

Data

Overview

The starting point of my data collection was the Newsweek Green Ranking which had assessed the world's largest publicly-traded companies in the US and in the world since 2009. This ranking had been developed through a collaboration between Newsweek, Corporate Knights Capital, HIP Investor Inc and leading sustainability minds from nongovernmental organizations and the academic and accounting communities. The ranking attribute an overall green score to companies. The score s based on a weighted average of key performance indicators (KPI's). This study uses these KPIs to measure both green initiatives and green performance of the 500 largest publicly-traded companies in the United States. Due to a methodology change in the 2014 Newsweek Green Rankings, only the 2014, 2015 and 2016 ranking were considered. Amongst those three ranking and of the 500 US companies, 405 companies were listed for each years.

Even though green rankings were published in 2014, 2015 and 2016, each company is evaluated based on the 2012, 2013 and 2014 data. Therefore, measures for financial performance of companies will be based on the 2012, 2013 and 2014 fundamental data. Financial data have been mainly collected on stockpup and in case of missing values I have completed with data coming from morningstar and ycharts. Of the 405 initial companies, a total of 6 companies were dropped because of missing data. The sample final includes 399 publicly-traded companies in the US covering the preiod from 2012 till 2014 inclusively.

The Table 1 contains a sample of my database. The Table 2 desribes my variables.You can notice that there are some missing values in the TobinsQ column. Indeed,compared to ROA, calculating Tobin's q requires a relatively high number of financial variables and is more susceptible to missing values. This creates a disparity among the number of observations for each dependent variables. @Delmas2015 encountered the same issue and conducted an identical analysis to check whther this introduces sample bias. Therefore I will do the same and depending on the robustness of results I will use one or two sample spaces in my study. I still need to figure out how to perform this test in R.

In the meantime, the function *pdim()* extracts the dimensions of both panel data, namely *DB_Roa* and *DB_TobinsQ*, and we can observe that both are caracterized as *unbalanced*. Indeed I had to remove some year obervations due to missing values.

```
library(plm)
# Apply pdim on the full panel data
pdim(DB_Roa)

## Unbalanced Panel: n = 399, T = 1-3, N = 1192

# Apply pdim on the panel data without missing values of TobinsQ
pdim(DB_Tobin)

## Unbalanced Panel: n = 360, T = 1-3, N = 1060
```

Table 1: Sample selection of the data base

	Companies	YearFinancialIndicator	ROA	TobinsQ
1-2013	1	2013	0.07	1.07
1-2014	1	2014	0.05	1.03
1-2015	1	2015	0.05	1.54
2-2013	2	2013	0.08	0.36
2-2014	2	2014	0.06	
2-2015	2	2015	0.06	
3-2013	3	2013	0.18	1.42
3-2014	3	2014	0.19	1.53
3-2015	3	2015	0.19	1.63
4-2013	4	2013	0.06	2.18

Dependent Variables

Independent Variables

Control Variables

Table 2: Variable Definition

	Variables	Description
1	Tobin's Q	The ratio of a firm's market value to the replacement cost of its assets
2	Return on Asset	Earnings before interest over total firm assets
3	Energy Productivity	Revenue (\$US) / Total Energy Consumption
4	Carbon Productivity	Revenue (\$US) / Total Greenhouse gas Emissions (CO2)
5	Water Productivity	Revenue (\$US) / Total water (m3)
6	Waste Productivity	Revenue (\$US) / [Total waste generated (metric tonnes)–waste recycled/reused (tones)]
7	Sustainability Pay Link	A mechanism to link the remuneration of any member of a company's senior executive team with the achievement of environmental performance targets. The existence of such a link is awarded a score of 100%. A score of 0% is attributed if there is no such mechanism in place
8	Sustainable Themed Commitment	Refers to the existence of a committee at the Board of Directors level whose mandate is related to the sustainability of the company, including but not limited to environmental matters. A score of 100% accrues to the company when such link exists and a score of 0% is attributed if there is no such link in place
9	Audit Score	Refers to the case where a company provides evidence that the latest reported environmental metrics were audited by a third party. Newsweek and their research partners award a score of 100% if such audit has been performed, and a score of 0% is given when such audit was not performed.
10	Leverage	Log of the square of the ratio of long-term debt to common shareholders' equity (shareholders equity minus preferred equity)
11	Net Margin	Log of the ratio of earnings to revenue
12	Firm Size	Log of total assets
13	Industry	Global Industry Classification Standard (GICS) of the firm. The variable take a value from 1 to 10 where 1 = Consumer Discretionary, 2 = Consumer Staples, 3 = Energy, 4 = Financials, 5 = Health Care, 6 = Industrials, 7 = Information Technology, 8 = Materials, 9 = Pharmaceuticals / Biotechnology, 10 = Telecommunication Services and 11 = Utilities