Online-Appendix

„Impact of CSR on Firm Performance: The Moderating Role of Family Ownership in Individualistic & Collectivistic Countries“

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Appendix

I. Industries / sectors attributing to the firms analysed for this study.

Industry / Sector / Business Classification	No. of Companies	Industry / Sector / Business Classification	No. of Companies
Advertising, Broadcasting, Entertainment & Marketing	4	Household Electronics, Appliances & Tools	7
Aerospace & Defense	5	IT Services & Consulting	11
Airlines	4	Medical Equipment, Technology, Supplies & Distribution	6
Aluminum, Iron & Steel	16	Multiline Insurance & Brokers	28
Apparel, Accessories & Footwear (Makers & Retailers)	12	Multiline Utilities	4
Brewers & Non-Alcoholic Beverages	12	Networking & (Tele)Communications	15
Computer Hardware & Electronics (Makers and Retailers)	7	Office Equipment	2
Construction, Materials, Goods, Machinery & Equipment	43	Oil & Gas Exploration, Refining & Transportation	34
Consumer Goods Conglomerates	19	Online Services	6
Consumer Lending, Finance & Investment Services	8	Paper Packaging & Products	2
Courier, Postal, Air, Marine Freight & Land-based Logistics	8	Phones & Handheld Devices	2
Diversified & Specialty Chemicals	21	Power Producers & Renewable Energy	2
Diversified Specialty Mining & Metals	5	Real Estate Rental, Development & Operations	5
Electric Utilities, Components & Equipment	20	Retail Stores and Distribution	36
Employment Services	2	Semiconductors	5
Fishing, Farming, Food Processing	18	Software	2
Healthcare & Pharmaceuticals	27	Vehicle (Car, Bikes, Truck) Makers & Retailers	36
Hospitality, Travel, Leisure & Recreation	5	**TOTAL**	**439**

Supplement I: Sector-Firm count for the empirical analysis in this study

The industry/sector is as per the company wise TRBC – Thomson Reuters Business Classifications. The data extract from Refinitiv yielded 439 firms with 92 different sectors. However, similar business classifications like 'Medical Equipment, Supplies & Distribution' and 'Advanced Medical Equipment & Technology' are clubbed together as 1 sector name 'Medical Equipment, Technology, Supplies & Distribution' to come up with a consolidated view.

II. Averages of Institutional and In-group collectivism practice as per Globe study.

Global Collectivism Practice Average (CPA) – 4.69					
Country	**CPA**	**Country**	**CPA**	**Country**	**CPA**
Australia	4.23	India	5.15	South Korea	5.37
Austria	4.57	Indonesia	5.11	Spain	4.65
Brazil	4.51	Ireland	4.89	Sweden	4.44
Canada	4.32	Italy	4.31	Switzerland	4.04
China	5.29	Japan	4.91	Taiwan	5.09
Denmark	4.17	Mexico	4.89	Thailand	4.87
Finland	4.35	Netherlands	4.08	Turkey	4.96
France	4.15	Portugal	4.72	United Kingdom	4.18
Germany	4.04	Russia	5.07	United States of America	4.23
Greece	4.26	Singapore	5.27		
Hongkong	4.73	South Africa	4.74		

Supplement II: Country-Collectivism Practice Average

Countries Belgium, Chile, Luxembourg and Norway are classified for Individualism/Collectivism by referring to the Hofstede's dimension scores.

III. Countries classified as per CPA with their respective firm count.

Country	Count	Country	Count	Country	Count
Individualistic Countries					
Australia	5	Germany	20	South Africa	1
Austria	1	Greece	2	Spain	6
Belgium	3	Ireland	2	Sweden	5
Canada	17	Italy	4	Switzerland	16
Denmark	3	Luxembourg	1	United Kingdom	13
Finland	2	Netherlands	5	USA	129
France	23	Norway	1	**TOTAL**	**259**
Collectivistic Countries					
Brazil	6	Indonesia	1	Singapore	4
Chile	4	Japan	68	South Korea	32
China	14	Mexico	9	Taiwan	8
Hongkong	9	Portugal	1	Thailand	5
India	14	Russia	3	Turkey	2
TOTAL	**180**				

Supplement III: Country-Firm Count with Individualism/Collectivism classification.

IV. A. The R Studio code:

```
## Importing the necessary libraries

library(plm)
library(tidyverse)
library(readr)
```

```
library(gplots)
library(foreign)
library(ggpubr)
library(car)
library(faraway)
library(readxl)
library(stats)
library(MASS)

## Reading and viewing the excel file from the directory
sem_data = read_excel ("Path name \\ file_name"), ## creating a variable name as sem_data
View(sem_data)

## Descriptive Statistics
summary(sem_data)

## Checking for normality assumptions of the dataset using visual method of histograms
par(mfrow = c(1, 1))
hist(sem_data$`Tobins Q`, col='steelblue', main='Financial Performance Density plot')
par(mfrow = c(1, 1))
hist(sem_data$`ESG Score`, col='steelblue', main='ESG Score Density plot')
par(mfrow = c(1, 1))
hist(sem_data$`Total Assets`, col='steelblue', main='Size Density plot')

##more histograms can be created and checked for normality assumptions.
Note: Leverage already had a normal distribution and log transformations for Leverage is not required.

## Normalizing categorical variables (variables having 0 can't be log transformed)
normalize_min_max <- function(x) {(x - min(x)) / (max(x) - min(x))}
N_Family <- normalize_min_max(sem_data$`Family Ownership Score`)
N_ESG <- normalize_min_max(sem_data$`ESG Score`)
N_CSR_Comm <- normalize_min_max(sem_data$`CSR Committee?`)
N_CSG <- normalize_min_max(sem_data$`CSR Strategy Grade`)
```

```
N_EBC <- normalize_min_max(sem_data$`ESG Based compensation?`)

## log transformation to account for normality assumptions. The variables are given short names as below. In the results section, the longer (usual) names are used for depiction. Ensuring all variables show positive values after transformations.

sem_data = sem_data %>% mutate (FP = log(`Tobins Q`) + 4, MC = log(`Market Cap`), TA = log(`Total Assets`), REV = log(Revenue), FO = N_Family, ESG = N_ESG, CSG = N_CSG, Comm = N_CSR_Comm, EBC = N_EBC, LEV = `Debt to Asset Ratio`)

##Declaring Panel Data
sem_data.pd = pdata.frame(sem_data, index = c("Company.Name", "Year"), drop.index = TRUE)

## Checking for normality assumptions of the dataset using visual method of histograms. Here log transformed histograms are checked for confirm normality
par(mfrow = c(1, 1))
hist(sem_data$FP, col='steelblue', main='Financial Performance Density plot')
par(mfrow = c(1, 1))
hist(sem_data$ESG, col='steelblue', main='ESG Score Density plot')
par(mfrow = c(1, 1))
hist(sem_data$TA, col='steelblue', main='Size Density plot')

## Checking for heterogeneity using scatter plot visual and thus a basis for panel data model
plotmeans(sem_data$FP ~ sem_data$`Company Name`, main = "Heterogeneity across Companies", data = sem_data)
plotmeans(sem_data$FP ~ sem_data$Year, main = "Heterogeneity across Time", data = sem_data)

## Checking for Multicollinearity using Linear Model for Revenue
LM = lm(REV ~ (ESG + FO + CSG + MC + TA + EBC + Comm), data = sem_data.pd)
faraway::vif(LM) ## using the Variance Inflation Factors
```

Step to remove the studentized residuals

```
residuals <- residuals(LM)
fitted_values <- fitted(LM)
residuals_sd <- sqrt(var(residuals))
studentized_residuals <- residuals / residuals_sd
abs_studentized_residuals <- abs(studentized_residuals)
residuals_df <- data.frame(ID = sem_data$`Company Name`, Time = sem_data$Year, Abs_Studentized_Residual = abs_studentized_residuals)
write.csv(residuals_df, file = "file name with the absolute studentized values", row.names = FALSE)
```

Read the Excel file with the residuals (greater than 3) removed and performs steps until the normalizations & panel data declarations

Panel data regression analysis model for Revenue with Random effects model

```
RE_sem = plm(REV ~ (ESG*FO + MC + TA + Comm + CSG + EBC), data = sem_data.pd, model = "random")
summary(RE_sem)
```

Panel data regression analysis model for Revenue with One-way fixed effects model

```
OW_sem = plm(FP ~ (ESG*FO + MC + TA + Comm + CSG + EBC), data = sem_data.pd, model = "within")
summary(OW_sem)
```

Hausman test for One-way fixed effects model

```
phtest(RE_sem, OW_sem)
```

Panel data regression analysis model for Revenue with Two-way fixed effects model

```
TW_sem = plm(FP ~ (ESG*FO + MC + TA + Comm + CSG + EBC), data = sem_data.pd, model = "within", effect = "twoways")
summary(TW_sem)
```

Hausman test for Two-way fixed effects model

```
phtest(RE_sem, TW_sem)
```

Perform the steps from removing studentized residuals for the model until the Hausman Tests with Tobin's Q Model (FP ~ (ESG*FO + MC + TA + Comm + CSG + EBC + REV + ROA + LEV))

B. Results

1. Descriptive Statistics

	Family Ownership Score	Debt to Asset Ratio	Revenue	Market Cap
Min.:	0.000	0.0000	0.2014	0.371
1st Qu.:	0.000	0.1588	14.2607	10.161
Median:	0.000	0.2500	24.7634	22.958
Mean:	0.869	0.2620	42.8350	55.060
3rd Qu.:	2.000	0.3600	47.6962	53.601
Max.:	4.000	0.9800	611.2890	2901.645

	Total Assets	Tobin's Q	CSR Strategy Score Grade
Min.:	0.983	0.01118	0.00
1st Qu.:	16.795	0.33633	2.00
Median:	34.440	0.63988	3.00
Mean:	81.302	1.04671	2.98
3rd Qu.:	75.177	1.25371	4.00
Max.:	1613.200	16.64007	4.00

	CSR Committee?	ESG Based compensation?	ESG Score
Min.:	0.0000	0.0000	1.359
1st Qu.:	1.0000	0.0000	46.574
Median:	1.0000	0.0000	59.502
Mean:	0.8301	0.3777	58.242
3rd Qu.:	1.0000	1.0000	71.187
Max.:	1.0000	1.0000	95.649

2.1. Multicollinearity test (for Historic Influence Model)

Variable	VIF Score
ESG Score	1.497591
Family Ownership	1.153214
CSR Strategy Grade Score	2.058120
Market Cap	1.718465
Total Assets	1.730672
ESG Based Compensation?	1.155615
CSR Committee?	1.705838

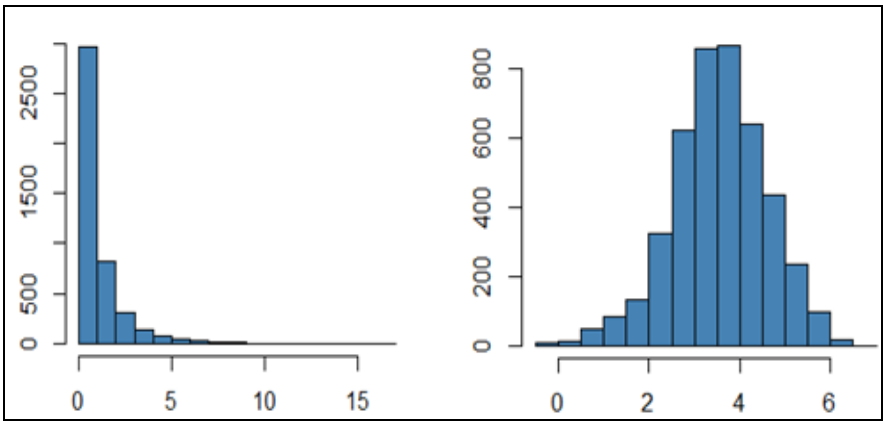
Supplement IV.B.2.1: VIF Scores for Multicollinearity test for Historic Influence Model

2.2. Multicollinearity test (for Predictive Model)

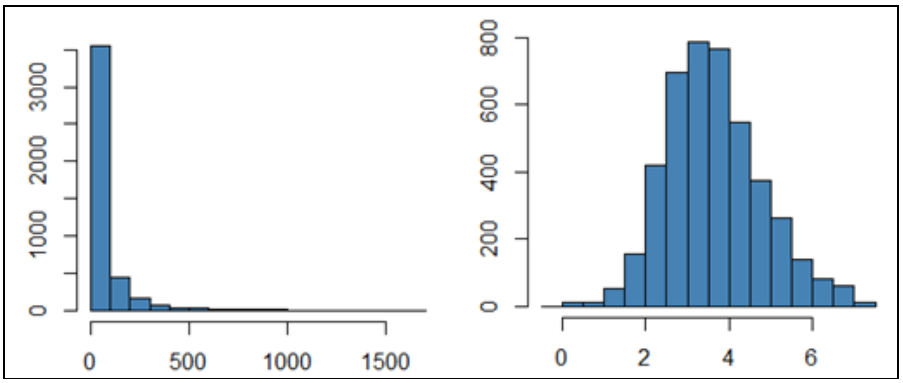
Variable	VIF Score
ESG Score	1.516362
Family Ownership	1.183610
CSR Strategy Grade Score	2.070164
Market Cap	2.730711
Total Assets	3.363965
ESG Based Compensation?	1.158447
CSR Committee?	1.730718
Revenue	2.542873
Return on Assets	1.664993
Leverage	1.039834

Supplement IV.B.2.2: VIF Scores for Multicollinearity test for Predictive Model

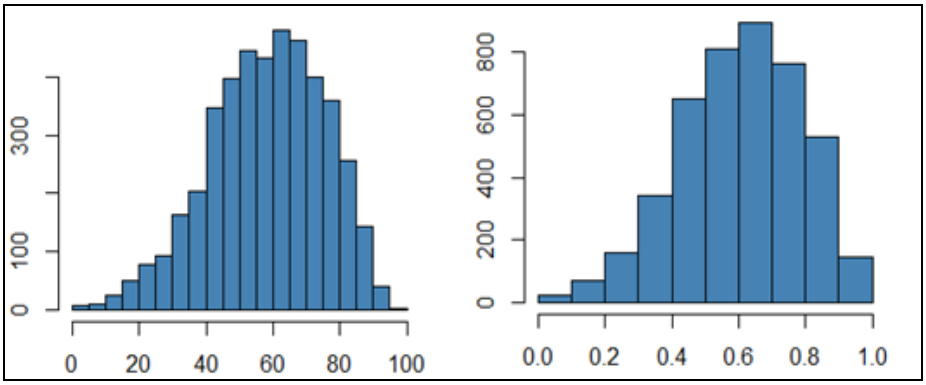
3. Checking and Confirming Normality after log transformations



Supplement IV.B.3.1: Density plots before (left) and after (right) normalization for Tobin's Q

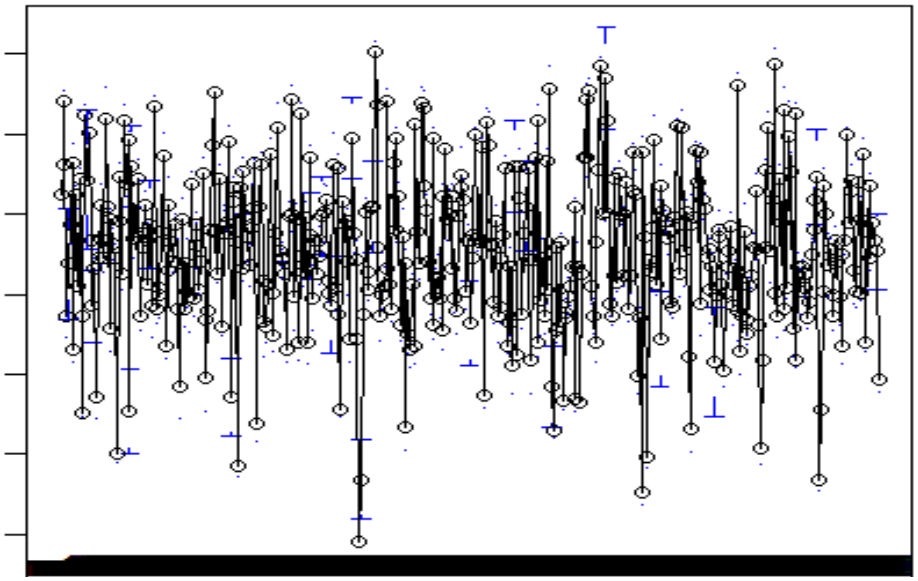


Supplement IV.B.3.2: Density plots before (left) and after (right) normalization for Total Assets

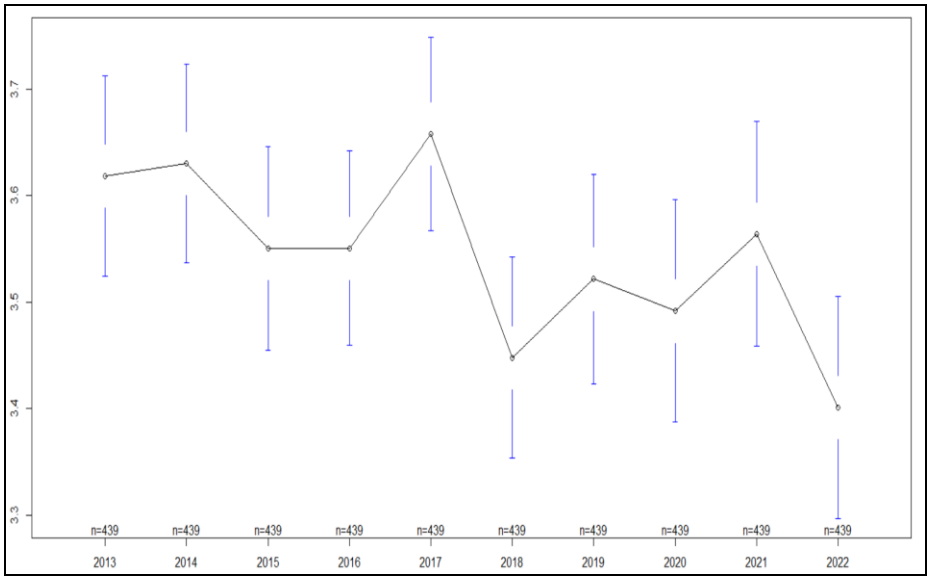


Supplement IV.B.3.3: Density plots before (left) and after (right) normalization for ESG Score

4. Checking for Heterogeneity



Supplement IV.B.4.1: Scatter plot for FP across Companies



Supplement IV.B.4.2: Scatter plot for FP across Years

5. Hausman Test results

For One-Way fixed effects (Historic Influence Model)

data: REV ~ (ESG * FO + MC + TA + Comm + CSG + EBC)
chisq = 37.854, df = 8, p-value = 8.01e-06
alternative hypothesis: one model is inconsistent

For One-Way fixed effects (Predictive Model)

data: FP ~ (ESG * FO + MC + TA + Comm + CSG + EBC + REV + ROA + LEV)
chisq = 20.325, df = 11, p-value = 0.04108
alternative hypothesis: one model is inconsistent

Click here for the link for the excel files used for the analysis.