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The Effect of Corporate Environmental Performance (CEP) of an Acquirer on Post-Merger Firm Value: Evidence from the US Market

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Abstract

Purpose: The acquirer's corporate environmental performance (CEP) in mergers and acquisitions has been a subject of debate, yielding mixed results. This paper uses the US firm-level data of 1437 M&A deals from 2002–2019 to examine the impact of overall CEP, resource use, emissions, and innovation on the acquirers' post-merger market value. **Design/methodology/approach:** This study employs multi-level fixed effects panel regression using Ordinary Least Squares (OLS) and the instrumental variable (IV) 2SLS method to estimate the models and compare the results with those from robust estimation. Absorbing the multiple levels of fixed effects (i.e., firm, industry, and year) offers a novel and robust algorithm for efficiently accounting for unobserved heterogeneity. The results from IV (2SLS) are more convincing, as the method overcomes the problem of endogeneity due to reverse causality and sample selection bias. **Findings:** The authors find that CEP has a significant impact on market value, particularly in the long term. While both resource use and emissions performance have positive effects, emissions performance has a stronger impact, presumably because external stakeholders and market participants are more concerned about emissions reduction. The performance of environmental innovation is relatively weak compared to other pillars. Descriptive analysis shows low average scores in environmental innovation compared to the resource use and emissions performance of the acquirers. However, large deals yield significant returns from investing in environmental innovation in both the short and long term compared to small deals. **Practical implications:** This paper offers several practical implications. First, environmental performance can help improve the acquirer's long-term market value. Second, managers can focus on the strategic side of environmental performance, based on its pillars, and benchmark their relative position against peers. Third, environmental innovation can be considered a new potential, as the market as a whole in this area is still lagging. Given the growing pressure to improve environmental technology and innovation, prospective acquirers should confidently prioritise actions on green revenue, product innovation, and capital expenditure now rather than ticking these boxes later. **Originality value:** The key contribution is offering valuable insights into the impact of acquirers' environmental performance on long-term value creation in mergers and acquisitions (M&A). These results fill the gap in the literature focusing mainly on the effect of environmental pillar and sub-pillar scores on acquirer's firm value. The authors claim that analysing sub-pillar-level granularity is crucial for accurately measuring the effects on firm-level performance.



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1. Introduction

Over the last decade, many countries, including the United States (US), have made notable progress in improving energy intensity and reducing CO₂ emissions ([Shahiduzzaman & Layton, 2017](#); [EIA, 2020](#)). Since its peak in 2007, energy-related CO₂ emissions in the US have declined by about 1.3% per year through to 2019. However, emissions in 2019 were still 1.8% higher than the 1990 level ([EIA, 2020](#)). Climate policy in the United States has undergone significant changes in tandem with regime shifts.¹

The role of firms achieving net-zero emission targets has been debated in the literature extensively ([Hart & Ahuja, 1996](#); [Heinkel et al., 2001](#); [Ambec & Lanoie, 2008](#); [Sharfman & Fernando, 2008](#); [Nofsinger et al., 2019](#); [Zerbib, 2019](#)). Some argue that the improvement of a company's environmental management can lead to net financial returns ([M. Porter & van der Linde, 1995a](#); [Klassen & McLaughlin, 1996](#)), and influence share prices resulting in abnormal returns ([Krueger et al., 2020](#)). Another string of literature argues that environmental programmes come with additional costs, thereby destroying firm growth, performance, and competitiveness ([Cropper & Oates, 1992](#); [Basuki & Irwanda, 2018](#)), hurting the market value of domestic firms ([Cañón-de-Francia & Garcés-Ayerbe, 2009](#)) with negative or no effects on abnormal stock returns, resulting in a decline in shareholder wealth ([Fisher-Vanden & Thorburn, 2011](#)). Overall, the results remain mixed.

This study contributes to the debate by examining mergers and acquisitions (M&A) for several key reasons. First, a merger is a top corporate challenge that prompts the need for a stakeholder approach to management ([Jemison & Sitkin, 1986](#)). The risks of being involved in a merger are potentially large, and many mergers fail to generate the intended benefits and, indeed, destroy shareholders' wealth ([Moeller et al., 2004, 2005](#); [Betton et al., 2008](#); [Renneboog & Vansteenkiste, 2019](#)). Sustainability factors can help to improve stakeholder relationships, thereby improving merger performance ([Hart & Dowell, 2011](#); [Segal et al., 2021](#)), becoming increasingly important in the approval and acquisition process ([PWC, 2022](#)). Brokers and underwriters consider environmental liability as the first rather than the last concern in mergers and acquisitions deals.² Awareness of buyers and lenders, stringent laws, corporate reputation, and complexity of negotiations of insurance-based risk transfer have led to environmental issues being resolved upfront rather than being a tick-box exercise later in M&A deals ([Bloomberg, 2022](#); [PWC, 2022](#)).

Second, aggregate investment in M&A is large and steadily growing. The size of the aggregate M&A stands at several trillion USD annually, with publicly disclosed deal value reaching an all-time high of over US\$5 trillion in 2021, up from US\$4.2 trillion at the pre-GFC level in 2007 ([PWC, 2022](#)). The size and growth of M&A have significant implications for an economy, thus, assessing the environmental performance of M&A is crucial. However, empirical studies so far remained largely silent on the matter.

We present and test the shareholders' value maximisation or value destruction view of environmental performance, contributing to the academic debate and providing guidance to the managers and stockholders of acquiring firms. Based on the Natural-Resource-Based View (RBV) ([Hart, 1995](#)) and Stakeholder View ([Edward Freeman, 2010](#)), we argue that the acquirer's ex-ante CEP provides a competitive advantage and improves stakeholder relationships. Accordingly, overall CEP provides net positive benefits to mergers, enabling a win-win situation for both managers and shareholders. The literature highlighted the challenges of managing the expectations of a diverging set of stakeholders in mergers ([Deng](#)

et al., 2013; Alexandridis et al., 2017; Segal et al., 2021). Proactive environmental strategies are associated with broader and deeper coverage of stakeholders (Buysse & Verbeke, 2003). Improved environmental risk management is also linked to better resource utilisation and a reduced cost of capital, thereby enabling enhanced operating performance (Sharfman & Fernando, 2008). CEP help build stakeholder relationships, mitigate adverse effects and achieve net financial performance, reducing agency problems (Dalton, 2007). However, the mixed evidence on the relationship between CEP and firm performance potentially creates conflict regarding the managerial incentives for CEP investments.

Hart and Dowell (2011) review the developments of the RBV and outline various elements of environmentally friendly capabilities required for companies to cope with new opportunities. Such areas include pollution prevention, clean technology, product stewardship, and so forth. The social forces, key resources, and external environment influencing firm-specific capabilities are different (Hoogendoorn et al., 2015; Du & Li, 2020). For example, regulatory factors can influence pollution abatement and energy-efficient processes (Symons et al., 1994; Du & Li, 2020). Firms that violate emissions standards may destroy customer trust and firm reputation, thereby negatively influencing sales. Ecosystem, competitive environment, and internal capability can affect environmental innovation. Overall, a firm's incentives to invest can differ due to differences in internal drivers.

A limited number of studies fall in line with the present study. Gomes (2019) studies the effects on an environmental pillar along with the social and governance attributes of CSR. The study finds that CSR aspects influence the choice of an M&A target. Similarly, Aroui et al. (2019) find that aggregate, as well as the three pillar scores of acquirers, reduce M&A completion uncertainty. These studies, however, pay inadequate attention to the role of CEP in subsequent merger performance, particularly in environmental sub-pillar levels.

This study investigates the effects of overall and sub-pillar level environmental scores, using panel data of US firms from 2002 to 2019. We find several interesting results. First, our results show a positive and significant effect of CEP on the acquirer's relative market value. The effects are consistent across different estimation methods. The results indicate a win-win situation for both managers and shareholders involved in the mergers, reconciling the mixed findings in the literature. Second, resource use and emissions performance provide value creation opportunities in mergers, consistent with the natural resource view (Hart, 1995). Therefore, no trade-off exists between environmental programmes and merger performance. The performance effect of emission reduction is relatively high as compared to resource use, presumably because emission reduction may reduce regulatory risk and build a reputation for the quality of management. Third, for environmental innovation, the associated effect is positive, but they are not significant in most cases. Overall, the average innovation score is lower than the resource use and emissions reduction score, reflecting the existence of the environmental innovation paradox in mergers. Fourth, our results also indicate that the value creation of environmental innovation differs significantly between large and small mergers. As such, unlike small mergers, environmental innovation provides value to large mergers. Given the potential value destruction risks of mergers (Moeller et al., 2004), the findings may encourage the managers involved in large mergers to invest more in environmental innovation to negate potential adverse market effects.

We contribute to the literature in several ways. First, we provide insights into the effect of acquirers' environmental performance on long-run value creation in the context of M&A. Prior studies focus mainly on the effect of CSR aggregate pillar scores, not particularly the environmental pillar and its sub-pillars on firm value, and they fail to examine the effect, particularly in the context of M&A (Gomes, 2019; Aroui et al., 2019). Analysis of sub-pillar level granularity is crucial to measure the accurate effects of each on firm performance (Nofsinger et al., 2019). The disaggregated analyses will provide valuable insights into a

broader range of market participants involved in trading and investment decisions. Finally, the results will support the formulation of environmental policies at the sub-pillar level.

The remainder of this paper is organised as follows. Section 2 presents the background literature and hypothesis development. Section 3 describes the data and methodology, while Section 4 presents the estimation results. Section 5 provides further evidence on environmental innovation, and Section 6 concludes.

2. Literature Review and Hypotheses Development

2.1. Theoretical Background

CEP can influence merger performance in several ways. In general, the abatement and compliance costs of a business increase in line with environmental performance, indicating potential conflicts (Schmaleense, 1993). M. Porter and van der Linde (1995a) oppose this view and argue that a sustainable business is economically efficient, delivering long-term win–win outcomes (M. Porter & van der Linde, 1995a, 1995b). Greater environmental disclosure can lead positive outcomes for firms (S. Li, 2024). Environmental programmes have strategic and innovative effects on firms, delivering a sustained competitive advantage (Clarkson et al., 2011).

From the perspective of mergers, the challenge of managing the expectations of a diverging set of stakeholders has been highlighted in the literature (Segal et al., 2021). M&A deals are a type of multistakeholder engagement, which means that acquirers need to maintain complex relationships with both external and internal stakeholders. Buysse and Verbeke (2003) postulate that proactive environmental strategies deliver better stakeholder engagement. Sharfman and Fernando (2008) show that improved environmental risk management is associated with better resource utilisation and reduced cost of capital, thereby enabling operating performance. Krueger et al. (2020) find that institutional investors believe climate risks have significant financial impacts on portfolio returns.

Should CEP help build stakeholder relationships, mitigate adverse effects and achieve financial performance, the interests of both owners and managers converge, thereby reducing agency problems (Dalton, 2007). However, if the evidence remains mixed on the relationship between CEP and firm performance, a potential conflict may emerge regarding the managerial incentives for the investments of CEP. In the case of mergers, where maintaining the interest of a diverse group of stakeholders becomes extremely complex (Deng et al., 2013), it would be more challenging to invest in CEP if such activities come at the expense of shareholders' wealth. Because shareholders hold the ultimate power to approve or reject a merger deal, they can block or delay the merger. As M&As are largely unanticipated events and are outcomes of corporate strategy and incentives, the effect of CEP on post-acquisition performance provides an important inference on the managerial incentives of investing in such initiatives.

2.2. Environmental Exposure and M&A Performance

The direct effects of CEP on the performance of mergers have received limited attention in the corporate finance literature. The extant literature has largely focused on the aggregate effects of corporate social responsibility (CSR), of which CEP is one pillar. For example, Deng et al. (2013) construct an aggregate index based on equal weights of seven dimensions of CSR, including the environment.³ Using data for US domestic mergers for 1997–2002, they find that high CSR acquirers, as compared to low CSR acquirers, realise higher merger announcement returns and larger increases in long-term operating performance. Krishnamurti et al. (2019) find evidence of positive announcement period returns from CSR. On the other hand, Shi et al. (2020) opposed the view. Other studies find negative or no effects of CSR on merger performance. Using an international sample of M&As between

2003 and 2028, [Jost et al. \(2022\)](#) find no significant effects of the acquirer's or target's CSR performance on M&A premia. [Krishnamurti et al. \(2020\)](#) use a similar aggregate measure of CSR as used by [Deng et al. \(2013\)](#), and document a negative relationship between firm-level CSR scores and M&A activity. [Ma et al. \(2024\)](#) report a decline of shareholder value in the post-merger period. [Teti and Spiga \(2023\)](#), however, find improvement in the operating performance of the post-merger period for the acquirer with higher CEP score. [Tampakoudis et al. \(2021\)](#) find evidence of a negative effect of CSR performance on shareholders' abnormal returns in the context of M&As before and during the COVID-19 pandemic. Overall, the effects of aggregate CSR on merger activity and outcomes remain at best mixed ([Cho et al., 2021](#)). Moreover, the majority of these studies have focused on the average or aggregate impacts of CSR; therefore, research on the roles of individual components, such as CEP, remains limited. We mitigate this gap in the literature. Given that, we hypothesise the following:

Hypothesis 1. *The Acquirer's corporate environmental performance positively influences its post-merger value.*

First, resource use efficiency improves and reduces the cost of inputs (e.g., energy) in a given level of production and therefore, improves profitability ([Özbuğday et al., 2020](#); [Simionescu et al., 2020](#); [Caragliu, 2021](#)). [Caragliu \(2021\)](#) finds that firms adopting energy efficiency practices leading to resource efficiency improve performance. [J. Li et al. \(2023\)](#) find that artificial intelligence has a positive effect of energy and resource efficiency of firms. Therefore, we hypothesise the following:

Hypothesis 2. *The Acquirer's resource efficiency performance positively influences its post-merger value.*

Second, for emissions, its the reduction can be achieved through (i) prevention and/or (ii) control ([Hart & Ahuja, 1996](#)). Reducing emissions via prevention is generally a cheaper option than emissions control, as the latter approach requires expensive, non-productive pollution control equipment to achieve compliance ([Smart, 1992](#); [Miah et al., 2021](#)). However, the idea of pollution prevention is analogous to quality management (e.g., fixing defects) so it can directly impact firm performance ([Hart & Ahuja, 1996](#)). While the net effect can vary, emission reduction can improve the acquirer's reputation and brand image ([Cowan & Guzman, 2020](#)). Finally, for a merging firm, the propensity of involving environmental innovation may depend upon the externalities of innovation, product market competition and absorbing capacity ([Federico et al., 2017](#); [Cohen & Levinthal, 1990](#)). Environmental innovation is not generally subjected to regulatory risk; however, they have the potential to build a reputation and engage stakeholders. As new business models are emerging and markets for sustainable products are promoted (e.g., banning of single-use plastics), environmental innovation can be considered an opportunity, making mergers profitable ([Miyagiwa & Wan, 2016](#)). However, the ability of firms to recognise the value of environmental innovation may depend on prior knowledge or absorptive capacity ([Cohen & Levinthal, 1990](#)). Based on the above, we formulate and test our third hypothesis, as follows:

Hypothesis 3. *The effect of environmental innovations on acquirers' post-merger value is positive.*

3. Data and Methodology

3.1. Sample of Acquisitions

Our sample consists of data for US domestic M&As for 2002–2019 (pre-pandemic years). We restricted the sample to pre-pandemic years to capture more representative and consistent M&A behaviour in a “normal economic environment” over a long period (18 years). The initial sample of M&A deals comes from Thomson’s Securities Data Company (SDC) Platinum database. We impose several restrictions in the SDC Platinum database to filter the data: (i) exclude all sellers of minority interests, (ii) percent of shares owned after transactions is 50% or higher, (iii) availability of deal value in SDC, (iv) acquirers target public status, not the government.

3.2. Data on Environmental Performance

We obtain data on the firms’ environmental scores from Refinitiv (previously known as Asset 4 ESG data). Refinitiv gathers extensive and objective quantitative and qualitative environmental data from over 10,000 companies, and its time series goes back to 2002. The aggregate environmental score is based on three broad pillars: resource use, emissions, and environmental innovation (Appendix A). The resource use category includes water, energy, sustainable packaging, and the environmental supply chain. The emissions category includes CO₂ emissions, waste, biodiversity, and environmental management systems. The innovation category includes product innovation, green revenues, R&D, and capital expenditure. The scores are adjusted for sectoral differences in terms of environmental importance. In the dataset, a score between 0 and 100 is given, where ‘0’ represents the lowest (environmental laggards) performance, and ‘100’ refers to the highest (environmental leaders) performance. Our final sample includes 1437 M&A deals in the USA domestic market.

3.3. Firm- and Deal-Specific Control Variables

Following the past literature on mergers (e.g., [Danbolt & Maciver, 2012](#); [Deng et al., 2013](#); [Humphery-Jenner et al., 2017](#); [Arouri et al., 2019](#)), we employ several firm-level controls: acquirer size (*firm size*), past ROA (*past return*), past Tobin’s Q, and the debt-to-equity ratio (*leverage*). Our deal-specific controls include the following: deal size, an all-cash deal indicator (*all cash*), an all-stock deal indicator (*all stock*), a private target indicator (*private target*), a subsidiary target indicator (*subsidiary target*), a diversifying merger indicator (i.e., if the merger takes place in a sector that is different from the acquirer’s primary industrial sector) (*diversifying*), a tender offer indicator (*tender offer*), and an indicator denoting whether the merger is hostile or friendly (*hostile*). The detailed data definitions and data sources are provided in Appendix B.

Table 1 provides a summary of the environmental score and key performance variable (Tobin’s Q) in the acquirers of our sample. The mean value of the environmental score is 28.18, which is higher than that of the uncompleted bids (23.67).

The scores of the individual environmental categories show an interesting pattern. The mean value of resource use performance is the highest (29.54) among the three categories for completed bids. The mean of the resource use score is significantly higher for completed bids than for uncompleted bids. The mean score of the emissions performance is 28.31 for completed bids compared to uncompleted bids. Finally, the environmental innovation score is significantly lower (17.81) compared to other categories.

Table 1. Summary Statistics.

Variable	Completed Bids			Uncompleted Bids		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Environmental score	1879	28.18	28.47	125	23.67	19.16
Resource use performance	1873	29.54	34.42	125	19.41	26.93
Emissions performance	1873	28.93	33.87	125	31.98	30.23
Env. innovation performance	1873	17.81	27.46	125	23.58	20.58
Tobin's Q (TQ)	1783	1.63	0.97			
Change in TQ1	1751	−0.063	0.76			
Change in TQ2	1754	−0.067	0.78			
Change in TQ3	1754	−0.074	0.81			

Figure 1 shows the trends in firm-level environmental performance scores. As seen in the figure, environmental performance indicators improved consistently for 2002–2014, before showing a downturn during 2015–2017. The scores then picked up again in the most recent years. The performance of environmental innovation remained low compared to the other scores over the whole sample period.

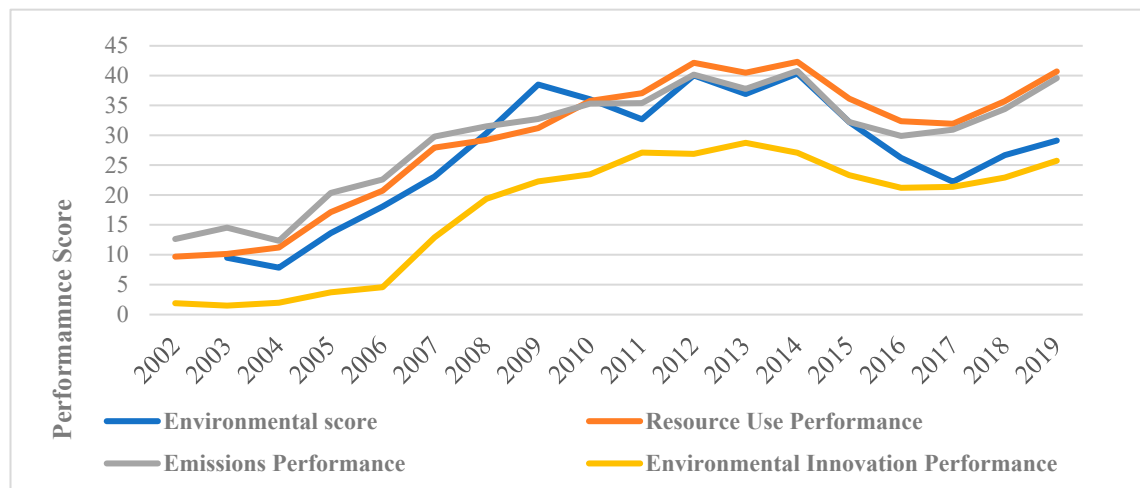


Figure 1. Trends in firm-level environmental performance scores during 2002–2019. Source: Author's estimation based on sample data used in this study.

3.4. Empirical Models

This study investigates the effects of acquirer CEP on acquiring firms' performance in US domestic mergers. The estimated model can be written as:

$$\Delta mv_{it} = \alpha + \beta_1 env_{i,t-1} + \delta_1 controls_{i,t-1} + year\ fixed\ effects + industry\ fixed\ effects + \varepsilon_{it}, \quad (1)$$

where Δmv refers to changes in Tobin's Q. Our main variable of interest is env , which is a measure of the acquirer's environmental performance. Environmental performance is measured by four indicators: aggregate environmental score, resource use score, emissions score, and environmental innovation score of firm i in year t . To examine short and long-term effects, we consider changes in TQ in next three years following acquisition, namely, $\Delta TQ1$, $\Delta TQ2$, and $\Delta TQ3$. We consider $t - 1$ the base year for the calculation of ΔTQ . We winsorize the ΔTQ variables at the 1st and 99th percentiles. Tobin's Q is a widely used measure of firm value (Zollo & Singh, 2004; Mitton & Goldstein, 2022), which measures the market value of a firm relative to its existing assets (Buchanan et al., 2018). The availability

of data for the period of 2002–2019 allows us to examine short-term (one year) and relatively long-term (two and three years) periods and consistently compare the resulting findings.

3.5. Estimation Methods

We used high-dimensional fixed-effect panel regression and the instrumental variable (IV) 2SLS method to estimate the models and compare them with robust estimation results. Our high-dimensional fixed effect approach provides a novel and robust algorithm to efficiently absorb the fixed effects. However, the results from IV (2SLS) would be more convincing, as the method overcomes the problem of endogeneity due to reverse causality and sample selection bias.

Finding valid instruments for the 2SLS regression is a challenge. The choice of an instrument should be justified by an appropriate theory, first-stage results, and test statistics (Larcker & Rusticus, 2010). In this paper, we take intuition from environmental economics and social science, particularly those that decompose various factors that explain the preferences for environmental good or activity (Dunlap & Mertig, 1995; Wei, 2011). According to these models, differences in income per capita explain preferences for environmental quality, and as income per capita grows, demand for such preferences generally improves. The income per capita also reflects productivity growth and technological improvements, as, according to growth models, technological changes reflect growth differences. We therefore posit that the differences in state-level income per capita, or affluence, are an important factor determining the firm-level initiatives of environmental quality.

Apart from affluence, we also used the industry average corporate social performance (CSP) as an instrument for the IV regressions. Both environmental and social performance are considered to be important pillars of corporate social responsibility (Schwartz & Carroll, 2003). Therefore, industry average social responsibility performance can be an important influencer on a firm's involvement in CEP. There is no reason to believe that state-level differences in income per capita and industry average social performance have any direct effects on our dependent variables (changes in Tobin's Q).

4. Regression Results

4.1. Aggregate Effect

We now present the regression results for the aggregate level of CEP, with the results for individual environmental categories presented in the next subsection. The results of both linear and instrumental variable regressions are presented with pooled regressions capturing the existence of many levels of fixed effects (Correia, 2015). Columns 1–3 in Table 2 show pooled OLS results, while the results for 2SLS are presented in Columns 4–7, with Column 4 presenting the corresponding first-stage regression results. The standard errors presented in parentheses are adjusted for heteroskedasticity and acquirer clustering.

The coefficients of CEP are positive and significant at the 5% level for changes in TQ in the pooled OLS estimation (Table 2). The results are consistent across all three years. The IV regression results (Columns 5–7) provide different estimates, and coefficients for CEP are significant at a 10% level for ΔTQ_2 and a 5% level for ΔTQ_3 . The effects of CEP are larger in the long run and imply that a 1-point increase in the overall CEP score increases ΔTQ_3 by approximately 0.008 points. These results hold after controlling for year and industry fixed effects.

Table 2. Corporate Environmental performance and post-merger acquirer Tobin's Q.

	Pooled OLS				IV (2SLS)		
					First Stage	Second Stage	
	$\Delta TQ1$	$\Delta TQ2$	$\Delta TQ3$	CEP	$\Delta TQ1$	$\Delta TQ2$	$\Delta TQ3$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Environmental score	0.002 **	0.003 **	0.003 **		0.005	0.007 *	0.008 **
Affluence (state) ^				17.371 ***			
Social score (industry) ^				1.187 ***			
Acquirer size	−0.016	−0.015	−0.012	13.182	−0.057	−0.077	−0.093 *
Target size	−0.043 ***	−0.040 **	−0.037 **	−0.506	−0.041 ***	−0.038 ***	−0.034 ***
Relative size	−0.006 **	−0.006 ***	−0.007 ***	0.870 ***	−0.008	−0.010 *	−0.012 **
Lag TQ	−0.282 ***	−0.334 ***	−0.362 ***	1.242 ***	−0.283***	−0.334 ***	−0.363 ***
Lag ROA	−0.381	−0.407	−0.537	28.141 ***	−0.352	−0.417	−0.588 *
Leverage	−0.023	−0.046	−0.037	−14.03 ***	0.039	0.050	0.083
Hostile	−0.648	−0.672	−0.527	−14.50	−0.596	−0.591	−0.420
Cash holding	0.210	0.315	0.367	16.829 **	0.052	0.110	0.142
All cash	0.047	0.075 *	0.080 *	1.248	0.049	0.076 **	0.080 **
Diversifying	−0.100 **	−0.113 ***	−0.124 ***	−3.984 ***	−0.113 **	−0.123 ***	−0.133 ***
Private target	0.083 *	0.129 ***	0.138 ***	−2.605	0.086	0.136 **	0.149 **
Subsidiary target	0.110 **	0.122 **	0.130 **	−3.4058 **	0.120 **	0.135 **	0.147 ***
Hi-tech	0.094 ***	0.110 ***	0.136 ***	−3.105 **	0.112 ***	0.137 ***	0.170 ***
Intercept	0.620 ***	0.626 ***	0.618 ***	−348.977	1.227 ***	1.345 ***	1.445 ***
Number of obs.	1363	1366	1367	1352	1349	1352	1553
R-Sq.	0.282	0.323	0.356		0.278	0.311	0.337
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	No	No	No	No
Sanderson–Windmeijer multivariate F test of excl. inst, <i>p</i> value				0.000			
Underidentification test: Anderson canon. corr. LM Stat					74.23 ***	414.8 ***	414.2 ***
Weak identification test: First-stage Cragg–Donald Wald F					38.34 ***	340.6 ***	339.5 ***
Overidentification test: Sargan_Hansen stat (chi Sq <i>p</i> value)					0.749	0.517	0.367

^ Instrumental variable. This table reports the pooled OLS and instrumental variable (IV) 2SLS regression results on the impact of CEP on changes in the examined acquirers' TQ in the three years following the corresponding merger events. The sample includes data for 1437 completed US domestic mergers for the period 2002–2019. All the variable definitions are in Appendix B. Standard errors are robust and clustered at the firm level (not reported for brevity). ***, ** and * denote significance at the 1%, 5%, and 10% levels, respectively.

Several firm- and deal-specific control variables have significant impacts on changes in acquisition returns. *Acquirer size*, *target size*, and *relative size* negatively affect acquirer relative performance, which supports the existence of the negative effect of size on acquisition returns found in the previous literature. The effects of *all cash*, *hostile*, *cash holding*, *diversifying*, *private*, and *subsidiary targets* vary across the equations. The literature, in general, presents mixed evidence on the effects of deal- and firm-specific characteristics (Malmendier et al., 2018). However, the inclusion of deal- and firm-specific characteristics significantly improves the explanatory power of the models measured in terms of goodness of fit. Notably, the positive and significant relationship between overall CEP and acquisition returns remains robust after controlling for the included firm- and deal-specific characteristics.

Column (4) of Table 2 shows the first-stage regression results on the suitability of our instrumental variables, namely, *affluence* and *industry average social score*. Both variables significantly influence CEP, and the coefficients are highly significant at the 1% level. The suitability of these instruments was further validated by four different test scores: (i) Sanderson–Windmeijer multivariate F test of the excluded instrument,⁴ (ii) Anderson canon underidentification test,⁵ (iii) First-stage Cragg–Donald Weak identification test⁶

and (iv) Sargan Hansen Overidentification test.⁷ The test results suggest the validity of our two instruments; therefore, the IV regressions provide reliable estimates.

4.2. The Effects of Individual Pillars of Environmental Performance

Tables 3–5 present the results for resource use (Table 3), emissions (Table 4), and environmental innovation (Table 5). In an approach similar to that adopted for overall CEP, the results of both linear and instrumental variable regressions are presented, and these results capture the existence of many levels of fixed effects (Correia, 2015).

Table 3. Resource use and post-merger acquirer Tobin's Q.

	Pooled OLS			IV (2SLS)			
				First Stage	Second Stage		
	$\Delta TQ1$	$\Delta TQ2$	$\Delta TQ3$	Resource Use	$\Delta TQ1$	$\Delta TQ2$	$\Delta TQ3$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Resource use score	0.002 **	0.002 **	0.002 **		0.005	0.007 **	0.009 **
Affluence (state) ^				17.897 ***			
Social score (industry) ^				1.158 ***			
Acquirer size	−0.018	−0.015	−0.011	16.024 ***	−0.074	−0.101	−0.121 *
Target size	−0.043 ***	−0.041 **	−0.039 **	−0.731	−0.039 ***	−0.037 ***	−0.033 **
Relative size	−0.006 **	−0.006 **	−0.007 ***	1.038 ***	−0.009	−0.011 *	−0.013 **
Lag TQ	−0.282 ***	−0.334 ***	−0.363 ***	1.485 *	−0.286 ***	−0.338 ***	−0.367 ***
Lag ROA	−0.395	−0.421	−0.549	38.250	−0.413 ***	−0.502	−0.688 **
Leverage	−0.006	−0.026	−0.018	−22.708	0.092 ***	0.124	0.169
Hostile	−0.664	−0.692	−0.547	−5.867	−0.632	−0.640	−0.481
Cash holding	0.226	0.325	0.371	14.645	0.067 *	0.122	0.151
All cash	0.052	0.079 *	0.085 **	0.815	0.053	0.080 **	0.085 **
Diversifying	−0.099 **	−0.111 ***	−0.123 ***	−4.786 ***	−0.105 **	−0.113 **	−0.122 ***
Private target	0.083 *	0.128 ***	0.137 ***	−3.223	0.090	0.140 **	0.154 **
Subsidiary target	0.115 **	0.124 ***	0.131 **	−5.523 **	0.134 **	0.152 ***	0.166 ***
Hi-tech	0.090 **	0.105 ***	0.132 ***	−0.482	0.099 **	0.119 ***	0.149 ***
Intercept	0.635 ***	0.638 ***	0.627 ***	−380.48 ***	1.389 ***	1.577 ***	1.717 ***
Number of obs.	1355	1358	1359	1345	1341	1344	1345
R-Sq.	0.283	0.325	0.358		0.274	0.301	0.321
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	No	No	No	No
Sanderson–Windmeijer multivariate F test of excl. inst, <i>p</i> value				0.000			
Underidentification test: Anderson canon. corr. LM Stat					46.35 ***	46.51 ***	46.48 ***
Weak identification test: First-stage Cragg–Donald Wald F					23.43 ***	23.52 ***	23.50 ***
Overidentification test: Sargan_Hansen stat (chi Sq <i>p</i> value)					0.791	0.576	0.434

^ Instrumental variable. This table reports the pooled OLS and instrumental variable (IV) 2SLS regression results on the impact of resource use on changes in the examined acquirers' TQ in the three years following the corresponding merger events. The sample includes data for 1437 completed US domestic mergers for the period 2002–2019. All the variable definitions are in Appendix B. Standard errors are robust and clustered at the firm level (not reported for brevity). ***, ** and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4. Emissions (inverse) and post-merger acquirer Tobin's Q.

	Pooled OLS				IV (2SLS)		
					First Stage	Second Stage	
	$\Delta TQ1$	$\Delta TQ2$	$\Delta TQ3$	Emissions Score (Inverse)	$\Delta TQ1$	$\Delta TQ2$	$\Delta TQ3$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Emissions score (inverse)	0.002 *	0.002 *	0.002 *		0.005	0.008 **	0.010 **
Affluence (state) ^				25.414			
Social score (industry) ^				0.843			
Acquirer size	−0.011	−0.011	−0.007	16.509	−0.081	−0.116 *	−0.143 **
Target size	−0.043 ***	−0.041 **	−0.039 **	−0.603	−0.040 ***	−0.037 ***	−0.034 **
Relative size	−0.005 **	−0.006 **	−0.007 **	1.091	−0.009	−0.013 *	−0.015 **
Lag TQ	−0.282 ***	−0.334 ***	−0.363 ***	1.632	−0.289 ***	−0.341 ***	−0.371 ***
Lag ROA	−0.371	−0.398	−0.529	25.866	−0.346	−0.414	−0.590 *
Leverage	−0.019	−0.039	−0.030	−13.389	0.049	0.067	0.107
Hostile	−0.648	−0.670	−0.524	−17.195	−0.565	−0.542	−0.356
Cash holding	0.242	0.340	0.385	10.246	0.088	0.139	0.167
All cash	0.052	0.079 *	0.085 *	0.184	0.056	0.084 **	0.089 **
Diversifying	−0.103 **	−0.115 ***	−0.127 ***	−3.375	−0.112 **	−0.121 ***	−0.132 ***
Private target	0.080 *	0.124 ***	0.133 ***	−2.146	0.086	0.134 **	0.149 **
Subsidiary target	0.110 **	0.119 **	0.126 **	−3.303	0.124 **	0.139 **	0.153 ***
Hi-tech	0.090 **	0.106 ***	0.132 ***	−1.856	0.105 ***	0.128 ***	0.161 ***
Intercept	0.599 ***	0.617 ***	0.612 ***	−443.60	1.406 **	1.637 ***	1.828 ***
Number of obs.	1355	1358	1359	1341	1341	1344	1345
R-Sq.	0.281	0.323	0.356		0.269	0.293	0.307
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	No	No	No	No
Sanderson–Windmeijer multivariate F test of excl. inst, <i>p</i> value				0.000			
Underidentification test: Anderson canon. corr. LM Stat					46.09 ***	45.72 ***	44.16 ***
Weak identification test: First-stage Cragg–Donald Wald F					23.29 ***	23.10 ***	22.29 ***
Overidentification test: Sargan_Hansen stat (chi Sq <i>p</i> value)					0.869	0.957	0.951

^ Instrumental variable. This table reports the pooled OLS and instrumental variable (IV) 2SLS regression results on the impact of emissions reduction on changes in the examined acquirers' TQ in the three years following the corresponding merger events. The sample includes data for 1437 completed US domestic mergers for the period 2002–2019. All the variable definitions are in Appendix B. Standard errors are robust and clustered at the firm level (not reported for brevity). ***, ** and * denote significance at the 1%, 5%, and 10% levels, respectively.

The results regarding the resource use category are presented in Table 3. Columns 1–3 present the results for pooled OLS, while the 2SLS (IV) estimation results are presented in columns 4–7. The results are qualitatively similar to the aggregate environmental score, except the coefficient value is slightly higher in the case of $\Delta TQ3$. The instruments are found to be valid, and the IV regressions are likely to provide more robust estimates. The results indicate that the effect of resource use slightly improves in the long term (from one year to two years after a merger event in this case).

The results regarding the emissions category are presented in Table 4. Columns 1–3 present the results for pooled OLS, while the 2SLS (IV) estimation results are presented in columns 4–7. The results are qualitatively similar to both aggregate environmental and resource scores, but the coefficient value is higher in the case of $\Delta TQ3$ (Column 7). The instruments are found to be valid, and the IV regressions are likely to provide more robust estimates. Consistent with the prior results, the IV regression results indicate that the effect of emissions performance slightly improves in the long term (from one year to two years after a merger event in this case).

Table 5. Env. Innovation and post-merger acquirer Tobin's Q.

	Pooled OLS				IV (2SLS)		
					First Stage	Second Stage	
	$\Delta TQ1$	$\Delta TQ2$	$\Delta TQ3$	Env. Innovation	$\Delta TQ1$	$\Delta TQ2$	$\Delta TQ3$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Env. Innovation	0.000	0.001	0.001		0.004	0.005 *	0.006 *
Affluence (state) ^				7.673			
Social score (industry) ^				1.525			
Acquirer size	0.015	0.019	0.022	0.602	−0.013	−0.015	−0.016
Target size	−0.044 ***	−0.042 **	−0.040 **	0.500	−0.042 ***	−0.040 ***	−0.037 ***
Relative size	−0.003	−0.004 *	−0.004 **	0.184	−0.004	−0.004	−0.005
Lag TQ	−0.279 ***	−0.331 ***	−0.359 ***	0.786	−0.278 ***	−0.326 ***	−0.353 ***
Lag ROA	−0.329	−0.347	−0.476	10.803	−0.276	−0.308	−0.452
Leverage	−0.044	−0.066	−0.057	5.131	−0.001	−0.007	0.008
Hostile	−0.677	−0.703	−0.556	18.163	−0.643	−0.658	−0.504
Cash holding	0.262	0.356	0.394	9.063	0.057	0.111	0.142
All cash	0.052	0.077 *	0.082 *	1.488	0.042	0.066	0.070 *
Diversifying	−0.105 **	−0.118 ***	−0.128 ***	1.670	−0.119 ***	−0.132 ***	−0.145 ***
Private target	0.080 *	0.125 ***	0.134 ***	2.226	0.081	0.127 **	0.137 **
Subsidiary target	0.107 **	0.116 **	0.123 **	2.106	0.113 **	0.123 **	0.129 **
Hi-tech	0.089 **	0.105 ***	0.132 ***	1.572	0.109 ***	0.133 ***	0.165 ***
Intercept	0.420 **	0.404 **	0.399 *	−200.95	0.881 ***	0.858 ***	0.844 ***
Number of obs.	1355	1358	1359	1341	1341	1344	1345
R-Sq.	0.278	0.319	0.353		0.264	0.296	0.325
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	No	No	No	No
Sanderson–Windmeijer multivariate F test of excl. inst, <i>p</i> value				0.000			
Underidentification test: Anderson canon. corr. LM Stat					60.419 ***	61.32 ***	62.10 ***
Weak identification test: First-stage Cragg–Donald Wald F					30.88 ***	31.36 ***	31.78 ***
Overidentification test: Sargan_Hansen statistics					0.464	0.237	0.134

^ Instrumental variable. This table reports the pooled OLS and instrumental variable (IV) 2SLS regression results on the impact of environmental innovation on changes in the examined acquirers' TQ in the three years following the corresponding merger events. The sample includes data for 1437 completed US domestic mergers for the period 2002–2019. All the variable definitions are in Appendix B. Standard errors are robust and clustered at the firm level (not reported for brevity). ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Finally, the results regarding the environmental innovation category are presented in Table 5. Columns 1–3 present the results for pooled OLS, while the 2SLS (IV) estimation results are presented in columns 4–7. The results are different from the resource use and emissions performance pillars. None of the coefficients in the pooled OLS models is found to be significant. In the IV estimations (columns 4–7), only the coefficient associated with $\Delta TQ3$ is significant and at a 10% level. The results for environmental innovation, therefore, provide a low level of significance. The results imply that firms are lagging in their performance in environmental innovation. This underperformance may be attributed to lower level investment in environmental innovation among completed bids (Table 1).

5. Further Analysis of Environmental Innovation

Our analysis in the preceding section indicates that environmental innovation provides post-merger gains, but the associated effects are not as strong as for the other environmental pillars, i.e., resource use and emissions performance. In this section, we further investigate the effect of environmental innovation by analysing the relative size of the deals.

Table 6 shows the average environmental score in terms of small and large deals. We define large deals as those with a relative size (deal value as a proportion of total

assets) equal to or above the median (50th percentile). Similarly, small deals are those with a relative size below the median (50th percentile). As seen in the table, the average environmental innovation scores are almost the same between large and small deals, and the difference between them is not statistically significant.

Table 6. Mean difference in environmental innovation between large and small deal sizes.

Relative Deal Size	Obs	Mean	Std. Err.	Std. Dev.	95% Coefficient Intervals	
Small	931	17.86	0.94	28.56	16.02	19.70
Large	944	17.77	0.86	26.35	16.08	19.45
Combined	1875	17.81	0.63	27.46	16.57	19.06
Diff		0.10	1.27		−2.39	2.58
H0: diff = 0		t = 0.0760, Pr[(T) > (t)] = 0.9395				

Table 7 presents the IV (2SLS) estimation results on the valuation effects of environmental innovation between large and small deals. The valuation effect is not significant for small deals. However, for large deals, environmental innovation shows positive and significant effects on the acquirer's post-acquisition performance in the three years following the acquisition. Given the prevailing concern that large deals destroy M&A value on a massive scale, investment in environmental innovation can, therefore, provide a mechanism of potential gains. This is possibly because the market reacts positively to the environmental innovation performance for large deals.

Table 7. Relative deal size and environmental innovation performance.

	Small				Large			
	First Stage				First Stage			
	Env. Inn.	$\Delta TQ1$	$\Delta TQ2$	$\Delta TQ3$	Env. Inn.	$\Delta TQ1$	$\Delta TQ2$	$\Delta TQ3$
	(4)	(5)	(6)	(7)				
Env. Innovation		−0.002	−0.001	0.002		0.006 *	0.007 **	0.007 **
Affluence (state) ^	−0.262				12.22 **			
Social score (industry) ^	1.110 ***				1.802 ***			
Acquirer size	6.892 ***	0.037	−0.016	−0.078	5.469 ***	0.062 *	0.072 *	0.083 **
Target size	−0.878	−0.078	−0.041	−0.002	−0.683	−0.089 ***	−0.091 ***	−0.089 ***
Lag TQ	−1.521	−0.148 ***	−0.265 ***	−0.318 ***	1.042	−0.357 ***	−0.375 ***	−0.389 ***
Lag ROA	20.864	−0.587	−0.702 *	−0.721 *	5.977	−0.051	0.123	−0.065
Leverage	4.681	−0.245	−0.302	−0.269	−9.818	0.148	0.164	0.155
Cash holding	57.483 ***	−0.339	−0.371	−0.530	11.062	0.311	0.460	0.546 *
All cash	3.715	0.037	0.037	0.001	2.892	0.038	0.060	0.077
Diversifying	−2.242	−0.070	−0.119 **	−0.136 **	−2.563	−0.163 ***	−0.166 ***	−0.180 ***
Private target	−2.089	−0.127	−0.133	−0.134	−1.770	0.200 ***	0.258 ***	0.276 ***
Subsidiary target	−2.361	−0.120	−0.153	−0.158 *	−2.199	0.215 ***	0.235 ***	0.253 ***
Hi-tech	−2.962	−0.008	0.046	0.093	−2.337	0.201 ***	0.220 ***	0.255 ***
Intercept	−109.448	0.679	1.181 *	1.650 **	−107.558	0.489 *	0.326	0.236
Number of obs.	580	576	579	580	765	765	765	765
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SW F test of ex. inst., p-value	0.008				0.000			
Unidentification test		9.39 ***	10.15 ***	10.70 ***		55.80 ***	55.80 ***	55.80 ***
Weak identification test		4.774	5.171	5.482		28.09 ***	28.09 ***	28.09 ***
Overidentification test		0.198	0.799	1.870		0.703	1.747	2.467

^ Instrumental variable. This table reports the instrumental variable (IV) 2SLS regression results on the impact of environmental innovation on changes in the examined acquirers' TQ in the three years following the corresponding merger events. The sample includes data for 1437 completed US domestic mergers for the period 2002–2019. All the variable definitions are in Appendix B. Standard errors are robust and clustered at the firm level (not reported for brevity). ***, ** and * denote significance at the 1%, 5%, and 10% levels, respectively.

6. Discussion and Conclusions

Over the last decades, there has been a growing demand for cleaner energy, a transition to zero emissions, and environmental innovation. Environmental standards have become a

new norm and are increasingly influential in corporate strategy, mergers, and acquisitions. However, there is a lack of understanding of the impact of environmental performance on the subsequent performance of mergers and acquisitions (M&As). This study fills this gap in the literature. We comprehensively study the effects of CEP and its three important pillars—resource use, emissions, and environmental innovations on acquirers' market value three years following the mergers. We control for firm- and deal-specific characteristics and industry and state-level factors in the US and address issues related to endogeneity, providing robust inference.

At the aggregate level, the results provide robust and consistent evidence of the significant and direct effect of CEP on the post-merger relative market value of an acquirer. The result is consistent with the Porter Hypothesis and Stakeholders' View. The Porter Hypothesis argues that corporate social responsibility can be treated as a strategic asset to deliver business success, while the Stakeholder Theory suggests that aligning business strategy with broader societal expectations enhances firm legitimacy and long-term value (M. E. Porter & Kramer, 2006).

At the disaggregated level, we found positive and significant effects of CEP's resource use and emissions pillars on the post-merger market value of an acquirer. Therefore, firms engaging with environmental stewardship can achieve both efficiency gains (Teti & Spiga, 2023) and market performance (Deng et al., 2013). We also found that emissions performance has a relatively higher impact on changes in market value than resource use, presumably due to growing concern over emissions and climate change issues. Previous studies found that institutional investors place significant weight on carbon emissions and climate change, highlighting the priority of the emissions reduction issue (Krueger et al., 2020).

The evidence of the effect of environmental innovation, another key pillar of CEP, is found to be relatively weaker. The associated coefficients of environmental innovation are positive, but they are not significant in most cases. The descriptive analysis also shows low scores on environmental innovation compared to resource use and emissions. We explore the issue further in terms of relative deal size and find that environmental innovation has a significant impact on the performance of large deals. They may be related to the concept of absorptive capacity (Cohen & Levinthal, 1990), as acquirers involved with larger deals may possess a greater ability to acquire and integrate new knowledge. Consequently, the market appears to react positively to environmental innovations when deals are relatively large.

Our results offer valuable insights for future mergers and acquisitions. Environmental performance can help improve post-merger market value in the long run. Managers can focus on the strategic side of CEP to benchmark their relative position against peers. Additionally, environmental innovation can be a potential avenue for improving post-merger value, given the growing pressure to enhance environmental technology and innovation. However, our findings are based on U.S. M&A data and may not be generalizable to other contexts. Country-specific factors could influence firm value following mergers in different regions. Future research is needed to examine the impact of environmental performance on post-merger firm value in an international setting.

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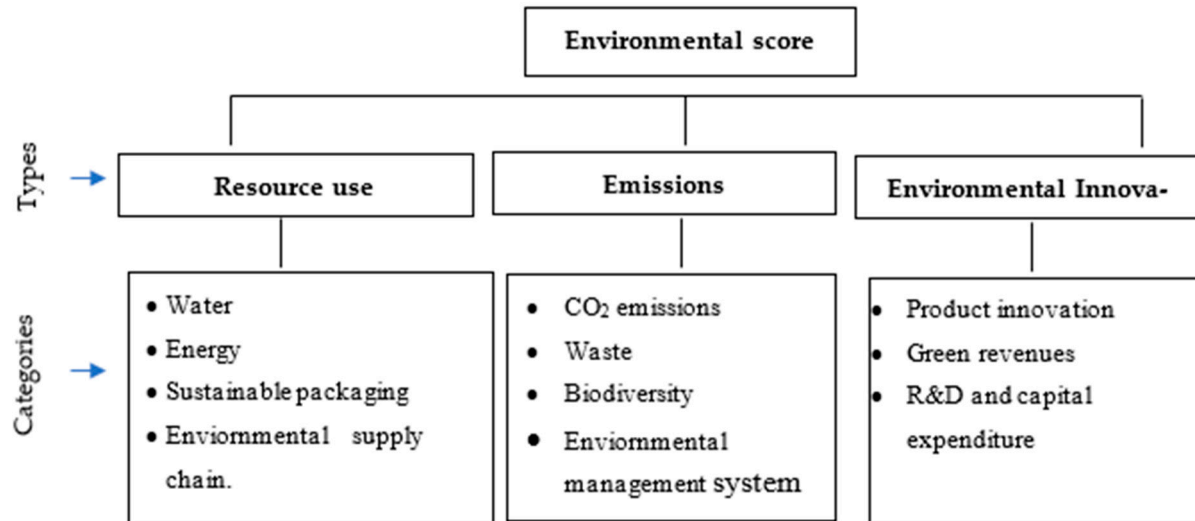
Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable. The study was based on secondary data, and no identifiable human data was used.

Data Availability Statement: The dataset and Stata code used for the analysis in this study are available from the corresponding author upon request.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. CEP Component



Appendix B. Variable Definition and Sources of Data

Variable	Definition and Sources of Data
Environmental and social score data	
Environmental Pillar Score	The score is based on three broad categories: emission, innovation, and resource use (Source: Refinitiv).
Emissions' performance	The score is based on four categories: CO ₂ emissions, waste, biodiversity, and environmental management systems (Source: Refinitiv).
Resource use	The score is based on four broad categories: water, energy, sustainable packaging, and environmental supply chain (Source: Refinitiv).
Environmental innovation	The score is based on four broad categories: green revenues, research and development, and capital expenditure (Source: Refinitiv).
Social score	The score is based on four broad categories: community, human rights, product responsibility, and workforce (Source: Refinitiv).
Firm characteristics	
$\Delta TQ1$	TQ refers to Tobin's Q, which is calculated as a ratio of the book value of total assets plus the market value of equity minus book value of equity to the book value of total assets. $\Delta TQ1$ is calculated as the change in the TQ (in percentage points) of the acquirer in year $c + 1$ minus TQ in $c - 1$. Year c is the year of the deal. (Source: Compustat)
$\Delta TQ2$	Average TQ for $c + 1$ and $c + 2$ minus TQ in $c - 1$. (Source: Compustat)
$\Delta TQ3$	Average TQ for $c + 1$, $c + 2$ and $c + 3$ minus TQ in $c - 1$. (Source: Compustat)

Acquirer size	Natural logarithm of acquirer firm's total assets (Source: Compustat)
Leverage	Acquirer firm's book value of long-term debt divided by total assets (Source: Compustat)
Relative size	The ratio of the deal transaction value to the acquirer's total assets (Source: Compustat)
ROA	Acquirer firm's income before extraordinary items scaled by total assets (Source: Compustat)
Target size	Natural logarithm of deal value (in million USD). (Source: SDC Platinum)
Deal characteristics	
All cash	Coded as 1 if the bid is paid by cash to target's shareholders; coded as 0 otherwise. (Source: SDC Platinum)
All stock	Coded as 1 if the bid is executed through stock swap; coded 0 otherwise. (Source: SDC Platinum)
Diversifying	Coded as 1 if the acquirer and target are not from the same 2-digit SIC; coded 0 otherwise. (Source: SDC Platinum)
Hostile	1 represents hostile acquisition, and 0 represents otherwise. (Source: SDC Platinum)
Private target	Coded as 1 if the target is a private enterprise, coded as 0 otherwise. (Source: SDC Platinum)
Subsidiary target	Coded as 1 in case the target firm is a subsidiary; coded as 0 otherwise. (Source: SDC Platinum)
Hi-tech	Coded as 1 if the acquirer's primary business is high tech, coded as 0 otherwise. (Source: SDC Platinum)
Instrumental variables	
Gross State Production per capita (GSPPC)	Gross State Production divided by population. Data Source: US Bureau of Economic Analysis (BEA)
Industry Average Social score	Industry average of firm-level social score. (Source: Refinitiv).

Notes

- ¹ While the reversal in climate policy, the announcement to withdraw from the Paris Agreement, weakened environmental protection rules, and commitment during the Trump administration shook the US's environmental policy, the Biden Government has pledged bold steps to combat climate challenges, both domestically and abroad. Accordingly, along with strengthening US Environmental Protection Authority (EPA) initiatives and incentivizing clean energy, the US then announced the creation of the Office of Environmental Justice to enforce environmental strategy and pursue cases of environmental crime, pollution, and climate change.
- ² See <https://riskandinsurance.com/environmental-coverage-is-becoming-a-bigger-player-in-ma-deals-heres-why-its-becoming-a-necessity/> (accessed on 29 December 2024).
- ³ The other dimensions are community, corporate governance, diversity, employee relations, human rights, product quality and safety. The construct based on KLD Database for the period of 1997–2002.
- ⁴ The null is that the particular endogenous regressor in question is unidentified.
- ⁵ The undentification test is an LM test of whether the equation is identified. The null hypothesis is that the equation is underidentified.
- ⁶ Tests whether the instruments are weak.
- ⁷ The joint null hypothesis in the Sargen-Hansen test is that the instruments are void instruments, i.e., uncorrelated with the error term, and the excluded instruments are correctly excluded from the estimated equation.

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