



THE NEXUS BETWEEN THE EXPORTATION OF SOCIAL SUSTAINABILITY CERTIFICATIONS THAT RESTRICT MALAYSIAN PALM OIL COMPANIES AND THEIR PROFITABILITY: A PANEL ON DRISCOLL AND KRAAY STANDARD ERRORS AND A FULLY MODIFIED ORDINARY LEAST SQUARE APPROACH

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ABSTRACT

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Currently, due to the restriction of social sustainability certifications, exports of biofuel to Europe and other countries are a crucial phenomenon that financially affect companies. The primary aim of the current study is to investigate the effects on the profitability of palm oil export companies in Malaysia that have social sustainability certifications. Data were extracted from the annual reports of companies that export biofuel and have had social sustainability certifications between 2009 to 2018. The results indicate that exports have a positive financial effect on palm oil export companies in Malaysia. These findings present guidelines to policymakers on removing restrictions on exports and developing policies that enhance the exportation of biofuel, thereby enhancing the economic growth of the country.

Contribution/Originality: This study contributes to existing literature by investigating the effects on the profitability of palm oil export companies in Malaysia that have social sustainability certifications.

1. INTRODUCTION

Literature from around the globe has examined increasing health issues that result from complex environmental concerns, perhaps because the world is exhibiting heightened levels of apprehension with regard to environmental issues. Palm oil and its related products are responding well to these concerns, as they are a healthy product; however, other issues have arisen in the form of environmental concerns. Palm oil is essential, as it is not atherogenic and it helps to maintain low cholesterol levels in the human body (Odia, Ofori, & Maduka, 2015). However, the use of palm oil in biofuel will be banned by the European Parliament by 2021 (Auld, 2009). Such actions from the European Parliament will have an adverse impact on the Malaysian economy, as the palm oil industry is one of its major contributors. In Malaysia, 90% of biofuel is exported to the United States of America (USA) and the European Union (EU) (Nawawi, Ali, & Lim, 2013). Another significant impact of this activity will be experienced by the 650,000 small-scale industries for which the cultivation of palm oil crops is their main form of survival (Basiron & Weng, 2004). It will also have an adverse impact on palm oil companies in terms of their operations, profits, reputation, and the trust of investors (Basiron, 2002). In the context of palm oil cultivation, the acquirement of a holistic and inclusive economy is aligned with environmental sustainability. The certified

sustainable palm oil (CSPO) certification is a result of the palm oil industry's adverse effects on sustainability and other environmental issues in Malaysia. Other such certifications include: The Roundtable on Sustainable Palm Oil (RSPO), the Sustainable Agriculture Network (SAN), the International Sustainable and Carbon Certification (ISCC), the Indonesian Sustainable Palm Oil (ISPO) certificate, the Palm Oil Innovation Group (POIG), and the Malaysia Sustainable Palm Oil (MSPO) certificate. However, the most valued and most common of these certificates is the RSPO (Suhaila, 2012).

Certain environmental factors such as temperature and frequency of rainfall make Malaysia the second largest producer of palm oil, having produced 17.4 million tons in 2016 (Board, 2016a). The total contribution of the palm oil export industry to Malaysia's GDP stands at 46.9% (Abor & Biekpe, 2009). These statistics indicate that the contribution of the palm oil sector to Malaysia's overall economy is higher in Malaysia than in Indonesia, which illustrates the importance of the palm oil industry (Jaafar, Salleh, & Manaf, 2015). The statistics show that the regions that import the most palm oil from Malaysia are the USA, the EU, Turkey, the Philippines, Pakistan, and China. After a deeper consideration of these statistics, it can easily be concluded that palm oil is considered to be a highly profitable industry, which is why several palm oil trading companies have expanded their capacity for production by moving to other Asian countries (Zainul, 2013).

The primary aim of this study is to highlight the significant benefits of the palm oil industry on society, such as employment creation in rural areas, an improvement to the standard of living, its contribution to economic growth, and its contribution to the exporting of biofuel (Basiron, 2002). On the other hand, the disadvantages are associated with protections against deforestation and the considerable habitat losses that occur due to palm oil production (Alam, Er, Begum, Siwar, & Ghani, 2016). Globally, the rapidly increasing demand for biofuel has resulted in the need for fresh plantation areas. Palm oil plantation areas, however, have been cut down every year. Between 2002 and 2009, the increase in palm oil cultivation areas increased from 3.4 to 5.8 million hectares (Board, 2016b). This rapid increase in palm oil plantation areas has damaged the environment and endangered animal habitats. Such deforestation destroys the habitat of flora and fauna and threatens engaged animals, such as orangutans, elephants, and tigers (Asimopoulos, 2016).

1.1. Profitability, Exports, and Social Sustainability Certifications

A technological transformation has created heightened awareness across the world. People around the globe are showing serious concern when buying certain products, as consumers now consider more detailed information regarding health and fitness concerns before buying products. The international status of the RSO certification means that it does not compromise its principals in terms of certified biofuel production. One of the basic policies behind the establishment of this certification was the protection of environmental factors, social equality, and the development of the economies of its associated nations. In this context, the Malaysian government has taken initiative by increasing standards in the production of biofuel to a viable level through the introduction of an MSPO certificate. The government of Malaysia has confirmed that, by the end of 2020, the MSPO will be compulsory in all levels of biofuel production.

The central purpose for the development of the seven principles of this certification was to ensure the sustainability of environmental protections with regard to the production of biofuel across Malaysia. Another purpose for this certification was to counter the negative perception of biofuel, thus ensuring that the sustainability of biofuel is widely acknowledged and accepted in the international market. These certificates have been created to comply with ISCC sustainability requisitions and European codes of practice (Shahida, Hafizuddin-Syah, & Fuad, 2018). With regard to sustainability issues around the globe, whether in terms of refining the supply chain or the cultivation, production, and processing of palm oil, the MSPO is considered to be one of the documents that is most highly regarded and implemented (De Gorter, Drabik, & Just, 2013). Generally, palm oil plantation and collection

are upstream industries, whereas the refining and production of the final products are classified as a downstream industries (Welford & Gouldson, 1993).

The primary aim for sustainability certificate holders in the upstream industry is to avoid deforestation, ensure the improved management of waste, and meet the established standards of fertilization practices. On the other hand, the downstream industry enjoys a low level of responsibility, as they are able to buy or use palm oil as a raw material in their production. Sustainability, however, should impact the entire process, from the processing of the plant to the finished palm oil product (Zeitun & Tian, 2007). Conversely, companies dealing with the finished palm oil products proudly quote their RSPO certification in order to attract and retain buyers. Keeping in view the rapidly increasing awareness of environmental sustainability in the palm oil industry, the government of Malaysia has announced that, by 2019, MSPO certification will be compulsory across all palm oil production and supply chain levels.

In the past, MSPO certification was not compulsory, which created a significant gap in the entire supply chain process in terms of punishing carelessness. This is one of the reasons why, in the past, companies had no need to acquire any kind of certification in order to enter and survive in the market. The statistics show that the percentage of companies who made an effort to acquire at least one certification stands at 43.6%, and only 17 of the 19 companies were approved (Yusof & Yew, 2016). The extra cost and loss of profit influences the oil-producing countries and encourages them to avoid any such documents (Novelli, 2016); they believe that such a certification primarily supports the organizations that palm oil is exported to. Another reason is that the major biofuel-importing countries, the EU and the USA, have forced Malaysia to only export certified oil, as these countries pay special attention to environmental and sustainability issues (Novelli, 2016). Therefore, the companies who trade without certification display a carelessness that results in deforestation and the devastation of wild species.

From now on, companies exporting biofuel to European countries will have to acquire a certification in order to assure environmental sustainability that will progress the advancement of society. Companies who already trade with RSPO certifications are experiencing a little confusion, as it is unclear whether or not they require another document, such as an MSPO. Even though it would enhance the buyer's reliance, it would also increase operational costs and decrease profitability. However, several companies feel hesitant about evading the standards of the RSPO. Literature on the certification of MSPO and financial profitability exists, particularly in the context of palm oil exporting in Malaysia (Amiruddin, 2003), and this study aims to expand this field of research by investigating the effects of sustainability certificates on the operational profitability of companies dealing in biofuel production.

This study will help the biofuel industry in multiple ways. First, being certified will affect palm oil companies' profitability. Second, environmental sustainability will be improved as a result of advice issued by Malaysian companies regarding the certification required when operating in biofuel at all levels. Finally, an awareness of biofuel will be created when trading companies see the benefits associated with certain mandatory practices. Thus, the primary aim of this study is to highlight the significant benefits of the palm oil industry on society, as well as its contribution to economic growth and the exportation of biofuel to other countries.

2. LITERATURE REVIEW

All palm oil industry stakeholders are showing serious concern with regard to sustainability, which ultimately increases the importance and need for certification when exporting palm oil to other countries. The Malaysian government are also concerned with sustainability and they are taking regulatory measures in order to enhance and strengthen existing laws, such as the ecological protection of flora and fauna in the country. At present, there are about 17 laws and regulations that exist in the country that are aligned with land use and the protection of the environment (Suhaila, 2012). Consequently, the Malaysian palm oil industry will be legally liable for the damage of cultivated land, financial responsibilities, and the loss of property (Schaltegger & Figge, 2000) in cases of non-compliance with sustainability criteria (Welford & Gouldson, 1993). Factors such as insurance coverage impact a

large number of companies, which results in non-compliance with environmental and sustainability issues (Xiaoling, 2010).

There are some advantages associated with the Forest Stewardship Council (FSC) certification, such as benefits from a taxation system, fees associated with research, and support from the government; this certification generally allows companies to trade with other countries without restrictions. Furthermore, there is a relatively weak association between palm oil firms' profitability and the adoption of sustainability practices (Shahida et al., 2018). The major importers of Malaysian palm oil are the USA and the EU. Another study proposed that certified practices attract the target market, opening up more horizons for oil exporters who are operating in forests in order to access targeted European markets (Ni, Ali, & Zainudin, 2016). Kuntom, Kushairi, and Choo (2003) proposed that the exporters who have obeyed government rulings regarding certification have seen improvements in the quality of their product. However, the question that arises here is: What are the preferences of the internal market players? In this context, the facts reveal that the trend of international preferences is focused on the environmental management system, as opposed to the price and quality of the product.

Any organization's ultimate aim is to earn a profit. As such, operational costs attached to the business are a major reason why the organization's profit is reduced. There are costs associated with the attainment of an environmental sustainability certificate, which leads to palm oil companies ignoring this certificate (Adams & Buckle, 2003). Organizations are also suggesting that the government should provide some relief in the form of a relaxed taxation system, as well as allowing them to freely export their final products to other countries that are strictly obeying government regulations in terms of the cultivation, production, and supply chain of palm oil at all levels (Welford & Gouldson, 1993). If the government encourages such initiatives, this will not encourage the organizations that are trading; instead, it will motivate other palm oil companies to attain the certificate.

Positive associations between compliance regarding the environment and financial profitability can be seen in multiple studies, such as the study carried out by Fisher, Maryudi, and Sahide (2017). Another study by Lazaro, Makindara, and Kilima (2008) was conducted on the connection between sustainability certifications and profitability, which discovered a positive association between sustainability and profitability and exports. Another investigation showed a positive association between the area chosen for the plantation of palm oil and the price of crude palm oil (CPO) in Malaysia. When analyzing the correlation between incremental financial cost and advantages associated with RSO compliance, it is the firms that have 42% of the plantation area and are compliant with RSPO instructions that process a higher amount of CPO, in comparison to firms that have 20% or less certified land (Ogebe, Ogebe, & Alewi, 2013). The outcomes of such studies show that the adoption of an RSPO certification results in the reduction of the company's expenditures, a reduction in the turnover of employees by 6%, and a positive trend in terms of revenue. The findings of this study are supported by Dragusanu and Nunn's (2014) investigation into the FSC certification, which proposed a positive association between profitability and tropical forest producers' net value in both small and medium level producers.

2.1. Social Sustainability Certifications, Exports, and Profitability

Around the globe, exports play a crucial role in developing a country's economy, which means that products are better able to flow between developing and developed countries. This cycle results in financial support being given to all sectors in developing economies. Developing economies rely heavily on exports, as they support the entire related industry. The recent world-changing trend towards environmentalism has affected all sectors of the economy, so as to maintain a balance between sustainability and financial stability. Furthermore, these sustainable practices force organizations to carry out certain developments in all aspects of their supply chain, such as agriculture, plantation, and construction. The central purpose behind the introduction of the sustainability certificate was the promotion of environmentally sustainable products that do not harm humanity.

In terms of developed countries, the countries with the strictest environmental protections are the USA and countries within the EU. At any cost, these countries require full compliance in terms of environmental safety, as they have a zero-tolerance policy. They force countries that trade with them to strictly follow the instructions set out in the sustainability certification for the safety of the environment. Gates, Prachyl, and Sullivan (2016) have proposed that, in Morocco, there were positive trends between certified biofuel exports and certification requests to insurance authorities. Such trends are higher in firms dealing in exports; for instance, coffee with a Fair Trade (FT) label is imported 5% more than the companies that do not have this label (Mukesh, 2007). This evidence shows that consumer interest in certified products has increased, as consumers are more considerate about the protection of their environment.

Price is another factor that plays a role in a company acquiring the certification. Booth, Aivazian, Demirguc-Kunt, and Maksimovic (2001) have proposed that an increase in inflation rate increases the firm's performance because the firm has a lower level of debt. This is one of the reasons why prices are standard in both certified and non-certified firms. The prices in both firms are the same, but production costs differ as a result of the operating expenses of additional practices that have been implemented according to the sustainability certification. Thus, certified companies bear extra costs that non-certified companies save. Some other investigations, such as those by Prafitri, Rachmina, and Maulana (2017) and Laurance et al. (2010) support these results. This difference in price results in companies being demotivated about the attainment of the certification. The oil-exporting companies that have social sustainability certificates have serious concerns about the issue of pricing.

Some other investigations have brought about new questions about sustainability only impacting the export industry, which is one of the reasons why non-certified companies enjoy high profits in the export industry. This concept has been further supported by Clough et al.'s (2016) study, which states that certification alone has little effect (Witt, Fairhurst, & Griffiths, 2006). Investigators have explored multiple factors for this, such as the dedication of the management team to the implementation of certificate proposals, proper knowledge of the certification process, and suitable responses to feedback from importing countries on how the certification effects the industry. Brown, Wright, and Brown (2011) proposed that the basic reason behind the intention to attain the FSC is to bring about sustainability in the surrounding environment, as opposed to earning more profit. The intentions behind the attainment of this certification are significant. In a materialistic world, people and businesses tend to ignore humanity by prioritizing materiality in the form of profitability. In this context, some organizations view the environment as one of the major factors in human development, and they have started to create wider awareness. Nations around the globe are paying more and more respect to environmental sustainability because they now know how important it is for our future. This is why they are aligning their organizations through the implementation of environmental laws.

2.2. Other Profitability Determinants

Leverage: In this investigation, the first profitability determinant is leverage, which has a strong impact on overall profitability. In past investigations, it has been proposed that leverage essentially influences the financial performance of a firm. Financial leverage alludes to the capacity of a firm to deal with the financial repercussions of unpredicted adversities (Obiechina & Agboma, 1989). In palm oil organizations in Malaysia, leverage is positively correlated to the financial performance of a firm because of the fact that organizations want to acquire more, in order to counterbalance the expense of obligation capital. Leverage can bring about a tax-protected advantage that emphatically improves the performance of a firm (Yoshizaki et al., 2013). However, findings by Cramb and Ferraro (2017) disclaim this idea, as their findings show that leverage is largely negatively correlated to a firm's productivity. Subsequently, it has been recommended that the firm use more of their value than the simple obligation to fund business activities. Zigah (2015) reports a similar finding. Research by Yoshizaki et al. (2012)

utilizes the proportions of obligation and value in order to decide the impact of the capital structures of vitality American firms on their gains.

Growth: The second determinant of profitability is firm growth. In standard firms, firm growth is the expansion in the organization's transaction, benefits, and production item improvement. Numerous examinations use the development of the offer, but this is difficult to quantify. As indicated by [Hidayat, Glasbergen, and Offermans \(2015\)](#) a high growth rate connotes a high obligation by organizations to value proportion. Moreover, a high-growth firm has the capacity to acquire financial support from banks ([Hansen & Nygaard, 2014](#)). The literature by [Adeniyi and Ogunsola \(2013\)](#) that examines the benefits of Malaysian palm oil organizations found that growth rate was positively correlated with the productivity of palm oil organizations. One potential conflict of this finding is that a positive growth rate will result in a firm gaining a positive impression. Comparative outcomes are explained in [Podile's study \(2018\)](#).

[Melero, Bautista, Morales, Iglesias, and Sánchez-Vázquez \(2010\)](#) guarantee that a high inflation rate (high CPI) improves a firm's performance because it leads to a lower level of obligation. In the palm oil industry, the yearly cost of CPO has a positive relationship with productivity, as high expenses are related to higher benefits, which at some point will bring about choice ([Lehebel-Peron, Feintrenie, & Levang, 2011](#)). In the meantime, the change in cost will build business opportunities and decrease expenses ([Purwanto et al., 2019](#)), which may lead to the firm taking part in supporting the reduction of the firm's fundamental values. Unquestionably, supporting such a movement could increase working costs and negatively influence firm productivity.

Liquidity: The third determinant is liquidity, which measures the trend of a firm's profitability. The productivity of a firm may be influenced by the liquidation of the organization, as firms could have the impetus to sell and transfer their resources towards more effective tasks. An examination by [Morgans et al. \(2018\)](#) on Chinese ports suggests the fact that a high proportion illuminates the productivity of a firm in meeting its brief timeframe obligations. Thus, liquidity is unequivocally related to a firm's profits in recorded Malaysian organizations during budgetary emergencies ([Hyman, 1990](#)). Such outcomes differ from [Wei's investigation \(2012\)](#), which confirms that liquidity doesn't influence the finances of recorded rural organizations in China. In other words, the ability to take care of existing responsibilities is not conflicted with the capacity to repay long-term obligations. A further investigation by [Nesadurai \(2013\)](#) presents a similar outcome.

Firm Size: The final determinant of this investigation is firm size. Larger organizations have a superior variety of capacities and an economy of scale that offers points of interest to improve the advantages of the organizations ([Brandi et al., 2015](#)). A larger firm will, in general, progressively acquire because of their capacity to distinguish risks. As indicated by the exchange of hypothesis, higher-yielding firms are able to profit through evaluation. Some organizations have limited sources of income and want to make use of interior financing as opposed to other obligations because of the greater expense and risk ([Villanueva, 2011](#)). Similarly, the hypothesis of [Adeniyi and Ogunsola \(2013\)](#) and [Iacobucci, Grayson, and Ostrom \(1994\)](#) suggests that firm size has a positive effect on a firm's productivity. Unexpectedly, the research has clarified that firm size does not have a particularly significant effect on profit. Currently, inefficiency occurs in cases when larger firms are challenging to manage and oversee.

Based on available research, the concept of sustainability certifications in the exporting industry is gaining more and more importance and needs to be further investigated. It has been noted that minimal reporting has focused on palm oil in the export industry, and there is very little quantitative research on the specific RSO and MSPO certifications in the context of Malaysia. In light of recent announcements by Malaysian governments with regard to the completion of the MSPO certification, serious concerns have been raised in the palm oil export industry, so more investigation is needed to measure the effect in this context. This study has been conducted to fill this gap through an examination of the effect of sustainability certificates on the Malaysian palm oil industry and its operational profitability.

3. RESEARCH METHODS

This study used the quantitative approach to empirically evaluate the effects that sustainability certifications have on companies that export palm oil in Malaysia and their profitability. This study has taken the profitability of (PR) export companies as its main concern, which has been measured by the proxy recommended by Wahab and Ramli (2014). This proxy is the ratio of earnings before interest and tax (EBIT) and total assets, which illuminates the efficiency of biofuel exporters with regard to the usage of their assets in generating income. However, the higher ratio has shown the firms' ability to efficiently utilize their assets in generating income. In addition, the exports (EX) of the companies that have social sustainability certifications, which are measured in US dollars, have been used in the study to predict the operational profitability of biofuel producing companies in Malaysia. Furthermore, the current study has included five control variables, including liquidity (LQ) that has peroxide by total, current assets divided by total, current liabilities, leverage (LV) that has peroxide the total liabilities to total shareholder equities, sales growth (SG) that has proxy the change in the revenue from preceding year divided by preceding year revenue, firm size (FS) that has peroxide the logarithm of total assets and price (LPR) of the crude oil that has peroxide the logarithm of the average price of CPO. Based on the aforementioned literature and other variables, the current study has developed the following equation. Furthermore, the variables and their measurements are provided in Table 1.

$$PR_{it} = \beta_0 + \beta_1 EX_{it} + \beta_2 LQ_{it} + \beta_3 LV_{it} + \beta_4 SG_{it} + \beta_5 FS_{it} + \beta_6 LPR_{it} + e_{it} \quad (1)$$

Where

i = Firm.

t = Time Period.

PR = Profitability.

EX = Exports.

LQ = Liquidity.

LV = Leverage.

SG = Sales Growth.

FS = Firm Size.

LPR = Log Price of Crude Oil.

Table 1. Measurements of variables

Variables	Measurements	Source
Profitability	EBIT/Total Assets	Wahab and Ramli (2014)
Exports	Exports in US Dollars	Shahida et al. (2018)
Liquidity	Current Assets/Current Liabilities	Gupta, Jain, and Yadav (2011)
Leverage	Total Liabilities/Total Shareholder Equities	Tailab (2014)
Sales Growth	(Revenue ₁ - Revenue ₀)/Revenue ₀	Ramasamy, Ong, and Yeung (2005)
Firm Size	Log of Total Assets	Ramasamy et al. (2005)
Price of Crude Oil	Log of the yearly average price of CPO	Khalid, Hamidi, Thinagar, and Marwan (2018)

4. DATA

The sample of the current study has included the 17 listed Malaysian palm oil companies that have had an RSPO and/or MSPO certification from 2009 to 2018, including both downstream and upstream industries. However, out of these 17 companies, only seven export biofuels. The summary of these companies is shown in Table 2. Thus, data has been collected from the published annual reports of these seven companies from the year 2009, as the RSPO certification was made available at the end of 2008.

5. DATA ANALYSIS

This study has two types of data sets — cross-sectional and time series. Therefore, this study employed the panel model approach to analyze the data. Before testing the panel data approach, the assumption of the ordinary least square model was checked. The assumption includes the multicollinearity as well as the homoscedasticity and auto-correlation.

Table 2. List of palm oil exporter companies in Malaysia

S#	Company	Types of Operation	RSPO Certification	MSPO Certification
1	Felda Global Venture Bhd	Upstream & Downstream	Yes	Yes
2	Sime Darby Bhd	Upstream & Downstream	Yes	Yes
3	IOI Corp. Bhd	Upstream & Downstream	Yes	No
4	Keck Seng (Malaysia) Bhd	Upstream & Downstream	Yes	No
5	Kuala Lumpur Kepong B	Upstream & Downstream	Yes	No
6	Kwantas Corp. Bhd	Upstream & Downstream	Yes	No
7	IJM Plantations Bhd	Upstream & Downstream	Yes	Yes

First, the normality assumption was checked using the Skewness and Kurtosis test and was calculated using the following equations:

$$\text{Skewness} = \sum_{i=1}^N (Y_i - \bar{Y})^3 / Ns^3 \tag{2}$$

$$\text{Kurtosis} = \sum_{i=1}^N (Y_i - \bar{Y})^4 / Ns^4 \tag{3}$$

Next, the multicollinearity was verified using the variance inflation factor (VIF), which can be evaluated using the following equations:

$$R^2_{PR} \quad PR_{it} = \alpha_0 + \beta_1 EX_{it} + \beta_2 LQ_{it} + \beta_3 LV_{it} + \beta_4 SG_{it} + \beta_5 FS_{it} + \beta_6 LPR_{it} + e_{it} \tag{4}$$

$$R^2_{EX} \quad EX_{it} = \alpha_0 + \beta_1 PR_{it} + \beta_2 LQ_{it} + \beta_3 LV_{it} + \beta_4 SG_{it} + \beta_5 FS_{it} + \beta_6 LPR_{it} + e_{it} \tag{5}$$

$$R^2_{LQ} \quad LQ_{it} = \alpha_0 + \beta_1 PR_{it} + \beta_2 EX_{it} + \beta_3 LV_{it} + \beta_4 SG_{it} + \beta_5 FS_{it} + \beta_6 LPR_{it} + e_{it} \tag{6}$$

$$R^2_{LV} \quad LV_{it} = \alpha_0 + \beta_1 PR_{it} + \beta_2 LQ_{it} + \beta_3 EX_{it} + \beta_4 SG_{it} + \beta_5 FS_{it} + \beta_6 LPR_{it} + e_{it} \tag{7}$$

$$R^2_{SG} \quad SG_{it} = \alpha_0 + \beta_1 PR_{it} + \beta_2 LQ_{it} + \beta_3 LV_{it} + \beta_4 EX_{it} + \beta_5 FS_{it} + \beta_6 LPR_{it} + e_{it} \tag{8}$$

$$R^2_{FS} \quad FS_{it} = \alpha_0 + \beta_1 PR_{it} + \beta_2 LQ_{it} + \beta_3 LV_{it} + \beta_4 SG_{it} + \beta_5 EX_{it} + \beta_6 LPR_{it} + e_{it} \tag{9}$$

$$R^2_{LPR} \quad LPR_{it} = \alpha_0 + \beta_1 PR_{it} + \beta_2 LQ_{it} + \beta_3 LV_{it} + \beta_4 SG_{it} + \beta_5 FS_{it} + \beta_6 EX_{it} + e_{it} \tag{10}$$

$$j = R^2_{PR}, R^2_{EX}, R^2_{LQ}, R^2_{LV}, R^2_{SG}, R^2_{FS}, R^2_{LPR} \tag{11}$$

$$\text{Tolerance} = 1 - R_j^2 \quad VIF = \frac{1}{\text{Tolerance}} \tag{12}$$

While the other two assumptions are checked using the Wooldridge test, the homoscedasticity assumption was verified using the Breusch-Pagan test.

This study applied the panel model approach to analyze the data because it is “able to provide larger data sets with more variability and reduce collinearity among variables compared to time series or cross-section data alone” (Hsiao, 2007). To check the appropriate model among the three possible models— the ordinary least square (OLS) model, the fixed effect (FE) model, and the random effect (RE) model, the Lagrangian Multiplier and Hausman test

were employed. Finally, after selecting the appropriate model, the Driscoll and Kraay standard error approach was used to eliminate the effects of data abnormality, as well as heteroscedasticity and auto-correlation issues.

The approach used by the study to estimate the panel regression was the robust standard error approach that was developed by Driscoll and Kraay (1998). The cross-sectional average of the residuals and regressors were worked out in order for the standard error, heteroscedasticity, and autocorrelation consistent (HAC) estimator to be computed. In addition, Driscoll and Kraay (1998) established the consistency of standard errors as the time and cross-sectional dimensions of the sample size growth that limit the dependence of the data on both the cross-sectional and time series. This approach to the standard error ensured that the serial correlation in the panel was robust. The heteroscedasticity and serial correlation were collapsed by the cross-sectional averages. Therefore, the HAC robust standard errors can be used in order to remove the serial correlation issue in the time dimension. This study has issues with both the serial correlation and heteroscedasticity, which is why it has been strongly recommended that the Driscoll and Kraay standard error approach is used for estimation. The second estimator used by the current study is the fully modified ordinary least square (FMOLS), as the variables demonstrate the cointegration between them. The FMOLS estimator introduced by Pedroni (2000) provides asymptotically unbiased estimates of long-term elasticities and normally distributed standard errors. Moreover, the FMOLS utilizes the semi-parametric correlation between residual autocorrelation and endogeneity. It is the group averages of group estimators that allows for an extensive degree of heterogeneity in the data. Therefore, this study uses this model because it has a high degree of heterogeneity issues.

6. FINDINGS

The first assumption related to the correlation between the constructs shows no significant correlation. This is because the values of VIF are lower than ten and the first assumption related to multicollinearity has been proven. The values of VIF are shown in Table 3.

Table 3. Variance inflation factor

	VIF	1/VIF
LNEX	9.791	.102
SG	7.8	.128
LV	5.993	.167
FS	3.768	.265
LPR	1.451	.689
LQ	1.193	.838
Mean VIF	4.999	.

The second assumption related to the normality of the data shows that the data from the majority of the constructs are normal and the probability values of PR, LQ and FS are larger than 0.05. However, in the case of LNEX, LV, SG and LPR, the probability values are less than 0.05, meaning that the data is not normal. The values from the Skewness and Kurtosis test are shown in Table 4.

Table 4. Skewness and Kurtosis

Variable	Obs	Pr (Skewness)	Pr (Kurtosis)	adj_chi2(2)	Prob>chi2
PR	70	0.432	0.087	3.700	0.157
LNEX	68	0.015	0.380	6.200	0.045
LV	70	0.026	0.023	8.760	0.013
LQ	70	0.211	0.641	1.840	0.398
SG	70	0.000	0.041	19.600	0.000
LPR	70	0.025	0.009	10.000	0.007
FS	70	0.989	0.616	0.250	0.882

The other assumptions, such as the homoscedasticity and autocorrelation that was verified using the Breusch-Pagan and Wooldridge test, indicated that the data had heteroscedasticity and auto-correlation issues, and that the effects of these issues was fixed by the Driscoll and Kraay standard error approach.

In addition, in order to check the appropriateness of the models between PLS, FE, and RE, the Lagrangian Multiplier and Hausman tests were utilized. The tests showed that the FE model was appropriate, as can be seen in the results of the Hausman specification test given below (See Table 5). The probability value was lower than 0.05, which shows that the RE was not appropriate.

Table 5. Hausman test

	Coef.
Chi-square test value	99.737
P-value	0

The results of the FE model have shown that exports from biofuel companies in Malaysia that have social sustainability certifications are positively correlated to the profitability of a company. Other profitability determinants, such as leverage and sale growth, are also positively correlated with profitability, whereas liquidity, the price of crude oil and firm size are negatively correlated to profitability. These figures are shown in Table 6 below.

Table 6. Fixed Effect Model (Driscoll and Kraay standard error approach)

PR	Beta	S.D.	t-values	p-values	L.L	U.L
LNEX	0.566	0.174	3.260	0.017	0.141	0.991
LV	0.767	0.251	3.060	0.022	0.153	1.380
LQ	-0.223	0.116	-1.910	0.104	-0.507	0.062
SG	0.966	0.252	3.830	0.009	0.349	1.583
LPR	-0.041	0.100	-0.410	0.695	-0.286	0.203
FS	-0.404	0.191	-2.110	0.079	-0.873	0.064
_cons	-1.939	0.707	-2.750	0.034	-3.668	-0.211
R-square		0.3217		Prob > F		0.0056

The findings of the FMOLS model show that the exports of biofuel companies in Malaysia that have social sustainability certifications are cointegrated with the profitability of the company. Similarly, leverage, firm size and sale growth are also cointegrated with profitability, whereas liquidity and the price of crude oil is not cointegrated with profitability. These figures are shown in Table 7 below.

Table 7. Cointegration Regression (FMOLS)

PR	Coef.	Std. Err.	z	P>z	L.L	U.L.
LNEX	1.192	0.430	2.780	0.006	0.351	2.034
LV	1.543	0.510	3.030	0.002	0.544	2.542
LQ	-0.120	0.128	-0.930	0.351	-0.371	0.132
SG	2.167	0.662	3.270	0.001	0.870	3.464
LPR	-0.026	0.075	-0.350	0.729	-0.174	0.122
FS	-0.932	0.369	-2.530	0.012	-1.655	-0.209
linear	-0.003	0.004	-0.810	0.415	-0.011	0.004
_cons	-4.812	2.348	-2.050	0.040	-9.414	-0.210

7. DISCUSSION

The results have indicated that exports have a positive role on the financial aspects of companies that export palm oil in Malaysia. These findings guide policymakers towards removing restrictions on exports and developing policies that increase the exportation of biofuel, thereby enhancing the economic growth of a country. The restriction of social sustainability certificates increases the cost of the palm oil industry in Malaysia; however, these

biofuel exports benefit the palm oil industry because they improve the profitability and financial position of the companies. These findings are similar to the results of [Shahida et al. \(2018\)](#), which also examined the link between profitability and social sustainability certifications. This study found that companies who hold social sustainability certifications are more profitable than other companies. The study by [Hafizuddin-Syah, Shahida, and Fuad \(2018\)](#) also found positive links between profitability and companies that have social sustainability certifications, which corresponds with the findings from this study. In addition, the results of the study by [Hasan and Reed \(2016\)](#) indicated that, if an organizations has a certification of social sustainability, they work more effectively and are better able to manage their exports, which has a positive effect on the financial aspects of the company. These results also correspond positively to the results of the current study. Moreover, another study conducted by [Pye \(2019\)](#) also indicated that social sustainability certifications have a positive financial effect on companies. A study by [Saikkonen, Ollikainen, and Lankoski \(2014\)](#) found that the profitability of the palm oil industry depends upon the biofuel imports from Europe. This also corresponds to the present study's findings, as it uncovered the fact that the exportation of palm oil to other countries as biofuel has a positive impact on the profitability of the palm oil industry in Malaysia. In addition, [Marks, Larson, and Pomeroy \(1998\)](#) also found that exportation of palm oil products can increase the profitability of the associated firms. Thus, the exportation of palm oil from Malaysia to Europe and other countries has a positive impact on the profitability of the palm oil industry in Malaysia.

8. CONCLUSION

The existing study has reached the conclusion that, if an organization follows environmental guidelines and obtains a social sustainability certification, their operations, including their exports, are positively impacted and their profitability is increased, which is the major goal of all biofuel exporters around the globe. Biofuel exporters in Malaysia that follow environmental guidelines, as well as having a social sustainability certification, are able to manage their exports appropriately, which is the reason why their profitability is positively influenced. Therefore, it is recommended that all companies should follow environmental guidelines and obtain a social sustainability certification. Although this may increase their costs, it will also organize the functions of the firm in a way that will benefit and improve the financial performance of the firm. These findings will also suggest that policymakers should remove restrictions on exports and develop policies that will increase the exportation of biofuel and improve the economic growth of the country.

9. LIMITATIONS AND FUTURE DIRECTIONS

This study has several limitations that should inform the direction of upcoming studies. First, the findings of the existing study are only focused on the palm oil industry in Malaysia, so it is recommended that future studies expand their study scope by considering other industries and countries. In addition, the existing study uses data from 2009 to 2018 because the RSPO certification only became available at the end of 2008. It is therefore recommended that future studies should consider other time periods in their evaluation. Moreover, future studies should consider other factors that may predict the profitability of the palm oil industry in the future.

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