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Role Reversal! Financial Performance as an Antecedent of ESG: The Moderating Effect of Total Quality Management

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Abstract: Shifting from short-term profit maximizing strategies to more sustainable long-term ones, the corporate world has been exerting extra effort to adopt environmental, social, and governance (ESG) performances. However, the loop question remains unsolved: *is ESG financially-driven* or *is financial performance (FIN) ESG-driven?* Building on the slack resources theory and bridging three management literatures, this analysis relies on a six-year panel dataset of multinational organizations from different industries. A distributed lag regression model is proposed to empirically investigate the impact of FIN performance on ESG and to test the moderator effect of total quality management (TQM). The findings reveal a stimulus effect between free cash flow (FCF) and ESG scores. While the interaction between TQM and FCF has a negative effect on ESG, the interaction between TQM and Tobin's Q reveals a positive relationship with ESG. This study sheds further insights for both research and practice towards the operationalization of sustainability management.

Keywords: environmental; social; governance; financial performances; free cash flow; total quality management; cross-national analysis

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1. Introduction

The aftermath of the financial crisis and the recommendations of the United Nations Global Compact have been re-shaping the financial markets, entailing governmental pressure to widespread environmental and social practices [1]. Consequently, a transformational shift has been occurring in the corporate world to assess the credibility of business institutions, their dual responsibilities toward both shareholders and stakeholders, and their advocacy to incorporate environmental, social, and governance (ESG) performances [2,3]. However, the ambiguity of this metamorphosis remains in identifying the prevailing dynamics or factors behind integrating "green" practices [4]. Practitioners and scholars in the field are still in search of the "building blocks" of sustainability practices to enhance ESG mechanisms. For instance, sustainability development is both perceived as a framework of three pillars (i.e., economic, environmental, and social) and as an "object of standardization" of management systems [5].

Over the last few decades, organizational responsibilities have been widening their targets to tackle a broader spectrum of goals, combining both financial and non-financial activities [6]. Large firms have been exerting extra effort to adopt sustainable practices and implement waste and pollution reduction management [7], as a tool to improve their societal behaviors and public image [8]. Moreover, through corporate social responsibility (CSR), companies have been actively and voluntarily engaged to contribute to a better community and ecosystem, as they attempt to engender a continuous dialogue among stakeholders to address the three pillars of sustainability [9]. To start with defining ESG,

prior studies describe it as non-financial performance, engendering environmental activities (ENV) i.e., efficient energy consumption and resources allocation [10,11]; social activities (SOC) i.e., employee motivation, labor welfare, organization–employee bonding [12,13]; customers' valuation and brand recognition [14,15]; and, last but not least, governance activities (GOV) related to regulatory obligation towards the society and good corporate performances [16,17].

Given the lack of conclusive findings and consensus among scholars, the ongoing debate on the nexus between ESG and financial performance (FIN) remains unsolved [18,19]. While Horváthová (2010) and Wright and Ferris (1997) [20,21] reveal a negative relationship between ESG and FIN performances, other studies indicate a catalyst effect (i.e., positive) [22,23] or non-significant effect [24,25]. Another controversy is the direction of the association between ESG and FIN: are ESG performances financially-driven or are financial performances ESG-driven [26,27]? Accordingly, there is no confirming statement clarifying whether "doing well" enables "doing good" [28]. In other words, as questioned by Peloza (2009) [29] (p.1520), he highlights a skeptical view in this regard as "do organizations that are more profitable engage in corporate social performance (CSP) or do organizations that engage in CSP become more profitable?" In the same vein, Aragón-Correa and Sharma (2003) [30] suggest that including moderators or mediators would enhance the investigation of the FIN-ESG association.

This study intends to examine the effect of FIN on ESG scores, including total quality management (TQM) as a moderator of this association. We engage in an empirical approach to tackle the emerging trend of analyzing the dual effect of financial performance and organizational standardization management systems on ESG. The sample of this study consists of 2087 multinational companies operating in more than 20 industries and located in Europe (EU), the United States (US), and Asia. The panel dataset consists of a six-year period from 2012 to 2018, taking into account the time factor and the moderating effect of TQM. Therefore, a distributed lag regression model is proposed to assess, empirically, the firm´s liquidity measured by cash generating efficiency as free cash flow (FCF) on ESG. We hypothesize that firms that are doing "financially good" (i.e., higher FCF) are doing "environmentally and socially good" (i.e., higher ESG scores). Financial achievements (as increased profitability, higher revenues, and net income) are perceived as pre-requisites or antecedents of ESG adoption. Economic success might enable the firm to dedicate and allocate a budget for ESG investments; therefore, it improves its sustainable practices toward both shareholders´ value and stakeholders´ wealth.

To elaborate on the rationale behind the moderator effect, TQM is perceived as one main component of lean management revealing potential implications for organizational practices [31]. In this study, TQM is measured by the International Organization of Standardization ISO 9000 certification [32]. ISO 9000 quality standards were fated to be perceived as a leading benchmark, issued in more than 160 countries. Schwartz and Tilling (2009) [5] describe the adoption of management standards as a "process" and a "legitimizing" component of responsible firms. European countries, followed by the US and China, show an incremental increase in the adoption rate of ISO certification [33]. While the motives behind implementing ISO (both ISO 9000 and/or ISO 14000) might vary among countries, the common aim converges toward quality and environmental management [34]. It was described as "tangible proof" providing evidence of the organization´s capacity to efficiently and effectively manage resources, taking into account stakeholders' satisfaction [35]. Prior studies claim that "lean" and "green" congregate toward the same targets, as they both incorporate waste reduction techniques and efficiency strategies [36,37]. These two concepts are perceived as a "dual" means to "one" end. Many articles consider social responsibility practices and quality management practices to be two sides of the same coin [38,39]. TQM models and change management programs enable the effective implementation and incorporation of sustainability initiatives within organizations [40]. Likewise, higher social standards and transparency can be achieved as a result of TQM implementation [41]. It helps in creating a corporate culture that fosters social

responsibility and ethical behavior [42], and allows firms to better serve their members and communities [43]. Organizations implementing TQM go through changes in their organizational culture, which makes them better equipped to implement ecological and social initiatives [40].

The motivation of this research is to contribute to the ongoing debate about FIN-ESG link and to investigate how ISO 9000 certification might impact this association. The FIN-ESG link can be described as a continuous "virtuous" cycle [44] (p. 334). However, we anticipate that the starting point is the FIN performance, which is considered as a "slack resource" to achieve a "collective" goal (i.e., adoption, investment, and engagement in ESG practices). It attempts to combine finance, sustainability, and operations management disciplines. Prior research relies mainly on market-based and/or accounting-based financial indicators, such as return on assets (ROA), return on equity (ROE), and Tobin´s Q [7,45]. For instance, in their research, Aguilera-Caracuel et al., (2013) [44] used the ratio of current assets divided by current liabilities as a measure of slack financial resources. Al-Tuwaijri et al., (2004) [46] highlight some limitations of the aforementioned measures, indicating an issue of bias when the sample consists of firms from multi-industries. Accounting-based financial measures indicate internal assessment of managerial and decision-making capabilities rather than external market evaluation of the organization [47]. Therefore, to mitigate and overcome these limitations, this analysis relies on an alternative measure of FIN as FCF, reflecting the liquidity effect of the organization on ESG investments. Previous studies document significant association between cash flow and organizations´ investment expenditure [48,49]. To handle some issues related to the valuation of intangible assets [50], Tobin´s Q has been included in this analysis to reflect the inherent value of the firm. Using a market-based indicator, Tobin´s Q is considered to be the most recommended metric for long-term financial performance, capturing the market valuation of future cash flow prospects [51].

Moreover, some studies are identified in the literature that are based on single-country samples such as the US [52], the United Kingdom (UK) [25], Germany [53], and Australia [54]. In addition, while the bulk of the literature relies on the Kinder, Lydenberg, Domini (KLD) index, this study uses Thomson Reuters Eikon as a measure of ESG. Some critics emerged regarding the GOV score of KLD, as the lack of a robust evaluation and the limitation of assessment factors [54]. In the same vein, few studies investigate the FIN-ESG association taking into account, simultaneously, the ESG overall score and segregate dimension, separately. For instance, among the three dimensions, environmental performance has been widely explored by scholars [55,56]; whereas, the other two dimensions of ESG have received less attention. As perceived mutually inclusive [54], the examination of all the dimensions simultaneously enhance the assessment of the "global" and "segregate" effect of ESG.

The structure of this study is presented as follow. The second section consists of the review of the literature and hypotheses formulation. Section three comprises the methodological framework and descriptive analysis. The results of the regression estimation, moderator effect, and cross-national analysis are discussed in section four. Lastly, section five highlights the conclusions and limitations of the study.

2. Literature Review

The nexus between financial and sustainability practices is influenced by a myriad of inter- and intra-organizational dynamics (i.e., sector, economic context, company size, board of directors, governmental regulation, and country policies) [29]. While the foundational components of FIN performances are dedicated to maximize profitability and shareholder´s value, the pillars of ESG practice comprise a wider set of societal responsibilities towards the ecosystem and public communities. Based on the "Investor Revolution", a study published by Harvard Business Review, ESG performance is considered to be a "top priority" action according to 70 senior leaders from 43 multinational investing companies [57]. Despite that, sustainability engagement may implicitly engender some

agency costs perceived as "unfavorable spending" going against stockholders' desires [22]. The skeptical decision-making among practitioners, portfolio analysts, and investors emphasizes the payback of "doing good". As stated by Eccles and Klimenko (2019) [57], the perception toward sustainability investments is that "ESG just hasn't gone mainstream in the investment community".

2.1. Theoretical Framework

According to the founder of the shareholder theory, Milton Friedman (1970) [58] explicitly states that any societal or environmental engagement induces extra expenses and consequently, these additional costs might reduce the economic or financial value of the company. Kim and Lyon (2015) [59] consider that environmental practices should be imposed as an "obligatory paradigm" among organizations. Since they are perceived as costly investments that most probably would not generate any profit, they tend to be avoided. From a different perspective, according to McWilliams and Siegel (2001) [60], the interaction between sustainability and FIN performances is perceived as a "neutral" or "break-even" effect, as the "incurred cost" and the "generated profit" of non-financial activities are counterbalanced under market equilibrium. As for the premises of the stakeholder theory, Edward Freeman (1984) [15] claims a synergetic relationship between environmental performances, social engagement, and financial achievements. The rationale behind this positive association is due to improved market competitiveness, decreased transaction costs, and cohesive interaction among the stakeholders' network, entailing a higher overall firm performance [61,62].

In this study, the line of analysis is developed under the scope of slack resources theory. Slack resources can comprise a wide range of a firm´s assets including economic, human, strategic, and managerial capitals [63]. Availability of slack resources enables organizations to engage more easily in extra activities such as research and development projects, and similarly in sustainability practices [64]. The slack resources paradigm deeply supports the fact that financial resources [65] (Kraatz and Zajac, 2001), as a tool for slack availability, enhance environmental and social performances [27,63]. The interconnection between resources slack and sustainability is described as an exponential association [65]. While Shahzad et al., (2016) [66] describe financial capital as a "key driver" for social practices in an organization to accomplish stakeholders' interest, McGuire et al., (1988) [67] perceive corporate financial status as "predictors" of ESG performances.

2.2. Financial Status: Catalyst of ESG Performance

While most prior studies address the association or the cause and effect between ESG and FIN performance [53,68,69], Hang et al., (2017) [70] and Preston and O´Bannon (1997) [71] highlight the scarcity of studies examining the reversed association. Some of the studies that are identified in the literature, investigate the effect of FIN on ESG: in France, Spain, and Japan [63]; in the US [52]; and in the Canadian context [72]. Following slack resources premises, the willingness of a firm to tackle stakeholders´ pressure varies relative to its financial situation and strategic positioning [73]. Companies with good financial status tend to widen their spectrum of investments due to accessibility and abundance of resources [26,74]. Hence, they are more willing and capable to engage in environmental and social practices [75]. Conversely, organizations with financial scarcity and unstable profitability tend to prioritize financially-oriented goals and shareholders' interests [52]. From the shareholders´ perspective, ESG performance is not classified as a necessity or compulsory action. As described by Schaltegger and Synnestvedt (2002) [76], sustainability performances are perceived as a "luxury" good, requiring a certain degree of financial flexibility. Thus, not until a specific threshold of financial performance is achieved, do organizations invest in ESG activities.

Perceived as a discretionary financial slack, Seifert et al., (2004) [77] provide evidence revealing a significant association between cash flow and corporate philanthropy. Shahzad et al., (2016) [66] show a positive effect of financial slacks on charitable and social

activities in the US context. Therefore, we anticipate that FCF (current and one-year lag) positively influences ESG practices. Firm´s cash flow is described as the "driver" behind higher ESG performance. In financial market analysis, a firm´s valuation (i.e., Tobin´s Q) is based on prospect profitability, providing an unbiased measure of the present value of discounted cash flow [78]. According to prior studies, firm market valuation has been commonly associated with firm profitability. Hence, Tobin´s Q (current and one-year lag), as a market-based financial indicator for firm value, is included in the analysis [53,77]. We anticipate that organizations with higher market value achieve higher profitability; thus, they tend to have higher ESG scores [69]. Based on the aforementioned literature, the following hypotheses are formulated:

Hypotheses 1 (H1). *FCF is positively and significantly associated with ESG scores.*

Hypotheses 2 (H2). *Tobin's Q is positively and significantly associated with ESG scores.*

2.3. Moderator Effect: Total Quality Management TQM

TQM is an established management philosophy that aims to increase organizations´ profitability and productivity by integrating all internal functions in order to continuously improve system quality and deliver superior value [79,80]. It is a managerial tool that seeks to prevent rather than detect defects, by allowing managers and employees to continuously improve the value adding processes within the organization [81,82]. In fact, prior empirical studies conducted in different industries and countries highlight a positive and significant relationship between TQM and performance [83,84]. Given that, ISO 9000 certification has been commonly used as a proxy of TQM [32,85]. It identifies regulatory requirements that will enable organizations to meet quality standards [86]. These practices aid the development of environmental management and socially responsible activities [87,88]. Molina-Azorín et al., (2009) [89] state that quality management´s aim of zero defects is closely related to environmental management´s goal of no waste. In addition, some studies show that quality management facilitates the implementation of environmental management initiatives [90,91]. However, the controversy remains in assessing the outcome of implementing TQM and estimating its effects on the financial situation and value of the firm [92].

While the bulk of the literature widely assesses the effect of environmental management systems on organizational performance (ISO 14,001 and ISO 26000) [5,93], we mainly investigate the "quality factor" (ISO 9000) on the FIN-ESG interconnection. We consider that this would have a higher implication in the field, since environmental standards might have a cofounding effect with ESG indicators. On the one hand, quality management could be perceived as an alternative tool of cash resources in terms of ESG performance. Organizations with ISO 9000 certification might benefit from the role of TQM and diminish their reliance on FCF to improve their ESG scores. Moreover, TQM qualification induces some costs and requires capital investments (i.e., training and information costs, measurement systems, and certification) [92]; this might generate a negative effect on the FCF-ESG nexus [32], at least on the short-run. This negative association may be described as an "opportunity cost" as organizations allocate a certain budget for TQM implementation instead of ESG investments. On the other hand, TQM is perceived as a "competitive advantage" enhancing firm profitability, stock returns, and firm´s market value [92,94]; thus, it is anticipated to reveal a positive effect on Tobin´s Q-ESG link. Based on the literature described above, the following hypotheses are formulated:

Hypotheses 3 (H3). *TQM negatively moderates the relationship between FCF and ESG.*

Hypotheses 4 (H4). *TQM positively moderates the relationship between Tobin´s Q and ESG.*

Figure A1 displays the model of the study and the formulated hypotheses.

3. Methodological Framework

The following section consists of the sample of the study, research design, and descriptive analysis.

3.1. Sample and Definition of the Variables

Since 2002, Thomson Reuters ESG assessment has been commonly used in the literature to evaluate firms´ performance taking into account a set of social and environmental issues [95]. After acquiring Asset4 in 2009, the screening process and the ESG ratings have been revealing some improvement. Thomson Reuters provides ESG scoring for over 6000 companies relying on more than 400 metrics and comprehensive indicators. Recently, financial analysts and investors have been extensively adopting these indices as benchmarks for ESG practices and financial market comparison [95]. Using Thomson Reuters Eikon database [96], the sample of this study relies on the top 3000 ranked companies based on their market capitalization from 2012 to 2018. Organizations that only have up to two years of reported ESG scores are removed from the dataset. However, due to some missing information, the final sample used to perform the regression analysis, consists of 1115 firms and 6690 firm-year observations. Table 1 provides information about the variables used in the empirical analysis.

Table 1. Summary of the measures and variables of the study.

Name	Abbreviation	Measures: Panel Data (from 2012 to 2018)
	Dependent Variables	
Environmental score	ENV	3 environmental practices: resource management and use (20 parameters with 11% weight); emissions (22 parameters with 12% weight); innovation (19 parameters with 11% weight). Continuous variable between 0 and 100.
Social score	SOC	4 societal practices: workforce (29 parameters with 16% weight); human rights (8 parameters with 4.5%weight); community (14 parameters with 8% weight); product responsibility (12 parameters with 7% weight). Continuous variable between 0 and 100.
Governance score	GOV	3 corporate governance practices: management (34 parameters with 19% weight); shareholders (12 parameters with 7%weight); CSR strategy (8 parameters with 4.5% weight). Continuous variable between 0 and 100.
Overall ESG score	ESG	An overall score of environmental, social and corporate governance performance. Continuous variable between 0 and 100.
	Independent Variables	
Free cash flow	FCF*(t)*	Measure of financial performance: operating cash flow less capital expenditures.
One-year lag free cash flow	FCF$(t-1)$	
Tobin´s Q	Tobin´s Q*(t)*	Market-based financial measure: the total market value divided by the total asset value.
One-year lag Tobin´s Q	Tobin´s Q$(t-1)$	
	Moderator	
Total quality management	TQM	A dichotomous variable:1 if the firm has ISO 9000 certification; 0 otherwise.
	Control Variables	
Firm´s size	SIZE	Total assets of the firm
Beta	BETA	A measure of stock volatility and firm riskiness.

Table 1. *Cont.*

Name	Abbreviation	Measures: Panel Data (from 2012 to 2018)
	Fixed effects	
Year	Year	Dummies for each year from 2012 to 2018
Country	Country	Dummies for each of the 23 countries: Austria, Belgium, Canada, China, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, Norway, Poland, Portugal, Russia, Spain, Switzerland, Sweden, United Kingdom UK, and US.
Industry	Industry	Dummies for each industry, as example: banking and investment services, real estate, chemicals, food and beverages, retailers, telecommunications, utilities, automobiles, etc.

Note: the calculation and explanation of the parameters for each ESG dimension and overall ESG score are based on the definition provided by Thomson Reuters Eikon database.

3.2. Research Design

A distributed lag regression model is suggested to test the formulated hypotheses and to provide statistical evidence on the association between FIN performance and ESG. It is perceived as a well-established tool when the estimation model includes multiple variables [97], investigates an interaction effect (i.e., moderator) [98], and for time series or panel data. The lag model specification is considered as a dynamic approach, considering the time factor and tracing the correlation between ESG and lag of FIN variables. As the impact of FIN performance on ESG scores might not be translated immediately, current *(t)* and one-year lagged $(t-1)$ of FCF and Tobin´s Q are included in the equation models (sub-equations are conducted for each dimension of the ESG score) Equations (A1) and (A2). To run the estimations, the integrated software package STATA (version 14.2) is used to perform the statistical analysis. Panel regression analysis is conducted using fixed effects method for both estimations. For robustness check, ordinary least square (OLS) method is performed (Appendix A) using random effects for Equation (A1) (including dummy variables for industry, country, and year).

3.3. Control Variables and Descriptive Statistics

According to prior studies, the control variables that are commonly identified in the assessment of the FIN-ESG nexus are firm risk, size, research and development (R&D), and industry [72,99]. Waddock and Graves (1997) [28] indicate that there is a different "comportment" between large and small organizations in terms of prosocial engagement and behaviors. Hence, smaller companies might exhibit less interest toward ESG performances and rather focus on financial and market survival. As for firm's riskiness, Roberts (1992) [100] claim that low-risk organizations are perceived to have a certain level of stability, which enhances their environmental and social practices. Due to limited data availability of R&D variables, only total assets (SIZE) and beta factor (BETA) are used as proxies to measure firm's size and firm´s riskiness, respectively. We anticipate that larger organizations with low level of risk tend to exhibit higher ESG performances. Table 2 provides an overview of the descriptive analysis with means and standard deviations of the variables included in the study. To overcome the effect of possible spurious outliers in the estimation models and to approximate a normal distribution, all the variables are winsorized at 95% percentiles [101,102].

Table 2. Descriptive analysis.

Variable.	Observation	Mean	Std. Dev.	Minimum	Maximum
ENV	11.633	59.64	22.40	20.6	92.35
SOC	11.633	58.03	20.56	20.04	90.22
GOV	11.634	55.47	20.26	18.46	87.18
ESG	11.634	57.80	17.073	27.19	84.2
FCF	10.468	7.38×10^8	1.21×10^9	-6.40×10^8	4.55×10^9
Tobin´s Q	11.786	1.28	1.30	0.11	18.46
TQM	11.634	0.33	0.47	0	1
SIZE	11.831	3.76×10^{10}	6.55×10^{10}	1.09×10^9	2.63×10^{11}
BETA	8.114	0.99	0.42	0.32	1.8

To check for multicollinearity among the variables, Pearson correlation and variance inflation factors (VIF) (Table 3) tests have been conducted. The results indicate no serious multicollinearity in the dataset. As for the VIF test, in large sample size, the cutoff points are less restrictive, with 10 points as threshold for VIF [103,104]. As predicted, FCF, TQM, and SIZE are positively and significantly correlated with ESG (p-value < 0.01). However, contrary to our expectations, ESG is negatively and positively correlated with Tobin´s Q and BETA, respectively. These results provide preliminary support to conduct the regression analysis.

Table 3. Pairwise correlation matrix and variance inflation factors.

	ESG	***FCF***	***Tobin´s Q***	***TQM***	***SIZE***	***BETA***	**VIF**
ESG	1.000						
FCF	0.335 ***	1.000					3.71
Tobin´s Q	−0.146 ***	−0.079 ***	1.000				5.86
TQM	0.246 ***	0.038 ***	−0.019 **	1.000			2.77
SIZE	0.320 ***	**0.528** ***	−0.363 ***	−0.081 ***	1.000		1.64
BETA	0.024 **	0.038 ***	−0.074 ***	0.046 ***	0.139 ***	1.000	1.02

** $p < 0.05$, *** $p < 0.01$.

4. Results and Discussion

This section discusses the results of the general analysis, moderator effect, and comparative cross-national analysis.

4.1. General Analysis: FIN-ESG Nexus

In accordance with the panel data structure of the dataset of this study, the Hausman test has been conducted [105]. The result indicates that fixed effects models should be used. The fixed effects technique controls for unobservable firm heterogeneity and mitigates some statistical concerns as endogeneity issue, reversed causality, and correlated omitted variables [106]. Four different estimations have been conducted. Model 1 displays the estimations for the overall ESG score; whereas Models 2, 3, and 4 show the results of the segregate scores for each dimension: environmental (ENV), social (SOC), and governance (GOV), respectively. All four estimations are statistically significant at p-value < 0.01. The explanatory power of the independent variables i.e., FIN indicators is higher for the variance of ESG, ENV and SOC scores than the GOV dimension. Overall, these results indicate that financial performance has a higher statistical effect on the environmental and social pillars of sustainability practices (Table 4).

Table 4. Distributed lag estimation for the general analysis with standard errors in parentheses.

Variables		**Model 1:** ***ESG***		**Model 2:** ***ENV***		**Model 3:** ***SOC***		**Model 4:** ***GOV***	
	Sign	Coef.	*p*-val.	Coef.	*p*-val.	Coef.	*p*-val.	Coef.	*p*-val.
Constant		**54.928** (0.6202)	0.000	**55.040** (0.8026)	0.000	**54.461** (0.8216)	0.000	**54.9984** (1.0244)	0.000
FCF(t)	+	$\mathbf{4.40 \times 10^{-10}}$ (1.34×10^{-10})	0.001	$\mathbf{6.05 \times 10^{-10}}$ (1.73×10^{-10})	0.000	$\mathbf{4.07 \times 10^{-10}}$ (1.77×10^{-10})	0.022	2.78×10^{-10} (2.21×10^{-10})	0.208
FCF(t − 1)	+	$\mathbf{4.60 \times 10^{-10}}$ (1.39×10^{-10})	0.001	$\mathbf{7.10 \times 10^{-10}}$ (1.80×10^{-10})	0.000	$\mathbf{6.05 \times 10^{-10}}$ (1.84×10^{-10})	0.001	1.12×10^{-10} (2.29×10^{-10})	0.626
Tobin´s Q(t)	+	−0.0405 (0.1552)	0.794	−0.1003 (0.2008)	0.618	−0.0929 (0.2056)	0.651	0.1295 (0.2563)	0.613
Tobin´s Q(t − 1)	+	**0.3142** (0.1570)	0.045	−0.1146 (0.2032)	0.573	**0.5854** (0.2080)	0.005	0.2358 (0.2593)	0.363
SIZE	+	$\mathbf{1.13 \times 10^{-10}}$ (1.13×10^{-11})	0.000	$\mathbf{1.38 \times 10^{-10}}$ (1.47×10^{-11})	0.000	$\mathbf{1.23 \times 10^{-10}}$ (1.50×10^{-11})	0.000	$\mathbf{7.30 \times 10^{-11}}$ (1.87×10^{-11})	0.000
BETA	−	0.1870 (0.4501)	0.678	**1.3040** (0.5825)	0.025	0.2848 (0.5962)	0.633	−0.9758 (0.7434)	0.189
Fixed effects									
Firm		Yes		Yes		Yes		Yes	
Industry		Yes		Yes		Yes		Yes	
Country		Yes		Yes		Yes		Yes	
Year		Yes		Yes		Yes		Yes	
# Obs.		6690		6690		6690		6690	
R-sq.		0.1103		0.1015		0.0931		0.0316	

To interpret the results of the financial proxies, FCF*(t)* and FCF*(t − 1)* reveal a positive and statistically significant association (*p*-value < 0.01) with the overall ESG score and with each segregate dimension except for GOV. This provides **support to hypothesis H1**. These findings propose that both current and one-year lag of FCF are perceived as a pre-requisite of higher overall ESG score. Organizations with higher cash liquidity tend to invest more in sustainability practices, in particular in ecological and social projects. These findings confirm the results of Bansal (2005) [107] and Waddock and Graves (1997) [28]. They state that organizational slack and financial capacity enable firms to engage in ESG practices. While, Artiach et al., (2010) [52] do not find any significant result in this regard, other studies reveal a negative association between FIN and corporate social responsibility spending in the African context [108]. Additionally, Tobin´s Q*(t)* reveals non-significant results in all the four estimation models. From this analysis, we cannot make any inference in terms of the association between firm value and its effect on sustainability performances. Hence, **hypothesis H2 is not supported.** However, Tobin´s Q*(t − 1)* shows positive and statistically significant effect with overall ESG score (*p*-value < 0.05) and SOC dimension (*p*-value < 0.01). thus, this finding can be interpreted as high valued organizations (for one-year lag Tobin's Q*(t − 1)*) tend to have higher ESG scores which are mainly driven by the social dimension (SOC).

To capture the effect of the control variables, the findings indicate a positive and statistically significant coefficients of SIZE in all the four models (*p*-value < 0.01). The positive association between SIZE and ESG confirm the findings of prior studies [52,63] indicating that larger organizations tend to invest more in ESG practices and implement higher sustainability performance. In contrast, BETA does not reveal any statistically significant association with ESG, except for Model 2 for the ENV dimension (*p*-value < 0.05). As a robustness check, ordinary least squares regression (OLS) is conducted, revealing consistent results with the above analysis, except for Tobin´s Q measures. Opposite to the fixed effects model, OLS reveals a negative and significant association between Tobin´s Q*(t)* and overall ESG, ENV and SOC dimensions (Appendix A).

4.2. The Moderating Role of TQM

Table 5 displays the results of the estimation of Equation (A2) which examines the moderating effect of TQM on the relationship between FIN indicators and ESG scores.

Model 1 represents the results with fixed effects and for a robustness check; Model 2 includes country, industry, and year fixed effects. Model 1 shows that when we include the moderating effect of TQM in the equation, FCF*(t)* and FCF*(t − 1)* maintain a positive and significant effect on the overall ESG score (p-value < 0.01). Besides, the effect of Tobin´s Q*(t)* is non-significant, and the effect of Tobin´s Q*(t − 1)* remains positive and marginally significant (p-value < 0.1). Furthermore, both models 1 and 2 reveal a statistically significant and positive association between TQM and ESG (p-value < 0.01). Prior studies show similar findings providing evidences to support a positive relation, first between ISO 9000 and overall firm performance [79] and second between ISO 9000 and corporate environmental practices [109]. Regarding the moderator effect, the results show that, as anticipated, TQMFCF has a negative and significant effect on the overall ESG score (p-value < 0.01). Hence, organizations that implement TQM have, on average, a lower effect of FCF on ESG score than organizations that do not implement TQM; thus, **giving support to hypothesis H3**. As argued previously, companies that implement TQM reduce the need to rely on financial capital to improve their ESG scores, due to the fact that TQM enables the development of sustainability initiatives within organizations [39,87,88]. Moreover, TQM certification requires some investments and increases costs [92], leading to a negative impact on ESG investments.

Table 5. Distributed lag estimation for TQM moderator effect with standard errors in parentheses.

Variables		**Model 1**		**Model 2**	
ESG	Sign	Coef.	p-val.	Coef.	p-val.
Constant		**53.886** (0.6476)	0.000	**62.543** (5.3974)	0.000
FCF(t)	+	$\mathbf{6.69 \times 10^{-10}}$ (1.62×10^{-10})	0.000	$\mathbf{8.78 \times 10^{-10}}$ (1.91×10^{-10})	0.000
FCF(t − 1)	+	$\mathbf{4.55 \times 10^{-10}}$ (1.38×10^{-10})	0.001	$\mathbf{4.67 \times 10^{-10}}$ (1.22×10^{-10})	0.000
Tobin´s Q(t)	+	−0.2278 (0.1674)	0.173	**−0.4115** (0.2033)	0.043
Tobin´s Q(t − 1)	+	**0.3048** (0.1561)	0.051	−0.1554 (0.1574)	0.324
SIZE	+	$\mathbf{1.10 \times 10^{-10}}$ (1.13×10^{-11})	0.000	$\mathbf{7.35 \times 10^{-11}}$ (7.43 × 10−12)	0.000
BETA	−	0.1783 (0.4475)	0.690	0.4220 (0.4225)	0.340
Moderator					
TQM	+	**2.7765** (0.6575)	0.000	**4.0291** (0.7429)	0.000
TQMFCF	−	$\mathbf{-5.63 \times 10^{-10}}$ (2.15×10^{-10})	0.009	$\mathbf{-7.53 \times 10^{-10}}$ (2.44×10^{-10})	0.002
TQMtobin´s Q	+	**0.8164** (0.2863)	0.004	0.1848 (0.3361)	0.582
Fixed effects					
Firm		Yes		No	
Country		Yes		Yes	
Industry		Yes		Yes	
Year		Yes		Yes	
# Obs. R-sq.		6690 0.1506		6690 0.3025	

Additionally, TQMtobin´s Q has positive and significant relationship with the overall ESG score (p-value < 0.01), indicating that Tobin´s Q*(t)* has a greater effect on the ESG score for organizations that are implementing TQM, **giving support to hypothesis H4**.

The importance of the result revealed in Model 1 emphasizes the crucial role of TQM as a moderator factor mitigating the negative association between Tobin´s Q and ESG and improving its statistical significance. The latter highlights interesting managerial implications, such as the positive contribution of TQM certification to firm market value. ISO 9000 standards are perceived by investors as an "internal benefit" positively influencing Tobin´s Q measure [110].

Model 2 confirms the results for the effects of FCF*(t)*, FCF*(t − 1)* and TQMFCF on the overall ESG scores. However, results regarding Tobin´s Q*(t)*, Tobin´s Q*(t − 1)* and TQMtobin´s Q remain inconclusive, as they depend on the estimation method. As for control variables, the findings remain consistent for both models with respect to the general analysis, showing significant results only for SIZE (p-value < 0.01) with the expected positive sign.

4.3. Cross-National Comparative Analysis: Between US and Non-US Firms

At a cross-national level, the triple mechanism of sustainability management, financial performance, and corporate governance reveals some discrepancies among countries, and more specifically between the US, Europe, and Asia [111]. Whereas the American context is known to be widely driven toward shareholders' interests, prioritizing wealth and profit maximization; the European paradigm takes into account a broader concern toward financial and non-financial goals in most of strategic and corporate agendas [112]. Similarly, in terms of TQM, ISO 9000 has been adopted all over the world for several reasons depending on the objective of each country, at a different pace [113]. Generally speaking, the ultimate purpose of implementing quality standards is to enhance international trade and improve competitiveness [114]. Described as a "formal evidence", this certification is perceived as a key to enter global markets. Given that, from the US perspective, the crucial role of ISO relates to the creation of competitive advantage for business legitimacy; whereas for other settings, ISO implementation basically aims to ensure stakeholders´ satisfaction and improve environmental performances [34,35].

Accordingly, this additional analysis attempts to empirically identify and highlight the potential country differences in the FIN-ESG association. The estimation relies on the same original sample, but forming two-sub groups of firms classified as US and non-US. For the sake of this analysis, the US sub-sample consists of firms headquartered in the US; whereas the non-US group comprises the remaining firms (i.e., Canada, China, EU, Japan, and Korea). Table 6 displays the results of both the general analysis (Model 1:US and Model 2: non-US) and the moderation effect (Model 3: US and Model 4: non-US).

Both estimations are globally significant at a p-value < 0.01. From Table 6, the results indicate that the explanatory power of the independent variables and controls is higher for explaining the variance of ESG in the US context than in the non-US setting. Similar to the former analysis, the findings are consistent in terms of FCF*(t)*, FCF*(t − 1)*, and SIZE, revealing a significant and positive relationship (p-value < 0.01). This result might be interpreted that for the US organizations, the liquidity factor (i.e., FCF*(t)* and FCF *(t − 1)*) plays a fundamental role to explain ESG investments, whereas firm market value as Tobin´s Q measure is not significantly related to sustainable performances. The clear dissimilarity in the general analysis between the US and non-US samples is Tobin´s Q*(t)*, Tobin´s Q*(t − 1),* and BETA. In contrast to the US sub-sample, Model 2 indicates a positive and slightly significant association between Tobin´s Q*(t − 1)* (p-value < 0.1), BETA (p-value < 0.05) and ESG, and significant and negative association between Tobin´s Q*(t)* (p-value < 0.05) and ESG. The inference from these results underlines the ambiguity of the link between firm value and ESG. From the revealed signs and the correlation coefficients (Tobin´s Q*(t)* and Tobin´s Q*(t − 1)*) (in Model 2-non US firms), we might implicitly note that the shape of the nexus of Tobin´s Q and ESG is not a linear relationship rather than curvilinear. The latter shape of the link between financial performance and sustainability has been addressed in depth in the study developed by Barnett and Salomon (2012).

Table 6. Distributed lag estimation for cross-national analysis with standard errors in parentheses.

		General Analysis				**Moderator Effect**			
Variables		**Model 1: US**		**Model 2: Non-US**		**Model 3: US**		**Model 4: Non-US**	
ESG	Sign	Coef.	*p*-val.	Coef.	*p*-val.	Coef.	*p*-val.	Coef.	*p*-val.
Constant		**52.533** (0.9169)	0.000	**56.801** (0.8348)	0.000	**51.776** (0.9230)	0.000	**54.487** (0.8625)	0.000
FCF(t)	+	$\mathbf{1.15 \times 10^{-9}}$ (2.25×10^{-10})	0.000	$\mathbf{5.73 \times 10^{-10}}$ (1.52×10^{-10})	0.000	$\mathbf{1.05 \times 10^{-9}}$ (2.37×10^{-10})	0.000	$\mathbf{1.15 \times 10^{-9}}$ (2.01×10^{-10})	0.000
FCF(t − 1)	+	$\mathbf{1.31 \times 10^{-9}}$ (2.36×10^{-10})	0.000	$\mathbf{5.66 \times 10^{-10}}$ (1.56×10^{-10})	0.000	$\mathbf{1.23 \times 10^{-9}}$ (2.34×10^{-10})	0.000	$\mathbf{5.76 \times 10^{-10}}$ (1.56×10^{-10})	0.000
Tobin´s Q(t)	+	−0.0125 (0.1897)	0.948	**−0.5564** (0.2401)	0.020	−0.1487 (0.1997)	0.457	**−0.6340** (0.2702)	0.019
Tobin´s Q(t − 1)	+	0.1417 (0.2001)	0.479	**0.3859** (0.2268)	0.089	0.1557 (0.1983)	0.433	0.3489 (0.2255)	0.122
SIZE	+	$\mathbf{1.01 \times 10^{-10}}$ (1.14×10^{-11})	0.000	$\mathbf{7.14 \times 10^{-11}}$ ($7.51 \times$ 10−12)	0.000	$\mathbf{1.01 \times 10^{-10}}$ (1.12×10^{-11})	0.000	$\mathbf{6.90 \times 10^{-11}}$ ($7.30 \times$ 10−12)	0.000
BETA	−	−0.8889 (0.5672)	0.117	**1.2391** (0.5873)	0.035	**−1.0868** (0.5624)	0.053	**1.1361** (0.5814)	0.051
Moderator									
TQM	+					**4.0239** (1.0371)	0.000	**5.5190** (0.6966)	0.000
TQMFCF	−					3.03×10^{-10} (3.84×10^{-10})	0.430	$\mathbf{-1.1 \times 10^{-9}}$ (2.49×10^{-10})	0.000
TQMtobin´s Q	+					**0.8743** (0.4169)	0.036	0.1690 (0.3459)	0.625
# Obs.		2898		3792		2898		3792	
R-sq.		0.2071		0.0843		0.2282		0.1552	

For the moderator estimation and regarding the non-US sub-sample, as predicted, TQM negatively moderates the association between FCF*(t)* and ESG (p-value < 0.01). As hypothesized previously, TQM requirements and costs might hinder ESG investments and influence short-term sustainable practices. Model 3 shows that for US firms, TQM moderates the nexus between Tobin´s Q*(t)* and ESG, first by mitigating the negative sign of the correlation coefficient, as anticipated, and secondly by strengthening the statistical significance of the association (p-value < 0.05).

5. Conclusions

This study empirically investigates the nexus between FIN and ESG performances, examines the moderating role of TQM on this link, and sheds further light on the financial-sustainability association at a cross-national level. Extending prior studies´ findings, this analysis evaluates the impact of financial status on environmental, social, and governance practices.

5.1. Theoretical and Practical Implications

Considering the time factor (i.e., distributed lag estimation model), the findings provide robust statistical evidences supporting a stimulus effect of operational financial measure (i.e., FCF*(t)* and FCF*(t − 1)*) on ESG scores. In accordance with the premises of the slack resource theory, a firm's liquidity is perceived as a "trigger" or "enhancer" of ESG performances. In terms of the managerial implications, organizations with capital flush tend to score higher ESG, thus pursuing better sustainability management. In contrast, no conclusive inference can be induced in regard to Tobin´s Q and its effect on ESG performances. The theoretical implications of this study call for attention to the fact that not all financial indicators (i.e., future market performance as measured by the Tobin's Q) are able to lead to consistent sustainable investment in all instances. This double-edged inference provides grounds for further empirical investigation in terms of present and future indicators of financial performance vis-à-vis sustainability management.

As for the moderating role of TQM on the FIN-ESG association, the above findings emphasize the conceptual contribution of the operations management discipline to the finance-sustainability literature. Quality management standards provide clearer under-

standing of the impact of financial performances on the implementation of sustainability investments. As for the managerial implication, companies that implement TQM alleviates the need to rely on financial capital toward improving ESG scores. In addition, the results show a dual effect of TQM on the Tobin's Q-ESG relationship, first by improving its statistical significance and secondly by modifying the sign of its correlation coefficient to a positive direction. At a broader scale, the practical inference of these findings might be implicitly translated by the interplay between tangible assets and intangible assets and their impact on ESG practices.

At a cross-national level, the results suggest a consent toward the "antecedent" role of financial status with regard to ESG practices, for both US and non-US organizations, particularly in terms of free cash flow. At a global scale, the "green" revolution and the 2030 Agenda of the United Nations for Sustainable Development, in particular goals 8,9, and 12, tacitly might influence the strategic planning and the financial budgeting of multinational firms to further allocate slack resources dedicated to ecological and societal activities. The differential effect of Tobin's Q on sustainability performances between the US and non-US contexts calls for attention to further investigate the significance of the contingencies of governance systems and institutional mechanisms.

5.2. Limitations and Future Directions

Behind our empirical analyses, there are always some caveats to be acknowledged. First, although we believe that the inclusion of both financial operational indicators and market-based measures strengthens the analysis, we consider that there is still room for improvement to attain more accurate evidences on the FIN-ESG interconnection. Additional studies are well placed to further examine conceptually the discrepancy among financial proxies, and more specifically, firm market valuation vis-à-vis sustainability. Using distributed lag regression, our results reveal a step forward in providing statistical evidences about the association between FIN and ESG. However, to confirm a cause-effect relationship between the two variables, future studies might consider to conduct Granger causality analysis. In regard to the moderator analysis, conceptual research might contribute to the sustainability literature by addressing the dual theoretical frameworks of quality management theory and slack resources theory. To enhance the significance of our results, future studies might consider conducting similar analysis using continuous or categorical variables instead of binary variables of the TQM moderation effect. Moreover, another limitation of this study is the number of control variables included in the analysis. Due to some limited data availability, only a firm´s size and a firm´s riskiness was used as a control. Future studies might rely on different control variables such as research and development intensity and advertising intensity.

Second, we recognize that the Thomson Reuters ESG index might not reflect a "holistic" proxy for sustainability performances. The reliability of the index and the assessment process cannot be demonstrated, which indicate certain constraints hindering the assertion of our conclusion. Therefore, future work would be recommended to replicate this study adopting alternative indices or relying on primary data to improve the internal validity of the findings revealed. In addition, based on the results obtained in our analysis, the governance dimension (GOV) of the ESG score does not reveal any significant findings. Therefore, future research is recommended to further investigate first the assessment criteria of the governance measure in sustainability indices, and second their impact on ESG practices.

Notwithstanding the abovementioned limitations, this study highlights new insights into the synergetic effect between FIN and ESG and documents the important role of TQM in moderating this relationship. It encompasses the theoretical framework of the slack resources paradigm, bridging the impact of firm's quality management and liquidity on sustainability. Finally, a rhetorical inference accentuates the corporate gap between "large" and "small" organizations toward sustainability adoption. This could be due either to the scarcity of financial resources or the reliance on other organizational factors,

restraining and/or replacing the acquirement of TQM certification, and by modifying organizational strategic agenda prioritizing financial survival over environmental, social, and governance investments.

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Appendix A

Table A1. OLS linear simple regression with robust standard errors.

		General Analysis							
Variables		***ESG***		***ENV***		***SOC***		***GOV***	
	Sig	Coef.	*p*-val.	Coef.	*p*-val.	Coef.	*p*-val.	Coef.	*p*-val.
Constant		**62.523** (3.1624)	0.000	**62.931** (4.1186)	0.000	**65.563** (3.8643)	0.000	**63.415** (4.2630)	0.000
FCF(t)	+	$\mathbf{2.14 \times 10^{-9}}$ (2.46×10^{-10})	0.000	$\mathbf{2.47 \times 10^{-9}}$ (3.21×10^{-10})	0.000	$\mathbf{2.35 \times 10^{-9}}$ (3.01×10^{-10})	0.000	$\mathbf{1.51 \times 10^{-9}}$ (3.32×10^{-10})	0.000
FCF(t − 1)	+	$\mathbf{1.81 \times 10^{-9}}$ (2.53×10^{-10})	0.000	$\mathbf{2.21 \times 10^{-9}}$ (3.29×10^{-10})	0.000	$\mathbf{2.19 \times 10^{-9}}$ (3.09×10^{-10})	0.000	$\mathbf{1.12 \times 10^{-9}}$ (3.41×10^{-10})	0.001
Tobin´s Q(t)	+	**−1.3480** (0.3078)	0.000	**−1.5383** (0.4008)	0.000	**−1.7296** (0.3761)	0.000	−0.6278 (0.4149)	0.114
Tobin´s Q(t − 1)	+	−0.1838 (0.3141)	0.549	−0.3248 (0.4091)	0.423	0.1821 (0.3838)	0.631	−0.5402 (0.4234)	0.191
SIZE	+	$\mathbf{5.51 \times 10^{-11}}$ (5.09×10^{-12})	0.000	$\mathbf{7.06 \times 10^{-11}}$ (6.63×10^{-12})	0.000	$\mathbf{6.51 \times 10^{-11}}$ (6.22×10^{-12})	0.000	$\mathbf{3.31 \times 10^{-11}}$ (6.87×10^{-12})	0.000
BETA	-	−0.3453 (0.5023)	0.514	0.2139 (0.6541)	0.751	0.0596 (0.6137)	0.929	**−1.270** (0.6770)	0.069
Fixed effects									
Country		Yes		Yes		Yes		Yes	
Industry		Yes		Yes		Yes		Yes	
Year		Yes		Yes		Yes		Yes	
# Obs.		6690		6690		6690		6690	
R-sq.		0.3103		0.3124		0.3131		0.1349	

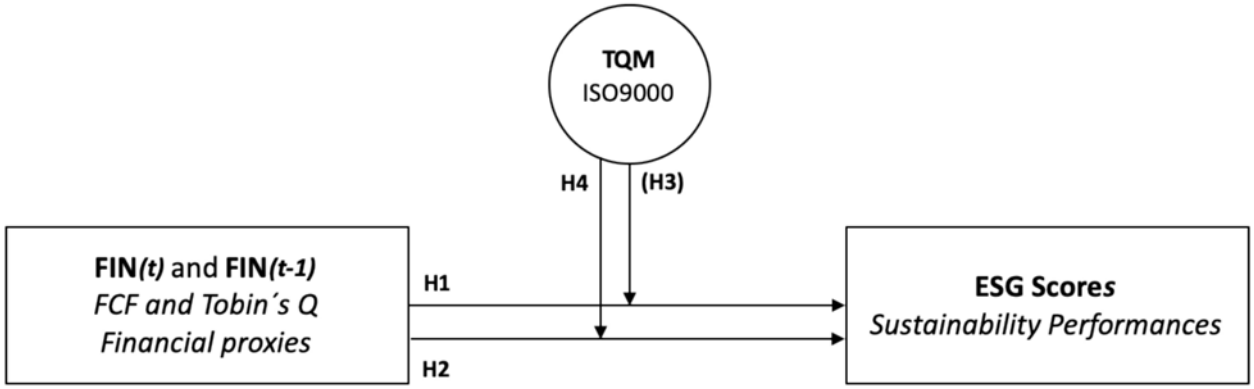

Figure A1. Framework of the study.

Note: Hypothesis (H3) between parenthesis: negative association between TQMFCF and ESG.

$$\mathbf{ESG}(i,t) = \beta 0 + \beta 1\ FCF(i,t) + \beta 2\ FCF(i,t-1) + \beta 3\ Tobin's\ Q(i,t) + \beta 4\ Tobin\ 's\ Q(i,t-1) + \beta 5\ CONTROLS(i,t) + \varepsilon(i,t) \quad \text{(A1)}$$

$$\begin{aligned} \mathbf{ENV}(i,t) &= \beta 0 + \beta 1\ FCF(i,t) + \beta 2\ FCF(i,t-1) + \beta 3\ Tobin's\ Q(i,t) + \beta 4\ Tobin\ 's\ Q(i,t-1) + \beta 5\ CONTROLS(i,t) + \varepsilon(i,t) \\ \mathbf{SOC}(i,t) &= \beta 0 + \beta 1\ FCF(i,t) + \beta 2\ FCF(i,t-1) + \beta 3\ Tobin's\ Q(i,t) + \beta 4\ Tobin\ 's\ Q(i,t-1) + \beta 5\ CONTROLS(i,t) + \varepsilon(i,t) \\ \mathbf{GOV}(i,t) &= \beta 0 + \beta 1\ FCF(i,t) + \beta 2\ FCF(i,t-1) + \beta 3\ Tobin's\ Q(i,t) + \beta 4\ Tobin\ 's\ Q(i,t-1) + \beta 5\ CONTROLS(Iit) + \varepsilon(i,t) \\ \mathbf{ESG}(i,t) &= \beta 0 + \beta 1\ FCF(i,t) + \beta 2\ FCF(i,t-1) + \beta 3\ Tobin's\ Q(i,t) + \beta 4\ Tobin\ 's\ Q(i,t-1) + \beta 5\ TQM(i,t) - \beta 6 \\ & FCF(i,t)*TQM(i,t) + \beta 7\ Tobin's\ Q(i,t)*TQM(i,t) + \beta 8\ CONTROLS(i,t) + \varepsilon(i,t) \end{aligned} \quad \text{(A2)}$$

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