COMPANY VALUE AND EMPLOYEE SATISFACTION: PRIMARY DATA ANALYSIS FOR TESTING THE BASIC HYPOTHESIS "EMPLOYEE SATISFACTION HAS AN IMPACT ON THE LEVEL OF COMPANY VALUE"

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Abstract. Numerous studies and authors support the idea that there is a link between employee satisfaction and customer satisfaction, leadership, productivity, and financial results. The main hypothesis of the underlying research paper is that "Employee Satisfaction has an Impact on the Level of Company Value". Based on a deep theoretical research, a secondary data analysis from the United States and a primary data analysis from Germany, the author showed in several publications that there is a dependency between employee satisfaction and financial results, respectively company value. The company value or the value of a company can be measured by the "Equity Value". In this primary data analysis the author compared 11 companies which took part in the Great Place Contest" 2007 and 2009 or only in 2009 regarding their "Equity Values" and "Great Place to Work Scores". The figures of these companies were provided to the author in an anonymous form. The author had no influence on the number of companies the "Great Place to Work Institute" provided to him. The "Great Place to Work Institute" tried to find companies, which attended both contests and also show their financial data in the "ElektronischenBundesanzeiger". Thus, the following paper aims to foster these results with some additional primary statistical analysis for testing this hypothesis. For this investigation the author did various types of statistical analyses which seem to confirm the underlying proposition. With different types of correlation analyses the relationship between Δ Equity Value and Δ "Great Place to Work" score was elaborated. A correlation analysis has been conducted on the basis of available data. By regarding the absolute average EBIT and Equity Value of the eleven out of "100 Best Companies" some differences can be pointed out, set in comparison with 30 randomly selected companies and at the end these hypotheses can be tested with a "t-test" or a "Mann-Whitney Test".

Keywords: *employee satisfaction, equity value, correlation analysis, Mann-Whitney, t-test*

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Introduction

Numerous studies and authors support the idea that there is a link between employee satisfaction and customer satisfaction, leadership, productivity, and financial results (Heskett, J.L., Jones, T.O., Loveman,

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G.W., Sasser, W.E. Jr and Schlesinger 1994, Hurley Robert F. and Estelami Hooman, 2007). Based on a deep theoretical research, a secondary data analysis from the United States and a primary data analysis from Germany, the author showed in several publications that there is a dependency between employee satisfaction and financial results, respectively company value (Brenninger H.-J. 2011; Brenninger H.-J. 2012). Employee satisfaction can be managed (Von Rosenstiel L.2003, Malik F. 2006) and therefore also the positive effect on financial results. The secondary data analysis based on the studies from the USA especially from Ingrid Smithey Fulmer, Barry Gerhard, Kimberly S. Scott (Smithey Fulmer I., Gerhard B., Scott K. S., 2003) and Eric J. Romero, University of Texas-Pan American (Romero E. J., 2004) showed high evidence that there is a correlation between employee satisfaction and company value.

In a primary data analysis the author compared 11 companies which took part in the Great Place Contest" 2007 and 2009 or only in 2009 regarding their "Equity Values" and "Great Place to Work Scores". The figures of these companies were provided to the author in an anonymous form. The author had no influence on the number of companies the "Great Place to Work Institute" provided to him. The "Great Place to Work Institute" tried to find companies, which attended both contests and also show their financial data in the "ElektronischenBundesanzeiger". These eleven companies employ more than 1000 employees and show in sum a turnover of some 100 Mio €, meaning that the result out of these were taken out of more than 1000 questionnaires.

Summing up, it can be assessed that after comparing the results of the "Great Place to Work" contest 2007 and 2009 and after analysing the financial data of these companies, the research shows high evidence about the correlation of the level of employee satisfaction and the impact on company value.

With the additional statistical analysis the results could be fostered and the hypothesis "High degree of employee satisfaction has a high impact on the level of company value" can be confirmed.

Primary Data Analysis for Testing the Basic Hypothesis

In a first step the "Great Place to Work Scores" were collected and shown in a table.

The table below gives an overview regarding the scores of the attending eleven companies with the average score.

Table 1

Scores of attending 11 companies with average score

Company	2007	2009
1	135.48	130.68
2	133.07	152.80
3	–	129.27
4	165.92	159.38
5	130.65	150.48
6	152.35	132.08
7	112.11	152.80
8	–	134.74
9	–	138.81
10	–	122.17
11	–	126.74
Average Score	**138.26**	**139.09**

Source: Great Place to Work Contest 2007, 2009 designed by author

After the analysis one by one of these eleven companies attending the “Great Place to Work Contest” the most interesting findings can be pointed out:

- All these eleven companies have a very high employee satisfaction.
- The six companies which took part two times in this contest and reached a place under the “100 Best” are outstanding regarding their employee satisfaction.
- The average score in 2009 is higher than the average score in 2007, meaning that these eleven outstanding companies could raise their average score regarding the respective period.

In a next step, the equity value of the attending companies will be computed.

All the figures and numbers of the companies are out of the “ElektronischenBundesanzeiger”. The author received the data directly from the “Great Place to Work Institute” in an unattributed form. Because of confidentiality GPTW eliminated the names of the companies. Another issue may be that only seven of the investigated companies showed their complete financial data in the “Elektronischen-Bundesanzeiger”. Only large incorporated companies with more than 50 Mio € turnover are obliged to show their complete financial data, smaller companies have lower or no standards for disclosure.

The table below shows the EBIT’s and Equity Values of the companies, which attended the “Great Place to Work Contest”.

Table 2

Computing average EBIT and average Equity Value of the “Great Place” to Work Companies

Company	EBIT in T €		Equity Value in T €	
	2006	2008	2006	2008
1	1,436	2,140	11,091	15,507
2	–	–	–	–
3	–	–	–	–
4	1,024	1,091	7,395	7,080
5	943	1,091	6,173	6,438
6	2,422	2,178	18,615	17,036
7	14,801	15,611	79,512	92,896
8	7,926	14,242	33,079	71,204
9	3,374	3,944	22,848	25,262
10	1,866	2,415	24,199	29,103
11	–	–	–	–
Average	**3,072**	**3,883**	**18,447**	**24,048**

Source: “ElektronischerBundesanzeiger” calculated and designed by author

Some findings can be stated:

- Seven of eight Companies could raise their EBIT during the regarded period.
- Six out of eight companies could raise their equity value, as well.
- Both average EBIT (26.4%) and Equity Value (30.45%) grew during the regarded period.

In the following research “Additional Primary Statistical Analysis for Testing the Basic Hypothesis” some statistical methods are used to prove the hypotheses in an exemplary way. The results regarding employee satisfaction of the companies which took part in the contest in 2007 or in 2009 and 30 randomly selected companies are compared regarding their average EBIT and Equity Value.

Correlation Analysis for the Relationship between Equity Value and Employee Satisfaction

With different types of correlation analysis the relationship between Δ Equity Value and Δ ”Great Place to Work” score was elaborated. A correlation analysis has been conducted on the basis of available data. If raising or declining equity values as the dependent variable are in line with rising or declining of the “Great Place to Work” scores (independent variable), representing employee satisfaction, the basic hypotheses would be substantiated.

Comparing the results of the years 2007 and 2009.

Table 3

Equity Value and Δ “Great Place to Work Score”

Correlation Analysis		
Company	**Δ Equity**	**Δ Great value to work score**
1	+4,416	-4.8
4	-315	-6.54
5	+265	+19.83
6	-1,579	-20.27
7	13384	+40.69

Source: Great Place to Work Contest 2007, 2009 and “ElektronischerBundesanzeiger”, designed by author

Only five out of the eleven companies participated in both years and also show their figures in the “ElektronischenBundesanzeiger”. Therefore, only for these companies an exemplary correlation analysis can be carried out.

The analysis based on the Pearson correlation Coefficient shows the following findings:

- The correlation analysis shows significant correlation at a high significance level of $p = 0.055$ representing $1 – p = 0.945$ expected probability;
- The analysis shows a strong positive correlation of 0.792;
- The coefficient of determination r^2 shows the relative impact of the independent variable on the variation on the dependent variable;
- In our case $r^2 = 0.792^2 = 0.627$ meaning that varying levels of company value are nearly to an impact of 63% “caused” by the independent variable employee satisfaction, measured by the “Great Place to Work” score;
- Conclusion: There is a positive relationship between the variations of company value in dependence of varying employee satisfaction.

The analysis based on “Kendall Tau” and “Spearman’s Rho” correlation coefficient shows the following findings:

Both “Kendall Tau” and “Spearman’s Rho” show a very strong relationship between the “Equity Value” as the dependent variable and the “Great Place to Work” score as the independent variable, representing employee satisfaction (0.8 “Kendall’s Tau” and 0.9 “Spearman’s Rho”).

Interestingly, both significance levels are very high (0.025 and 0.019), which further confirms our basic hypothesis.

However, we have to concede that the available data only allowed for a very small sample, which may limit our findings.

Nevertheless, also our first primary analysis is in line with our conjecture that equity value maybe significanctly influenced by employee satisfaction.

Testing statistics for average EBIT and average Equity Value comparing "GPTW-Companies" and "Randomly selected Companies"

In this chapter the average EBIT and Equity values of the eleven analysed companies which attended the "Great Place to Work Contest" in 2007 or 2009 are computed. As mentioned before, the "Great Place to Work Institute" tried to find some companies which attended the "Great Place to Work Contest" in 2007 and 2009 and also show the relevant data in the "ElektronischenBundesanzeiger". Only eight of the eleven companies which attended the contest in 2007 and 2009 showed sufficient data for the analyses of EBIT and "Equity Value". The data were given to the author in an anonymous form because of data security.

Out of this data set, a comparison can be done between these eight out of the "100 Best companies" and other randomly selected companies. By regarding the absolute average EBIT and Equity Value of the eleven out of the "100 Best Companies" some differences can be pointed out, set in comparison with 30 randomly selected companies and at the end these hypotheses can be tested with a "t-test" or a "Mann-Whitney Test".

To test if there is any remarkable difference regarding EBIT and company value between the "100 Best Companies" and "Normal Companies" an additional test can be done. 30 companies which were not under the "100 Best" or did not participate in the contest were selected randomly out of the "ElektronischenBundesanzeiger".

Based on a random procedure we chose a sample of 30 companies out of the total population representing the statistical minimum sample size for statistical analysis. (Rasch D., Verdooren L.R., Growers J.I., 1999).

The author's intention is the following:

If the average EBIT and "Equity Value" of the eight "Great Place to Work Companies" should be significantly higher than the average EBIT and "Equity Value" of the remaining German Companies (represented by the randomly selected sample of 30 companies), we can postulate that this result may have been caused at least to a certain extend by higher employee satisfaction. This is the fact because the selected eleven "Great Place to Work Companies" are definitely among the best "Great Place to Work Scores (representing employee satisfaction) within a sample of some hundred companies participating in the "Great Place to Work Contest". It can be assumed that generally only these companies decided to participate in the "Great Place to Work Contest" which presumably show a higher level of employee satisfaction anyway. (Dr.Schulte-Deußen K., 2012).

Comparing average EBIT and average Equity Value

Out of the empirical investigation some results and findings have already been generated.

Table 2above shows the EBIT's and Equity Values of the companies which attended the "Great Place to Work Contest".

Now the average EBIT and Equity Value of these 30 randomly selected companies can be computed.

The table 4 shows the EBITs and Equity Values of the 30 randomly selected companies representing the whole population of German companies.

Findings:

Only slightly more than half of the 30 randomly selected companies (16) could raise their equity value during the regarded period.

There are some companies out of the randomly selected ones which show negative equity values. Theoretically that would mean that the owner of the company has to give the buyer of the company some money to get rid of it. In practice or in the Mergers & Acquisition business this would never happen. Therefore, for a realistic point of view computing average company value should be corrected while neglecting negative Equity Values.

Table 4

Average EBIT and Equity Value of 30 randomly selected companies in Germany

Company	EBIT in T €		Equity Value in T €	
	2006	2008	2006	2008
1	508	466	-16	-1,676
2	407	520	129	-1,398
3	303	126	1,968	661
4	858	338	4,423	15
5	195	61	-2,154	-4,073
6	6,046	3,310	44,628	23,322
7	-272	1,223	-3,618	5,587
8	-396	130	-2,346	-222
9	4,928	6,611	34,992	45,974
10	-15,495	-3,016	-107,686	-16,435
11	511	691	3,305	4,414
12	6,965	9,917	56,074	70,180
13	623	639	5,327	5,438
14	2,415	7,930	25,208	62,146
15	3,452	2,183	24,101	15,189
16	7,902	10,066	42,353	53,810
17	737	410	1,675	-2,170
18	4,138	3,895	25,013	28,292
19	3,803	3,694	20,289	8,784
20	885	1,145	-1,698	-1,017
21	3,678	6,340	27,180	43,299
22	614	450	2,729	2,433
23	2,090	1,068	18,130	12,182
24	624	639	5,334	5,438
25	1,382	1,220	8,260	5,501
26	823	1,058	1,103	5,370
27	4,434	1,851	41,510	27,391
28	791	1,306	3,704	5,901
29	293	347	-617	1,099
30	1,912	2,212	11,622	11,425
	1,505	2,228	9,697	13,895

Source: "ElektronischerBundesanzeiger" calculated and designed by author

Table 5

Comparison of "Great Place to Work "– and 30 Randomly Selected Companies with Correction of Negative Equity Values

	Ø EBIT in T€			Ø Equity Value in T€		
	2006		2008	2006		2008
GPTW Companies	3072	26.4%	3883	18447	30.36%	24048
30 randomly Selected	1505	48%	2228	13635	8.5%	14795
Δ	1567		1655	4812		9253

Source: "ElektronischerBundesanzeiger" calculated and designed by author

Comparing the results of the “Great Place to Work Companies” with the results of the 30 randomly selected ones, it is evident that there is a high difference, not only in the absolute amounts of average EBIT and average Equity Value , but also in the percentage of the equity value raise.

Testing Statistics for comparing different average EBIT and Equity Values with the Mann-Whitney-Test

Out of a generated data set which was processed out of these absolute figures and arranged with rank numbers a statistical Mann-Whitney- Test can be run with SPSS.

The analysis based on the Mann-Whitney-Test of the EBIT 2006 comparing the eight “Great Place to Work Companies” with the 30 randomly selected companies show the following results:

For the 2006 results there is obviously no statistical difference between the eight “Great Place to Work Companies” and the 30 randomly selected companies shown by the value for the “Asymptotic Significance” and the “Exact Significance” of 0.616 and 0.686.

From these results alone it could not be stated that “Great Place to Work Companies” are better than the randomly selected 30 companies representing the whole population.

The same procedure for 2008 shows an “improved” result in terms of “Asymptotic and Exact Significance” values of 0.122 respective 0.221.

But it still means that it cannot be stated superiority in EBIT 2008 of the eight “Great Place to Work Companies” against the randomly 30 selected companies representing the whole population.

The analysis based on the Mann-Whitney-Test “EQUITY VALUE” 2006 shows the following results:

The Mann-Whitney test procedure for the Equity Value 2006 also shows “Asymptotic Significance and Exact Significance” of 0.200 and 0.219. That means that we cannot state statistical difference even though the data set indicates an “Equity Value” advantage of the eight “Great Place to Work Companies”

The Mann-Whitney “Equity Value” test for 2008 becomes statistically much more interesting, because the “Asymptotic Significance and Exact Significance” values “improve” drastically to 0.066 respective 0.074. This means that on a p-level of about 0.07 it can be stated that there is an obvious superiority in the 2008 “Equity Value” of the eight “Great Place to Work Companies against the representative remaining 30 randomly selected companies.

Testing Statistics for comparing different average EBIT and Equity Values with the “t-test”

In the first place we conducted the Mann-Whitney-test because as a non-parametric test it does not require specific formats of statistical and empirical distributions. Even though we cannot be sure that our sample data for the eight “Great Place to Work Companies” and the sample of the 30 randomly selected companies are subject to a normal distribution.

There are some strong hints this maybe the case:

First, “Great Place to Work Company Scores” generally follow a normal distribution (www.greatplace towork.com, 2009) and secondly there is no indication that scores and values of the population of German companies do not follow a normal distribution. (www.elektronischerbundesanzeiger.de, 2011)

Therefore, we also conducted a t-test to find out whether the EBIT and “EQUITY VALUE” of the “Great Place to Work Companies” of 2006 and 2008 are higher than the EBIT and “EQUITY VALUE” of the representative sample of the 30 randomly selected companies.

Based on these assumptions the t-test shows the following findings:

- The EBIT of 2006 of the "Great Place to Work Companies" and the other 30 randomly selected companies, which represent the whole population of German companies does not show a statistical difference, meaning the 0-hypotheses of equal EBIT's cannot be rejected in this case.

The analysis based on the "t-Test" EBIT 2008 shows the following findings:

- Interestingly, for EBIT 2008 there is a significant difference between the eight "Great Place to Work Companies" and the 30 randomly selected companies on a highly significant level of 0.027.
  Therefore, it can be stated that the average EBIT 2008 of the eight "Great Place to Work Companies" is higher than the EBIT 2008 of the representative group of the 30 randomly selected companies.

The next step is to do the statistic calculation for the Equity Value of these two groups of companies.
The analysis based on the "t-Test" Equity Value 2006 shows the following findings:

- The Equity Value 2006 of the "Great Place to Work Companies" and the other 30 randomly selected companies, which represent the whole population of German companies does not show a statistical difference, meaning the 0-hypotheses of equal Equity Value's cannot be rejected.

Finally, the analysis based on the "t-Test" Equity Value 2008 shows the following findings:

- Our test procedure indicated, based on the t-value, that the 0-hypotheses (equal Equity Values) should be rejected that there is an obvious difference between the Equity Value of the eight "Great Place to Work Companies" and the 30 randomly selected companies (representing the whole population of German companies).
  However, the level of significance is relatively non-sufficient.

Comparing Average Great Place to Work Scores

Last but not least the average score of our 11 attending companies will be compared with the average score of the "100 Best" and with the average score of all attending companies, to see if there also can be some remarkable findings.

For the year 2007 the average total score of all attending companies was 115.9 and for the "100 Best" 132.7.

For the year 2009 the average total score of all attending companies was 107.2 and for the "100 Best" 128.9.

The diversification of these two years is caused by two effects. First, the Great place to Work Institute made a new calibration of their validation for the year 2009, which leads to a stricter validation. Second, there is a tendency that more companies take place in the contest knowing that they don't really have a chance. (Dr. Schulte-Deußen K., 2012)

Table 6

Comparison of average total scores and randomly selected companies

Average Score	2007	2009
11 randomly selected companies	138.26	139.09
Best 100	132.7	128.9
All attending companies	115.9	107.2
Δ Best 100	5.56	10.19
Δ 11 selected to all	22.36	31.89

Source: "Great Place to Work Institute", Dr. Schulte-Deußen K., 2012, designed by author

The table 6 shows that the eleven randomly selected companies are significantly above the average "BEST 100" scores. This is clear and evident, but very interesting is the fact that the average score of "All attending companies" and of the "Best 100 companies" declined during the regarded period, while the average "Great Place to Work–Score" of the "eleven randomly selected companies" rose during the regarded period. That may lead to the assumption that these eleven companies which are among the top 50 out of the "100 Best" could raise their employee satisfaction more than the rest and that they belong to the top rated German companies in terms of employee satisfaction.

Conclusions and Recommendations

Our primary statistical analyses have produced various complementary findings which can be pointed out as follows:

- There is a strong impact of employee satisfaction on the Equity Value in a positive way (as shown in the correlation analysis). Our sample of the eleven GPTW companies indicates that their overall employee satisfaction is higher than the average employee satisfaction within the population of German companies.
- Even though the conducted Mann-Whitney-Test and t-test procedures for EBIT and Equity Value deliver mixed results, there are some indications that the average EBIT and Equity Value of the eight (only eight out of the eleven showed sufficient financial data in the "Elektronischen-Bundesanzeiger") regarded "Great Place to Work Companies" may be significantly higher than the EBIT and Equity Value of the other 30 randomly selected companies (representing the whole population of German Companies).
- Since it can be presumed that the level of employee satisfaction within the eleven "Great Place to Work Companies" is generally higher than the level of employee satisfaction of the representative other 30 randomly selected companies we may – cum granosalis – postulate: "Increasing employee satisfaction has a positive impact on the EBIT and therefore on Equity Value"! Eventually, we have to consider that our primary analysis data set is restricted in terms of volume and sample size, which may limit our research statements and would definitely require more research based on a more voluminous data set and sample size.

The theoretical research, the secondary data analysis from the USA and the primary data analysis with the testing statistics confirm the hypothesis that "Employee Satisfaction has an Impact on the Level of Company Value". Based on this research it is recommended for managers to improve their employee satisfaction to get better results and therefore a higher equity value.

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