CEO and Chairperson Characteristics and Corporate Environmental Performance: A Study of Cooperatives in Vietnam

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Abstract
This research aims to examine the influence of chairperson/CEO demographic characteristics on the level of cooperatives’ environmental performance of Vietnamese cooperatives, based on Upper Echelon Theory. To measure environmental performance levels, this study uses energy consumption levels (electricity) to test the hypotheses. A sample of 1,508 cooperatives (from 2014 to 2016) has been used to carry out the OLS regression model, controlling for year and industry fixed effects. This study shows that the relationship between a chairperson’s educational level and electricity consumption is negative and significant (decreasing energy consumption). A similar finding is also found with CEO duality, which supports the negative nexus with electricity used. In addition, no significant association was found between chairperson/CEO gender and energy consumption level, whereas the relationship with a chairpersons’ age is positive. Drawing from Upper Echelon Theory, the current research provides novel insights into the relationships between chairpersons/CEOs’ characteristics and the cooperatives’ environmental performance. From practical implication, since cooperatives are a relatively common type of business in the rural areas of Vietnam and environmental protection is quite essential, it is necessary for cooperatives to choose suitable chairpersons/CEO based on their demographic characteristics.

JEL: G30, K32, M14

Keywords
CEO characteristics, chairperson characteristics, energy consumption, Upper Echelon Theory, Vietnam

Introduction
Global warming and climate change are issues that challenge many countries in the world, including Vietnam. Vietnam, is a developing country and has experienced both rapid economic growth, and increasing environmental pollution due to high energy consumption (Tang & Tan, 2015). Energy consumption is considered to be one of the reasons for increasing CO2 emissions (Acaravi & Ozturk, 2010; Apergis & Payne, 2009; Qader et al., 2022; Tang & Tan, 2015). Reducing energy consumption is, therefore, a part of contributing to reducing CO2 emissions into the environment. Moreover, energy saving is one of main goals of sustainable development in many businesses. The study of Hori et al. (2014) found a positive relationship between environmental perception and energy-saving actions, and lower energy consumption also means a better corporate environmental performance. This study investigates one of the indicators of positive environmental performance levels: energy-saving actions. In Vietnam, the assessment of environmental performance is quite challenge because of the lack of corporate social responsibility (CSR) reports published and CSR assessment organisations. Thus, energy consumption level is a good assessment tool for environmental performance.

Because environmental issues have risen in importance recently, scholars have paid more attention to

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corporate environmental actions (Lewis et al., 2014). The increasing of stakeholders’ expectations regarding corporate environmental responsibility make firms change their strategies. In this situation, firms have to not only to concentrate on economic growth but also preserve sustainable development. Thus, firms, appreciated as performing positive environmental responsibility by stakeholders, can take advantage of low operating cost, low employee turnover, decreasing operating cost (fuel, energy and water costs), reducing the risk of legal sanctions relating to environment, better resource access and more market opportunities (de Villiers et al., 2011). In addition, corporate environmental responsibility is a factor impacting on customers’ purchasing decisions (Bhattacharya & Sen, 2004). From that, firms receive sustainable benefits (McWilliams & Siegel, 2011), including beneficial influences on firms’ performance (Kao et al., 2018), and positive shared value (McWilliams & Siegel, 2011; Porter & Kramer, 2006).

Previous studies suggest that CEO/chairpersons have ultimate impact on their firms’ policies and are under pressure from governments, regulators, investors, consumers and other stakeholders to make decisions that are favourable to environmental issues such as improving corporate energy efficiency and making greener decisions (Amore et al., 2019; Elsayih et al., 2021). Based on Upper Echelon Theory, there is a significant relationship between CEOs’ characteristics and firms’ strategies (Hambrick & Mason, 1984). The demographic characteristics of the firms’ executives express high or low levels of social and environmental performance (Altunbaş et al., 2022; Slater & Dixon-Fowler, 2009) and lead to different social and environmental strategies (Cannella et al., 2008). For example, CEOs’ characteristics, such as age, work experience and educational level, have been found to be related to firms’ environmental performance or CEOs’ incentive plans to impact on environmental performance level (McGuire et al., 2003). Sun et al. (2021) also find empirical evidence that CEOs with high education levels positively impact environmental and social performance. There has been a large number of papers to examine the relationship between senior executive/chairpersons characteristics and environmental performance (Kanashiro & Rivera, 2019; Kang, 2017; Le et al., 2015), environmental disclosure (Velte, 2019) and environmental strategy (Mazutis, 2013). However, the number of studies that examine this relationship in the context of Vietnam is limited, especially with corporate environmental performance because of the lack of a database, related to firms’ environmental performance. To mitigate this limitation, this study uses energy consumption/energy efficiency as indicators of corporate environmental performance and electricity consumption was chosen as a reliable indicator of the firms’ whole energy consumption (Amore et al., 2019). Hence, the goal of this paper is to investigate the relationship between CEO/chairperson characteristics and cooperatives’ responsible behaviour for the environment: energy consumption.

Cooperatives are a popular and encouraged economic organisational model in Vietnam, especially in rural areas. According to the Law on Cooperatives 2012, cooperatives are created when there are at least seven members, and are based on self-determination, self-responsibility, equality and democracy. Although cooperatives are not the main economic sector in Vietnam, they play an important role in creating jobs and ensuring the living standards of many workers, contributing to socio-political stability and promoting socio-economic growth. There are three important factors in cooperatives: the board of directors, the chairperson and the manager. The board of directors consists of the members and the chairperson who is the legal representative of the cooperative and responsible for planning activities of the board of directors and assigning tasks to members. In addition, some cooperatives hire an outside professional manager/CEO for administrative jobs. The manager is responsible for organising the implementation of production and business plans; carrying out resolutions of the decisions of the board of directors; signing contracts are authorised by the chairperson of the board of directors; reporting annual financial statements to the board of directors; developing departmental organisation plan; recruiting of employees according to the decision of the board of directors. However, because the role of the cooperatives is to benefit their members, the managerial discretion of outside managers/CEOs are limited and overshadowed by the board of directors and chairpersons who also take responsibility for management. In summary CEO and chairperson are the most important factors when making environmental related decisions.

In this study, I collected data from the General Statistics Office of Vietnam (GSO), including energy consumption and chairperson/CEO characteristics of 1,508 cooperatives from 2014 to 2016. The results display that chairperson/CEO characteristics impact on cooperatives’ energy consumption. To be specific, chairpersons’ age is positively associated with the energy consumption of cooperatives. By contrast, chairpersons’ education and duality of roles have a negative influence on energy used. In addition, no a significant relationship was found between CEO/chairpersons’ gender and energy consumption.

The study has several theoretical and practical implications. Regarding the theoretical contribution, this work supports the Upper Echelon Theory, because it indicates that chairperson characteristics has an impact on cooperatives’ environmentally performance. As the theory argues that leaders’ demographic characteristics
can have an influence on corporate performance, the findings of this study prove for this theories’ suggestion. This paper also applies other theories to explain the impact trend of these characteristics on environmental performance. In addition, in terms of practical contributions, the study examines chairperson/CEO characteristics that critically impact the environmentally responsible behaviour of cooperatives in Vietnam. The results show that cooperatives can reduce the energy used by a chairperson with suitable personalities such as highly educated and younger. Moreover, to promote energy efficiency in cooperatives, they should prioritise a chairperson to handle the position of chief executive officer (duality) instead of hiring an outside manager. In addition, cooperatives can develop appropriate policies for economic and efficient use of electricity; avoid natural resource waste and protect the environment, especially in rural areas with low education levels and difficult access to information.

Theoretical Background and Hypothesis Development

Theoretical Foundation: Upper Echelon Theory

Performance or growth can be affected by many aspects, and the top management team’s characteristics are crucial factors. However, it is not easy to evaluate the impact of a CEO’s background (his or her cognitive, social and psychological characteristics) on firm’s outcomes. Hambrick and Mason (1984) developed a management theory called: ‘The Upper Echelon Theory’ to solve this issue. The idea is that each top manager has their own perceived base of values and observes business operations through a personalised lens (Finkelstein et al., 2009). The theory explains the correlation between organisational performance and the basic characteristics of managers and shows that organisational performance is predictable partly by demographic characteristics of the top executive (Nishii et al., 2007). These demographic characteristics insights into strategic situations arise from differences among executives in terms of experience, values, personality and other human factors. In addition, this theory also argues that the more complex a decision is, the more important the individual characteristics of the decision are, such as age, tenure and expertise. Nielsen (2009) also found that other top managers’ characteristics such as age or experience will directly affect firms’ strategic choices and organisational performance.

Upper Echelon Theory is applied in much academic research: Manager’s academic level impacts on environmental disclosure level (Lewis et al., 2014), environmental performance (Tran & Pham, 2020), internationalisation (Ramón-Llorens et al., 2017) and financial outcome (King et al., 2016). R&D activities are also affected by the characteristics of managers. Companies, managed by younger managers who have STEM backgrounds, intend to spend more on R&D (Barker & Mueller, 2002). Other previous research have also demonstrated that managers’ characteristics influence firms’ other activities. For example, managers’ characteristics are a significant predictor of internal control quality (Lin et al., 2014), organisational culture (Giberson et al., 2009), internationalisation process (Hsu et al., 2013), adoption of IT (Hameed et al., 2012), firms’ innovation activities (Lin et al., 2011) and firms’ long-term financial outcomes (Muller & Kräussl, 2011; Wang & Qian, 2011). Relating to social and environmental related activities, Manner (2010) concludes that female executives and executives with a bachelor’s background in humanities are positively associated with environmental performance.

In this study, because chairpersons take the most of the CEO, chairperson’s leadership roles in cooperatives, it is appropriate to apply Upper Echelon Theory to both chairperson and managers’ characteristics.

Hypotheses

CEO/chairperson age. Previous studies showed that age could be seen as an essential demographic factor, affecting the CEO’s behaviours on firms’ decisions and strategies (Suárez-Rico et al., 2018). Similarly, managers’ age is the factor that impacts their attitude towards social and environmental issues (Fabrizi et al., 2014).

Some studies suggested that young CEOs may be less willing to make long-term investments like environmental-oriented activities. For instance, Fabrizi et al. (2014) found that firms managed by a CEO at 60-year-old have a 13% higher social and environmental performance level than firms with 50-year-old CEOs. The difference is because young executives have a concentration on promoting short-term performance such as financial outcomes. When young CEOs follow the goal of profit maximisation, corporate environmental responsibility issues are of less concerned to them (Shahab et al., 2020). Compared with the young, older people show more significant concern about firms’ environmental issues and impact positively on environmental performance (Forte, 2004; Kollmuss & Agyeman, 2002). Due to being in early careers, younger CEOs are pressed to follow positive financial short-term results to the market and ignore social/environmental-related activities (Fabrizi et al., 2014). Moreover, older executives have a stronger orientation to support the development of local communities (McCuddy & Cavin, 2009) and understand the role of diversity management practices in business, than young ones (Ng & Sears, 2012). In addition, although many managers are willing to advance environmental performance, they lack expertise to do that. Thus, a higher level of management skill, experience and knowledge (intellectual capabilities of CEO) can also be the advantage of
older executives. Building from these arguments, the following hypothesis is proposed:

**Hypotheses 1:** There is a negative correlation between CEO/chairperson age and energy consumption.

**CEO/chairperson gender.** Some previous studies have tried to investigate the impacts of CEO’s gender on the decision whether or not to undertake firms’ social and environmental oriented practices (Galletta et al., 2022; Manner, 2010). Based on Upper Echelon Theory scholars argued that there is an association between CEOs’ gender and firms’ social and environmental oriented practices. Taking a sample of 650 US firms, Manner (2010) concluded that female executives are positively associated with environmental performance. Similar to this, the study of Glass et al. (2016) also find that female CEOs positively impact a firm’s CSR than males. In general, most studies found a positive relationship between female leaders and business environmental/social performance (Cook & Glass, 2018; Kassinis et al., 2016). There are several reasons for this. Theories on gender difference suggest that men and women follow different behaviour types because socialisation differentially encourages and rewards them (Glass et al., 2016). Socialisation makes women care and have concern for others, whereas men tend to be more autonomous and individualistic (Gilligan, 1982). Women are more stakeholder oriented, focus on the interest of various stakeholders including customers, employees, suppliers and communities (Harrison & Coombs, 2012; Matsa & Miller, 2013). Thus, previous studies argued that female CEOs are generally more concerned with social and environmental problem than male colleagues (Glass et al., 2016). Female managers are willing to explore more approaches to decrease corporate environmental pollution than male colleagues (Fukukawa et al., 2007). Other studies also demonstrate that female managers pay more attention to the problems related to ethics and social responsibility (Eagly & Johannesen-Schmidt, 2001) and are more environmental-oriented than men (Jiang & Akbar, 2018).

In addition, while male managers tend to focus on their self-interest as their main goal in business, female colleagues take into account social and environmental issues (Jiang & Akbar, 2018). In summary, it can be suggested that CEO gender is a relevant factor in illustrating the relationship between CEO characteristics and environmental performance. As a consequence, the following hypothesis is proposed:

**Hypothesis 2:** Female CEO/chairperson is associated with a lower level of energy consumption than their male counterparts.

**CEO/chairperson education.** Regarding the CEO/chairperson’s level of education, some notable studies focus on this topic. Most of these studies have mainly described the influence of the educational background of CEOs on firms’ social and environmental performance (Çera et al., 2022; Manner, 2010; Slater & Dixon-Fowler, 2009). Studies have shown that CEOs’ education level is a significant predictor of activities relating to firms’ environmental responsibility behaviour (Shahab et al., 2020; Slater & Dixon-Fowler, 2010). Specifically, there is a positive correlation between CEO/chairperson education level and environmental awareness: highly educated CEOs tend to be more concerned about climate change (Amore et al., 2019).

Bhagat et al. (2012) suggested that educational level is one of the criteria that reflects executives’ knowledge and technical skills, which can impact responsible behaviour for the environment. The better-educated CEOs are better able to identify and possess energy-saving campaigns for lower utilisation of energy inputs because of their better managerial skills (Amore et al., 2019). Furthermore, higher educated individuals tend to behave responsibly towards society and the environment (Meyer, 2016). Moreover, highly educated CEOs are concerned with the benefit of shareholders and the environment (Amore et al., 2019). Nowadays, education about social and environmental issues has been integrated into universities’ curriculum designs around the globe to increase social development and promote students’ awareness of environmental issues (Matten & Moon, 2008). Although there is no conclusive evidence that going to college can change student behaviour, studies indicate that environmental lessons increase students’ awareness of environmental problems (Thomas, 2005). Therefore, the education level of CEOs may be associated with firms’ environmental responsibility performance. Taking into account the arguments as mentioned earlier, the following hypotheses is proposed below:

**Hypothesis 3:** CEO/chairperson with higher education levels lead to the lower amount of energy consumption.

**CEOs’ duality.** Although prior studies have concentrated on the relationship between CEO characteristics and social and environmental performance, they mostly overlooked this relationship. CEO duality happens when the CEO of the company holds the chairman’s position on the board of directors. The simultaneous holding of both positions enhances the power and control of a single individual, increasing conflicts of interest (Li et al., 2010). Previous studies suggested that the dominant power of the CEO in the board (duality) is the lack of socially and environmentally attention in the firm’s that
they manage (Mallin & Michelon, 2011). García Martín and Herrero (2020) also supported for the separation of executive and chairman's positions to reduce the conflict between them, facilitating the promotion of social and environmental investment of firms. First, a dual role makes CEOs-chairpersons tend to concentrate on their self-interest rather than the benefit of firms’ stakeholders, including society and environment (Simpson & Gleason, 1999). Second, according to Agency Theory, CEOs’ powerful dominations of organisations tend to decrease the effectiveness and efficiency of the board’s monitoring ability (Oh et al., 2016). Lim et al. (2008) also argued that CEO duality is the source of conflicts in governance mechanisms, especially with audit committees and non-executive/outside directors. Outside directors are important in encouraging firms to be involved in social and environmental responsibility because of their boarder experience and stakeholder orientation (Oh et al., 2016). However, the strong power of CEO duality in the board can distort and limit the ability and benefits that outside directors can bring to the CSR of firms (Oh et al., 2016). Moreover, the combination of CEO and chairman positions associates with lower corporate transparency and social/environmental performance (Li et al., 2010). In summary, the following hypothesis is proposed:

**Hypotheses 4:** There is a positive correlation between CEO duality and cooperatives’ energy consumption.

**Methodology**

**Data Collection**

The sample was taken from the GSO (General Statistics Office of Vietnam) database from annual surveys. The subjects of the investigation are corporations, state corporations, and independent economic accounting enterprises, cooperative, cooperative union and credit funds, established and regulated by the Law on Enterprises. The survey was carried out nationwide. The method of data collection comprises of direct interviews and electronic questionnaires. The investigation information includes company’s name, type of business, labour and income of employees and business’ performance: asset, capital, financial performance, corporate tax and investment. The sample consists of cooperatives collected in this database, which followed for 3 years from 2014 to 2016 (because of the limitation of the database, this time period cannot be extended more). The study sample is strongly balanced (data were available for all cooperatives for the whole research period), with 4,524 firm-year observations (1,508 cooperatives) from 69 industries. Appendix A shows the composition of the sample. Frequency analysis indicates that the farming service activities industry takes the first position with 3,296 cooperates, which carries about 72.86%. The farming, mixed livestock industry occupies second place with 598 cooperates, accounting for about 13.22%. This statistical result is similar to the context in Vietnam where most cooperatives operate in the field of farming and livestock.

**Regression Model**

This research, uses the OLS regression model, controlling for year and industry fixed effects. In addition, a 1-year time lag is applied to all explanatory and controlling variables to reduce the endogenous problem between CEO/chairperson demographic characteristics and electricity consumption and the potential for reverse causality (Abdullah et al., 2016; Shamir, 2011).

\[
\text{KWHEMP}_{it}/\text{KWHG}_{it}/\text{KWHFA}_{it}/\text{KWHA}_{it} = \text{lag. CHAIRAGE}_{it}/\text{lag. CEOAGE}_{it}/\text{lag. CHAIRGEN}_{it}/\text{lag. CEOGEN}_{it}/\text{lag. CHAIREDU}_{it}/\text{lag. CEOEDU}_{it}/\text{lag. DUAL}_{it} + \text{lag. ASSET}_{it} + \text{lag. EMP}_{it} + \text{lag. FEEMP}_{it} + \text{lag. ROA}_{it} + \text{lag. REV}_{it} + \text{INDUSTRY}_{it} + \text{YEAR}_{it}
\]

**Dependent variables.** Energy consumption is measured by the logarithm of a firm’s electricity used divided by the number of employees (KWHEMP). To improve the robustness of the results, there are three other approaches to measure energy consumption, the logarithm of a firm’s electricity used divided by gross profit (KWHG), fixed asset (KWHFA), total asset (KWHA). This measurement method used is based on the study of Amore et al. (2019).

**Explanatory variables.** The variable: CHAIRAGE, CEOAGE represents the age of chairperson (number of years) and CEO respectively. Two dummy variables were created to identify the gender of the chairperson and the CEO. These variables both take the value of 1 if the CEO or chairperson is a woman, 0 otherwise. Categorical variables were to identify chairperson/CEO education level, a higher number meanings that they have a higher education level: 1—untrained, 2—trained but no degree, 3—vocalional elementary degree, 4—vocalional intermediate degree, 5—vocalional college degree, 6—bachelor, 7—post-graduate degree. CEO duality is the situation that the CEO also holds the position of chairperson in the cooperative. A dummy variable was used for CEO duality, which takes the value of 1 if the CEO is also chairperson and 0 if not.

**Control variables.** A set of control variables were chosen based on previous studies (Amore et al., 2019; Fan et al., 2017). Control variables are ASSET (firms’ total
assets), EMP (firms’ total labour force), FEEMP (female employee rate), ROA (return on assets) and REV (revenue). They are firms’ characteristics and should be included in the model. All variables used are shown in Table 1.

### Results

#### Descriptive Statistics

The descriptive statistics of the sample are illustrated in Table 2. As shown from Table 2, the electricity usage is measured in 1,000 kWh used by cooperatives’ activities annually. The variable: KWH has a mean of 42.3262, a minimum of 0.05 and a maximum of 8,000. Five dependent variables: KWHEMP, KWHG, KWHFA, KWA, H KWHHA are measured by the natural logarithm of electricity consumption divided by total labour workforce, gross profit, total fixed assets and total assets, respectively. The means of these variables are between -0.6415 and -4.9221. The age of chairpersons and CEOs has a mean age of 52 years. Only 4.08% of the CEOs and 3.79% of the chairpersons are female. Regarding CEOs’ and chairpersons’ education level, the average level is between 3 and 4, meanings that between vocational elementary degree and vocational intermediate degree. CEO duality is not common within the sample, as its dummy’s mean value is at 0.1055.

Table 3 reports the correlation matrix for the variables used in the estimations. To eliminate strong correlations between main explanatory variables that can distort the regression results, they were separated them into different regression. The VIF of all explanatory variables is below 5, which indicates the absence of multicollinearity in all the regression models.

#### Main Results

Tables 4 and 5, show the results of the pooled OLS regression controlling for industry fixed effects and year fixed effects with electricity consumption as the dependent variable. To eliminate causal effects and endogenous problems, explanatory and control variables are lagged by one period (1 year). In terms of chairperson age, the relationship between electricity consumption

### Table 1. A Summary of Variables.

| Variable   | Definition                                                                 | Measurement                                                                 |
|------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Dependent variable |                                                                             |                                                                            |
| KWHEMP     | Electricity used divided by number of employees                              | The natural logarithm of electricity used divided by the number of employees |
| KWHG       | Electricity used divided by gross profit                                    | The natural logarithm of electricity used divided by the gross profit       |
| KWHFA      | Electricity used divided by fixed assets                                    | The natural logarithm of electricity used divided by the fixed assets       |
| KWA         | Electricity used divided by total assets                                     | The natural logarithm of electricity used divided by the total assets       |
| Independent variable |                                                                             |                                                                            |
| CHAIRAGE   | The age of chairperson                                                      | Number of years                                                             |
| CEOAGE     | The age of CEO                                                              | Number of years                                                             |
| CHAIRGEN   | The gender of chairperson                                                    | Equal to 1 if chairperson is female and 0 if male                          |
| CEOGEN     | The gender of CEO                                                           | Equal to 1 if CEO is female and 0 if male                                  |
| CHAIREDU   | The education level of chairperson                                           | Equals from 1 to 7: 1—untrained, 2—trained but no degree, 3—vocational elementary degree, 4—vocational intermediate degree, 5—vocational college degree, 6—bachelor, 7—post-graduate degree |
| CEOEDU     | The education level of CEO                                                   | Equal to 1 if CEO is also chairperson otherwise 0                          |
| DUAL       | CEO duality                                                                 | Equal to 1 if CEO is also chairperson otherwise 0                          |
| ASSET      | Firms’ total asset                                                          | The natural logarithm of firms’ total assets                               |
| EMP        | Firms’ total labour force                                                   | The natural logarithm of firms’ total labour force                          |
| FEEMP      | The rate of female employees in the firm                                     | The number of female employees divided to total employees                   |
| ROA        | Return on asset                                                             | Profit before tax divided to total assets                                   |
| REV        | Revenue                                                                     | The natural logarithm of revenue                                            |
and chairperson age is positive and significant (KWHEMP: $\beta = .0097$, $p < .05$; KWHG: $\beta = .0084$, $p < .1$; KWHFA: $\beta = .0159$, $p < .01$; KWHA: $\beta = .0109$, $p < .05$), whereas this relationship is not significant with CEO age, which means that the first hypothesis is rejected. The regression results also show that CEO/chairperson gender impacts are not significant on energy used, which rejects the second hypothesis. Regarding chairperson education level, the nexus between energy used and education level of chairperson is negative and significant (KWHEMP: $\beta = -2.0736$, $p < .01$; KWHG: $\beta = -2.0743$, $p < .01$; KWHFA: $\beta = -2.0683$, $p < .01$; KWHA: $\beta = -2.0691$, $p < .01$), whereas this relationship is not significant with CEO education level; hence, the third hypothesis is supported with chairpersons’ age. The results also show that the coefficient on CEO duality is negative and significant ($\beta = -2.5002$, $p < .01$ [KWHEMP]; $\beta = -3.834$, $p < .01$ [KWHG]; $\beta = -4.518$, $p < .01$ [KWHFA]; $\beta = -4.401$, $p < .01$ [KWHA]), proving that CEO duality is negatively associated with cooperatives’ electricity consumption. Thus, hypothesis 4 is rejected. The summary of the findings is shown in Table 6.

### Discussion

The main goal of this study is to examine the relationship between CEO/chairperson characteristics and cooperatives’ energy consumption. Using a sample of 1,508 cooperatives in the period of 3 years from 2014 to 2016, this research supports the perspective of the Upper Echelon Theory, which CEOs/chairpersons characteristics impact organisations’ activities. To be specific, the results showed that the age of the chairperson is positively related to energy consumption. This study also found that the gender of the chairperson and CEO does not correlate with electricity used, whereas CEO duality is negatively associated with energy consumption.

### Reverse Causality Concern

To demonstrate whether or not CEO’s/chairpersons’ characteristics is chosen, based on cooperatives’ energy consumption (reverse causality effect), the CEO/chairpersons’ characteristics variables in 2016, were investigated, which was regressed on energy consumption in 2015. Similarly, CEO/chairpersons’ characteristics variables in 2015 were regressed on energy consumption in 2014. The results indicate that energy consumption level in 2015 does not predict CEO’s/chairpersons’ characteristics in 2016 ($p$-value > .1) and energy consumption level in 2014 does not have a significant effect on CEO’s/chairpersons’ characteristics in 2015 ($p$-value > .1). Therefore, there is no evidence of reverse causality between CEO’s/chairpersons’ characteristics and energy consumption level and diminished the risk of causality effect.
Table 4. Regression Results (1).

|          | KWHM | KWHG | KWHFA | KWHB | KWHHA | KWHB | KWHHA | KWHB | KWHHA | KWHB | KWHHA | KWHB | KWHHA | KWHB | KWHHA |
|----------|------|------|-------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|
| CHAIRAGE | 0.0097*** | 0.0084* | 0.0159*** | 0.0109*** | 0.0003 | -0.0001 | 0.0002 | -0.0014 | 0.0303 | 0.3815** | 0.1175 | 0.1642 | 0.1802 | 0.5502** | 0.1535 | 0.3259** |
| CEOAGE   | 0.0102*** | 0.016 | -0.5719*** | -0.5101*** | 0.1294*** | 0.0377 | 0.5734*** | -0.5499*** | 0.1059*** | 0.0205 | -0.5657*** | -0.5062*** | 0.1304*** | 0.0406 | -0.5764*** | -0.5428*** |
| CEOGEN   | 0.0318 | 0.0386 | 0.0330 | 0.0286 | 0.0300 | 0.0347 | 0.0296 | 0.0319 | 0.0343 | 0.0386 | 0.0330 | 0.0286 | 0.0299 | 0.0346 | 0.0296 |
| ASSET    | -0.2929*** | 0.0832* | 0.2455*** | 0.2756*** | 0.3109*** | 0.1265*** | 0.2426*** | 0.2865*** | 0.2989*** | 0.0709 | 0.2443*** | 0.2718*** | 0.3153*** | 0.1126*** | 0.2387*** | 0.2782*** |
| EMP      | 0.0481 | 0.0504 | 0.056 | 0.0498 | 0.0443 | 0.0465 | 0.0504 | 0.0447 | 0.0465 | 0.0507 | 0.0569 | 0.0501 | 0.0434 | 0.0455 | 0.0506 | 0.0448 |
| FEEMP    | -0.6288*** | -0.6029*** | -0.8988*** | -0.8280*** | -0.8141*** | -0.5964*** | -0.9639*** | -0.8368*** | -0.6538*** | 0.7249*** | -0.8979*** | -0.8960*** | -0.9632*** | -0.7492*** | -1.0055*** | -0.9219*** |
| ROA      | -0.0017 | -0.0043 | -0.0119 | -0.0038 | -0.0007 | -0.0032 | -0.0218 | -0.0031 | -0.0011 | -0.0035 | -0.0027 | 0.0046 | -0.0006 | -0.0029 | -0.0216 | 0.0031 |
| REV      | 0.0070 | 0.0075 | 0.0013 | 0.0068 | 0.0007 | 0.0133 | 0.0007 | 0.0007 | 0.0007 | 0.0035 | 0.0007 | 0.0006 | 0.0071 | 0.0133 | 0.0070 | 0.0030 |
| _const   | -0.0381 | -0.0469 | -0.1422 | -0.7288*** | 3.3735 | -4.8280** | -1.3143 | -7.2321*** | -3.5396*** | -6.4060*** | -2.6049 | -4.7956** | 3.7579** | -5.4999*** | -1.4754 | -7.6783*** |
| Industry | 0.1728*** | -0.0891 | 0.2628*** | 0.1549*** | 0.2608*** | 0.0356 | 0.3712*** | 0.2608*** | 0.1722*** | -0.0832 | 0.2603*** | 0.1568*** | 0.2623*** | -0.0305 | 0.3730*** | 0.2643*** |
| Year     | 0.178** | 0.0141 | 0.0647 | 0.0403 | 0.0352 | 0.0372 | 0.0364 | 0.0389 | 0.0412 | 0.0469 | 0.0404 | 0.0352 | 0.0371 | 0.0419 | 0.0336 |
| Adjusted R² | 0.901 | 0.973 | 0.144 | 0.148 | 0.0972 | 0.0727 | 0.1167 | 0.1474 | 0.0886 | 0.0776 | 0.1113 | 0.1468 | 0.0930 | 0.0754 | 0.1169 | 0.1483 |

Note: Standard error is shown in parentheses.

***.01 Sig. **.05 Sig. *.1 Sig.
| Table 5. Regression Results (2). |
|-------------------------------|
|                             | KWHEMP | KWHG | KWHFA | KWHA | KWHEMP | KWHG | KWHFA | KWHA | KWHEMP | KWHG | KWHFA | KWHA | KWHEMP | KWHG | KWHFA | KWHA |
| CHAIREDU (lag)              | -0.0736*** | -0.0743*** | -0.0949*** | -0.0683*** | -0.0340*  | -0.0294 | -0.0361  | -0.0305 | -0.5002*** | -0.3834*** | -0.4518*** | -0.4401*** |
| CEOEDU (lag)                | 0.1086*** | 0.0193 | -0.5611*** | -0.5025*** | 0.1266*** | 0.0335 | -0.5775*** | -0.5463*** | 0.1275*** | 0.0147 | -0.5724*** | -0.5265*** |
| Dual (lag)                  | -0.2931*** | 0.0832 | 0.2687*** | 0.2844*** | -0.3080*** | 0.1271*** | 0.2459*** | 0.2893*** | -0.3219*** | 0.0873*** | 0.2095*** | 0.2455*** |
| ASSET (lag)                 | 0.0483   | 0.0506 | 0.0564   | 0.0501   | 0.0436   | 0.0457  | 0.0305   | 0.0449   | 0.0477   | 0.0501   | 0.0506   | 0.0493   |
| FEEMP (lag)                 | -0.5801*** | -0.5684*** | -0.7633*** | -0.7701*** | -0.7892*** | -0.5743*** | -0.9378*** | -0.8056*** | -0.8101*** | -0.8529*** | -1.1129*** | -1.0268*** |
| ROA (lag)                   | -0.0017 | -0.0044 | -0.0118   | 0.0039   | -0.0013  | -0.0038  | -0.0216  | 0.0024   | 0.0045   | -0.0015  | -0.0054  | 0.0142*** |
| REV (lag)                   | 0.1840*** | -0.0807*  | 0.2699*** | 0.1666*** | 0.2692*** | -0.0292  | 0.3760*** | 0.2693*** | 0.1925*** | -0.0491  | 0.2909*** | 0.2676*** |
| cons                        | -3.4778** | -3.8984** | -2.3073   | -6.4709*** | -3.4254*** | -6.2659*** | -1.0959  | -4.2019*** | -3.5312** | -3.9147*** | -5.902   | -4.7773*** |
| Industry Controlled         | 1.7888   | 1.8439   | 1.9716   | 1.8416   | 1.8106   | 1.8739   | 2.0102   | 1.8606   | 1.7699   | 1.8398   | 1.9750   | 1.8273   |
| Year Controlled             | 1.7888   | 1.8439   | 1.9716   | 1.8416   | 1.8106   | 1.8739   | 2.0102   | 1.8606   | 1.7699   | 1.8398   | 1.9750   | 1.8273   |
| Adjusted R²                 | 0.0904   | 0.0970   | 0.1171   | 0.1491   | 0.1483   | 0.0721   | 0.1177   | 0.1483   | 0.1032   | 0.0825   | 0.1184   | 0.1598   |

Note. Standard error is showed in parentheses.

***.01 Sig, **.05 Sig, *.1 Sig.
decide towards a short-term orientation (Matta & Beamish, 2008; Oh et al., 2016). Previous studies also indicated that older managers are less motivated to invest in long-term activities such as R&D (Hambrick & Fukutomi, 1991), advertising (Dechow & Sloan, 1991) and long-term performance (Davidson et al., 2007). Reducing energy consumption by investing in energy-reduction facilities will cost in the short term but contribute to the sustainable development of a firm. Thus, because of the long-term payoff of energy used efficiency, older CEOs, who are near retirement age and are less motivated to make long-term oriented decisions, are not favourable towards reducing energy consumption.

Second, regarding CEO/Chairperson gender, there is an insignificant relationship between female CEO/chairperson and cooperatives’ energy consumption levels. These results are inconsistent with the hypothesis proposed. This can be because of the token female representation on the top management team and the boards of directors. More specifically, a critical mass of female managers and directors is needed to positively impact female managers/directors on corporate social responsibility (Yarram & Adapa, 2021). A solo female member will be under the pressure of other male members on the board, so they tend to replicate the behaviour of the majority of male members and their points of view being token representation only (Yarram & Adapa, 2021). Moreover, Vietnam is an East Asian culture where prejudices about female roles (doing housework and taking care of their children) in society are common (Pham & Hoang, 2019). Thus, Vietnamese women have to surpass many challenges to achieve a position in top management team and the board of directors and their role in business is overshadowed by male colleagues.

Third, in terms of chairperson education levels, the results indicate that better-educated chairpersons help to reduce electricity consumption by spurring firms’ energy efficiency. This result is in align with the previous studies of Amore et al. (2019) and Zhou et al. (2021). Increased chairperson education level leads to managerial styles that concern corporate energy efficiency and environmental responsibility (Amore et al., 2019; Zhou et al., 2021). Chairpersons, trained at a higher education level, may have a broader knowledge of environmental issues.

Fourth, regarding CEO duality, contrary to the original assumption, the study’s results showed that there is a positive relationship between CEO duality and efficiency of energy used (reducing energy consumption). However, the results support the findings of Bear et al. (2010) and Jizi et al. (2014). The reasons can be that to increase tenure prospects and enhance reputation, powerful CEOs may pursue more activities in social and environmental related fields (performance and disclosure) (Jizi et al., 2014). In addition, cooperative business is an economic organisation belonging to the collective economic sector established on a voluntary basis for the common benefit of its members. They cooperate and support each other in operation, business and job creation to satisfy the interests and needs of members, based on autonomy, democracy, equality and self-responsibility in cooperative management communes. The situation when the Chief Executive Officer also takes a role of the presidency of the cooperative can decrease the conflict of interest between managers and owners, based on stewardship theory (Lam & Lee, 2008). Hence, the alignment of interest between members is very important to cooperatives, which requires cooperation and support.

**Conclusion**

This study’s findings confirm that CEOs’ characteristics and functions have an important effect on corporate environmental performance. However, although previous studies have addressed the relationship between CEOs’/chairpersons’ characteristics and firms’ environmental performance, there is a lack of studies investigating the impact of CEOs’/chairpersons’ characteristics on energy consumption. This study explores whether CEO characteristics matter for energy-saving. Using OLS method and lagged independent variables with a sample of 4,524 firm-year observations from cooperatives in Vietnam

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**Table 6. The Summary of Results.**

| Hypotheses                                                                 | Results                                                                 |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------|
| H1: There is a negative correlation between CEO/chairperson age and energy consumption. | Reject: A positive relationship between chairperson age and energy used |
| H2: Female CEO/chairperson is associated with a lower level of energy consumption than their male counterparts. | Reject: CEO/chairpersons’ gender impacts insignificantly on energy consumption |
| H3: CEO/chairperson with higher education levels lead to lower amounts of energy consumption. | Support: Chairperson with higher education levels lead to the lower amount of energy consumption |
| H4: There is a positive correlation between CEO duality and cooperatives’ energy consumption. | Reject: There is a negative correlation between CEO duality and cooperatives’ energy consumption. |
from 2014 to 2016, it was found that chairperson age is positively related to energy consumption. By contrast, chairpersons with higher education levels and CEO duality are negatively-related, and CEOs’/chairpersons’ gender is not related to energy consumption.

This paper contributes knowledge to literature and practice. First, considering the theoretical contribution, this study supports the Upper Echelon Theory that CEOs’/chairpersons’ demographic characteristics (age, education level and duality) can impact corporate environmental performance such as energy-saving actions (Hori et al., 2014). These findings again prove the correctness of this theory and future studies can continue to apply this theory in examining the relationship between executives’ characteristics and firm performance. In addition, based on other theories and previous empirical findings, I explain the impact of CEOs’/chairpersons' characteristics as well as the direction of impact on environmental performance are explained. Second, regarding practical implications, because environmental performance assessment in Vietnam is not easy, the energy consumption level is considered an appropriate indicator. Thus, understanding the influence of CEO/chairperson characteristics on energy-saving actions is an appropriate approach to investigate the relationship between managers’ demographic characteristics and environmental performance. Companies can use the findings of this study to select suitable CEO/chairperson with their characteristics to improve energy-savings as well as environmental performance. For example, a chairperson who is younger, more educated and holds an executive position will lead to a higher chance of reducing energy consumption. This is also a good indicator for stakeholders to know more about firms’ environmental performance.

However, this paper also has some limitations. First, this study only takes a sample of cooperatives in Vietnam, so the findings may be not appropriate with other samples of listed firms or SMEs. Thus, it is suggested that future studies should examine research questions in other samples such as in other countries. Second, this study uses electricity used as the dependent variable of energy consumption but cooperatives also use other types of energies such as coal, diesel and petroleum. Hence, future studies should use coal, diesel or petroleum consumption as dependent variables and test to examine whether the findings stay similar or not. Future studies should increase the robustness of results by this way.

Appendix

Table A1. Sample Description.

| Sector                                         | N   | Percentage | Sector                                         | N   | Percentage |
|------------------------------------------------|-----|------------|------------------------------------------------|-----|------------|
| Rice cultivation                               | 39  | 0.86       | Manufacture of gymnastics and sports equipment | 30  | 0.66       |
| Planting sugarcane                             | 3   | 0.07       | Salt mining                                    | 2   | 0.04       |
| Planting trees for fiber                       | 1   | 0.02       | Processing and preservation of meat products   | 1   | 0.02       |
| Growing vegetables of all kinds                | 33  | 0.73       | Processing and storage of other vegetables     | 1   | 0.02       |
| Growing annual flowers                         | 15  | 0.33       | Production of animal oils and fats             | 1   | 0.02       |
| Planting other annuals                         | 6   | 0.13       | Manufacture of macaroni, noodles and similar   | 3   | 0.07       |
| planting trees in the tropics and subtropics   | 3   | 0.07       | Producing animal, poultry and aquatic feed     | 1   | 0.02       |
| Growing oranges, tangerines and other citrus   | 6   | 0.13       | Producing building materials from clay         | 3   | 0.07       |
| Planting longan, lychee, rambutan              | 1   | 0.02       | Producing concrete and products from concrete, | 2   | 0.04       |
|                                                   |     |            | cement and plaster                             |     |            |
| Planting other trees                            | 1   | 0.02       | Production, transmission and distribution of   | 27  | 0.6        |
|                                                   |     |            | electricity                                     |     |            |
| Planting coffee trees                           | 1   | 0.02       | Non-hazardous waste collection                 | 1   | 0.02       |
| Planting perennial spices                       | 1   | 0.02       | Non-hazardous waste treatment and destruction  | 2   | 0.04       |
| Planting medicinal plants, perennial            | 4   | 0.09       | Construction all kinds of houses               | 5   | 0.11       |
| aromatherapy                                    |     |            |                                                |     |            |
| Planting other perennials                       | 7   | 0.15       | Construction of other civil engineering projects| 1   | 0.02       |
| Multiplication and care of agricultural seedlings| 57  | 1.26       | Wholesale of rice, corn and other cereal grains| 10  | 0.22       |
| Raising buffaloes and cows and producing       | 9   | 0.2        | Wholesale flowers and plants                   | 1   | 0.02       |
| buffalo and cow breeds                          |     |            |                                                |     |            |
| Breeding goats, sheep and breeding              | 1   | 0.02       | Wholesale of live animals                      | 1   | 0.02       |
| goats, sheep, deer, deer                        |     |            |                                                |     |            |

(continued)
Table A1. (continued)

| Sector                        | N  | Percentage | Sector                        | N  | Percentage |
|-------------------------------|----|------------|-------------------------------|----|------------|
| Pig and pig breeding          | 54 | 1.19       | Wholesale of feed and feed ingredients for livestock, poultry and aquatic animals | 2  | 0.04       |
| Incubation and hatchery activities | 5  | 0.11       | Wholesale other agricultural and forest products (except wood, bamboo) | 2  | 0.04       |
| Chicken farming               | 18 | 0.4        | Wholesale seafood             | 1  | 0.02       |
| Other livestock               | 10 | 0.22       | Wholesale of vegetables and fruits | 2  | 0.04       |
| Farming, livestock mixed      | 598| 13.22      | Wholesale of other food       | 3  | 0.07       |
| Farming service activities    | 3,296| 72.86     | Wholesale of petroleum and related products | 28 | 0.62       |
| Livestock service activities  | 2  | 0.04       | Wholesale of fertilisers, pesticides and other chemicals used in agriculture | 2  | 0.04       |
| Post-harvest service activities | 25 | 0.55       | Retail of food, foodstuffs, beverages, tobacco and pipe tobacco accounts for a large proportion in general stores | 1  | 0.02       |
| Seed processing for propagation | 6  | 0.13       | Retail sale of other foods in specialised stores | 1  | 0.02       |
| Planting and taking care of woody trees | 15 | 0.33       | Retail sale of motor fuel in specialised stores | 1  | 0.02       |
| Planting and taking care of bamboo forests | 3  | 0.07       | Retail sale of cement, bricks, tiles, stones, sand, gravel, iron and steel and other construction materials in specialised stores | 3  | 0.07       |
| Forestry service activities   | 1  | 0.02       | Retail sale of flowers, ornamental plants, ornamental fish, ornamental birds and pets in specialised stores | 1  | 0.02       |
| Marine capture fisheries      | 17 | 0.38       | Retail sale of other new uncategorised goods in specialised stores | 1  | 0.02       |
| Inland capture fisheries      | 4  | 0.09       | Transporting goods by other cars (except for specialised cars) | 2  | 0.04       |
| Inland aquaculture            | 7  | 0.15       | Trading in real estate, land use rights belonging to owners, users or renters | 6  | 0.13       |
| Marine aquaculture            | 43 | 0.95       | Architectural activities      | 1  | 0.02       |
| Fish farming                  | 29 | 0.64       | Landscape care and maintenance services | 3  | 0.07       |
| Shrimp farming                | 49 | 1.08       |                                 |    |            |

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