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The Effect of Tax Holidays on ESG Performance of Pioneer Industry in Indonesia

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ABSTRACT

This study investigates the effect of tax incentives under the tax holiday scheme on the Environmental, Social, and Governance (ESG) performance of pioneer industry firms in Indonesia. Using panel data from 97 listed companies during 2015–2024, this study applies panel regression analysis with fixed effect and random effect models selected through Chow, Hausman, and Lagrange multiplier tests. The results show that tax holiday incentives have a positive and significant impact on overall ESG performance, particularly on the environmental and social dimensions, while the governance effect is relatively weaker. Board independence and audit committee independence significantly strengthen ESG performance, whereas profitability and leverage show no consistent influence. This study contributes to the limited literature on tax holidays and ESG by examining how tax holiday incentives affect each ESG dimension separately in pioneer industries. The findings reveal that tax holidays have different effects across environmental, social, and governance performance, with governance showing the weakest association.

Keywords: Tax incentives; tax holiday; ESG performance; pioneer industry; corporate governance.

INTRODUCTION

Over the past decade, corporate sustainability has transformed from a normative discourse into a key pillar of global business strategy. Companies in various countries are aggressively integrating Environmental, Social, and Governance (ESG) principles in response to economic crises, environmental degradation, and technological disruption [45]. The shift toward sustainability is also reflected in investor preferences, which increasingly prioritise companies with good ESG performance [44, 53]. In Indonesia, the same trend is evident in the significant increase in the number of companies on the Indonesia Stock Exchange (IDX) that publish sustainability reports and have ESG scores, with growth of 162% over the last 10 years, from 37 companies in 2015 to 97 in 2024 (Figure 1). The growing adoption of ESG reporting indicates that ESG practices are becoming increasingly important in corporate strategy, although their implementation requires considerable resources for environmental, social, and governance initiatives [16, 43]. In this context, fiscal incentives, such as tax holidays, may help firms ease financial constraints and support the implementation of sustainability-related programmes and investments [20]. The rapid expansion of ESG reporting therefore reflects not only broader corporate efforts to integrate sustainability into business strategy but also raises an important policy question regarding whether fiscal incentives can help firms translate sustainability commitments into meaningful ESG performance [16, 20, 43]. Against this background, examining the role of tax holiday incentives becomes increasingly relevant for understanding whether fiscal policy can transform the rapid growth of ESG reporting into tangible improvements in corporate sustainability performance [20, 54].

Despite this encouraging trend, the rapid increase in ESG reporting does not necessarily reflect the substantive quality of ESG implementation. According to OECD data, increases in ESG reporting across countries are accompanied by considerable disparities in implementation quality [13]. This phenomenon indicates a tendency toward symbolic practices (greenwashing), in which companies are more oriented toward image-building than toward the internalisation of absolute ESG values. In fact, neglecting ESG has direct implications for increased financial and cash flow risks, as well as limited access to financing. One factor that has received relatively limited attention in explaining differences in ESG implementation is the role of fiscal policy, particularly taxation as part of the broader corporate governance framework.

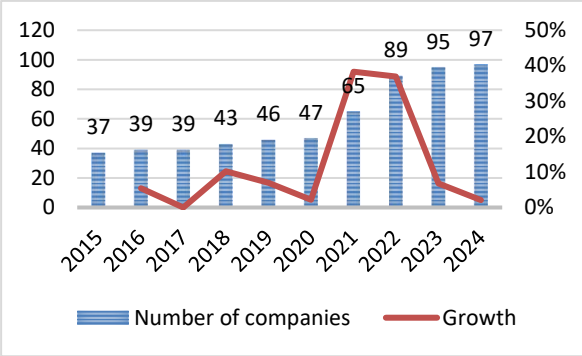


Figure 1. Number of Companies with ESG Scores in IDX 2015-2024
Source: LSEG Refinitiv

In response to these challenges, global practice shows that taxation instruments play a strategic role in strengthening ESG performance. Companies globally view tax policy as an important factor in promoting sustainability [44, 50]. Various countries, such as the United States, Malaysia, Australia, Germany, and the Philippines, have adopted fiscal incentives to support ESG and renewable energy projects. Malaysia, for example, through its Deduction for Expenditure in Relation to Environmental Preservation, Social and Government Rules 2025, provides tax deductions of up to RM50,000 per year for ESG-related expenditure. Unlike these countries, Indonesia, as a developing country, still faces structural limitations in steering its industrial sector toward a green economy through fiscal policy [20, 23, 47], although tax incentives are recognised as a key instrument for reducing transition costs and promoting green innovation [50].

On the other hand, although international literature has largely confirmed the positive relationship between tax incentives and improved ESG performance, existing studies remain concentrated on general fiscal incentives rather than selective industrial tax policies. For instance, Zhu et al. [54] show that tax incentives improve ESG performance among Chinese listed firms by easing financing constraints, while Huang et al. The research of [20] finds that tax incentives enhance ESG performance through stronger financial performance and green innovation, particularly in firms with common institutional ownership. More recently, Zhang et al. [52] also report that tax incentives promote ESG performance through technological innovation. Despite these important findings, these studies focus on broad tax incentive policies applied across listed firms and do not specifically examine tax holiday schemes targeted at strategic industries or explore whether such policies affect the environmental, social, and governance dimensions differently.

In Indonesia, tax incentives are given selectively [46], particularly to pioneer industries through policies that reduce corporate income tax under PMK No. 130/PMK.010/2020, as last updated by PMK No. 69 of 2024. Unlike the general tax incentive policies examined by Zhu et al. [54] and Huang et al. [31], this policy is specifically designed to encourage investment in strategic industries that are expected to generate high value-added activities and broader economic spillover effects. Policy dynamics characterised by variations in facility duration and scope, and relatively rapid regulatory changes, have the potential to produce heterogeneous impacts on companies' ESG performance [54]. In addition, the effectiveness of tax incentives is greatly influenced by corporate governance quality, ownership structure, and corporate innovation capacity [31]. Despite these unique institutional and policy characteristics, empirical evidence on the ESG effects of tax holiday incentives in Indonesian pioneer industries remains limited. By examining tax holidays within this selective sectoral policy framework, this study extends previous research beyond general tax incentives and provides evidence on how a sector-specific fiscal policy influences overall ESG performance as well as its environmental, social, and governance dimensions.

To explain the mechanism by which tax incentive policies influence ESG performance more systematically, this study draws on three main theoretical foundations: economic incentive theory, stakeholder theory, and sustainability theory. Incentive theory explains that fiscal relief serves as a driver of change in corporate behavior, including green technology investment and the strengthening of sustainable management practices [27]. The stakeholder theory emphasises that companies must respond to the expectations of regulators, investors, and the public regarding social and environmental responsibility [11]. Meanwhile, sustainability theory emphasises the importance of integrating economic growth, environmental conservation, and social justice to create long-term value [20].

Based on this framework, this study explicitly aims to examine the impact of corporate income tax reduction policies for pioneer industries on the ESG performance of companies listed on the Indonesia Stock Exchange using panel data from 2015 to 2024. Using a quantitative panel data regression approach, this study seeks to answer the main research question: Does the tax incentive policy for pioneer industries significantly improve companies' ESG performance in Indonesia? The focus on this selective sectoral policy enables a more precise analysis than previous studies, which remained aggregate in nature [54]. This study offers three main contributions to the existing literature. First, it provides empirical evidence from Indonesia, where tax incentives are implemented through a selective tax

holiday policy specifically targeted at pioneer industries, extending previous studies that primarily examine general tax incentive policies across broad samples of listed firms [31, 54]. Second, unlike previous studies that focus mainly on overall ESG performance, this study investigates whether tax holiday incentives influence the environmental, social, and governance dimensions differently, providing a more comprehensive understanding of how fiscal incentives affect corporate sustainability. Third, by linking a sector-specific fiscal policy with multidimensional ESG performance within an emerging economy, this study extends the discussion on fiscal policy and corporate sustainability while complementing the existing theoretical framework on the relationship between tax incentives and ESG performance [28]. Thus, the results of this study are expected to serve as a strategic reference for policymakers, industry players, and academics in designing fiscal policies that support Indonesia's transformation toward a green economy.

Theoretical Review

In general, environmental, social, and governance can be defined as a set of operational standards consisting of three main criteria for measuring the sustainability and impact of an investment [22]. In this chapter, we will discuss various theories related to economic incentives and ESG.

Economic Theory

Economic theory provides a broad foundation for explaining how fiscal incentives, including tax holidays, influence corporate behavior. Under the assumption of economic rationality, companies respond to tax incentives by reallocating resources to maximise long-term utility, including investments in sustainability and ESG initiatives. Tax holidays, as temporary reductions in tax burdens, can increase companies' cash flow and motivate investments that were previously considered additional costs but are now viewed as part of long-term value creation strategies.

From a microeconomic perspective, companies evaluate the trade-off between ESG-related expenditures and the economic benefits they generate. Tax incentives have been shown to improve ESG performance by strengthening technological innovation capabilities, reflecting efficiency-based allocative decisions under favourable fiscal conditions [52]. This reinforces the relevance of economic theory as an analytical framework for explaining how fiscal incentives influence corporate sustainability behavior.

Empirical evidence further suggests that fiscal incentives encourage green technology adoption and more sustainable corporate practices [45]. In addition, tax reductions can serve as a mechanism linking corporate resource allocation decisions with ESG-related outcomes [20]. Therefore, economic theory predicts that tax holidays can function not only as fiscal instruments but also as strategic policy tools that support long-term corporate sustainability and ESG performance.

Stakeholder Theory

Stakeholder theory, introduced by Freeman in 1984, argues that companies have responsibilities not only to shareholders but also to a broader group of stakeholders, including employees, customers, governments, local communities, and the environment. In the context of tax holidays, this theory suggests that fiscal incentives can provide firms with additional resources to support environmental, social, and governance (ESG) initiatives that address stakeholder expectations. Therefore, tax holidays are not merely instruments of cost efficiency but can also signal a company's commitment to sustainability and responsible business practices.

Stakeholder theory is widely applied in ESG research because it emphasizes the importance of responding to social and environmental expectations through effective sustainability strategies [20]. Tax holidays can provide firms with greater financial flexibility to develop ESG programs, thereby strengthening relationships with both internal and external stakeholders [20]. In addition, ESG performance can enhance corporate reputation and financial performance, with reputation acting as an important mediating mechanism [29]. By facilitating ESG-related investments, tax incentives may strengthen customer trust, investor confidence, and corporate legitimacy.

Empirical evidence also supports the role of stakeholders in shaping ESG outcomes. Addison [2] finds that foreign ownership is positively associated with ESG performance, reflecting investors' growing preference for sustainable business practices. Furthermore, ESG has been shown to mediate the relationship between managerial incentives and firm performance [8, 32, 49]. From a stakeholder perspective, ESG compliance is not merely a matter of regulatory compliance but forms part of a broader strategy to create shared value for stakeholders [1]. Accordingly, stakeholder theory provides a relevant framework for explaining how tax holidays can encourage companies to strengthen ESG performance while creating long-term value for diverse stakeholder groups.

ESG Performance

ESG performance refers to a company's effectiveness in managing environmental, social, and governance dimensions as part of its broader

commitment to sustainable development, stakeholder interests, and long-term value creation [30]. ESG performance is widely used to evaluate how firms manage sustainability-related risks and opportunities, including environmental impacts, social responsibilities, and corporate governance practices [30].

Several frameworks have been developed to assess ESG performance, including the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), and Task Force on Climate-related Financial Disclosures (TCFD) [35]. In empirical research, ESG performance is commonly measured using scores and ratings provided by independent agencies such as MSCI, Sustainalytics, and Refinitiv [30]. These ratings aggregate multiple environmental, social, and governance indicators into a comprehensive measure of corporate sustainability performance.

Given the availability and comparability of data across firms and years, this study uses ESG scores from the LSEG Refinitiv database as a proxy for corporate ESG performance. Refinitiv ESG scores are widely used in sustainability research and provide a comprehensive assessment of firms' environmental, social, and governance practices [30].

Tax Holiday

The Indonesian government provides corporate income tax reductions to investors in pioneer industries through PMK No. 130/PMK.010/2020, as last amended by PMK No. 69 of 2024. Tax holiday facilities are granted to eligible firms through partial or full corporate income tax reductions for a specified period, depending on investment value and sectoral characteristics.

Pioneer industries refer to strategic sectors with high value-added potential, significant economic spillover effects, and strong contributions to national economic development. These industries typically include sectors such as renewable energy, basic metals, petrochemicals, telecommunications, and other technology-intensive activities. Governments frequently employ tax holidays as a fiscal instrument to accelerate investment, innovation, and industrial development in these sectors. Previous studies suggest that appropriately designed tax holiday schemes can increase investment attractiveness and improve long-term economic returns [5].

Although Indonesia has implemented tax holiday policies to stimulate investment in pioneer industries, direct fiscal incentives linked to ESG performance remain limited [24]. This condition presents an opportunity for policy reform by integrating sustainability considerations into investment incentive schemes. In this context, tax holidays may serve not only as instruments for promoting investment but also as policy tools to encourage corporate sustainability and ESG performance [24].

The Effect of Tax Holidays on ESG Performance

Various empirical studies have examined the relationship between tax incentives and ESG performance in different jurisdictions. Tax incentives through accelerated depreciation policies can improve corporate ESG performance by easing financing constraints and increasing investment in research and development [20]. Similar findings were observed in India, where fiscal incentives, such as tax breaks for clean energy investments, improved companies' environmental behavior [27]. On the other hand, adverse effects have been identified when fiscal incentives are not aligned with corporate ESG strategies, creating a paradox between fiscal efficiency and social responsibility [11]. Other studies indicate that the effectiveness of incentives is highly dependent on internal company conditions such as governance quality, ownership structure, and the external regulatory environment [54].

Although these studies have made important contributions to explaining the role of tax incentives in ESG performance, there is a significant gap in the literature regarding sectoral context and selective fiscal policies. Most studies have been conducted at an aggregate or cross-sectoral level, without accounting for the variation in incentives granted only to strategic industries, such as pioneering industries [3]. This gap is particularly relevant in the Indonesian context, where there are tax incentive policies specifically designed to encourage growth in specific sectors, as set out in PMK No. 130/PMK.010/2020, as amended by PMK No. 69 of 2024. In addition, there is a lack of studies that use a quantitative approach to measure the direct impact of these policies on the ESG performance of companies listed on the Indonesian capital market.

This article occupies a strategic position in filling this gap by proposing a quantitative analysis model to measure the exogenous impact of corporate income tax reduction policies for pioneer industries on companies' ESG performance. Focusing on the period 2015–2024 and the population of companies listed on the Indonesia Stock Exchange, this article presents empirical evidence that has not been widely explored in previous literature. Furthermore, the sector-based approach allows for the identification of more precise mechanisms regarding how selective fiscal policies can influence sustainable behavior at the corporate level [41]. This contribution broadens the theoretical and practical understanding of fiscal instruments as catalysts for sustainability in developing countries.

As a basis for the methodology section, the conceptual synthesis in this study emphasises that tax incentives act as external interventions that can modulate the relationship between sustainability goals and actual corporate behavior. Referring to the theoretical framework of economic incentives and stakeholders, and taking into account the sectoral and institutional context in Indonesia, this study proposes that the policy of reducing corporate income tax for pioneer industries can serve as a trigger for improving ESG performance, which is realised through environmental investment, better governance, and more structured social responsibility programmes [28]. Thus, this section establishes a robust theoretical and empirical framework to explain the causal relationship that will be statistically tested in the subsequent methods section.

As the primary variable to be studied, Environmental, Social, and Governance (ESG) is a concept that has been developing since the 1960s, in line with increasing investor awareness of the importance of responsible investment not only in terms of government regulations, such as taxation, but also in terms of environmental sustainability and social aspects. ESG has since grown into a full set of tools for figuring out how long a company can stay in business.

ESG serves as an important guide for investors in determining which investments are ethical and responsible. ESG also serves as a means for companies to report on corporate actions oriented toward risk management and the prevention of fraudulent practices. Based on a synthesis of economic incentive theory, stakeholder theory, and previous empirical findings, tax holiday facilities are considered capable of reducing corporate tax burdens, increasing liquidity, and expanding companies' investment capacity in the environmental, social, and governance sectors. Thus, pioneering industrial companies that obtain *tax holiday* facilities are expected to have greater opportunities to improve their ESG performance than companies that do not obtain such facilities. Therefore, the hypothesis proposed in this study is as follows:

H_1: The provision of tax holiday facilities has a positive effect on the ESG performance of pioneering industrial companies in Indonesia.

H_2: The provision of tax holiday facilities has a positive effect on the environmental performance of pioneering industrial companies in Indonesia.

H_3: The provision of tax holiday facilities has a positive effect on the social performance of pioneering industrial companies in Indonesia.

H_4: The provision of tax holiday facilities has a positive effect on the governance performance of pioneering industrial companies in Indonesia.

RESEARCH METHOD

This study adopts a quantitative, explanatory design to analyses the relationship between tax holiday opportunities and corporate ESG performance. This approach stems from the argument that changes in fiscal incentive regimes can influence corporate sustainability practices by altering expectations, legitimacy pressures, and corporate adaptation to regulations. The analysis was conducted using panel data regression, which offers advantages for overcoming unobserved heterogeneity across companies and for capturing the dynamics of time in corporate behavior [6, 48].

The research sample consists of companies listed on the Indonesia Stock Exchange (IDX) during the 2015–2024 period. The sample was selected using purposive sampling based on several criteria: (1) companies operating in pioneer industries eligible for tax holiday incentives, (2) companies with ESG scores available in the LSEG Refinitiv database, and (3) companies that consistently published annual and sustainability reports during the observation period. Based on these criteria, 97 companies were included in the final sample. Financial and governance variables were obtained from the same database and verified using annual and sustainability reports. The resulting panel structure was unbalanced, a common condition in cross-time ESG research [13].

The main variables in this study consist of ESG scores as the dependent variable and tax holiday opportunity windows as the independent variable. ESG performance is analyzed both in aggregate and separately for each dimension of environmental (E), social (S), and governance (G), as is standard practice in ESG literature, which emphasises that each dimension may respond differently to economic incentives [15]. This approach enables the identification of ESG dimensions most sensitive to tax holiday exposure, consistent with empirical findings that fiscal incentives and corporate financial conditions have heterogeneous effects on environmental, social, and governance aspects [45, 54].

The tax holiday variable refers to the period during which tax holiday facilities are legally available to firms operating in eligible pioneer industries. Because firm-level information on tax holiday recipients in Indonesia is not publicly disclosed, directly identifying beneficiary firms is impossible. Therefore, this study uses the tax holiday period as a proxy for policy exposure, defined as the time during which the facility is available and the company operates in an industry that meets the regulatory criteria. The use of the "tax holiday opportunity window" variable is scientifically justified because it represents policy exposure when recipient data are unavailable [1]. The concept of an opportunity window is also methodologically valid for representing periods of economic opportunity in policy

analysis [18], while cross-country evidence shows that policy duration may have a stronger influence on economic outcomes than the identity of individual recipients [40]. A similar approach was used in the US Opportunity Zone Tax Incentive study, which assessed investment responses based on policy periods rather than individual recipient data [12]. Given these data constraints, this study captures firms' exposure to the tax holiday policy rather than the actual utilization of tax holiday facilities.

While this approach provides a reasonable basis for evaluating policy exposure under existing data constraints, it cannot distinguish between firms that actually received tax holiday facilities and those that were only eligible during the policy period. Consequently, the findings should be interpreted as evidence of the broader effect of exposure to tax holiday policy across eligible pioneer industries rather than the effectiveness of the incentive for individual recipient firms. This limitation does not affect the suitability of the proxy for evaluating sectoral policy exposure, but it should be considered when interpreting the scope of the findings. Subsequent research may enhance this analysis by integrating firm-level recipient data, contingent upon the availability of such information to the public.

Control variables include capital structure, company size, profitability, and governance attributes. All of these variables are compiled based on empirical literature and corporate finance methodology to ensure the internal validity of the research [9]. To provide clarity on the definition and measurement of each variable used in this study, the following Table presents the operationalisation of variables, including variable categories, operational definitions, measurement methods, and data sources.

The empirical model in this study was estimated using three main approaches: pooled ordinary least squares (pooled OLS), fixed effects model (FEM), and random effects model (REM) to accommodate the characteristics of panel data with individual and time dimensions. The selection of the best model was carried out in stages using the Chow test to determine the preference between pooled OLS and FEM, followed by the *Lagrange Multiplier (LM) Breusch–Pagan test* to compare pooled OLS with REM, and the Hausman test to determine whether FEM or REM was more appropriate to use as the final model. This model selection procedure aims to ensure that the estimates produced are efficient and unbiased while accounting for unobserved individual heterogeneity and potential correlations between individual effects and independent variables [48].

The empirical model in this study is formulated in the form of a panel data regression equation as follows:

$$ESG_it = \alpha + \beta 1TH_it + \beta 2DER_it + \beta 3SIZE_it + \beta 4ROAA_it + \beta 5INED_it + \beta 6IAC_it + \varepsilon_it \quad (1)$$

Table 1. Operational Definitions of Variables

Category	Variable	Operational Definition	Measurement	Source
Dependent variables	ESG	ESG score	0–100	Refinitiv
	E	Environmental score	0–100	Refinitiv
	S	Social score	0–100	Refinitiv
	G	Governance score	0–100	Refinitiv
Independent variables	TH	Exposure to tax holiday opportunities	0 before 2021; k/4 2021–2024	PMK 130/202; PMK 69/2024
Control variables	DER	Company leverage	Total Debt / Equity	Refinitiv
	SIZE	Company size	Ln Total Asset	Refinitiv
	ROAA	Profitability	Net Income / Avg Assets	Refinitiv
	INED	Proportion of Independent Commissioners	INED / Total Commis-sioners	Refinitiv
	IAC	Independence of the Audit Committee	Indep AC / Total AC	Refinitiv

Where ESG_it represents the ESG score of company i in year t, TH_it is the tax holiday period, DER_it is leverage, SIZE_it is company size, ROAA_it is profitability, INED_it is the proportion of independent directors, and IAC_it is audit committee independence. Meanwhile, ε_it is the error component that reflects the influence of other factors outside the model. For more in-depth analysis, the regression equation was also estimated separately for each ESG dimension, namely environmental (E), social (S), and governance (G), in order to identify the specific response of each dimension to the *tax holiday* opportunity.

This study conducted a series of classical panel-data assumption tests, including normality, multicollinearity, heteroscedasticity, and autocorrelation tests. The multicollinearity test was performed using the Variance Inflation Factor (VIF) to ensure that there was no high correlation among independent variables that could cause inefficient estimation [17]. Heteroscedasticity was tested using the Breusch–Pagan and White tests, while autocorrelation was tested using the Wooldridge test for panel data, which is widely used for its ability to efficiently detect serial correlation in a panel framework [48]. If a violation of the assumption of homoscedasticity or the absence of autocorrelation is found, the estimates will be corrected using robust standard errors to produce consistent statistical inferences [37].

RESULTS AND DISCUSSION

Results

This study aims to analyze strategies for improving Environmental, Social, and Governance (ESG) performance through the use of tax incentives

in pioneering industries in Indonesia. Pioneer industries refer to strategic sectors that have high added value, extensive externalities, and play an important role in national economic development (Ministry of Finance of the Republic of Indonesia, 2024), such as renewable energy, basic metals, petrochemicals, and telecommunications, as part of the transition toward a green economy. The analysis was conducted using panel data from 97 companies selected through purposive sampling from companies listed on the Indonesia Stock Exchange (IDX). The sample was determined based on several criteria, including companies operating in pioneer industries, consistently publishing sustainability reports, and having ESG scores available during the 2015–2024 observation period. The models were estimated using the Fixed Effect Model (FEM), Random Effect Model (REM), and Common Effect Model (CEM).

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. dev.	Min	Max
CO	970	49	28.01444	1	97
Year	970	2019.5	2.873763	2015	2024
ESG	970	30.34775	28.3417	0	88.95334
E	970	24.34148	27.32884	0	92.67771
S	970	33.1995	31.32467	0	96.23825
G	970	30.81568	30.12077	0	94.01335
TH	970	0.25	0.3537358	0	1
DER	970	0.8279463	3.93301	0	117.1352
SIZE	970	3.285532	1.72549	-1.506652	7.794503
ROAA	970	0.0513895	0.1057626	-0.9718728	0.7833089
INED	970	28.00095	24.5186	0	100
IAC	970	53.80188	45.55548	0	100

Based on the descriptive statistics table, the study included 970 observations covering the period 2015–2024, with an average annual value of 2019.5, indicating that the data were fairly balanced temporally. The average ESG score for companies was 30.35, with a standard deviation of 28.34, indicating that ESG performance remains relatively low and highly heterogeneous across firms. Given that ESG scores range from 0 to 100, higher scores reflect better environmental, social, and governance performance. When reviewed by dimension, the average scores were 24.34 for environmental performance (E), 33.20 for social performance (S), and 30.82 for governance performance (G), indicating that the social dimension exhibited the highest average performance among the three ESG dimensions.

From Table 2, it can also be observed that the tax holiday opportunity window (TH) variable has an average value of 0.25, indicating that approximately 25% of the observations were exposed to tax holidays. Among the financial variables, leverage (DER) has an average value of 0.83 and a relatively high maximum value, suggesting substantial variation in capital structures across firms. Company size (SIZE) has an average value of 3.29, reflecting differences in firm scale within the sample. In terms of profitability, ROAA has an average value of 5.14%, with a negative minimum value, indicating that some companies experienced losses during the observation period. Meanwhile, the average proportion of independent commissioners (INED) is 28.00%, while audit committee independence (IAC) averages 53.80%. These figures indicate that most firms have implemented basic corporate governance practices, although the level of governance compliance and oversight still varies across companies.

The correlation table in Appendix 1 shows that ESG scores have robust correlations with their dimensions, namely E, S, and G, with correlation coefficients of 0.9033, 0.9715, and 0.9310, respectively (p-values = 0.0000). This is reasonable because ESG scores aggregate these three dimensions and indicate that differences across environmental, social, and governance dimensions primarily explain variations in overall ESG performance. The Tax Holiday Opportunity Window (TH) variable correlates positively and significantly with ESG scores ($r = 0.4461$; $p < 0.01$) and with each of the E, S, and G dimensions ($r = 0.4255$, 0.4213, and 0.3931, respectively), providing an initial indication that companies exposed to tax holiday opportunities tend to have higher ESG performance.

Furthermore, several control variables also show significant relationships with ESG. For example, company size (SIZE) is positively correlated with ESG ($r = 0.5254$), while the proportion of independent commissioners (INED) and audit committee independence (IAC) exhibit strong positive correlations with ESG ($r = 0.7834$ and 0.7543, respectively), which is consistent with the argument that better governance is associated with stronger sustainability practices. Profitability (ROAA) is also positively correlated with ESG ($r = 0.1629$), although the magnitude of the relationship is relatively modest. On the other hand, leverage (DER) does not show a statistically significant correlation with ESG ($r = 0.0260$; $p > 0.05$). The correlations among the independent variables are generally below 0.80, suggesting no serious multicollinearity concerns at the descriptive level. However, the correlation between INED and IAC is relatively high ($r = 0.8828$) and therefore will be further examined through the variance inflation factor (VIF) test in the multicollinearity assessment. Overall, the results of this correlation analysis provide an initial overview of the direction of relationships among the variables before estimating the panel regression models.

In summary, the panel regression results table in Appendix 2 displays four models: (1) overall ESG score, (2) E dimension, (3) S dimension, and (4) G dimension, each estimated using pooled OLS, fixed effects (FEM), and random effects (REM). Consistently across almost all specifications (FE, RE, and OLS for ESG, E, and S), the Tax Holiday Opportunity Window (TH) coefficient is positive and significant at the 1% level, indicating that exposure to tax holiday opportunities is associated with an increase in ESG scores and each of its dimensions. For the governance dimension, the effect of TH remains positive and statistically significant in both the FE and RE models, although it becomes insignificant in the OLS specification. Several control variables, such as company size (SIZE), the proportion of independent commissioners (INED), and audit committee independence (IAC), generally exhibit positive and significant effects across the models. In contrast, leverage (DER) shows mixed effects across ESG dimensions, with a negative and significant effect on the social dimension and a positive and significant effect on the governance dimension. The R-squared values, ranging from approximately 0.50 to 0.78, indicate that the explanatory variables account for a substantial proportion of the variation in ESG scores and their dimensions.

Based on the results of the Chow test, Hausman test, and LM Breusch–Pagan test, the model used for the dependent variables ESG and E is the fixed effects model (FEM), while the random effects model (REM) is selected for the dependent variables S and G. Prior to the final estimation, mean-centering was applied to the INED and IAC variables to reduce potential multicollinearity arising from their relatively high correlation. In addition, robust standard errors were employed to address indications of heteroscedasticity and autocorrelation, resulting in more reliable statistical inference. The following table presents the panel regression results after applying centring and robust standard error corrections.

After centring the INED and IAC variables and correcting for robust standard errors, the regression results in Table 3 show that the Tax Holiday Opportunity Window (TH) remains positively and significantly influential at the 1% level across all selected models. In Model 1 (ESG), companies exposed to tax holiday opportunities have ESG scores approximately 12.60 points higher than those outside the opportunity window, ceteris paribus. This effect is even stronger in the environmental dimension (Model 2, coefficient 19.28), followed by the social dimension (Model 3, coefficient 10.73), while the governance dimension (Model 4, coefficient 5.224) also shows a positive and statistically significant effect, although the magnitude is relatively smaller. These findings reinforce the argument that exposure to tax holiday opportunities is associated with stronger sustainability commitments, particularly in environmental and social dimensions.

Table 3. Regression Results After Treatment

VARIABLES	Model 1 (ESG)	Model 2 (E)	Model 3 (S)	Model 4 (G)
TH	12.60***	19.28***	10.73***	5.224***
	(1.549)	(2.421)	(2.102)	(1.961)
DER	-0.0306	-0.0481	-0.166***	0.125***
	(0.0371)	(0.0488)	(0.0316)	(0.0464)
SIZE	1.215	0.975	2.933***	1.372*
	(0.753)	(0.903)	(0.806)	(0.728)
ROAA	2.326	1.691	12.55*	-2.786
	(5.888)	(7.681)	(6.594)	(6.258)
INED_c	0.332***	0.0674	0.324***	0.541***
	(0.0625)	(0.0843)	(0.0757)	(0.0756)
IAC_c	0.173***	0.165***	0.208***	0.141***
	(0.0332)	(0.0444)	(0.0350)	(0.0448)
Constant	23.11***	16.27***	20.37***	25.04***
	(2.484)	(2.957)	(2.886)	(2.566)
Observations	970	970	970	970
R-squared	0.781	0.576		
Number of Co	97	97	97	97

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The centred governance variables, namely INED_c and IAC_c, generally exhibit positive and significant effects on ESG performance and its dimensions. An increase in the proportion of independent commissioners around the sample mean (INED_c) is associated with higher ESG scores (coefficient 0.332) and significantly improves the social and governance dimensions, although its effect on the environmental dimension is not statistically significant. Similarly, greater audit committee independence (IAC_c) consistently shows a positive and significant influence across all models, suggesting that stronger governance mechanisms contribute to improved ESG outcomes. These findings are consistent with the argument that effective corporate governance supports sustainability-oriented decision-making and strengthens firms' ESG performance.

Among the firm-specific control variables, company size (SIZE) exhibits a positive and significant effect on the social dimension and a weaker positive effect on the governance dimension, indicating that larger firms may possess greater organisational capacity and resources to support stakeholder-related and governance initiatives. Profitability (ROAA) is positively associated with the social dimension but does not significantly affect overall ESG, environmental, or governance performance. Meanwhile, leverage (DER) has a negative and significant effect

on the social dimension but a positive and significant effect on the governance dimension, suggesting that the influence of capital structure on ESG performance varies across sustainability dimensions and appears less consistent than the influence of governance variables.

The R-squared values of 0.781 for the ESG model and 0.576 for the environmental model indicate that the explanatory variables account for a substantial proportion of the variation in ESG performance. Since the final estimates are based on the selected panel models (FEM for ESG and E; REM for S and G), combined with variable centring to reduce multicollinearity and robust standard errors to address heteroscedasticity and autocorrelation, the resulting coefficients can be considered sufficiently reliable for drawing empirical conclusions regarding the effect of tax holiday opportunities on corporate ESG performance.

Discussion

The findings of this study indicate that tax incentives under the Tax Holiday scheme have a positive and significant effect on ESG performance among pioneering industries in Indonesia. These results suggest that fiscal policy, particularly the provision of tax incentives, plays a strategic role in encouraging corporate transformation toward sustainable business practices. By reducing corporate income tax liabilities, tax holidays increase firms' internal financial capacity, enabling them to redirect financial resources toward sustainability-related investments [20, 27]. In pioneer industries, these additional resources can be used to invest in cleaner production technologies, waste management systems, energy-efficient production processes, and workforce and community development programs, thereby strengthening corporate ESG performance [20, 27]. Practically, Indonesia has introduced tax incentive policies for strategic industries that generate significant economic spillover effects, including renewable energy and electric vehicle battery industries. These incentives are regulated through Minister of Finance Regulation (PMK) No. 12 of 2025, which provides government-borne value-added tax (PPN-DTP) and luxury goods sales tax (PPnBM-DTP) incentives to reduce the purchase cost of electric and hybrid vehicles and encourage wider public adoption. This aligns with recent literature indicating that green fiscal policies serve as effective economic incentives to accelerate sustainable innovation and improve the quality of ESG reporting in strategic industrial sectors [45]. In the Indonesian context, these incentives also support the broader policy direction toward green industrial development and the national transition to a low-carbon economy [40]. PMK No. 12 of 2025 further illustrates how fiscal policy can be used as a strategic instrument to promote sustainable economic development while supporting Indonesia's carbon emission reduction agenda.

These findings are closely aligned with government policies that integrate industrial development with sustainability objectives. Since 2020, environmentally oriented tax incentives have been strengthened to support the Indonesia Green Taxonomy and the Net Zero Emission 2060 target, positioning pioneer industries as key drivers of the green economic transition [19]. Within this policy framework, tax holidays reduce the financial burden associated with large-scale capital investments, enabling firms to allocate greater resources to projects that are consistent with national sustainability priorities, such as renewable energy, cleaner production technologies, and energy-efficient industrial processes. The tax holiday therefore provides not only fiscal relief but also encourages firms to adopt more structured and measurable sustainability strategies that are aligned with Indonesia's long-term environmental and industrial policies. This suggests that tax holidays can function not only as investment incentives but also as policy instruments that facilitate the integration of corporate investment decisions with broader sustainability objectives. In summary, integrating sustainability into national policies is projected to influence economic progress over the long term [10, 34, 38, 42].

Across many countries, tax incentives have gradually evolved from instruments designed primarily to attract investment into policy tools that support sustainability and green industrial transformation. Evidence from China shows that tax incentives can enhance corporate ESG performance by stimulating technological innovation and green transformation, thereby encouraging firms to allocate more resources to sustainable investment and cleaner production processes [20, 52, 52]. Similarly, studies in China have shown that investment-related tax incentives promote green transformation through cleaner technologies and productivity improvements, while recent evidence also suggests that the environmental effectiveness of tax incentives depends on whether sustainability objectives are explicitly incorporated into policy design [26, 51]. In the European context, fiscal incentives are increasingly aligned with sustainable industrial policies through the EU Taxonomy and the Clean Industrial Deal, which encourage investment in clean technologies, industrial decarbonization, and energy-efficient production [14, 36]. Unlike China and several European countries, where sustainability objectives have increasingly been incorporated into the design of fiscal incentives, Indonesia's tax

holiday policy remains primarily investment-oriented. Nevertheless, the findings of this study suggest that even without explicit ESG eligibility criteria, tax holidays can generate positive sustainability outcomes. The Indonesian case therefore demonstrates that tax holidays can support ESG performance even when sustainability criteria are not explicitly embedded in policy design, although incorporating ESG-based performance criteria could further strengthen the sustainability impact of Indonesia's tax holiday scheme.

A possible explanation for these findings is that tax incentives reduce operational costs, improve firms' financial capacity, and encourage long-term investment in sustainable business practices, consistent with previous studies [21]. Lower tax burdens provide firms with greater financial flexibility to undertake investments that might otherwise be postponed because of funding constraints, including environmental technologies, employee development programs, and other sustainability-related initiatives. This finding is also in line with previous research suggesting that the relationship between fiscal policy and ESG performance may reinforce each other over time, as firms with stronger sustainability performance are more likely to respond to policy incentives and further strengthen their ESG commitments [39].

Furthermore, the positive and significant effects of board independence and audit committee independence suggest that corporate governance plays an important supporting role in translating fiscal incentives into better sustainability performance. While tax holidays increase firms' financial capacity, independent boards and audit committees help ensure that these additional resources are directed toward sustainability-related investments and reported transparently. Strong governance also strengthens oversight, improves the credibility of sustainability reporting, and reduces the risk of greenwashing, thereby reinforcing the long-term effectiveness of fiscal policy in promoting ESG performance [15].

The effects of financial variables appear mixed across ESG dimensions. Leverage does not significantly affect overall ESG or environmental performance, but it negatively affects the social dimension and positively affects the governance dimension. Similarly, profitability is positively associated with the social dimension, although its influence on the other ESG dimensions is not statistically significant. These mixed results suggest that financial capacity alone is insufficient to explain variations in ESG performance among pioneer industries. Instead, firms' sustainability commitments appear to be shaped by how financial resources are translated into sustainability initiatives within the broader institutional and regulatory environment. This finding reinforces the view that sustainability commitments in pioneer industries are influenced more by institutional factors and public policy pressures than by companies' internal financial conditions. Previous global research has shown that the relationship between financial performance and ESG remains inconclusive and varies across sectors, particularly under strong regulatory pressures and policy incentives [15]. In the context of pioneer industries, government policies such as tax holidays may therefore play a more influential role in shaping corporate sustainability strategies than firms' financial characteristics alone. Thus, improvements in ESG performance are not merely a consequence of financial capacity but also reflect firms' responses to stakeholder expectations and policy incentives that encourage long-term sustainable investment.

These findings extend the literature by integrating fiscal policy and corporate governance perspectives in explaining ESG determinants, an area that remains underexplored in developing country contexts. The evidence suggests that targeted tax incentives aligned with environmental objectives can influence corporate behavior by encouraging firms to redirect financial resources toward sustainability-related investments and by strengthening managerial incentives to incorporate ESG considerations into long-term business strategies. This finding is consistent with broader evidence showing that institutional interventions and support mechanisms can encourage sustainability-oriented behavior across different contexts, including environmental decision-making and sustainability practices in Indonesia [25]. From a policy perspective, the results highlight the need for a more refined design of green tax incentives in Indonesia. Rather than focusing solely on investment realization, future tax holiday policies could also incorporate measurable sustainability outcomes into their evaluation framework. A performance-based approach, linking the magnitude and duration of tax holidays to measurable sustainability indicators—such as carbon emission reductions, renewable energy adoption, or environmental certification—may improve policy effectiveness. Such an approach would help ensure that fiscal incentives are allocated to activities that contribute meaningfully to the green economic transition.

The provision of tax holidays for pioneer industries, as stipulated in Government Regulation No. 94 of 2010, as amended by Government Regulation No. 55 of 2022, is not explicitly intended for companies that have implemented ESG. However, the findings of this study indicate that tax holiday incentives are positively associated with corporate ESG performance, suggesting that fiscal incentives may generate broader sustainability benefits

beyond their original investment objectives. Given that the strongest effects are observed in the environmental and social dimensions, future tax incentive policies could be designed to explicitly encourage investments in activities such as low-carbon technologies, renewable energy, resource efficiency, employee development, and community empowerment, while also incorporating governance-related indicators to strengthen corporate accountability. Therefore, greater policy effectiveness may be achieved by integrating sustainability criteria into the design and evaluation of tax incentive schemes. In addition, the findings highlight the need for integrated monitoring systems across institutions, such as the Directorate General of Taxes, the Financial Services Authority, and the Indonesia Stock Exchange, so that information on the use of tax incentives can be linked more systematically with ESG performance and sustainability reporting. Such integration would improve policy evaluation by enabling policymakers to assess not only whether tax incentives stimulate investment but also whether they contribute to measurable sustainability outcomes. This is important to strengthen policy accountability and to minimize the risk that fiscal incentives are used primarily for tax savings without generating meaningful sustainability benefits.

The regression results indicate that tax holiday opportunities have a stronger effect on the environmental and social dimensions than on the governance dimension. This pattern is consistent with the characteristics of pioneer industries, which are generally capital-intensive, technology-oriented, and closely associated with large-scale physical investment across strategic sectors. As a result, additional financial resources generated by tax holidays are more readily translated into investments with visible environmental and social outcomes, such as cleaner production technologies, resource efficiency, employee development, and community engagement. By contrast, improvements in governance are inherently more gradual because they depend on organizational structures, board oversight, internal control systems, and corporate governance practices that cannot be transformed solely through additional financial resources or investment incentives. This finding suggests that fiscal incentives are more effective in encouraging sustainability initiatives that involve tangible investments than those requiring institutional and organizational change. These results differ from evidence reported in Korea, where the governance dimension has been found to play a more prominent role in enhancing corporate resilience during periods of crisis [7]. Previous studies also suggest that weak governance is commonly associated with inadequate internal controls, weaker corporate policies, and lower reporting quality [33]. Unlike some ESG-oriented policy frameworks, Indonesia's tax holiday policy is primarily designed to attract investment and stimulate industrial development, without explicitly requiring improvements in governance structures such as board independence, audit committee effectiveness, or sustainability oversight. Consequently, the findings suggest that tax holidays are more likely to accelerate improvements in the environmental and social dimensions, while governance performance depends on broader institutional reforms and firm-level governance practices beyond the scope of fiscal incentives alone.

Table 3 further confirms that the governance model (Model 4) produces smaller coefficient estimates than the environmental and social models. The tax holiday variable is still positive and statistically significant (coefficient = 5.224; $p < 0.01$), but the smaller size shows that governance reacts more slowly to fiscal incentives than the environmental and social dimensions. This finding is consistent with the earlier discussion that improvements in governance require institutional and organizational changes beyond those directly encouraged by investment-oriented tax incentives.

In contrast to the environmental and social models, ROAA shows a negative, although statistically insignificant, coefficient in the governance model. This finding suggests that corporate profitability alone does not necessarily lead to improvements in governance performance. Governance quality is more closely associated with institutional arrangements, effective oversight, and internal control systems than with firms' short-term financial performance. Accordingly, the insignificant relationship indicates that profitability is not a key determinant of governance performance in pioneer industries.

The same pattern can also be observed for the leverage variable (DER) in Model 4. While leverage has a negative and significant effect on the social dimension, it exhibits a positive and statistically significant association with governance performance. One possible explanation is that firms with higher leverage are subject to greater monitoring and reporting requirements from creditors, encouraging stronger governance practices, more transparent reporting, and closer managerial oversight. This finding is consistent with the view that debt can function as an external governance mechanism by strengthening managerial discipline and accountability. Accordingly, leverage may contribute to governance performance through external monitoring rather than through improvements in firms' internal financial capacity. These results also suggest that financial variables influence ESG dimensions through different channels, depending on the

mechanisms by which financing conditions affect corporate behavior. This interpretation is consistent with previous studies showing that ESG performance is closely associated with financing conditions, including the cost of debt [4]. Within the context of pioneer industries, these findings imply that governance improvements are supported not only by fiscal incentives but also by external monitoring from capital providers, highlighting the complementary roles of public policy and market discipline in promoting sustainable corporate behavior.

CONCLUSION

This research investigates the impact of corporate income tax reduction policies for pioneer industries on the ESG performance of companies listed on the Indonesia Stock Exchange. The focus on this selective sectoral policy enables a more precise analysis than previous studies. In addition, pioneer industries are strategic sectors in Indonesia with the potential to promote technological advancement, generate economic spillovers, and support the development of renewable energy.

Based on a sample of 97 companies in pioneer industries during the period 2015–2024, the results indicate that tax holiday opportunities are positively associated with ESG performance among pioneer industrial firms in Indonesia. ESG scores increased significantly, with the environmental dimension showing the strongest improvement, followed by the social dimension, while the governance dimension also improved significantly but with a relatively smaller effect. Overall, the findings suggest that the integration of green fiscal policies and ESG practices contributes to sustainable industrial transformation. The stronger response of the environmental and social dimensions indicates that fiscal incentives are particularly effective in encouraging sustainability initiatives that are directly linked to investment and operational activities.

From a research perspective, this study extends the literature on fiscal policy and corporate sustainability by demonstrating that tax holiday incentives influence ESG dimensions differently. While previous studies generally examined ESG performance as a single construct, this study shows that fiscal incentives generate stronger effects on environmental and social performance than on governance performance. These findings highlight the importance of examining ESG dimensions separately when evaluating the effectiveness of sustainability-oriented fiscal policies.

For policymakers, these findings imply that tax incentive policies such as the Tax Holiday scheme can serve as effective instruments to promote sustainable industrial transformation and improve ESG performance among pioneer industries. Since the environmental and social dimensions show stronger improvements than the governance dimension, policymakers may consider strengthening governance-related regulations, monitoring systems, and ESG disclosure requirements to ensure a more balanced ESG implementation. In addition, the findings support the development of integrated monitoring systems involving the Directorate General of Taxes, the Financial Services Authority, and the Indonesia Stock Exchange to improve policy accountability and better link fiscal incentives with sustainability outcomes. For corporations, the results highlight the importance of preparing ESG reports that provide investors and stakeholders with a comprehensive overview of the company's environmental, social, and governance performance. ESG reporting should therefore be viewed not merely as a compliance requirement but as an integral part of corporate accountability and long-term value creation.

Future research is encouraged to expand sectoral coverage, incorporate additional environmental policy instruments, and examine ESG dimensions separately to provide more nuanced insights into the effectiveness of fiscal policies in supporting a green economic transition. Future studies may also utilize firm-level tax incentive data, where available, to further examine the relationship between fiscal incentives and corporate sustainability performance.

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APPENDIX 1. Correlation analysis

	ESG	E	S	G	TH	DER	SIZE	ROAA	INED	IAC
ESG	1.0000									
E	0.9033*	1.0000								
	0.0000									
S	0.9715*	0.8598*	1.0000							
	0.0000	0.0000								
G	0.9310*	0.7624*	0.8541*	1.0000						
	0.0000	0.0000	0.0000							
TH	0.4461*	0.4255*	0.4213*	0.3931*	1.0000					
	0.0000	0.0000	0.0000	0.0000						
DER	0.0260	0.0025	0.0229	0.0469	0.0277	1.0000				
	0.4185	0.9383	0.4753	0.1447	0.3894					
SIZE	0.5254*	0.4699*	0.5226*	0.4780*	0.1766*	0.0013	1.0000			
	0.0000	0.0000	0.0000	0.0000	0.0000	0.9666				
ROAA	0.1629*	0.1895*	0.1598*	0.1342*	0.0047	0.0268	-0.0035	1.0000		
	0.0000	0.0000	0.0000	0.0000	0.8828	0.4051	0.9131			
INED	0.7834*	0.6271*	0.7545*	0.7815*	0.4811*	0.0376	0.4293*	0.1065*	1.0000	
	0.0000	0.0000	0.0000	0.0000	0.0000	0.2423	0.0000	0.0009		
IAC	0.7543*	0.6197*	0.7387*	0.7338*	0.4944*	0.0337	0.3769*	0.1198*	0.8828*	1.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.2950	0.0000	0.0002	0.0000	

APPENDIX 2. Regression Result

VARIABLES	FE	RE	OLS	FE-E	RE-E	OLS-E	FE-S	RE-S	OLS-S	FE-G	RE-G	OLS-G
TH	12.60***	11.42***	6.587***	19.28***	17.58***	12.25***	11.99***	10.73***	5.642**	6.726***	5.224***	1.297
	(1.549)	(1.591)	(1.959)	(2.421)	(2.418)	(2.439)	(2.053)	(2.102)	(2.263)	(1.983)	(1.961)	(2.267)
DER	-0.0306	-0.0314	-0.0204	-0.0481	-0.0564	-0.153	-0.172***	-0.166***	-0.0354	0.126***	0.125***	0.143
	(0.0371)	(0.0394)	(0.0961)	(0.0488)	(0.0549)	(0.126)	(0.0264)	(0.0316)	(0.0779)	(0.0446)	(0.0464)	(0.0961)
SIZE	1.215	2.199***	3.955***	0.975	2.334***	4.124***	1.917**	2.933***	4.575***	0.0606	1.372*	3.132***
	(0.753)	(0.713)	(0.281)	(0.903)	(0.813)	(0.364)	(0.875)	(0.806)	(0.338)	(0.878)	(0.728)	(0.295)
ROAA	2.326	6.321	24.06***	1.691	8.963	35.90***	8.938	12.55*	26.11***	-8.370	-2.786	15.89***
	(5.888)	(5.705)	(5.455)	(7.681)	(7.578)	(7.761)	(6.906)	(6.594)	(5.664)	(7.046)	(6.258)	(4.811)
INED_c	0.332***	0.350***	0.474***	0.0674	0.0944	0.242***	0.308***	0.324***	0.435***	0.520***	0.541***	0.643***
	(0.0625)	(0.0605)	(0.0564)	(0.0843)	(0.0838)	(0.0760)	(0.0788)	(0.0757)	(0.0648)	(0.0783)	(0.0756)	(0.0628)
IAC_c	0.173***	0.169***	0.156***	0.165***	0.159***	0.141***	0.211***	0.208***	0.207***	0.146***	0.141***	0.125***
	(0.0332)	(0.0319)	(0.0287)	(0.0444)	(0.0430)	(0.0358)	(0.0368)	(0.0350)	(0.0323)	(0.0456)	(0.0448)	(0.0358)
Constant	23.11***	19.97***	14.49***	16.27***	11.86***	6.011***	23.58***	20.37***	15.45***	29.26***	25.04***	19.27***
	(2.484)	(2.514)	(1.255)	(2.957)	(2.996)	(1.615)	(2.896)	(2.886)	(1.499)	(2.838)	(2.566)	(1.298)
Observations	970	970	970	970	970	970	970	970	970	970	970	970
R-squared	0.781		0.688	0.576		0.498	0.734		0.652	0.704		0.648
Number of Co	97	97		97	97		97	97		97	97	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1