0.2020	0.0994
(16) FIN	0.1088	-0.0308	-0.0648	0.0667	-0.0244	0.0297
(17) COVID	-0.2321	0.0537	0.1428	-0.0705	0.0230	0.0486
Variable	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	
(13) NONEXEC	1.0000					
(14) INDEP	0.6450	1.0000				
(15) BGENDER	0.1884	0.2335	1.0000			
(16) FIN	-0.0301	-0.0663	-0.1712	1.0000		
(17) COVID	0.0666	0.1253	0.4239	-0.1553	1.0000	

Source: Own computation

There are identified positive and strong correlations between the variables measuring the company indebtedness, and between non-executive members and board independence, so these variables will be used in different econometric models.

4. EMPIRICAL RESULTS

The empirical study is conducted using multiple linear regression models with unbalanced panel data, incorporating cross-section fixed effects, cross-section and period fixed effects, cross-section random effects, and cross-section random effects with period fixed effects, using Stata 18 software. Table 3 shows the empirical results for Return on Assets models, while Table 4 indicates the econometric results for Return on Equity models.

Table 3. Econometric results for ROA models

Variable	**Model ROA_1**			
	Cross-section fixed effects	Cross-section and period fixed effects	Cross-section random effects	Cross-section random effects and period fixed effects
TDBT	-.0278***	-.0258***	-.0171***	-.0195***
	(.0043)	(.0043)	(.0038)	(.0039)
TANG	-.0261**	-.0234**		.0049
	(.0112)	(.0112)		(.0074)
LIQ	.0046***	.0057***	.0065***	.0075***
	(.0011)	(.0011)	(.001)	(.001)
ETR	-.0641***	-.0642***	-.0608***	-.0582***
	(.0052)	(.0053)	(.005)	(.0052)
FAGE	.002***	.0024***	.0002***	.0002***

	(.0002)	(.0007)	(.0001)	(.0001)
FSIZE	-.0284***	-.0284***	-.0181***	-.0197***
	(.0018)	(.0018)	(.0012)	(.0013)
CEOD	.0058***	.0061***	.0041**	.0052***
	(.0017)	(.0017)	(.0017)	(.0017)
BSIZE	.0006	.0005		.0004
	(.0005)	(.0005)		(.0005)
BMEET	-.0009***	-.001***	-.0011***	-.0011***
	(.0002)	(.0002)	(.0002)	(.0002)
NONEXEC	-.0045	-.0014	-.0091	-.0053
	(.0116)	(.0116)	(.0112)	(.0113)
INDEP				
BGENDER	.0309***	.0222**	.05***	.0277***
	(.0097)	(.0098)	(.0086)	(.0093)
FIN		-.0193***	-.004*	
		(.0072)	(.0021)	
COVID	.0038**		.0068***	.0247***
	(.0018)		(.0016)	(.0067)
C	.6982***	.6885***	.5128***	.5381***
	(.0395)	(.0449)	(.0293)	(.0306)
R^2	.1093	.13	.0957	.1232
No. obs.	4641	4641	4693	4641
Variable	**Model ROA_2**			
	Cross-section fixed effects	Cross-section and period fixed effects	Cross-section random effects	Cross-section random effects and period fixed effects
TDBT	-.0302***	-.0279***	-.0192***	-.0215***
	(.0042)	(.0041)	(.0037)	(.0038)
TANG	-.0281***	-.0251**		
	(.0108)	(.0108)		
LIQ	.0043***	.0054***	.0061***	.0069***
	(.0011)	(.0011)	(.001)	(.001)
ETR	-.0626***	-.0626***	-.0596***	-.0556***
	(.0052)	(.0052)	(.005)	(.0051)
FAGE	.0018***	.0027***	.0002***	.0002***
	(.0002)	(.0007)	(.0001)	(.0001)
FSIZE	-.028***	-.0275***	-.0182***	-.0195***
	(.0017)	(.0017)	(.0012)	(.0012)
CEOD	.0046***	.005***	.0032**	.0041***
	(.0017)	(.0017)	(.0016)	(.0016)
BSIZE	.0005			
	(.0005)			
BMEET	-.0009***	-.0009***	-.001***	-.0011***
	(.0002)	(.0002)	(.0002)	(.0002)
NONEXEC				
INDEP	.0025	.0075	.0069	.004
	(.0091)	(.0091)	(.0086)	(.0086)
BGENDER	.0306***	.0211**	.0479***	.0275***
	(.0094)	(.0095)	(.0084)	(.009)
FIN		-.0125**	-.0037*	
		(.0057)	(.002)	
COVID	.0043**		.0068***	.0328***
	(.0017)		(.0016)	(.0049)
C	.6899***	.6504***	.5024***	.5236***
	(.0373)	(.042)	(.0275)	(.0284)
R^2	.1061	.127	.0931	.1192
No. obs.	4877	4877	4932	4932

Significance level: *** p<.01, ** p<.05, * p<.1. Standard errors are displayed in brackets.

Source: Own computation using Stata 18 software.

Table 4. Econometric results for ROE models

Variable	Model ROE_1			
	Cross-section fixed effects	Cross-section and period fixed effects	Cross-section random effects	Cross-section random effects and period fixed effects
NETDBT	.0447***	.0448***	.0509***	.0487***
	(.0027)	(.0026)	(.0026)	(.0025)
TANG	-.047	-.0495		
	(.0437)	(.0422)		
LIQ	-.0056		-.0047	
	(.0042)		(.0039)	
ETR	-.214***	-.2024***	-.2019***	-.1686***
	(.0203)	(.0198)	(.0196)	(.0192)
FAGE	.0098***	.0071***	.0011***	.0009***
	(.0009)	(.0026)	(.0003)	(.0003)
FSIZE	-.1012***	-.0948***	-.0558***	-.0615***
	(.0071)	(.0068)	(.0051)	(.0049)
BSIZE	.0042**	.0039**	.0031*	.0039**
	(.0019)	(.0018)	(.0018)	(.0018)
BMEET		-.0022**	-.0024**	-.0025***
		(.0009)	(.0009)	(.0009)
NONEXEC	-.0361	-.048	-.0482	-.0286
	(.0449)	(.0433)	(.0439)	(.042)
INDEP				
BGENDER	.1122***	.1002***	.223***	.1242***
	(.0375)	(.0363)	(.0336)	(.0346)
FIN			-.0168**	.0404*
			(.008)	(.0242)
COVID	.014**	.0929*	.03***	.1423***
	(.0068)	(.0508)	(.0063)	(.025)
C	2.2476***	2.1618***	1.5097***	1.5367***
	(.1553)	(.1676)	(.1183)	(.1131)
R^2	.1777	.1805	.1561	.1725
No. obs.	4505	4715	4512	4768
Variable	**Model ROE_2**			
	Cross-section fixed effects	Cross-section and period fixed effects	Cross-section random effects	Cross-section random effects and period fixed effects
NETDBT	.0444***	.0445***	.05***	.0487***
	(.0026)	(.0025)	(.0025)	(.0025)
TANG	-.0788*	-.0741*	-.0352	
	(.0416)	(.0402)	(.0289)	
LIQ	-.0069*		-.0065*	-.0048
	(.004)		(.0038)	(.0037)
ETR	-.1962***	-.192***	-.1996***	-.1748***
	(.0198)	(.0192)	(.0193)	(.0197)
FAGE	.0091***	.0072***	.0011***	.0007***
	(.0008)	(.0025)	(.0003)	(.0003)
FSIZE	-.1026***	-.098***	-.0582***	-.0671***
	(.0067)	(.0064)	(.0049)	(.005)
BSIZE	.0036**	.0034*	.0024	.003*
	(.0018)	(.0017)	(.0018)	(.0017)
BMEET	-.0017*	-.0021**	-.0025***	-.0024***
	(.0009)	(.0009)	(.0009)	(.0009)
NONEXEC				
INDEP	-.0286	-.0132	.0273	-.0084

	(.035)	(.0337)	(.0333)	(.0335)
BGENDER	.1239***	.0989***	.2157***	.1221***
	(.0359)	(.0348)	(.0328)	(.0349)
FIN			-.0171**	.0335*
			(.0078)	(.0177)
COVID	.0177***	.0725	.0318***	.138***
	(.0066)	(.0464)	(.0062)	(.0188)
C	2.3192***	2.2346***	1.5198***	1.6882***
	(.1447)	(.157)	(.1102)	(.113)
R^2	.1781	.1825	.1594	.1778
No. obs.	4696	4960	4696	4751

Source: Own computation using Stata 18 software. Significance level: *** p<.01, ** p<.05, * p<.1. Standard errors are displayed in brackets.

It can be observed that total debt has a negative influence on ROA, while net debt positively impacts ROE. Thus, a 1% increase in the total debt to total assets ratio leads to a 1.71% to 3.02% decrease in Return on Assets, while a 1% increase in the net debt to total equity ratio conduces to a 4.44% to 5.09% increase in Return on Equity. Hypothesis 1 cannot be accepted. Assets tangibility negatively affects both ROA and ROE, meaning that a 1% growth in tangibility results in a 2.34% to 2.81% decrease in Return on Assets, and a 7.41% to 7.88% decrease in Return on Equity. Hypothesis 2 is accepted (Harymawan et al., 2020). Company liquidity has a positive influence on ROA and a negative influence on ROE, meaning that hypothesis 3 is rejected. Company age positively impacts both ROA and ROE, leading to the validation of hypothesis 4 (Azeez, 2015; Sahoo et al., 2023). Return on Assets and Return on Equity are negatively influenced by the company size, and, consequently, hypothesis 5 cannot be accepted.

Moreover, CEO duality has a positive impact on ROA, meaning that when the CEO is also the Chairman, the company's performance increases. Hypothesis 6 is accepted (Azeez, 2015). Board size positively affects ROE, showing that larger boards lead to an increase in the financial performance of the companies. Hypothesis 7 is accepted (Sahoo et al., 2023). Furthermore, hypothesis 8 cannot be accepted, because the board independence does not affect ROA and ROE. Board gender diversity has a positive impact on Return on Assets and Return on Equity, validating hypothesis 9 (Boshnak et al., 2023; Sahoo et al., 2023).

Furthermore, the global financial crisis primarily negatively affected the companies' performance, while the Covid-19 pandemic crisis had a beneficial effect on the companies included in the S&P 500 Index.

5. CONCLUSION

The paper analyzed the factors influencing the performance of the non-financial companies included in the S&P 500 Index, over 20 years, from 2004 to 2023. Given that the studied period crosses two crises – the global financial crisis and the COVID-19 pandemic crisis – the attention was focused on the impact of these crises on the company's financial performance, measured by Return on Assets and Return on Equity. Therefore, in the empirical analysis, alongside variables characterizing indebtedness, tangibility, liquidity, taxation, company age and company size, there were also included indicators regarding the characteristics of corporate governance at the level of the analyzed companies. The empirical study was conducted using multiple linear regression models with unbalanced panel data, incorporating fixed effects and random effects. The results of the empirical research are mostly following the results of previous studies from the literature

review and highlight that the main independent variables which have a positive impact on the company's performance are the company age (Azeez, 2015; Sahoo et al., 2023), the board size (Sahoo et al., 2023), and the board gender diversity (Boshnak et al., 2023; Sahoo et al., 2023), while tangibility (Harymawan et al., 2020), taxation, the company size (Sahoo et al., 2023; Ullah et al., 2020), and the board meetings exert a negative influence on enterprise performance. Five of the nine proposed research hypotheses were validated. Furthermore, the global financial crisis primarily negatively affected the companies' performance, while the Covid-19 pandemic crisis had a beneficial effect on the companies included in the S&P 500 Index.

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