

## Effective tax rate, board diversity, and firm performance: Evidence from the electric and electronic industry



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### ABSTRACT

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This study examines the effect of effective tax rate (ETR) and board diversity on the performance of Malaysian public-listed companies (PLCs) in the electric and electronic (E&E) industry. The sample of this study comprised 51 E&E public companies listed in the Main Market of Bursa Malaysia during the financial periods 2018 and 2022. This study documents a significant positive relationship between firm performance and ETR, consistent with the political cost theory, suggesting that high-performing industries such as E&E are more at risk of political scrutiny and, hence, tend to pay higher amounts of tax despite the tax incentives provided by the government. Interestingly, foreign directors are negatively related to a firm's performance. The possible explanation for this is that the E&E industry is highly regulated by the Malaysian government; hence, foreign directors' contribution and authority to make independent strategic changes to drive the firm's performance are limited. Finally, the effect of female directors on firm performance is found to be insignificant, possibly because, on average, only 10% of women are represented on the board of the E&E PLCs. The study findings are of significant interest and beneficial to policymakers, the government, and tax authorities in trying to understand the implications, assess the effectiveness, and tightly monitor the tax incentives and board diversity policy of the E&E companies.

**Contribution/ Originality:** To the best of the authors' knowledge, this represents the first study to examine the effects of ETR and board diversity on the E&E firm's performance. This study is important as the Malaysian government placed an emphasis on efforts to accelerate the E&E industry growth through *Rancangan Malaysia Ke-12* (RMKe-12).

### 1. INTRODUCTION

According to the Malaysian Investment Development Authority (MIDA), Malaysia's electric and electronic (E&E) industry will become the hub of Asia's semiconductor presence, with the industry significantly contributing to Malaysia's gross domestic product (GDP) growth, export earnings, investment, and employment [1]. A Special Investment Tax Allowance has been allocated in the 2020 National Budget specifically for the E&E industry to promote high-value-added activities towards the 5G digital economy and Industry 4.0 transitions and to encourage further reinvestments in Malaysia [2]. In addition, the E&E industry has been identified by the Economic Planning Unit (EPU) as the most influential strategic industry under *Rancangan Malaysia Ke-12* (RMKe-12), with potential contribution of RM120 billion towards the country's GDP in 2025.

Furthermore, the novel coronavirus disease (COVID-19) outbreak in 2020 has resulted in a considerable E&E manufacturing market disruption due to the government's imposed lockdowns worldwide, which have also reduced consumption. Worse, the war between Russia and Ukraine is hurting the chances of a global economic recovery from the COVID-19 pandemic. These bilateral wars have resulted in economic sanctions against several countries, high commodity prices, supply chain disruptions, inflation of goods and services, and other economic impacts on most markets worldwide. This will lead to lower revenue for the E&E public-listed companies (PLCs) and lower firm performance or financial losses during this pandemic and war period. According to [Malay Mail Online \[3\]](#), the Chairman of the Malaysian Semiconductor Industry Association said that Malaysia's E&E industry, which has been affected by the Russia-Ukraine war, will face global headwinds and expect less growth in semiconductors in 2023 than last year. In addition, this is due to cost pressures and global restructuring efforts resulting from headwinds such as the looming recession and US-China tensions. The E&E sector in Malaysia has grown by 18% in 2021 and 30% in 2022, but the industry still needs to be nurtured and grown further. Similarly, [Bernama \[4\]](#) also reported that Malaysia's E&E industry will likely experience slower growth in 2023 than in the previous year amid the looming global recession headwinds and US-China tensions. Given that the E&E industry is the country's golden goose, the government must expedite growth and provide encouragement to this industry.

The RMKe-12 focus will be placed on accelerating the development of eight strategic and High Impact Industries (HII) and activities, which are: electrical and electronics (E&E), global services, aerospace, creative, tourism, halal, smart farming, and biomass. More emphasis is given to the E&E industry regarding tax incentives. To be more impactful, other than that, the research and development (R&D) grant and other incentives will also be given to developing design and development (D&D) in particularly integrated circuit areas. This is because the E&E industry, being part of accelerating the development of strategic and HII, is expected to gain export value worth RM495 billion at the end of 2025.

The government's tax incentives to HII through RMKe-12, notably for listed E&E companies, have motivated this study. This represents the first study to explore whether the E&E industry has tax planning strategies that leverage tax incentives, leading to a lower effective tax rate (ETR) and higher firm performance. In addition, this is the first study to investigate whether women directors and foreign directors' composition on the board contributes to better performance for E&E companies. This study is important as the Malaysian government has placed an emphasis on the E&E industry as HII in RMKe-12 and the upcoming New Industrial Master Plan. The findings from this study would be of significant interest to policy maker/government and tax authorities in trying to understand the implications, assess the effectiveness, and tightly monitor the tax incentives and board diversity policy of the E&E industry.

Interestingly, in support of the political cost theory, this study found that ETR is significantly positively related to firms' performance. This finding suggests that E&E PLCs pay a higher ETR, given that they are more at risk of political pressure/scrutiny by the government and politicians, as they are large companies from the HII. Besides that, foreign directors and firm performance are found to be negatively related. This finding supports the notion that the effect of foreign directors' on strategic changes weakens as corporate performance improves and that the status quo and industry standards continue to prevail. Finally, given that there are only 10% of women represented on the boards of E&E PLCs, the effect of female directors on firm performance is found to be insignificant.

The remainder of this study is structured as follows: In Section 2, this study reviews the literature, which is comprised of the theoretical underpinnings and the hypotheses developed for the study. Section 3 provides a description of the research methodology, which covers the description of the data and sample selection as well as the model specification. Section 4 presents the results of the study, including the descriptive statistics, correlation, multiple regression, and additional analysis. Finally, the findings of the study are discussed and concluded in Section 5 of the paper.

## 2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### 2.1. The Underpinning Theory

The political cost theory and the resource-based view (RBV) theory are used to explain the connection between the dependent variable (firm performance) and the independent variables (ETR, female directors, and foreign directors). Under the RBV theory, the tax incentives provided by the government to the E&E industry and the diversity of its board composition (i.e., male and female directors, foreign and local directors) can be considered the organization's internal resources and capabilities (a collection of physical, human, and organizational resources) that can be used to achieve the company's sustainable competitive advantage and superior performance relative to its competitors. According to the RBV theory, businesses in the E&E sector should profit from the significant tax incentives provided by the government, leading to lower ETR payments and higher profitability and performance. On the contrary, the political cost theory explains how accounting discretion can be applied to make profits appear diminished in response to the growing threat of political risk pressures. This theory will be used to explain the situation when companies are found to still pay a higher ETR despite the high number of incentives provided by the government to achieve better performance and avoid political scrutiny.

### 2.2. ETR and Firm Performance

According to a study by Janský [5], the ETR estimated from company balance sheet data is a useful metric for the tax system. Such an ETR can show how much an individual company pays corporate tax on its profits, and the average is how much tax all companies or a particular group of them pay as a percentage of their income [5]. The study examined three types of ETRs for listed companies in China: the cash ETR, the effective income tax rate under generally accepted accounting principles (GAAP ETR), and the effective sales tax and cumulative tax rate (STA ETR). On the other hand, Wang, et al. [6] attempted to identify the basic types of taxes imposed on Chinese companies and analyse the factors that influence high and low ETR. Jaafar and Thornton [7] examined the impact of tax haven operations on the effective corporate tax burden of public-listed and private companies based in 14 European Union countries during the period 2001 to 2008. Their study tried to determine whether firms operating cross-border in tax havens have higher or lower ETRs than firms operating purely domestically. Uemura [8] assessed Japan's corporate tax reform in 2010 by estimating two types of ETR: the average effective tax rate (EATR) and the effective marginal tax rate (EMTR). By conducting simulations, the study aims to verify whether tax reform's impact on EATR and EMTR is high or low.

Zirgulis, et al. [9] study on the Lithuanian retail sector examines whether firms' performance through profitability is the main driver of tax pressure, given that the most profitable companies have greater incentives to inject tax aggressively. Their study measures firms' performance by dividing firms' operating income by lagged total assets. Delgado, et al. [10] study in the European Union (EU) setting documented that the main factors that led to or contributed to a lower company's ETR are the company's size, profitability, and the intensity level of its inventories. On the other hand, higher ETR are mainly driven by the company's level of debt. Another study by Lazăr and Istrate [11], which examines the impact of the overall firms'-specific tax mix on the performance of Romanian listed companies, reported that firms' profits will reduce by 0.15% whenever there is an increase in the firm's tax rate by 1%.

Derashid and Zhang [12] and Noor, et al. [13] documented that tax incentives provided by the government have benefited companies in terms of lower ETR and better firm performance. On the contrary, a more recent study by Razali, et al. [14] reported that ETR positively affects firms' performance and corporate value. Based on the mixed findings from the literature, we posit the following first hypothesis:

*Hypothesis: There is a Significant Positive Relationship between ETR and Firms' Performance Among E&E Public Listed Companies.*

### 2.3. Female Directors and Firm Performance

Concerning gender diversity, proponents argue that women directors bring distinct beliefs, values, and problem-solving abilities to management, fostering diverse perspectives that contribute to improved firm performance compared to their male counterparts. Additionally, Daily and Dalton [15] highlighted that females are often noted for their more process-oriented and participative communication styles, emphasizing the importance of recognizing and valuing their experience, expertise, and skills.

However, the existing literature on the relationship between board diversity and company performance shows inconclusive findings. While some studies provide evidence on the negative effect of board diversity on firm performance ([16-18]), there are plenty of studies that demonstrate a positive relationship ([19-34]). These divergent findings are often attributed to variations in regulatory environments and cultural norms across different countries. Despite that, studies by Robb and Watson [35], Marinova, et al. [36], and Gregory-Smith, et al. [37] found no conclusive evidence that a company's performance is affected by women's representation on the company's board.

A study in the UK by Brahma, et al. [38] on The Financial Times Stock Exchange (FTSE) 100 companies reported that women's directors have positive effects on firm performance, especially when three or more females are appointed to the board with certain education and age profiles. Conyon and He [39] suggested female directors contributions to the board are more prevalent in higher-performing companies. EmadEldeen, et al. [40], Arayssi, et al. [41], Liu, et al. [26], and Agyemang-Mintah and Schadewitz [42] also emphasized the positive impact of female directors on the performance of UK companies. Despite that, Shehata, et al. [43] found otherwise and attributed the negative effect of gender diversity on UK small and medium-sized enterprises (SMEs) to increased conflicts in the decision-making process.

Saha [44] study in India reported that the independence of the female directors matters in their contribution to the firm's financial performance. Lee and Thong [45] found that during the Covid-19 pandemic and in countries with stringent securities laws mandating board diversity disclosure, robust shareholder rights, and strong economic empowerment of women, the role of female directors on firms' performance became more imperative. Smriti and Das [46] documented that a firm's intellectual capital performance is negatively affected by the presence of female independent directors. Smriti and Das [46] found that female independent directors significantly, but negatively, impact a firm's intellectual capital performance. Rubino, et al. [47] reported that graduate female directors strengthen the positive link between executive women and firm performance, while firm's performance is negatively affected when the female director is busy and is a foreigner. Given the diverse findings in the literature, we propose the following second hypothesis:

*Hypothesis 2: There is a Significant Positive Relationship between Female Directors on Board and Firms' Performance Among E&E Public Listed Companies.*

### 2.4. Foreign Directors and Firm Performance

Harjoto, et al. [48] emphasised that globalisation and competitive pressures have significantly influenced the composition of firms' boards of directors. Nationality diversity encompasses differences in languages, beliefs, cultures, lifestyles, and experiences. According to Ruigrok, et al. [49], such diversity enhances management's decision-making capabilities by offering varied expertise, unique insights, perspectives, and viewpoints. The diversity in nationalities among board members broadens the behavioural and cognitive spectrum in the boardroom and enriches information resources [48], affecting management behaviour, corporate governance effectiveness, transparency, and disclosure practices [50]. Consequently, companies with foreign directors stand to gain as these board members bring valuable connections, information, and expertise from their home countries, enhancing the internationalization of businesses [49]. These consequently improved boardroom and management systems bolster company performance and facilitate international financing and investment.

However, the literature on the effect of board nationality diversity is somehow mixed. Oh, et al. [51] reported a

positive association between the presence of foreign independent directors on the board, foreign sales, and firm value. Samara and Yousef [52] documented that foreign directors with extensive experience represent a catalyst for a firm's strategic change, whose strength is reflected in the company's performance. Besides that, Mardini and Elleuch Lahyani [53] found that the carbon emission performance and disclosure of French non-financial listed companies improve in the presence of foreign directors on the board.

The positive effect of board diversity on a firm's performance was documented in the US lodging industry by Song, et al. [29] and in India by Shukla [54]. Nielsen and Nielsen [55] discovered that the positive impact of board diversity on a Swiss company's performance is more prevalent in highly internationalized companies, organizations with longer tenures, and those in generous environments. In the UK, EmadEldeen, et al. [40] and Estélyi and Nisar [56] discovered that board nationality diversity positively affects company performance in the various categories of FTSE companies. On the other hand, Khan and Abdul Subhan [28] found that nationality diversity negatively impacts company financial performance due to communication and cultural barriers. In contrast, Darmadi [18] and Guest [57] documented insignificant findings. Given the mixed findings in the literature, we propose the following third hypothesis:

*Hypothesis: There is a Significant Positive Relationship between Foreign Directors on Board and Firms' Performance Among E&E Public Listed Companies.*

### 3. METHODOLOGY

#### 3.1. Data and Sample Selection

The sample of this study comprised E&E public companies listed in the Main Market of Bursa Malaysia during the financial periods 2018-2022. Data on board diversity (female director and foreign director) is obtained from the Corporate Governance section of the annual report of the E&E PLCs, whereas the financial data is downloaded from Refinitiv Eikon DataStream. The five-year period from 2018 to 2022 is chosen as this study also evaluates whether there are any changes in the effect of ETR on firm performance before and after the tax incentives under RMKe-12 are implemented. The determination of sample size is summarised in the Table 1 as follows:

Table 1. Sample selection procedure.

Sample of study	N
Listed company in the main market (15 sectors)	980
Minus: Non-E&E companies (13 sectors)	(929)
Total sample (2 sectors)	51
Times: No. of years observed	5
Final sample	255

#### 3.2. Model Specification

The model used for this study is adapted from Zirgulis, et al. [9]; Delgado, et al. [10], and Lazăr and Istrate [11].

$$ROA = \beta_0 + \beta_1 ETR + \beta_2 SIZE + \beta_3 LEV + \beta_4 BSZ + \beta_5 FEDB + \beta_6 FODB + \varepsilon_t$$

Firms' performance proxied by Return on Assets (ROA) is calculated as earnings before interest and tax (EBIT) divided by total assets at book value, in line with previous studies by Zirgulis, et al. [9]; Delgado, et al. [10], and Lazăr and Istrate [11]. A micro-backward-looking method for examining the variability of corporate ETR measured using company-level data is to divide current income tax expense by EBIT. The second ETR2 is calculated as total income tax expense plus deferred tax expense divided by EBIT. As with earlier research by Janský [5]; Wang, et al. [6]; Jaafar and Thornton [7]; Uemura [8]; and Fernández-Rodríguez, et al. [59], ETR2 looks at future tax liabilities that may come up because of short-term differences between taxable income and financial accounting income. In this study, the actual data is filtered when ETR is recorded as zero for companies with negative EBIT and negative tax



expenses, including negative ETR companies. If the denominator of the ETR, which is pre-tax income, is zero or negative, the ETR has no economic meaning, which is why data filtering is necessary [60].

Female Directors on Board (FEDB) is defined as the percentage of female directors to the total number of directors on board, consistent with previous studies by Saha [44]. Foreign Directors on Board (FODB) is defined as the percentage of foreign directors to the total number of directors on board, consistent with previous studies by Mardini and Elleuch Lahyani [53]. The control variables are SIZE, LEV, and BSZ. Consistent with prior studies, firm size (SIZE) is measured by the natural logarithm of firms' total assets, the ratio of financial leverage (LEV) is measured by long term debt divided by total assets at book value, and board size (BSZ) is measured by the number of directors on the board.

## 4. RESULTS

### 4.1. Descriptive Statistics

In Table 2, the result of ROA shows that minimum and maximum observation record a figure of -0.69 (69%) and 0.36 (36%) with a mean value of 0.06. The yearly analysis of average ROA across E&E PLCs for five years is as follows: 2018 (4%), 2019 (6%), 2020 (2%), 2021 (6%), and 2022 (10%). The slight drop in the year 2020 is most probably due to COVID-19 and the war between Russia and Ukraine.

ETR1 has a minimum rate of 0.00 (0%) and a maximum rate of 0.35 (35%). While ETR2, which includes deferred tax as part of the formula, has the same minimum but a different maximum amount of 0.00 (0%) to 0.44 (44%), respectively. The zero amount is expected for the minimum amount for both ETR1 and ETR2, mainly because of the COVID-19 pandemic effect, where many companies suffered losses during the period between the third quarters of 2019 and the second quarter of 2021; hence, no taxes were being paid by these companies during these periods. The yearly analysis of average ETR1 and ETR2 across E&E PLCs for five years is as follows: 2018 (10%), 2019 (10%), 2020 (8%), 2021 (10%), and 2022 (10%). While for ETR2: 2018 (11%), 2019 (12%), 2020 (11%), 2021 (11%), and 2022 (13%). The statutory tax rate (STR) published on the *Lembaga Hasil Dalam Negeri* (LHDN) website (Tax Rate of Company) from 2018 until 2022 shows that the company's tax rate is stagnant at 24%. The maximum amount of 35% and 44%, respectively, for ETR1 and ETR2, which are above the STR, indicates that some companies are still aggressively paying a high amount of tax despite the tax incentives given under RMK-12.

The mean values for SIZE and LEV is 19.62 and 0.08. The minimum BSZ is three and the maximum is 13, with an average of 6.95 board members. FEDB shows a minimum of zero and a maximum of 0.5 (50%), with a mean value of 0.172 (17.2%). The Malaysian Code on Corporate Governance (MCCG) 2021 sets a goal of having at least 30% female directors on the board as a best practice in Malaysian PLCs, and even though the maximum value for FEDB is more than 50%, the minimum value of zero indicates that companies need to improve their female composition on the board. The result on FODB shows that minimum and maximum observation show a figure of 0 (0%) and 0.6 (60%) with a mean value of 0.10. This means that, on average, 10% of the board members of the E&E PLCs are non-Malaysian or foreigners.

Table 2. Descriptive statistics (N=255).

Variable	Min.	Max.	Mean	Std. dev.
ROA (%)	-0.69	0.36	0.06	0.14
ETR1 (%)	0.00	0.35	0.10	0.01
ETR2 (%)	0.00	0.44	0.13	0.01
SIZE	14	26	19.62	1.68
LEV (%)	0.00	0.70	0.08	0.12
BSZ	3	13	6.95	1.94
FEDB (%)	0.00	0.50	0.17	0.12
FODB (%)	0.00	0.60	0.10	0.18

#### 4.2. Correlation

Table 3 presents the correlation matrix for all the variables used in the study. While most of the variables are significantly correlated with each other, a significantly high correlation of 0.901 is observed between ETR1 and ETR2. In order to avoid any multicollinearity issues, ETR1 and ETR2 are not tested in the same regression model.

**Table 3. Correlation matrix (N=255).**

Variable	ROA	ETR1	ETR2	SIZE	LEV	BSZ	FEDB	FODB
ROA	1	0.327**	0.365**	0.255**	0.005	0.019	0.037	-0.136*
ETR1	0.327**	1	0.901**	0.232**	0.125*	0.073	-0.033	0.069
ETR2	0.365**	0.901**	1	0.222**	0.168**	0.082	-0.045	0.000
SIZE	0.255**	0.232**	0.222**	1	0.361**	0.384**	0.219**	0.023
LEV	0.005	0.125*	0.168**	0.361**	1	0.060	0.188**	-0.206**
BSZ	0.019	0.073	0.082	0.384**	0.060	1	0.122	-0.177**
FEDB	0.037	-0.033	-0.045	0.219**	0.188**	0.122	1	0.139*
FODB	-0.136*	0.069	0.000	0.023	-0.206**	-0.177**	0.139*	1

Note: All p-values are two-tailed. \*\* significant at 0.01 level, \* significant at 0.05 level.

#### 4.3. Multiple Regression

The result of dependent variables (ROA) against all six independent variables (ETR1 and ETR2, SIZE, LEV, BSZ, FEDB, and FODB) using multiple regression analysis is summarised in Table 4 and Table 5 as follows:

**Table 4. Multiple regression using ETR1 and ETR2 (N=255).**

Variables	ETR1		ETR2	
	Coefficients	t	Coefficients	t
Constant	0.000	-3.822**	0.000	-3.914**
ETR1	0.312	5.325**		
ETR2			0.350	6.079**
SIZE	0.306	4.480**	0.307	4.571**
LEV	-0.198	-3.104**	-0.216	-3.420**
BSZ	-0.161	-2.549**	-0.164	-2.633**
FEDB	0.071	1.197	0.078	1.327
FODB	-0.244	-4.014**	-0.228	-3.819**

Note: All p-values are two-tailed. \*\* significant at 0.01 level.

Table 4 presents the results of the multiple regressions, which tested separately the effects of ETR1 and ETR2 with five other independent variables on ROA. When ETR1 is used, the coefficients for ETR1 (0.312) and SIZE (0.306) are significantly positively related to ROA. On the other hand, the coefficients for LEV (-0.198), BSZ (-0.161), and FODB (-0.224) are significantly negatively related to ROA. Only one independent variable, FEDB, is found to be insignificant. Comparable coefficients and significance were reported in Table 4 when ETR2 was used in the multiple regression. The coefficients for ETR2 (0.350) and SIZE (0.307) are significantly positively related to ROA, whereas the coefficients for LEV (-0.216), BSZ (-0.164), and FODB (-0.228) are significantly negatively related to ROA. FEDB still remains insignificant. Hence, only Hypothesis 1 is supported, while Hypothesis 2 and 3 are rejected.

#### 4.4. Additional analysis: Pre- and Post RMKe-12

After that, another study was done to see if the effects of ETR, SIZE, LEV, BSZ, FEDB, and FODB on ROA were different before and after the RMKe-12 tax incentive was put in place. Hence, the final sample is split into pre- and post-RMKe-12 sub-samples. The pre-RMKe-12 sub-sample covers the period from 2018 until 2020 (Table 5), while the post-RMKe-12 sub-sample covers the period from 2021 to 2022 (Table 6). The results are summarized in Table 5 and 6 as follows:

**Table 5.** Multiple regression for pre RMKe-12 Using ETR1 and ETR2 (N=255).

Variables	ETR1		ETR2	
	Coefficients	t	Coefficients	t
Constant	0.000	-2.832**	0.000	-2.909**
ETR1	0.024	4.370**		
ETR2			0.229	4.965**
SIZE	0.011	3.362**	0.011	3.421**
LEV	-0.409	-2.040*	-0.426	-2.259*
BSZ	-0.026	-2.229*	-0.026	-2.247*
FEDB	0.167	0.229	0.150	0.389
FODB	-0.324	-2.864**	-0.297	-2.564**

Note: All p-values are two-tailed. \*\* significant at 0.01 level, \* significant at 0.05 level.

**Table 6.** Multiple regression for post RMKe-12 Using ETR1 and ETR2.

Variables	ETR1		ETR2	
	Coefficients	t	Coefficients	t
Constant	0.000	-2.311*	0.000	-2.591**
ETR1	0.254	4.444**		
ETR2			0.254	5.219**
SIZE	0.008	3.071**	0.010	3.316**
LEV	-0.416	-1.725**	-0.435	-1.972*
BSZ	-0.028	-2.522**	-0.028	-2.531**
FEDB	0.032	1.598	0.032	1.582
FODB	-0.358	-3.246**	-0.330	-2.985**

Note: All p-values are two-tailed. \*\* significant at 0.01 level, \* significant at 0.05 level.

Results from Table 5 to Table 6 show that there is no significant difference between the results of the two sub-samples. This means that the main findings reported in Table 4 earlier are truly representations of the findings both in the pre- and post-RMKe-12 periods.

## 5. DISCUSSION AND CONCLUSION

Overall, the result of this study shows that ETR has a positive and significant relationship with firms' performance. This is consistent with prior studies by Razali, et al. [14] in support of the political cost theory suggesting that E&E PLCs are large companies from HII, so they pay higher ETR, given that they are more at risk of political pressure/scrutiny by the government and politicians. The finding of a negative relationship reported between foreign directors and firm performance is consistent with Khan and Abdul Subhan [28]. A possible explanation for this is that foreign directors' influence on strategic changes weakens as corporate performance improves and that the status quo and industry standards continue to prevail [52]. Finally, similar to Robb and Watson [35], Marinova, et al. [36], and Gregory-Smith, et al. [37], the effect of female directors on firm performance is found to be insignificant, possibly because on average there are only 10% of women represented on the boards of the E&E PLCs.

As mentioned earlier, the Malaysian government placed an emphasis on the E&E industry as a high-impact and strategic industry in RMKe-12 and the upcoming New Industrial Master Plan. Hence, the findings from this study are beneficial to policymakers, governments, and tax authorities in trying to understand the implications, tightly monitor, and assess the effectiveness of the tax incentives provided to the E&E industry in Malaysia to support industry growth. Besides that, the study provides insights for regulators on the extent to which board diversity plays an important role in accelerating the growth of the E&E industry. For firm managers, the findings from this study can provide essential risk assessment tools to improve their current corporate governance mechanisms and take advantage of the incentives given to HII by the government for specific industries.



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**Transparency:** The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

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**Authors' Contributions:** All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

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