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ORIGINAL ARTICLE

The Relationship between Culture, Sustainable Use of Resources, and Financial Performance: An Institutional and Natural-Resource-Based Perspective

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Abstract

Modelling a dataset of 5230 globally listed firms through two statistical approaches reflecting the primary principles of Natural-Resource-Based Theory and Institutional Theory, respectively, this study provides evidence that sustainability initiatives developed by firms are being rewarded in the form of improved Corporate Financial Performance (CFP). Culture has a significant influence on both firm sustainability performance, captured in ESG ratings, and CFP and also interacts with other variables, including industry sector and socio-economic development of a firm's markets. This study is unique in hypothesising and statistically proving that sustainability is a mechanism that activates the potential of culture to produce CFP. Natural-Resource-Based Theory (NRBT) and Institutional Theory (DiMaggio & Powell, 1983) provide complementary explanations for the relationship between the culture of a firm and its CFP being mediated by sustainability, effectively determining firms' approach to the use of their resources in a sustainable or unsustainable way. Certain relationships between culture, sustainability performance, and CFP, however, are better explained by Institutional Theory than NRBT.

Keywords: National culture, Sustainability, ESG, Resource-Based Theory, Natural-Resource-Based Theory, Institutional Theory

JEL classification: A13, M14, Q01

Introduction

How should firms deal with competing demands for short-term Corporate Financial Performance (CFP) versus their long-term commitments to people and the natural environment and simultaneously maintain a competitive advantage? Investments in sustainability are costly, and without a reasonable expectation of a return on investment, firms must evaluate whether it pays to do good (Sikacz & Wołczek, 2018). Despite the growing importance and prominence of environmental, social, and governance (ESG)

behaviour, research on the relationship between Corporate Social and Environmental performance (CSEP) and CFP has mixed results, hence creating confusion rather than reinforcing the importance of the relationship (Grewatsch & Kleindienst, 2017; Lo & Kwan, 2017).

With the profusion of studies examining the link between corporate social and financial performance, the role of culture has been largely ignored. The tensions between short-term financial performance and long-term sustainability, together with globalisation and international sales and operations by firms, raises

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questions about the role that culture plays in how firms deal with these competing demands (Kostova et al., 2008).

The study's objective was to investigate the extent to which firms approach the use of their resources in a sustainable or unsustainable way, which acts as the mechanism through which culture generates financial results.

The use of cultural definitions applied nationally at firm level is justified in several ways. First, several studies (Ho et al., 2012; Husted, 2005; Peng et al., 2012; Ringov & Zollo, 2007; Russo & Fouts, 1997; Wronski & Klann, 2020) have applied Hofstede's (1980) national culture dimensions at the firm level. Shi and Veenstra (2020) have also used Minkov's reconceptualised national culture dimensions in this way. Furthermore, with respect to the relationship between the culture of an organisation and the market in which it operates, according to Institutional Theory, organisations conform to the prevailing institutional structure of the environment in which they operate and exhibit the values and norms of their societies (Shane, 1992).

At firm-level, culture is central to sustainability for two main reasons. First, culture is an antecedent of firm sustainability performance (Ringov & Zollo, 2007), and second, the institutions and stakeholders, including customers that influence firms, may value sustainability, expressed as a firm's investment in people and the natural environment, differently, if at all (Tata & Prasad, 2015). Despite culture's influence on the relationship between firm sustainability or CSEP and CFP, it is significantly underresearched (Miska et al., 2018; Parboteeah et al., 2012). Furthermore, studies tend to lack theoretical grounding in explaining how national culture affects sustainability at the firm level (Miska et al., 2018).

This study uniquely positions a firm's investment in sustainability in the centre of the relationship between its culture and its financial performance. In so doing, the study posits, first, that the sustainability approach of firms is the mechanism or mediator through which culture produces CFP, and second, that the culture of a firm is an antecedent of sustainability actions. Consequently, sustainability is viewed as a matter of principle or through the lens of cultural values, rather than as an operations issue.

The aim of this study is to investigate the relationship between culture and sustainability practices in ensuring CFP. In light of this, the primary research question of the study is: Can NRBT and Institutional Theory provide an explanation for the relationship between culture and CFP being mediated by sustainability, that is, a firm's approach to the use of its resources in a sustainable or unsustainable way? The

following subquestions guide the objectives of the research:

1. Is a firm's sustainable use of resources influenced by the sector in which it operates and by the level of socio-economic development of its markets?
2. What is the relationship between culture and a firm's sustainable use of its resources? Put differently, can cultural differences at firm level account for varying levels of sustainability performance?
3. What is the relationship between culture and a firm's financial performance?
4. What is the relationship between a firm's sustainable use of its resources and its financial performance?
5. Does sustainability mediate the relationship between culture and financial performance, and if so, how?

1 Literature review

1.1 Theoretical explanations: Institutional Theory and Resource-Based Theory

The study draws on two theories of firm competitiveness, namely Institutional Theory (DiMaggio & Powell, 1983) and Resource-Based Theory (RBT; Barney, 1991). Both can explain how it pays to do good or how firms extract CFP from culture through their sustainability policies and practices, but for different reasons.

RBT argues that firms build competitive advantage from internal firm resources and capabilities that are valuable, rare, inimitable, and organised to enable their exploitation (Barney & Hesterly, 2012). Furthermore, the natural environment in RBT literature includes not only the earth's natural resources but resources that are related to social welfare and used in a socially responsible way (Bals & Tate, 2018; Hart & Dowell, 2010; McWilliams & Siegel, 2011). RBT views culture as an internal, intangible resource or capability for capturing value (Barney et al., 2011).

Institutional Theory describes national culture at a country level as an informal institution (North, 1990) and as a means for firms to gain legitimacy. It is suggested here that legitimacy is gained through utilising resources in a way that is valued by society, which then produces outcomes that match the values of both the firm and its stakeholders including its customers, employees, and markets. Put differently, legitimacy is achieved when the culture of the firm is aligned with or assimilates the culture

of the firm's influencing institutions. Institutional Theory may provide a fuller understanding of culture's influence on CSEP and CFP as it explains how firms assimilate the national cultures of their markets (Shane, 1992).

Acknowledging that differences in firm and context characteristics may affect the CSEP–CFP relationship and better explain it, literature has also moved from whether it pays to do good to when it pays to do good (Orlitzky et al., 2011). For example, Shi and Veenstra (2020) found evidence for the moderating effect of the national culture of firms on the strength of the relationship between CSEP and firms' CFP. Surroca et al. (2010) provided evidence rather for the mediation effect of culture. In other words, culture does not merely attenuate or amplify the strength of the relationship between CSEP and CFP but explains it. With the above two studies being among the exceptions, research has largely ignored the obvious—the pervasive influence of values in the CSEP–CFP discussion (Maurer et al., 2011; Walsh et al., 2003).

1.2 Dimensions of culture

This study applies six dimensions of Hofstede's (1980) national culture and Minkov's reconceptualisation (Minkov, 2018; Minkov et al., 2018, 2017) of Hofstede's dimensions at the firm level. These dimensions are summarised in Table 1.

1.3 Culture and Corporate Financial Performance (CFP)

Corporate Financial Performance (CFP) defines the performance of firms in clearly defined financial terms. Regarding the CFP measurement, the average percentage change in a firm's share price over five years, calculated annually, is the chosen measure of CFP for the purposes of the study for several reasons. Firstly, market-based measures and especially average percentage change in a firm's share price over five years is more suited to valuing intangible assets, such as culture and sustainability (Hillman & Keim, 2001). Secondly, market-based measures are a reflection of future, long-term financial performance that takes into account stakeholder sentiments (García et al., 2020). Thirdly, it accounts for firms' performance over five reporting years, thereby reducing the effect of economic shocks or specific events. Fourthly, this market-based measure reduces effects of manipulation that may be inherent in accounting-based measures of performance (Hillman & Keim, 2001). Finally, average percentage change in share price over five years has not been used in the reviewed literature on the relationship between CSEP and CFP. Several

authors have, however, used variations of share price performance as a proxy for CFP in the context of sustainability (Brooks & Oikonomou, 2018; Lo & Kwan, 2017).

Shi and Veenstra (2020) provide evidence that when firms engage in strategic investments consistent with the embedded cultural values of stakeholders, customers are more likely to purchase goods and services, resulting in increased CFP. In contrast, firms that make investments that clash with stakeholders' cultural values produce lower CFP. This is a result of lower organisational legitimacy and the lack of value placed in firms' misaligned investments by its stakeholders. With respect to CFP of firms generated through share value, Sultana et al. (2018) suggests that investment decisions made in selecting a share from a wide range of available stock market options is culturally derived.

1.4 Culture and Corporate Social and Environmental Performance (CSEP)

CSEP embraces each ESG pillar, namely environmental, social, and governance performance. Crittenden et al. (2011), for example, note that an array of management approaches and terms (e.g., social responsibility, corporate social responsibility, environmental responsibility, sustainability, sustainable development, green marketing, corporate citizenship, and triple bottom line) have been enacted to demonstrate firms' accountability. Husted and Milton de Sousa-Filho (2017) claim that ESG performance refers to the actual impacts and outcomes of sustainability initiatives which materialise from the projects, practices, and policies created by firms to satisfy the obligations they assume for society's benefit.

One relevant difference among countries for sustainability performance is culture (Bonera et al., 2017; Shi & Veenstra, 2020; Staiff, 2008). Several studies, most of which use some form of regression analysis, have also tested the direct relationship of Hofstede's dimensions of national culture at firm level on CSEP (Ho et al., 2012; Park et al., 2007; Peng et al., 2012; Ringov & Zollo, 2007; Vitolla et al., 2019). See Table 2.

1.5 Human Development Index and industry sector

This study investigates two variables that are hypothesised to influence sustainability performance. First, to the extent that institutional context affects CSEP and CFP, the relationship between the two is expected to vary across different economic sectors (Ait Sidhoum & Serra, 2017). As a result, this study investigates the influence of a firm's industry sector. Second,

Table 1. Investigated dimensions of culture.

Individualism vs. collectivism (IND)

In individualistic (IND) societies individuals have loose ties that often only bind an individual to their immediate family. The emphasis is on the “I” versus the “we.”

Masculinity vs. femininity (MAS)

When emotional gender roles overlap and are not polarised, society is said to be feminine, that is to say, both women and men and are supposed to be concerned with the quality of life, modesty, and tenderness (Hofstede et al., 2010, p. 140), as opposed to achievement, material rewards for success, heroism, assertiveness, and competitiveness.

Power distance (PD)

PD is defined as “the extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally” (Hofstede, 2011, p. 9).

Uncertainty avoidance (UA)

The uncertainty avoidance index reflects a society’s acceptance of ambiguity. UA is an indicator of whether people embrace or avoid the unknown, unexpected, or situations challenging the status quo.

Long-term orientation vs. short-term orientation (LTO)

Societies with a high degree in this index (long-term) regard it as a necessity to be pragmatic and adaptable to solve problems as circumstances dictate. At the same time, LTO societies display a strong tendency to invest and save, be thrifty, and persevere in achieving results (Hofstede, 1984).

Indulgence vs. restraint (INDULGE)

Indulgence is displayed in societies that allow relatively free gratification of human desires, particularly directed at having fun and enjoying life. Restraint is expressed in societies that suppress gratification of needs and control gratification through strict social norms (Hofstede, 1984).

Individualism–collectivism (INDM)

Minkov et al. (2017) reconceptualised IND–COLL by identifying at least two independent dimensions: social ascendancy and conformism. Dominant in collectivist cultures, the dimension’s conformism aspect incorporates a lack of personal space for individuals to choose which societal rules are sensible or obsolete, restrictiveness, and conflict avoidance. Societal freedom is greater in IND cultures and lesser in collectivist ones.

Monumentalism–flexibility (MON)

This dimension is a reconceptualisation of long-term orientation (LTO) (Hofstede, 2001) or Confucian work dynamism (Chinese Culture Connection, 1987). Monumentalist societies embrace the inherency of strong beliefs and values even when circumstances change and shift. Societies high in flexibility place importance on being adaptable and flexible rather than holding unalterable beliefs and values (Minkov, 2018).

previous research (Park et al., 2007; Sumantri, 2017) suggests that the socio-economic development of the market in which a firm operates will also influence this relationship. Consequently, the study adopts the United Nations Human Development Index (HDI) as a measure for the level of socio-economic development in country markets. The HDI remains a simple unweighted average of a nation’s income, education, and longevity, and is widely accepted in development discourse (United Nations, 2021).

2 Methodology

2.1 Hypotheses

The review of literature led to the development of the following hypotheses:

H1₀. *There is no statistically significant relationship between the level of socio-economic development of the market in which a firm operates and its sustainable use of resources.*

H1_a. *Socio-economic development of the market in which a firm operates has a statistically significant relationship with a firm’s sustainable use of resources.*

H2₀. *There are no statistically significant differences between the sustainability practices of different industry sectors.*

H2_a. *There are statistically significant differences between the sustainability practices of different industry sectors.*

H3₀. *From the perspective of NRBT, the sustainability practices of a firm do not mediate the relationship between culture and the financial performance of the firm.*

H3_a. *From the perspective of NRBT, the sustainability practices of a firm are a statistically significant mediator of the relationship between culture (i.e., dimensions of low power distance, low UA, individualism, femininity, LTO, indulgence, collectivism [Minkov] and monumentalism) and financial performance of the firm.*

For mediation to occur the following hypotheses are tested:

H3(i_a). *There is a statistically significant relationship between culture and firm financial performance.*

H3(ii_a). *Culture has a statistically significant relationship with a firm’s sustainability practices.*

Table 2. Comparison of findings on the relationship between CSR/CSEP and Hofstede's dimensions.

Authors	Scope	CSR issue	PD	IND	MAS	UA	LTO	IVR
Studies at the firm level								
Ringov & Zollo, 2007	Global	CSEP (Innovest ESG index)	—**	NS	—**	NS		
Vachon, 2010	Global	CSEP practices	NS	+**	NS	—**	NS	
Ho et al., 2012	Global	CSEP	+*	—*	+*	+*		
Ioannou & Serafeim, 2012	Global	CSEP (constructed index)	+***	+***				
Once & Almagtome, 2014	Global	Environmental disclosure	—**	+**			+**	
Peng et al., 2012	Global	CSR engagement (DJSI index)	—***	+**	—***	+***		
Thanetsunthorn, 2015	Asia, NZ, Aus	CSR, including employee, community, and environment (CSR Hub)	NS	—	—	+		
Maali & Al-Attar, 2017	Global	Transparency (Transparency International index)	—	NS	—	+	NS	NS
Petruzzella et al., 2017	Global	Corporate Environmental Responsibility (Thomson Reuters ESG database)	+***	NS	+***	NS	+***	
Vitolla et al., 2019	Global	Integrated Reporting Quality as a proxy for value creation	—*	—***	—	+***	+**	—***
Studies at the country level								
Husted, 2005	Global	The social and institutional capacity for environmental sustainability (Environmental Sustainability Index, ESI—WEF)	—	+	—			
Park et al., 2007	Global	Environmental Sustainability Index (WEF)	—**	NS	—*	NS		
Cox et al., 2011	Global	GDPC balanced with environmental sustainability (Weighted GDPC)	—***	+***	NS	NS		
Halkos & Skouloudis, 2017	Global	National CSR index	NS	NS	NS	—***	+**	+**

* $p < .1$; ** $p < .05$; *** $p < .01$; NS: nonsignificant.

Source: own review of research.

H3(iii_a). *There is a statistically significant relationship between the sustainability practices of a firm and its financial performance.*

H4₀. *From the perspective of Institutional Theory, the sustainability practices of a firm do not mediate the relationship between culture and the financial performance of the firm.*

H4_a. *From the perspective of Institutional Theory, the sustainability practices of a firm mediate the relationship between culture (i.e., dimensions of low power distance, low UA, individualism, femininity, LTO, indulgence, collectivism [Minkov] and monumentalism) and financial performance of the firm.*

For mediation to occur the following hypotheses are tested:

H4(i_a). *There are statistically significant differences in the financial performance of high versus low cultural groupings of firms.*

H4(ii_a). *There are statistically significant differences in the value that is placed on the sustainability practices of high versus low cultural groupings of firms.*

H4(iii_a). *There is a positive and statistically significant relationship between the sustainability practices and the financial performance of firms that have cultures highly valuing sustainability.*

H4(iv_a). *There is a positive and statistically significant relationship between the sustainability practices and the financial performance of firms that have cultures that do not value sustainability.*

In an RBT approach, the relationships under investigation were determined through logistical regression analysis; from an Institutional Theory perspective, differences in high- and low-performing groups were analysed using Analysis of Variance (ANOVA), at a significance level of 10%, followed by the Tukey test to compare the levels in the dimensions that presented a significant result at 5%.

The overall theoretical model, shown in Fig. 1, illustrates how firms' sustainable use of resources or CSEP mediates the relationship between culture and CFP.

2.2 Data collection

All firm level data, including ESG and CFP measures, were extracted from the financial services

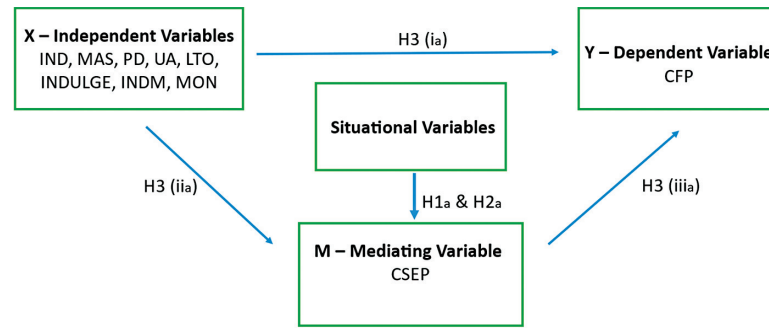


Fig. 1. Path diagram showing the arrangement of variables. Source: own construct.

company Refinitiv during 2021 (retrieved on April 10, 2021) and reflect data for the previous tax year. In addition to a range of accounting and market-based CFP measures, Refinitiv captures and calculates over 500 company-level ESG measures, of which a subset of 186 of the most comparable and material per industry constitute the overall company assessment and scoring process (Refinitiv, 2021). These are grouped into 10 categories that reformulate the environmental, social, and governance pillar scores and the final combined ESG score, which reflects the company's ESG performance, commitment, and effectiveness based on publicly reported information. The ESG scores provided by Refinitiv are claimed to be less biased as the formulation considers several control variables, such as the firm type, size, and number of employees (Refinitiv, 2021).

The Human Development Index ranking is drawn from the United Nations 2020 Human Development Report (United Nations, 2021). Hofstede cultural scores were taken from Hofstede Insights, an organisation that has merged with Itim International, The Hofstede Centre and Feedback Dialogue (Hofstede Insights, 2019). Minkov culture scores were extracted from the work of Minkov and collaborators (Minkov et al., 2018, 2017). Minkov's cultural dimension scores are on a different scale to Hofstede's (1980) cultural scores for countries. As a result, Minkov's cultural dimensions were transformed such that the values are on the same range as Hofstede's cultural dimensions. This allows for the direct comparison of Minkov's dimensions to Hofstede's dimensions.

This study includes a sample of 5230¹ listed companies with both headquarters and country of exchange based in 55 countries distributed in several sectors, including basic materials, industrials, consumer cycli-

cals, consumer non-cyclicals, financials, healthcare, and technology.

While the study has accounted for the interaction effects of co-variables such as socio-economic development and sector, the relationships between culture, sustainability, and CFP may depend on various organisational and other contingencies, such as resource slack, firm size, and the stage in the firm's life cycle, among other factors. Future studies could include these factors.

2.3 Data analysis procedure

Two modelling approaches were conducted for the two theories to explore complementarity of the theories. The first model is reflective of the principles of NRBT, and the second, which examines differences between high and low groups across the three major variables, reflects the nature of Institutional Theory's interest in groups and subgroups. See Table 3.

The NRBT mediation model was tested using regression analysis on the full dataset to determine whether, firstly, NRBT's primary tenet that firms' sustainable use of resources will produce CFP or sustainable competitive advantage (SCA) holds, and secondly, that culture is a resource to be leveraged for value capture. To create the dependent variable, the average percentage change in share price over five years was recoded into a binary variable (0 and 1), where 0 indicated that the value of the average percentage change in stock price was negative and 1 indicated that the value of the average percentage change in stock price was positive. Any company with 0% growth was excluded from this analysis. Through logistic regression, the effect of each cultural dimension in determining the probability of a firm experiencing positive growth was tested. This analysis

¹ To reflect the national culture of firms more accurately, companies whose country of origin and country of exchange were not the same were removed from the full dataset of 7333 firms. Companies for which the combined ESG score was unavailable were removed from the database. Firms based in countries that had not been rated on the chosen national cultural dimensions were also removed. To negate the issues of an imbalanced dataset, weightings were applied to the data. The weights, applied based on standard deviation, are the inverse of the variance for observations between each country (Pruzek & Frederick, 1978).

Table 3. Comparison of the models employed.

	Method	Outcome	Variables	Relationships investigated
NRBT	Regression	Evidence of a universal relationship between variables	- Independent variable: cultural dimensions IND, MAS, PD, UA, LTO, INDULGE, INDM, MON - Mediating variable: ESG - Situational variables: HDI and sector - Dependent variable: CFP	- HDI to CSEP (H1_a) - Sector to CSEP (H2_a) - Cultural dimensions to CFP (H3_i_a) - Cultural dimensions to CSEP (H3_{ii}_a) - CSEP to CFP (H3_{iii}_a)
Institutional Theory	ANOVA	Evidence of differences between high and low groups in the nuanced relationships between variables	- Covariables: cultural dimensions, ESG, HDI, and sector - Dependent variable: CFP	- Low, medium, and high cultural dimensions to low, medium, and high CFP - Low, medium, and high cultural dimensions to CSEP - High and low CSEP-valuing cultures to CFP

Source: own construct.

was also performed according to the observations by level of HDI—low or high—and by economic sector to determine whether these variables affected the results.

The Institutional Theory mediation model was tested using ANOVA on subgroups of the full dataset in accordance with Institutional Theory's assumptions, including that culture in firms across the global dataset is derived from heterogeneous, informal institutional, cultural pressures. The Institutional Theory mediation model then expects to find nuances in the relationship between culture, sustainability, and CFP among high, medium, and low cultural groups.

To determine the influence of HDI and economic sector on ESG, subgroup analysis was employed due to the nature of the data type of both the HDI variable being categorised as low or high and the categorical variable Economic Sector (Sharma et al., 1981).

The Institutional Theory mediation model was tested by first splitting each cultural dimension into three distinct categories, with the splits occurring at the 33.3rd percentile and 66.7th percentile to assess whether the relationship differed for companies with low- and high-performing cultural profiles. The percentile split was informed by the nature of the cultural dimensions being rated on a scale of 0 to 100, and to aid in the interpretation of the results (DeCoster et al., 2011). The low category included observations that fell below 33.3%, the middle category included observations that fell in the range 33.3% to 66.7%, and the high category included observations that fell above 66.7%. This analysis was performed on the full dataset and did not exclude the 0% growth in CFP as in the NRBT dataset. The confidence intervals of variables ESGCombined and CFP per cultural dimension category were determined to confirm that these confidence intervals did not overlap. Following that, ANOVA was performed, followed by Tukey's

Honestly Significant Difference (HSD) Test (Tukey, 1949), with means adjusted by the HDI2019 and ESGCombined covariates with the aid of the emmeans package (Lenth, 2021; R Core Team, 2021).

The effect of variables that define the cultural dimension of companies on company performance was analysed using a linear model with nested effects for company sector. The model is described below.

$$Y_{ijk} = \mu + \beta_i + \gamma_j + \eta_k + \delta_1 + \delta_2 + \delta_3 + \delta_4 + \delta_5 + \delta_6 + \delta_7 + \delta_8 + \delta/\eta_{1k} + \delta/\eta_{8k} + \delta/\eta_{ijk}$$

where:

Y_{ijk} = observed variable; μ = constant;

β = ESGCombined covariate;

γ = HDI2019 covariate;

η = sector effect;

δ_1 = individualism effect;

δ_2 = masculinity effect;

δ_3 = long-term orientation effect;

δ_4 = uncertainty avoidance effect;

δ_5 = indulgence effect;

δ_6 = MON effect;

δ_7 = PD effect;

δ_8 = INDM effect;

ϵ = residual with $\sim N(0, \sigma^2)$;

and nested effects.

After ANOVA, the Tukey test was performed to compare the levels in the dimensions that presented a significant result at 5%.

3 Results

Before an analysis of results according to the two approaches informed by NRBT and Institutional Theory respectively was undertaken, the hypothesised influence of socio-economic development, measured by HDI and sector, was completed. In testing for the

Table 4. Regression analysis of HDI on ESG.

Coefficients									
Model	B	SE	Beta	T	σ	95.0% CI for B		Collinearity statistics	
						Lower bound	Upper bound	Tolerance	
1	(Constant)	19.93	0.486	40.968	0	18.977	20.884		
	HDI2019	25.527	0.546	.095	46.722	24.456	26.598	1	

effects of HDI on ESG, a regression was performed, which confirmed that HDI was a positive significant predictor of ESG as a measure of sustainability. The results are depicted in Table 4.

Accordingly, the results confirm a rejection of the null hypothesis and confirmation for the alternative hypothesis (H1_a): Socio-economic development of the market in which a firm operates has a statistically significant and positive causal relationship with a firm's sustainable use of resources.

In testing for effects of sector on firms' sustainability performance, ANOVA was used to determine significant differences between sustainability practices within different industry sectors. An overall difference was found to be statistically significant, as shown in Table 5 below.

Using the Tukey test, significant differences were found between all sectors, except between consumer cyclicals and financials, where the difference was statistically insignificant.

The results entail a rejection of the null hypothesis and confirmation for the alternative hypothesis (H2_a): There are statistically significant differences between the sustainability practices of different industry sectors.

3.1 NRBT mediation model

Baron and Kenny (1986) list three conditions that must hold for mediation to exist. Condition one states that the independent variables and the proposed

mediator must each be significantly related to the dependent variable when considered separately. This condition requires that the culture variables, taken separately, and ESG each have a significant impact on CFP. Results show that this condition holds for Hofstede's dimensions but not for Minkov's.

In the first ordinary least squares regression model, all Hofstede's cultural dimensions were assessed with CFP, and all the dimensions were statistically significant. Minkov's individualism (INDM) and monumentalism (MON) were assessed with CFP, and only INDM was statistically significant. Power distance (PD), masculinity (MAS), uncertainty avoidance (UA) and indulgence (INDULGE) showed a negative relationship with performance, indicating that an increase in one of these cultural dimensions relates to a decrease in the probability of obtaining positive growth. Individualism (IND), long-term orientation (LTO), and INDM showed a positive relationship with performance, which indicates that an increase in IND, LTO, and INDM corresponds with a greater probability that the company will experience positive growth. Table 6 depicts the relationships between the cultural dimensions and CFP. While the relationships between these cultural dimensions and CFP is significant, the effect is very small or weak, indicated by OR being very close to one.

With respect to Minkov's two dimensions, only INDM was significant. MON was nonsignificant. With respect to all six of Hofstede's cultural dimensions, however, there is sufficient evidence to reject the null hypothesis and affirm the alternative hypothesis H3(i_a): There is a statistically significant relationship between culture and firm financial performance.

The second part of the first condition pertaining to the requirement of the mediator, ESG, having a significantly positive relationship with CFP, is also satisfied. It is apparent that ESGCombined is a statistically significant predictor of CFP (Wald = 536.265, $df = 1$, $\sigma = 0.000$, $\text{Exp}(B) = 1.005$). In general, the likelihood of a company having positive growth is greater as the ESGCombined score increases. The scale of increase is small, however.

Results confirm a rejection of the null hypothesis and acceptance of H3(iii_a): that there is a statistically

Table 5. ANOVA between sectors for ESG performance.

Tests of between-subjects effects				
Source	Type III sum of squares	df	Mean square	F
Corrected model	282,490.15 ^a	6	47,081.692	127.002
Intercept	283,958,787.1	1	283,958,787.1	765,974.9
Sector	282,490.15	6	47,081.692	127.002
Error	52,961,163.5	142,862	370.716	
Total	373,645,021.3	142,869		
Corrected total	53,243,653.65	142,868		

^aR squared = .005 (adjusted squared = .005).

Table 6. Logistic regression for the relationship of cultural dimensions to CFP.

		B	Wald	σ	OR	95% CI for OR	
						Lower	Upper
1	PD	−0.009	510.271	0	0.991	0.99	0.991
	IND	0.014	2050.686	0	1.014	1.013	1.015
	MAS	−0.006	382.881	0	0.994	0.994	0.995
	UA	−0.003	219.659	0	0.997	0.996	0.997
	LTO	0.006	515.909	0	1.007	1.006	1.007
	INDULGE	−0.007	235.073	0	0.993	0.992	0.994
	ESG	0.006	599.688	0	1.006	1.005	1.006
2	MON	0	0.003	0.958	1	1	1
	INDM	0.003	1453.491	0	1.003	1.003	1.003
	ESG	0.005	407.157	0	1.005	1.004	1.005

significant relationship between the sustainability practices of a firm and its financial performance.

Similarly, condition two states that the independent variables should be significantly related to the proposed mediator. In this study, it would suggest that the national culture variables should have a significant impact on ESG. In the first ordinary least squares regression model, all tested Hofstede's cultural dimensions were significantly related to ESG. Minkov's cultural dimensions MON and INDM were also both significantly related to ESG. These results can be found in Table 7. All the cultural dimensions had a positive relationship with ESG, except MAS. Masculinity had a negative relationship with ESG. The beta coefficients indicated the strongest effect on ESG for LTO (.192), UA (.175), MAS (−.154), and INDULGE (.153), with the strength of the relationship weaker for IND (.071) and PD (.054). The relationship between Minkov's dimensions (MON .023; INDM .085) and ESG was the weakest.

The results support the rejection of the null hypothesis and acceptance of the alternative hypothesis H3(ii_a): that culture has a statistically significant relationship with a firm's sustainability practices.

Table 8. Proportion of the relationship between culture and CFP mediated by sustainability.

	Model	OR	95% CI for OR		Proportion mediated
			Lower	Upper	
1	PD	0.991	0.99	0.991	0.039501
	IND	1.014	1.013	1.015	0.020568
	MAS	0.994	0.994	0.995	0.194743
	UA	0.997	0.996	0.997	0.461988
	LTO	1.007	1.006	1.007	0.120493
	INDULGE	0.993	0.992	0.994	0.167056
2	MON	1	1	1	0
	INDM	1.003	1.003	1.003	0.044586

Finally, Baron and Kenny's (1986) third condition for mediation states that the relationship between independent variables and the dependent variable should be weaker (for partial mediation) or nonsignificant (for full mediation) when the proposed mediator is included in the model than when the mediator is not included. In this study, this condition requires that the coefficients of the culture variables on CFP are significantly smaller when ESG is included in the model than when it is not included. In order to determine the extent to which sustainability mediated the relationships between culture and CFP, the indirect and direct effects were determined, and the proportion mediated was calculated. The results are depicted in Table 8. There is no generally accepted threshold to indicate what constitutes a large proportion mediated (Miočević et al., 2018). Researchers merely discuss small proportions and large proportions. However, previous studies have considered an acceptable proportion mediated at greater than .5 (Miočević et al., 2018).

The cultural dimension with the greatest proportion mediated is UA at .46198, with OR = 0.997, which indicates that the greater the level of UA, the lower the odds of the company experiencing positive financial growth. The relationships between MAS (0.19),

Table 7. Linear regression for the relationship of culture dimensions to ESG.

	Model	Unstandardized coefficients		Standardized coefficients			95.0% confidence interval for B	
		B	SE	Beta	T	σ	Lower bound	Upper bound
1	(Constant)	21.456	0.505		42.511	0	20.467	22.445
	PD	0.057	0.004	.054	15.852	0	0.05	0.064
	IND	0.049	0.003	.071	18.279	0	0.044	0.054
	MAS	−0.163	0.002	−.154	−67.834	0	−0.168	−0.158
	UA	0.158	0.002	.175	76.313	0	0.154	0.162
	LTO	0.137	0.003	.192	54.693	0	0.132	0.142
	INDULGE	0.167	0.004	.153	41.676	0	0.159	0.174
2	(Constant)	41.495	0.053		789.831	0	41.392	41.598
	MON	0.005	0	.023	11.123	0	0.004	0.006
	INDM	0.028	0.001	.085	41.649	0	0.027	0.029

INDULGE (0.17), and LTO (0.12) with CFP indicated mediation percentages below the 0.5 threshold.

Evidence indicates the **null hypothesis** (H_{30}) cannot be rejected. From the perspective of NRBT, the sustainability practices of a firm do not mediate the relationship between culture (i.e., dimensions of low power distance, low UA, individualism, femininity, LTO, indulgence, femininity [Minkov], and monumentalism) and financial performance of the firm.

3.1.1 Subgroup analysis

Following an analysis of the results for the overall mediation model, analysis for mediation was performed at a subgroup level for high and low HDI, as well as for sector.

In order to test whether HDI, as a measure of socioeconomic development of the country in which a firm operates, influences results, a median split was used to separate firms into two categories, low (.645–.926) and high (.9261–.957). A median split has been used in previous studies in order to simplify the interpretation of the analysis (DeCoster et al., 2011).

The cultural dimension that had the greatest proportion mediated overall was uncertainty avoidance at .46198. The relationships between masculinity (.19), indulgence (.16), long-term orientation (.12), power distance (.03), individualism (.02), and INDM (.04) with CFP were mediated at levels below the accepted threshold at which mediation is considered to occur. The collation of results of mediation for each cultural dimension, depicted in Table 9, shows that sustainability weakly mediated the relationship between PD and CFP; the proportion mediated was highest in high-HDI countries (.18) and in the healthcare (.34) and technology (.14) sectors. Sustainability also weakly mediated the relationship between individualism and CFP; the proportion mediated was highest in the basic materials (.18), technology (.14), and healthcare (.40) sectors. Sustainability weakly mediated the relationship between masculinity and CFP; the proportion mediated was highest in the basic materials (0.14), healthcare (0.15), and industrials (0.21) sectors. For uncertainty avoidance—the cultural dimension that had the greatest proportion

mediated—with the greater the level of UA, the lower the odds of the company experiencing positive financial growth, the mediation effect was strongest in basic materials (.23), consumer cyclicals (.51), healthcare (.46), and technology (.64). Sustainability weakly mediated the relationship between LTO and CFP; the proportion mediated was highest in high-HDI countries (.33) and the consumer cyclicals (.36), basic materials (.24), and healthcare (.32) sectors. Sustainability also weakly mediated the relationship between indulgence (INDULGE) and CFP, but for low-HDI countries ESG fully mediated the relationship between INDULGE and CFP. The proportion mediated equalled 1, indicating full mediation as the relationship between INDULGE and CFP became statistically insignificant with the addition of sustainability as a mediating variable, with $OR_{\text{mediation}} = 1$. The mediation effect was also more pronounced in the basic materials (.28) and healthcare sectors (.25). In contrast, the proportion mediated in high-HDI countries was small (.07). Sustainability weakly mediated the relationship between INDM and CFP, but the mediation effect was more emphatic in healthcare (.62) and technology (.54). Sustainability also weakly mediated the relationship between MON and CFP, but the mediation effect was noticeable in healthcare (.46) and technology (.21).

While the extent to which sustainability, measured by firms' ESG scores, explains the relationship between cultural dimensions and CFP across sectors, evidence indicates the **null hypothesis** (H_{30}) cannot be rejected: that the sustainability practices of a firm, from the perspective of NRBT, do not mediate the relationship between culture (i.e., dimensions of low power distance, low UA, individualism, femininity, LTO, indulgence, collectivism [Minkov], and monumentalism) and financial performance of the firm.

The following section summarises the eight cultural dimensions' relationships with ESG and CFP, according to the results.

Power distance (PD). Power distance (PD) showed a statistically negative relationship with CFP, which indicates that an increase in PD relates to a decrease in

Table 9. Summary of proportion mediated per cultural dimension.

	Overall	LOW HDI	HIGH HDI	BM	CON	FIN	HC	IND	CON NON	TECH
PD	.03	.09	.18	.04	.03	.01	.34	.00	.00	.14
IND	.02	.04	.01	.18	.11	.01	.40	.01	.00	.14
MAS	.19	.06	.06	.14	.27	.05	.15	.21	.01	.13
UA	.46	.17	.04	.23	.51	.02	.46	.14	.01	.64
LTO	.12	.04	.33	.24	.36	.05	.32	.07	.05	.09
INDULGE	.16	1	.07	.28	.00	.02	.25	.10	.01	.01
INDM	.04	.06	.11	.09	.10	.03	.62	.05	.00	.54
MON	0	0	.13	.04	0	.01	.46	.05	.04	.21

Table 10. Summary of relationship strength between cultural dimensions and ESG.

	Overall beta	LOW HDI	HIGH HDI	BM	CON	FIN	HC	IND	CON NON	TECH
PD	.054	−.016	−.235	.105	.11	.16	−.269	.004	.016	.279
IND	.071	.016	.043	.125	.216	−.077	−.118	.113	.01	.391
MAS	−.154	−.011	−.106	−.212	−.162	−.215	.024	−.204	−.118	−.303
UA	.175	−.009	−.104	.141	.149	.09	.151	.172	.084	.365
LTO	.192	.014	.171	.208	.083	.122	.146	.163	.178	.229
INDULGE	.153	.16	−.225	.255	−.013	.145	.131	.06	.404	−.031
INDM	.085	.004	.057	.042	.052	−.048	.079	.047	.061	.047
MON	.023	0	.065	−.005	−.001	.011	.042	.014	−.021	.032

the probability of obtaining positive financial growth (Table 6).

Sustainability weakly mediated the relationship between PD and CFP; the proportion mediated was highest in high-HDI countries (.18) and in the healthcare (.34) and technology (.14) sectors. See Table 9.

PD had a statistically significant positive relationship with ESG, but the strength of the relationship was among the weakest of the cultural dimensions (Table 7). PD's relationship with ESG was stronger and positive in technology (.279) and negative in high HDI (−.235) and healthcare (−.269). See Table 10.

Individualism (IND). Individualism (IND) showed a positive relationship with performance, which indicates that an increase in IND corresponds with a greater probability that the company will experience positive growth. IND had a statistically significant positive relationship with ESG, but the strength of the relationship was among the weakest of the cultural dimensions (Table 7). Sustainability weakly mediated the relationship between IND and CFP; the proportion mediated was highest in the basic materials (.18), technology (.14), and healthcare (.40) sectors (Table 8). IND's relationship with ESG was stronger and positive in consumer cyclicals (.216) and technology (.391). See Table 10.

Masculinity (MAS). Masculinity (MAS) showed a statistically negative relationship with CFP, which indicates that an increase in MAS relates to a decrease in the probability of obtaining positive financial growth (Table 6). Masculinity had a negative relationship with ESG. The beta coefficients indicated a relatively strong effect of MAS on ESG (−.154) (Table 7). MAS's relationship with ESG was negative across low and high-HDI countries and strongly negative in every sector, except healthcare, where the relationship was negligibly positive. See Table 10.

Sustainability weakly mediated the relationship between MAS and CFP; the proportion mediated was highest in the basic materials (.14), healthcare (.15), and industrials (.21) sectors. See Table 9.

Uncertainty avoidance (UA). Uncertainty avoidance (UA) showed a statistically negative relationship with CFP, which indicates that an increase in UA relates to a decrease in the probability of obtaining positive financial growth (Table 6). UA had a statistically significant positive relationship with ESG, and the relationship was relatively strong (.175) (Table 7). UA's relationship with ESG was positive across all sectors but negative in high-HDI countries (−.104). See Table 10. UA was the cultural dimension that had the greatest proportion mediated, at .46198, with $OR = 0.997$, which indicates that the greater the level of UA, the lower the odds of the company experiencing positive financial growth. The mediation effect was strongest in basic materials (.23), consumer cyclicals (.51), healthcare (.46), and technology (.64). See Table 8.

Long-term orientation (LTO). Long-term orientation (LTO) showed a positive relationship with performance, which indicates that an increase in LTO corresponds with a greater probability that the company will experience positive growth. LTO had a positive relationship with ESG. The beta coefficients indicated the strongest effect for LTO (.192) on ESG (Table 7). LTO was the only cultural dimension whose relationship to ESG was positive regardless of socio-economic development or sector. See Table 10. Sustainability weakly mediated the relationship between LTO and CFP; the proportion mediated was highest in high-HDI countries (.33) and the consumer cyclicals (.36), basic materials (.24), and healthcare (.32) sectors (Table 9).

Indulgence (INDULGE). Indulgence showed a statistically negative relationship with CFP, which indicates that an increase in indulgence relates to a decrease in the probability of obtaining positive financial growth (Table 6).

INDULGE had a positive relationship with ESG, and the strength of this relationship (.153) was relatively high (Table 7). INDULGE's relationship with ESG was positive overall and across sectors (the

relationship was negligibly negative for consumer cyclicals) and low-HDI countries. In stark contrast, INDULGE had a strong negative relationship with ESG in high HDI countries (−.225). See Table 9. Sustainability weakly mediated the relationship between Indulge and CFP, but for low-HDI countries ESG fully mediated the relationship between INDULGE and CFP. The proportion mediated equalled 1, indicating full mediation as the relationship between INDULGE and CFP became statistically insignificant with the addition of sustainability as a mediating variable, with $OR_{\text{mediation}} = 1$. The mediation effect was also more pronounced in basic materials (.28) and the healthcare sectors (.25). The proportion mediated in high-HDI countries was small (.07) (Table 8).

Individualism (INDM). INDM showed a positive relationship with performance, which indicates that an increase in INDM corresponds with a greater probability that the company will experience positive growth (Table 6). INDM had a positive relationship with ESG, but the strength of the relationship was relatively very weak (Table 7), showing no significant variation across sectors of low- and high-HDI countries (Table 10). Sustainability weakly mediated the relationship between INDM and CFP; the mediation effect was more emphatic in healthcare (.62) and technology (.54). See Table 8.

Monumentalism (MON). Monumentalism (MON) did not have a statistically significant relationship with CFP (Table 6). MON had a positive relationship with ESG. The relationship, however, was the weakest compared with the other cultural variables, showing no significant variation across sectors of low- and high-HDI countries (Table 10). Sustainability very weakly mediated the relationship between MON and CFP, but the mediation effect was noticeable in healthcare (.46) and technology (.21) (Table 8).

3.2 Institutional Theory model

The Institutional Theory model employed ANOVA to determine the differences between high- and low-performing cultural subgroups of the dataset. The summary of interaction effects was determined for the holistic model and is provided in Table 11.

The covariates ESG and HDI did not have an individual effect on the performance of the companies, but they did have an effect on the performance of the company in interaction with sector and culture, highlighting the role and interactive effects of significant culture dimensions in the process through which sustainability produces CFP. A significant effect was observed for interactions between $ESG \times IND \times$

Table 11. Summary of ANOVA.

	Pr(>F)	Means adjusted for
ESGCombined	0.3583	
IND	0.0000*	ESG, HDI
MAS	0.1987	
UA	0.0000*	—
LTO	0.0000*	ESG, HDI
INDULGE	0.5227	
MON	0.0000*	—
PD	0.0042*	—
INDM	0.0000*	ESG, HDI
HDI2019	0.1314	
ESGCombined:IND	0.4727	
ESGCombined:MAS	0.2374	
ESGCombined:UA	0.6605	
ESGCombined:LTO	0.0009*	ESG, HDI
ESGCombined:INDULGE	0.1585	
ESGCombined:MON	0.6632	
ESGCombined:PD	0.5646	
ESGCombined:INDM	0.0076*	ESG, HDI
IND:HDI2019	0.0046*	ESG, HDI
MAS:HDI2019	0.1153	
UA:HDI2019	0.0077*	HDI
LTO:HDI2019	0.1934	
INDULGE:HDI2019	0.5048	
MON:HDI2019	0.3361	
PD:HDI2019	0.0000*	HDI
INDM:HDI2019	0.0012*	HDI, ESG
ESGCombined:IND:Sector	0.0000*	ESG, HDI
ESGCombined:Sector:MAS	0.0691*	ESG
ESGCombined:Sector:UA	0.9575	
ESGCombined:Sector:LTO	0.1092	
ESGCombined:Sector:INDULG	0.5398	
ESGCombined:Sector:MON	0.112	
ESGCombined:Sector:PD	0.1963	
ESGCombined:Sector:INDM	0.671	
IND:Sector:HDI2019	0.0276*	ESG, HDI
Sector:MAS:HDI2019	0.3714	
Sector:UA:HDI2019	0.8649	
Sector:LTO:HDI2019	0.0126*	ESG, HDI
Sector:INDULGE:HDI2019	0.0403*	HDI
Sector:MON:HDI2019	0.294	
Sector:PD:HDI2019	0.7961	
Sector:INDM:HDI2019	0.6894	

*Significant at 5% of the error.

sector, $ESG \times MAS \times$ sector, $HDI \times IND \times$ sector, $HDI \times LTO \times$ sector, and $HDI \times INDULGE \times$ sector. In order to better understand these significant interactions, Tukey contrasts were used with means adjusted by the HDI and ESG covariates, with the aid of the emmeans statistical software package.

For the Tukey test analysis, firms in each cultural dimension were split according to high, middle, and low groups based on cultural score. The top-scoring 33 percentiles were high, percentiles 33–66 were middle, and the bottom 33 percentiles were low. Results indicated that the variables UA, PD, IND, LTO, INDM, and MON had a significant direct effect on the company's performance, addressing the relationship between culture and CFP. In order to

determine the differences in CFP between the high, middle, and low cultural groups, the dataset was also split by CFP, where group *a* represented the highest average CFP, and group *c* represented firms with the lowest average CFP. Group *b* represented firms achieving a CFP that was neither high nor low, relative to each other.

Results of the Tukey tests, which analysed significant interaction effects by sector on the adjusted CFP means of firms, fall within a relatively narrow range between 0.01% and 0.34%. The average means for the technology sector, however, ranges between 11.92% and −48.37%. The variance can be attributed to disproportionate investment money flows into the technology sector, which for the past decade have provided stock-exchange investors with the best growth opportunities. The variance is also explained in the context of the size of the firms dominating the sector, including Facebook, Amazon, Netflix, and Google.

3.2.1 Culture interaction effects

LTO and INDM had significant interaction effects with ESG in producing CFP. Moreover, the results of ANOVA in Table 11 and the subsequent Tukey tests for IND, MAS, and LTO (Table 12) show that the interaction with ESG creates significant differences in CFP between high and low groups of these dimensions. ESG performance explains the propensity for IND, MAS, and LTO to produce CFP across sectors, but it does not explain or mediate the relationships of PD, UA, INDULGE, MON, and INDM with CFP.

The results support confirmation of the null hypothesis (H_0): From the perspective of Institutional Theory, the sustainability practices of a firm do not mediate the relationship between culture (i.e., dimensions of low power distance, low UA, individualism, femininity, LTO, indulgence, femininity [Minkov], and monumentalism) and financial performance of the firm.

ANOVA, reflected in Table 11, and Tukey test in Table 13 indicated that the variables UA, PD, IND, LTO, INDM, and MON had a significant effect on CFP and that significant differences were evident in

Table 13. Tukey test showing culture as a predictor of CFP.

Level	UA	MON	PD	INDM	IND	LTO
HIGH	2.26a	−0.56b	−2.50b	−1.38a	−3.01b	−6.12c
MIDDLE	−4.89c	−0.18a	−1.19a	−2.68c	−4.97c	−0.96b
LOW	−3.61b	−5.50c	−2.54b	−2.18b	1.74a	0.83a

CFP between high and low groups of these cultures. This supports the rejection of the null hypothesis and acceptance of the alternative hypothesis $H_4(i_a)$: There are statistically significant differences in the financial performance of high versus low cultural groupings of firms.

The Tukey tests for IND, MAS, and LTO (Table 12) with means adjusted by ESG show significant differences in CFP between high and low groups of these dimensions, indicating that low and high groups perform differently with means adjusted for ESG and thus that sustainability is valued differently by low and high cultural groups. There is sufficient evidence to reject the null hypothesis and affirm the alternative hypothesis $H_4(ii_a)$: There are statistically significant differences in the value that is placed on the sustainability practices of high versus low cultural groupings of firms.

A comparison of the Tukey test results for the cultural dimensions that had significant interaction effects with ESG and sector, namely IND, MAS, and LTO (Table 12), shows that the average sum of the CFP medians, across all sectors excluding technology, varies between the high, medium, and low groups within the three cultural dimensions. When IND is high, CFP is highest (0.20). When IND is low, CFP is lowest (0.045). When MAS is high, CFP is high (0.10). When MAS is low, CFP is equally highest (0.20). When LTO is high, CFP is low (0.14), and when LTO is low, CFP is higher (0.17). This indicates that high IND places a higher value on sustainability than low IND and that low MAS places a higher value on sustainability than high MAS. Evidently, individualism is related to ESG producing CFP, and collectivism is less responsive to or valuing of ESG. In addition, low masculinity or femininity is rewarded with comparatively

Table 12. Tukey tests for IND, MAS, and LTO.

Sector	IND			MAS			LTO		
	Low	Middle	High	Low	Middle	High	Low	Middle	High
Healthcare	0.26a	0.25a	0.09b	0.17a	0.18b	0.25a	0.14a	0.22a	0.23b
Basic materials	0.34a	0.30a	0.07b	0.17a	0.22b	0.32a	0.17a	0.25a	0.29b
Financials	0.12a	0.14a	0.07b	0.08a	0.10b	0.14a	0.14a	0.06a	0.13b
Industrials	0.18a	0.19a	0.05b	0.09a	0.13b	0.20a	0.16a	0.10a	0.17b
Consumer non-cyclicals	0.22a	0.11a	0.01b	0.09a	0.07b	0.18a	0.13a	0.12a	0.09b
Consumer cyclicals	0.13a	0.16a	0.02b	0.05a	0.05b	0.16a	0.15a	0.01a	0.11b
Technology	−22.34b	−35.92b	11.92a	−0.61b	2.64a	−48.37b	−43.69b	−7.47b	4.82a

higher CFP. The differences in CFP, adjusted for ESG and HDI, between high, middle and low LTO groups is marginal overall, and the overall pattern does not hold for firms in the financial, consumer non-cyclicals, and consumer cyclicals sectors.

There is a significant relationship between high-sustainability-valuing cultures, for example, individualism in firms, and CFP. Conversely, there is a significant relationship between low-sustainability-valuing cultures, such as masculinity, and CFP. There is sufficient evidence to reject the null hypotheses and approve the alternative hypotheses:

H4(iii)_a. *There is a positive and statistically significant relationship between the sustainability practices and the financial performance of firms that have cultures highly valuing sustainability.*

H4(iv)_a. *There is a positive and statistically significant relationship between the sustainability practices and the financial performance of firms that have cultures that do not value sustainability.*

4 Discussion of results

In the process of answering the primary questions, the study has provided insights into the relationships between culture and CFP and culture and sustainability, measured by ESG.

4.1 NRBT approach

4.1.1 Socio-economic development and sector effects on sustainability

Results point to the affirmation of socio-economic development of the country in which firms operate influencing firm sustainable use of resources. In testing for the effects of HDI on ESG, the regression performed determined that HDI was a positive significant predictor of ESG sustainability ($B = 25.527$, $SE = 0.546$, $t = 46.722$, $\sigma = 0$). The strength of the relationships between the cultural dimensions and sustainability, measured by ESG, of firms operational in low- versus high-HDI countries is summarised in Table 14.

It is noteworthy that the influence of culture or the values held by societies is substantially higher on firm sustainability performance in high HDI countries. This finding supports the Kuznets effect (Özokcu & Özdemir, 2017). During earlier stages of socio-economic development in a country, for example, environmental harms are higher, but as development and affluence reach a certain point, markets place a higher value on the natural environment. The shared interest in quality-of-life enhancement, expressed as

Table 14. Beta coefficients showing comparative strength of relationships between culture and ESG for firms in high- and low-HDI countries.

	LOW	HIGH
PD	−0.016	−0.235
IND	0.016	0.043
MAS	−0.011	−0.106
UA	−0.009	−0.104
LTO	0.014	0.171
INDULGE	0.16	−0.225
INDM	0.004	0.057
MON	0	0.065

consumer demand for sustainable products and social equity, will lead to added pressure on firms to invest their resources more sustainably. The impact of indulgence (INDULGE) in firms, which is the extent to which a society allows relatively free gratification of basic and natural human desires related to enjoying life and having fun, highlights an anomaly. Firm sustainability performance is substantially lower in high-HDI than low-HDI countries that are higher in indulgence versus restraint, suggesting that societies high in indulgence (INDULGE) that are more socio-economically developed, such as the USA, in fact place a lower value on sustainability. These societies place a higher value on and have the means to give expression to freedom and gratification, unfettered by strict norms and regulations. High-HDI and high-restraint countries like South Korea, however, value sustainability more highly and exert pressure on firms to align their operations with this value. The value of sustainability is diminished or neutralised in countries which are high in restraint, China and India being examples, as a result of their lower level of socio-economic development.

The results of this study show that the value of the HDI, according to which a country can be classified on a continuum between poorly and highly developed, is significantly related to sustainability performance of firms.

4.1.2 Culture and CFP

There is a statistically significant relationship between both Hofstede's and Minkov's culture dimensions applied at firm level and CFP. The relationships between each independent variable and CFP are, however, weak. The NRBT model fails to explain the meaningful influence of culture on CFP, despite being statistically significant. The same pattern of results was evident for firms operating in countries characterised by either high or low HDI, suggesting that the relationship between culture and CFP is not influenced by levels of socio-economic development. The pattern of results also did not differ at a sectoral subgroup level, with the beta coefficient for each

significant dimension being marginal for basic materials, consumer cyclicals, consumer non-cyclicals, financials, healthcare, industrials, and technology. NRBT, in the context of the study, provides sufficient evidence of the role of culture as a resource or capability in producing SCA. It also, however, highlights the relatively weak nature of the direct relationship and indicates that the relationship between culture and CFP may not be linear.

4.2 Institutional Theory model

4.2.1 Culture and CFP

From the Institutional Theory perspective, employing ANOVA in testing uncertainty avoidance (UA), monumentalism (MON), power distance (PD), Minkov et al.'s individualism (INDM), Hofstede's individualism (IND), and long-term orientation (LTO) had a significant direct effect on CFP in the holistic model. The subsequent Tukey tests reflected CFP with means adjusted for socio-economic development, measured by HDI, and sustainability, measured by ESG. Viewing culture by disaggregating the dataset into high, middle, and low groups exposed the substantial influence of culture on CFP, which the NRBT model was unable to do. The wide variance in average CFP performance between high- and low-culture groups indicates the strength of culture's influence, interacting together with ESG and HDI on a firm's CFP measured as average percentage change in share price over five years displayed in Table 14. In the context of understanding the influence of culture on CFP, the Institutional Theory mediation model provided robust and significant outcomes. Institutional Theory's focus on how culture is created at subgroup level, and how various and specific institutions influence this, provides sustainability researchers, in particular, with a richer context through which to make analyses. The view of culture as a resource applied universally within the NRBT mediation model was less effective in explaining culture's influence. This thesis has provided pioneering evidence that culture is an antecedent of sustainability and that culture and sustainability work together or complementarily to produce CFP. Moreover, as Institutional Theory is more focussed on the levers and mechanisms around isomorphism and legitimacy than value capture, it is interesting that the analysis powerfully demonstrates gains in CFP for groups of firms that seek legitimacy by aligning their operations, and particularly sustainability performance, with the culture of their markets.

With respect to the relationship between culture and CFP, the model also showed significant interaction effects between HDI $\times$ IND $\times$ sector, HDI $\times$

Table 15. Summary of differences in relationships between high- and low-culture groups and CFP.

When ...	Is ...	CFP is ...	Variance in CFP of high and low groups
UA	High	Higher (2.26%)	5.87%
	Low	Lower (−3.61%)	
IND	Low	Higher (1.74%)	4.75%
	High	Lower (−3.01%)	
LTO	Low	Higher (0.83%)	6.95%
	High	Lower (−6.12%)	
INDM	High	Higher (−1.38%)	0.80%
	Low	Lower (−2.18%)	
MON	Low	Lower (−5.50%)	4.94%
	High	Higher (−0.56%)	
PD	Low	Lower (−2.54%)	0.04%
	High	Higher (−2.50%)	

LTO $\times$ sector, and HDI $\times$ INDULGE $\times$ sector, suggesting, in line with the regression analysis, that socio-economic level and sector are noteworthy influences on the relationship between culture and CFP.

4.2.2 Culture and sustainable use of resources

With respect to the relationship between culture and CFP, the Institutional Theory model also showed significant interaction effects between ESG $\times$ IND $\times$ sector, ESG $\times$ sector $\times$ MAS, sector $\times$ LTO $\times$ HDI, and sector $\times$ INDULGE $\times$ HDI.

For the purposes of relating culture's interaction with ESG in producing CFP, only the interactions which were significant with ESG, and reflected in the Tukey tests described in the results section, are discussed now. A summary of these is depicted in Table 16. The ANOVA highlights the significance of IND, MAS, and LTO in sustainability.

The regression analysis shows that masculinity is negatively related to ESG and does not have a statistically significant relationship with CFP. The ANOVA and subsequent Tukey test identify, in addition, that when masculinity interacts with ESG and sector, higher levels of MAS produce only half of the CFP that more feminine cultures produce. Masculinity is associated with reduced CFP with means adjusted for ESG. Evidence then supports the mediation or

Table 16. Summary of differences in relationships between high and low culture groups and CFP (extracted from Tukey tests).

When ...	Is ...	CFP, means adjusted for ESG, is ...	Average difference in CFP (means) between high and low culture groups, for all sectors except technology
IND	High	Higher (0.208)	0.163%
	Low	Lower (0.045)	
MAS	High	Lower (0.10)	0.10%
	Low	Higher (0.20)	
LTO	High	Lower (0.148)	0.022%
	Low	Higher (0.170)	

interaction effect of sustainability on the relationship between masculinity and CFP. The findings of this thesis pertaining to masculinity's negative relationship with sustainability support previous studies, including [Husted \(2005\)](#) and [Cox et al. \(2011\)](#), who found that masculine values lead to lower levels of responsiveness to environmental problems, as well as [Vachon \(2010\)](#), who linked masculinity to capitalism, which does not typically advocate social justice and environmental concern. [Sumantri \(2017\)](#) and [Tsoy and Yongqiang \(2016\)](#) found the same relationship between masculinity and sustainability at a country level, supporting the results of this thesis that cultures characterised by masculinity place less value on sustainability.

The difference in performance between high and low Individualism (IND) groups shows that when ESG interacts with IND, higher levels of IND produce significantly higher CFP than low groups. The Tukey test supports and amplifies the statistically positive relationship between IND and sustainability reflected in the regression analysis. In financials, industrials, and consumer cyclicals, the middle group performs marginally better than the high group, but the difference between the high and low groups is satisfactory proof that higher IND works with ESG to produce CFP. These findings contrast with [Ringov and Zollo \(2007\)](#) and [Park et al. \(2007\)](#), who reported no significant relationship between individualism and sustainability performance. These findings, however, support the outcomes of research by [Husted \(2005\)](#) and [Cox et al. \(2011\)](#), which found a positive relationship between higher-level individualistic culture and sustainability development performance and research, showing that individualism was related to high levels of corporate environmental disclosure ([Luo & Tang, 2016](#); [Once & Almagtome, 2014](#)). The positive relationship between individualism and sustainability or CSEP (which emphasises care for people and environment) seems paradoxical, given that individualist societies' behaviours are based on individual preferences, personal goals, motivations, and desires, which are considered more important than those of the group. The relationship may be explained, however, in individualism/collectivism scores' strong correlation with national wealth. Wealth tends to lead to individualism ([Hofstede, 2001](#), p. 253) and ensures that members of society can afford to pursue personal goals and desires—beyond more basic needs—which will include processes and products presented by firms that support sustainability, even if they are more costly. Moreover, as [Husted \(2005\)](#) noted, environmental activism might be more widespread in individualistic cultures compared to collective cultures, which suggests that individual-

istic cultures have a better social and institutional capacity to respond to environmental degradation problems.

The results presented in this thesis for individualism require specific attention, given the particular attention this dimension has received in academia and the correlations with several other conceptualisations of national culture. These include GLOBE, Trompenaars, and the World Values Survey.

For LTO in general, higher-LTO firms perform worse than low-LTO firms. From a sectoral perspective, this is evident in healthcare, basic materials, and industrials. Higher-LTO firms, however, perform better than low-LTO firms in financials, consumer cyclicals, and consumer non-cyclicals. This could be attributed to the nature of these sectors, being more competitive and accessible to scrutiny of a large percentage of stakeholders. Healthcare, basic materials, and industrials provide more specialised, primary products less prone to competitive forces that would warrant greater attention to societal perception. To complicate the relationship between LTO and CFP—taking into account the interaction of ESG—, in some instances the middle LTO group performs the worst. For example, the middle group significantly underperforms in financials, industrials, and consumer cyclicals. The underperformance of firms that are neither high nor low may indicate a misalignment between these firms' investment or non-investment in sustainable operations and the expectations of the institutions in the markets in which they operate. Firms that take neither a long-term or short-term approach give consumers and investors little incentive for support. LTO or long-termism may even be more acceptable to stakeholders expecting a short-term return than a muted or confused market strategy that is proverbially sitting on the sustainability fence and which is unlikely to produce neither solid future returns nor sterling short-term returns.

Cultural dimensions, both Hofstede's and Minkov's, were included as independent variables. While Hofstede's dimensions had statistically significant relationships with both ESG and CFP, only Minkov's individualism (INDM) was statistically significant on CFP in the regression analysis. Moreover, Minkov's dimensions showed a significantly weaker influence on ESG scores in the regression analysis. This was supported in the ANOVA, where there were no significant interaction effects with ESG on CFP. ANOVA and subsequent Tukey tests do show, however, that Minkov's INDM and MON had direct effects on CFP. In the context of the above, Minkov's dimensions may be less suited to research on culture and sustainability as Hofstede's and do not provide comparability at this stage.

4.3 NRBT and Institutional Theory models

The NRBT approach to the model, which examined relationships between the variables in the dataset through regression analysis, proved effective in determining the direct relationships between one variable and another. The model provided sufficient evidence of the influence of sector and socio-economic development on the sustainability performance of firms. Testing for mediation, it was also able to successfully calculate the proportion of the relationship between culture and CFP that was mediated by sustainability. While the calculation of odds ratios (OR) assisted in determining the degree of likelihood that the effect would produce a financial outcome in either direction, the model could not calculate or estimate the real impact of the relationships on CFP. The results pertaining to the relationship between culture and CFP, however, support RBT literature, which proposes culture as a significant internal resource that firms can leverage for SCA. The model also supports firms' sustainable use of resources, or sustainability as a resource, by proving that sustainability mediates the relationship between culture and CFP to varying degrees.

The Institutional Theory approach to the model, which examined the relationships between high and low groups of the variables in a single, integrated, and holistic model, was effective at simultaneously identifying multiple interactions between the variables on CFP impact. While more complex to interpret, the results provide a better overall perspective of the full range of culture, ESG, HDI, sector, and CFP interactions without detailing the impact of one selected variable on another.

Both approaches showed that there is a direct relationship between culture and CFP, which supports this study's unique hypothesis that sustainability can be operationalised as a mediator in the CSEP–CFP discussion. The results support the view that culture is an antecedent of sustainability and that sustainability mediates the relationship between culture and CFP.

Both approaches showed that ESG, sector, and HDI interact in producing CFP. The results also confirm the premise of Institutional Theory that firms adopt the culture of their country of operations by investing in sustainability to the extent that the institutional culture, which is also the national culture, legitimises it. Achieving legitimacy supersedes the imperative of capturing value, according to Institutional Theory. The results of the ANOVA and Tukey test, however, suggest that aligning sustainability with national culture produces financial returns too. The results confirm that certain cultures place a higher

value on sustainability than others. The regression analysis shows, for example, that higher-INDULGE and -MAS cultures have a stronger negative relationship to sustainability. The greater the level of MAS and INDULGE, the lower the odds of the company experiencing positive financial growth. The Tukey tests examining the differences in CFP of high and low groups in these two cultural dimensions show that low-INDULGE firms outperform high-INDULGE firms in low-sustainability-valuing cultures. The same pattern is maintained for low-MAS or feminine firms who significantly outperform high-MAS firms in cultures less valuing of sustainability, such as MAS cultures. The principle was observed also in cultures that place a higher value on sustainability, for example, individualistic societies, indicated by a positive relationship with ESG in the regression and mediation analyses. Firms in the high IND group substantially outperformed firms in the lower IND group. While LTO was positively related to ESG in the regression and mediation analyses, firms across high and low levels of LTO showed conflicting financial performance. It was expected that high-LTO firms would outperform low-LTO firms across the board, but this was only evident in three of the six sectors compared, namely financials, consumer non-cyclicals, and consumer cyclicals. Lower-LTO firms achieved higher financial performance in healthcare, basic materials, and industrials. This could be ascribed to the nature of products and services offered by firms. Apparently, the sectors in which individual consumers are most participative and in which firms are most publicly visible, such as financials, consumer non-cyclicals, and consumer cyclicals, are most aligned with general national cultural expectations.

The idea that culture works together with sustainability to produce firm CFP supports RBT-related work on resource complementarity. Complementarity occurs when the benefits from one resource are leveraged by the presence of another (Morgan et al., 2009). Moreover, Kozlenkova et al. (2014) assert that complementarity also applies when externally focused market-based resources are complemented by internal resources to generate greater benefits. This study finds positive synergies between cultural orientation or culture (external market-based resource) and sustainable use of resources (internal resource). Both resource intangibility and resource complementarity, in addition to the obvious benefit of producing larger synergistic effects than a single resource, make imitation more difficult for competitors because causal ambiguity exists, meaning competitors cannot easily discern which resources are responsible for generating advantages (Kozlenkova et al., 2014). As much as 70% of a firm's market value could emanate from

its intangible resources (Capraro & Srivastava, 1997), and organisational performance increasingly seems tightly connected to intangible resources. Particularly this thesis has provided evidence of complementarity between culture and sustainability.

5 Conclusion

Through the representation of two modelling approaches, namely regression and ANOVA of NRBT and Institutional Theory, respectively, this study has answered the primary research question. NRBT and Institutional Theory do not provide mutually exclusive nor superior explanations for the relationship between culture and a firm's financial performance being mediated by sustainability (i.e., its approach to the use of its resources in a sustainable or unsustainable way). Both support sustainability and its antecedent culture as means of generating either returns or legitimacy. It was initially considered that Institutional Theory would better explain the relationship between culture, sustainability, and CFP in the absence of evidence of financial returns. Institutional Theory's emphasis on firms' efforts to secure legitimacy in their markets, even at the expense of CFP, would at least show alignment between firm and national culture. The differences in relationships between the culture and sustainability of subgroups alone would have added significant value. The results of ANOVA, which was aligned with Institutional Theory's focus on how culture is manifest in or between subgroups, however, show significant evidence of CFP resulting from the relationship between culture and sustainability. Consequently, from an Institutional Theory perspective, it can be deduced that in striving for legitimacy, firms achieve CFP through sustainability, even if their primary motivation for sustainability may not have been monetary. Equally, from an NRBT perspective, firms that invest in the sustainable use of resources to achieve CFP unlock the associated resource of culture's ability to produce CFP.

A limitation of this study has been the use of two modelling approaches for the two theories. Now that the complementarity of the theories has been demonstrated, future research can build a combined and more comprehensive model and test its goodness of fit. Such future studies could also incorporate variables such as firm size, labour size, and aspects of regional and intranational cultures, which exist (Li et al., 2013). Future research could also operationalise the variables used here in more focussed studies on geographically defined samples to test the relationships investigated in specific cultural or geographic environments, which will contribute to

praxis. Finally, for effective, comparative enquiry into cross-cultural studies to be undertaken, national culture variables must become a focus of analytical interest. This will also enable corporate leaders to optimise their investments in sustainability—particularly in the burgeoning area of ESG reporting.

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