Methodology

Econometric model

Panel data is a common approach to adress the CFP-CEP nexus [@Albertini2013]. Panel data, also called longitudinal data or cross-sectional time-series data include observations on N cross section units (i.e., firms) over T time-periods [@Hsiao2007a]. As panel data analysis use variation in both these dimensions, it is considered to be one of the most efficient analytical methods for data [@DimitriosAsteriou2006]. It usually contains more degrees of freedom, less collinearity among the variables, more efficiency and more sample variability than one-dimensional method (i.e.cross-sectional data and time series data) giving a more accurate inference of the parameters estimated in the model [@Hsiao2007, @HsiaoChapitrePanelData2014]. @Roberts2013 also argued that using panel data offer a partial, but by no means complete and costless, solution to the problem of omitted variables in model, namely the most common causes of endogeneity in empirical corporate finance. Consequently this study use equation 1 to test the combined effect of process and outcome-based CEP on CFP.

$$\begin{aligned} Y_{it+1} = \quad & \beta_0 + \beta_1(SPL_{it}) \\ & + \beta_2(STC_{it}) + \beta_3(A_{it}) \\ & + \beta_4(EnP_{it}) + \beta_5(CaP_{it}) \\ & + \beta_6(WatP_{it}) + \beta_7(WastP_{it}) \\ & + (Controls_{it}) + \varepsilon_{it} \end{aligned} \tag{1}$$

where Y_{it+1} is a proxy of CFP measured as ROA or Tobin's Q, SPL_{it} is a proxy for a firm's sustainability pay link, STC_{it} is a proxy for a firm's sustainability themed commitment, A_{it} is a proxy for a firm's audit score, EP_{it} is a proxy for a firm's energy productivity, CP_{it} is a proxy for a firm's carbon productivity, $WatP_{it}$ is a proxy for a firm's water productivity, $WasP_{it}$ is a proxy for a firm's waste productivity, $Controls_{it}$ is a vector of control variables that includes firm size, industry sector, financial risk, R&D activities, advertising intensity and capital structure and lastly ε_{it} which is the error term.

Panel data setting implies that endogeneity occurs in cases where the independent variable in a regression model is correlated with the error term, or due to simultaneous causality between the dependent and the independent variable [@Sanchez-Ballesta2007, @Biorn2008, @Roberts2013]. Consequently, the presence of endogeneity implies that the fourth and fifth assumptions of OLS[1] are violated and scholars have to used a different method to produce consistent estimators [@Wooldridge2008, @Roberts2013]. Recent meta-analysis provided evidences that the CFP-CEP nexus is characterized by a bidirectional causality [@Orlitzky2001, @Orlitzky2003, @Wu2006, @Albertini2013, @Dixon-Fowler2013, @EndrikatMakingsenseconflicting2014, @Ludecadedebatenexus2014, @WangMetaAnalyticReviewCorporate2016, @Busch2018]. In order to adress potential endogeneity problems in my model, firstly, I have lagged observations in dependent and control variables one year behind financial performance. This method allows to increase the confidence of the direction of the relationship [@Hart1996, @Delmas2015, @MiroshnychenkoGreenpracticesfinancial2017] and *in fine* reduce the simultaneity bias. Secondly, given that the standard Hausman test had rejected the null hypothesis of random effect (see Annex... for results of the test) I use a fixed effect model to regress 1. According to @Roberts2013, fixed effect model ameliorate endogeneity concerns.

Sensitivity Analysis

For the sensitivity analysis, let's make as [@MiroshnychenkoGreenpracticesfinancial2017], namely take ROE as an other accounting based indicators and I need to find an other market based indicator.

[1] Five assumptions are required to produce consistent estimators with OLS : (i) a random sample of observations on y and $(x_1, ..., x_n)$, (ii) a mean zero error term, (iii) no linear relationship among the explanatory variables, (iv) an error term that is uncorrelated with each explanatory variables and (v) an error term with zero mean conditional on the explanatory variables.