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Article

Corruption and Firm's Decision to Export: Evidence from Indonesia

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Abstract

Trade liberalization is an excellent opportunity for many firms in a country to export their products. For several years, there have been continuous discussions over what factors influence a company's decision to export. One of the essential factors that companies consider when deciding to export or not is the institutional environment, such as corruption. This study investigates the corruption's impact on firms concerning the export markets. Specifically, this study argues that corruption has a grease effect on the economy and may increase the probability of exporting directly or indirectly. The model's propositions are tested using a comprehensive dataset covering over 2,700 companies in Indonesia in 2009 and 2015 by adopting the probit and logit method. The cross-section and panel regressions confirm that firms are more likely to become exporters if they perceive higher levels of corruption in their home regions. In addition, the intensity of their exporting operations is related to business characteristics such as the firm's age, size, foreign ownership, and access to foreign technologies.

Keywords: corruption, export, export decision, international trade.

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I. Introduction

The growth of international trade has been rapid because the trade barriers (tariffs and non-tariffs) between countries have significantly decreased. Most-favored-nation (MFN) tariffs have shown a decreasing trend at a steady rate since 2018 (WTO, 2019). The reductions or even removal of trade barriers, called trade liberalization, are happening between countries. Approximately 1% decline has been observed in the world average of applied tariffs in 2018, which became 9% from the 2008 level (WTO, 2019). As a result, world trade which consists of the export of merchandise and commercial services has grown by 26% in the past decade (WTO, 2019).

Trade liberalization is an excellent opportunity for many firms in a country to export their products. Melitz (2003) shows that exposure to trade enables the more productive firms to export, while the less productive ones prefer to continue producing only for the domestic market. Thus, in a standard model based on Melitz (2003), a more productive firm is likely to export its product, while a less productive firm has a reverse trend. In other words, a firm's productivity affects its participation decision in the international markets, either exporting its products or importing raw materials for production.

However, a firm's decision to export does not depend on one aspect. For several years, there have been continuous discussions over what factors influence a company's decision to export. Decision-makers in many countries have acknowledged that there are many factors affecting them. Several obstacles can also impede exports. Both need to be understood. The growing body of literature about exporting and its impact on economic growth signifies the importance of a study related to a firm's decision to enter a foreign market.

Furthermore, much prior research on exporting has paid significant attention to the variables affecting the decisions to export. These variables tend to be internal, specific to the company, and external, specific to the sector, market, and environment (Albaum & Duer, 2011). Both these variables should be understood and considered simultaneously to encourage an increase in exports. Also, according to Krammer *et al.* (2018), a firm's export decision will rely on its company-specific capabilities (such as productivity) and its institutional environment. The study suggests that it is more probable for a firm to enter the foreign market when they face uncertainty in the domestic environment due to high levels of corruption, political instability, and significant informal competition. Thus, given the incentives from the international market in the form of trade liberalization, the situation in the exporting country itself determines its international trade. It is essential to understand these main business constraints to encourage the private sector to become an engine of growth (Hosny, 2017).

Moreover, firms may regard bribes as a fixed cost investment that reduces its average cost as the firm increases sales by exporting to different markets and reduces the efficiency of these operations. They repeatedly pay bribes and forge long-standing relationships with corrupt officials to access a broader range of resources at a lower cost (Lee & Weng, 2013). Therefore, export decision analysis benefits decision-makers in both the private and public sectors.

One of the crucial factors that companies consider when deciding to export or not is the institutional environment, such as corruption. It is one aspect that significantly affects firms' trading activities in the foreign market and impedes economic growth. Mauro (1995) indicates that corruption has degrading effects on economic growth. Another study, on the other hand, discovered that corruption increases economic growth (Kato & Sato, 2015). Although some studies have started examining the effect of corruption on exports (Krammer *et al.*, 2018; Lee & Weng, 2013; M. Lee *et al.*, 2014; Olney, 2016; Qi *et al.*, 2018), there are still no consistent results in the existing research. The studies indicate that the effects of corruption might vary across countries because each country has different institutional

efficiency levels and production functions. Indonesia, like other developing countries, also suffers from corruption.

In Indonesia itself, the number of successfully resolved corruption cases has been more likely to rise since the formation of the Corruption Eradication Commission or Komisi Pemberantasan Korupsi (KPK) in 2003. KPK (2019) states that it has successfully taken to court several corruption cases in both central and local governments. Indonesia scored 58 in the Corruption Index according to the PRS International Country Risk Guide's assessment. It concerns corruption in the political system, special payments and export-import bribes, and suspicious relationships between politicians and business people (KPK, 2019), on a scale of 0–100 (where 0 is highly corrupt and 100 is very clean). Moreover, in the World Economic Forum EOS (Executive Opinion Survey), respondents were asked about bribes and extra payments on imports and exports, public services, annual tax payments, contracts and permits, and court decisions; Indonesia scored 46 (KPK, 2019). This situation indicates that corruption in Indonesia is still moderate, which means that it exists and has some effects.

For comparison, based on the Corruption Perception Index (CPI) 2020, Indonesia only scored 37 out of 100 and was ranked 102. Meanwhile, other middle-income countries in Southeast Asia, such as Malaysia, had a score of 51 and ranked 57. However, Indonesia's position is still better than Vietnam, which scored 36 and ranked 104, and the Philippines, which ranked 115 with a score of 34 (Transparency International, 2020).

Given that corruption is a common impediment in developing countries and that access to foreign markets is often a source of growth and development, it is crucial to study the relationship between corruption and a firm's decision to export. Thus, in this study, the research objective is to analyze the firm's decision to export and enter the foreign market and how it is affected by corruption in Indonesia.

Although several studies on the effect of corruption on export decisions exist, previous research has not yet distinguished the business sector from the extractive sector (a mining sector that includes mining and excavation). A recent study by Kenny and Warburton (2021) indicated that the extractive industries have the highest percentage of firms reporting bribery committed, coerced to give money to certain people and consider such practices as natural in their business sector. The mining industry is highly likely to be vulnerable to corruption since the extractive industry requires many trade licenses from the government to run its business, creating room for corruption. Therefore, this study also investigates the extractive-sector firms and whether their export decisions are affected by corruption.

This analysis also contributes to filling the gap in export decision studies at the level of firms in Indonesia. By presenting new evidence on the effect of corruption on a firm's decision to enter a foreign market, this paper will contribute to the current literature. Additionally, this paper will provide new evidence about the relationship between the business sector and corruption. Previous studies have not distinguished the business sector from the extractive sector, specifically whether corruption affects export decisions. In addition, taking suggestions from Krammer *et al.* (2018), this study also seeks to see the relationship between export performance and the institutional environment by using the panel data method to see the dynamic effect of this relationship. These are some of the gaps this research attempts to fill.

Hopefully, the outcome of this study will provide fresh insights into the current debate on the impact of corruption on trade. It is debatable whether corruption between government officials and firms pushes firms to export more or instead forces firms away from entering the export market and making them stay in the domestic sector. This paper can also act as a document for the government to determine and design more appropriate policies to encourage exports, especially in Indonesia, since corruption can play an essential role in policy determinations.

The following is the study's structure: the first is the introduction, which provides information about the background of the research, research question, contribution, and scope. The next chapter reviews the existing literature related to corruption and export decisions. The third chapter, research and methodology, explains the data used, the definition of the variables, and the empirical strategy. Moreover, the fourth chapter discusses the results and analysis. Finally, the last chapter provides the conclusions and policy implications.

II. Literature Review

There is much research on corruption. According to Shleifer and Vishny (1993), corruption is an abuse of power by government officials that give them personal gains, such as bribes for information and resource exchanges, licenses, or permits, between one who gives bribes and one with the power to do these economic activities more quickly. Corruption provides additional benefits to those who do it through an abuse of power. Blackburn *et al.* (2005) define corruption in the public sector as a misuse of authority by bureaucratic officials who manipulate the government's discretionary powers by engaging in illegal and unregulated activities in pursuing their interests.

Although the relationship between economic development and corruption is still debatable, scholars believe that corruption will hamper economic growth. By increasing transaction costs, corruption hinders all economic activities, causing more significant uncertainty and less market transparency (Cuervo-Cazurra, 2016). The existence of corruption causes the costs to increase. As a result, the company's burden increases and makes it unable to compete. Corruption is also considered a tax on companies that increases their costs by enforcing operational and investment costs (Athanasouli & Goujard, 2015) and transferring risks to others (Doh *et al.*, 2003). The costs incurred due to direct dealings with corrupt officials by a specific business are the direct costs of corruption (Doh *et al.*, 2003). It is because of these additional costs that corruption hinders economic growth.

On the other hand, some argue that corruption can minimize the transaction costs of governmental resources that firms face and alleviate domestic regulations' burdens (Lee & Weng, 2013). Lee and Weng's (2013) research indicates that corruption decreases companies' transaction costs. Corruption makes a company pay a particular person to "get things done," instead of doing everything by-the-book, which may cost more. Cuervo-Cazurra and Dau (2009) find that corruption can effectively resolve the challenges of political instability and informal sectors.

Accordingly, recent research has begun to realize the impact of institutional factors on a firm's export decision, particularly the relationship between corruption and export (Krammer *et al.*, 2018; Lee & Weng, 2013; M. Lee *et al.*, 2014; Olney, 2016; Qi *et al.*, 2018). Nevertheless, empirical evidence on how corruption affects the probability of a firm's decision to enter a foreign market is mixed.

On the one hand, studies show that corruption positively impacts a firm's decision to enter foreign markets. Olney (2016) argued that corruption could harm access to foreign markets, thereby limiting trade benefits, especially for less-developed countries. In his research, he found that corruption decreases the likelihood that a company exports directly, raises the likelihood that a business exports indirectly through an intermediary, and lowers the likelihood that a business only sells domestically. M. Lee *et al.* (2014) also propose that corruption would promote exports. The study argued and provided evidence that companies may use exports to escape the high costs of doing business with aggressive institutions in their home country. It is highly likely that when their home countries have more issues of government corruption, the firms will export more.

On the other hand, evidence suggests that corruption decreases the possibility for companies to export. Lee and Weng (2013) suggest that bribery decreases them within the

home country instead of increasing the company's exports. Bribe-related preferential treatment could decrease exports by providing firms with more defined domestic market positions. Thus, reducing the incentive for the firms to enter foreign markets. The prior argument that in return for bribes, preferential treatment from government officials will encourage exports by improving productivity and allowing the bribing companies to compete better in foreign markets was not proven.

Similarly, another study found a special relationship between corruption and a firm's exports within the context of emerging economies. As companies pay bribes, they will obtain preferential treatment from institutions and benefit from preserving or developing their domestic market positions, thus reducing their export incentives (Qi *et al.*, 2018). When companies are demanded enormous bribes, they are forced to export their products. Instead of selling their products domestically and paying a large amount of money, they enter the export market. The bond (called a U-shaped) between corruption and export is improved, which is seen in a market environment with high political uncertainty and regulatory burdens (Qi *et al.*, 2018).

However, Krammer *et al.* (2018) prove that corruption does not significantly impact exports. They argued that emerging financial firms (EFF) would be more likely to export when facing more uncertainty in other institutional environments, such as increased political instability, major informal competition, and high levels of corruption, within home countries. All of them are considered to give firms uncertainties in the domestic market and encourage them to search for foreign markets. Nevertheless, it is found that corruption is not a significant determinant of the EFF's export decisions. Cuervo-Cazurra and Dau (2009) found that structural reform (reducing government constraints and regulations) positively affects the export conduct of companies in developing countries, as reduced transaction costs and rising productivity enable companies to increase their foreign competitiveness and resolve the challenges of entering a foreign market.

III. Methods/Methodology

3.1. Data and Variables

The analysis in this research will be conducted using the World Bank's Enterprise Survey (WBES) from the data of emerging economies. More specifically, this research will use the World Bank's Enterprise Survey of 2009 and 2015. WBES is a survey that produces credible data because it is collected using a stratified method that can represent the conditions of the country being surveyed. Industry, establishment size, and region stratification are all three levels of stratification used for sampling. Thus, it is often used for various studies. This survey gathered information from around 2,700 firms in nine large provinces of Indonesia including Jawa Barat, Jawa Timur, Jawa Tengah, DKI Jakarta, Banten, Sulawesi Selatan, Sumatera Utara, Bali, and Lampung. Table 1 shows the number of firms listed in each survey.

Table 1. Summary of observations

Year	No. of firms interviewed	Percentage
2009 only	818	29.88
2015 only	952	34.77
2009 and 2015	968	635.35
Total	2,738	100.00

Source: World Bank Enterprise Survey 2009 and 2015

The dependent variable in this study is the decision to export (dummy), which is shown by the percentage of direct or indirect export. This approach is in line with previous

research done by Krammer *et al.* (2018). Meanwhile, the independent variable of interest is corruption, a variable related to the institutional environments in the firms' home countries. This research aims to see whether corruption significantly affects the firm's decision to export its products. The percentage of total sales measures the corruption variable to pay for informal payments from firms to government officials. Firms are often required to give public officials gifts or informal payments to deal with issues regarding customs, taxes, permits, legislation, utilities, and others. Qi *et al.* (2018) used the exact measurement in their research. Other independent variables considered necessary in the export literature will be used to account for firm heterogeneity.

This study proposes the extraction sector variable, its interaction with corruption, and the panel data analysis as a novelty. Many businesses in the extractive sector need a license from the government to keep their operations going. The hypothesis is that this situation might increase the likelihood of corruption in government institutions, thus increasing the probability of firms exporting. The classification approach of the extractive sector is based on classification by Bursa Efek Indonesia (BEI). It describes the extractive sector as a mining sector that includes mining and excavation businesses, including mining coal, oil, gas, metal ore, rocks, clay, sand, mining salt and minerals, chemicals, and fertilizer materials gypsum, asphalt, and limestone.

Age is the firm's age, which is the number of years since the firm first began operations. M. Lee *et al.* (2014) also calculated the age of new ventures by counting how many years have passed since they were formed. Some prior studies on export have recommended using this variable as a good predictor for exports (Krammer *et al.*, 2018; Olney, 2016). In order to expand internationally, older companies need to gain more market experience and export capability, even though some studies argue that age is no longer a prerequisite for successful international expansion (Krammer *et al.*, 2018). Therefore, this paper will also include age as one of the control variables.

Other than that, this research uses firm size as the control variable. Given that larger companies tend to internationalize faster and to a more considerable extent than smaller companies (Bernard *et al.*, 2007), the number of total workers reflecting the company's size is crucial.

Foreign ownership is the percentage share of the firm owned by private foreign individuals, companies, or organizations. According to Singh (2009), foreign-owned companies have better technologies and business relations/markets to boost exports. Foreign-owned enterprises are more likely to export than domestic ones because they are already connected to global networks and have the requisite skills to support profitable exports (Krammer *et al.*, 2018).

Furthermore, based on a study by Krammer *et al.* (2018), exporting is greatly influenced by technology, which confirms the importance of external (foreign) technical capacities to manufacture products of sufficient quality to compete in foreign markets. Therefore, the variable of foreign technology (dummy) will also be used as a control. The summary variables proposed to be used in this research and their specific definitions are shown in Table 2.

Table 2. The Variables and Their Descriptions

Variable	Type of Variable	Description
Dependent: Export	Dummy variable	1 if the share of direct or indirect export is more than 0
Independent:		
Corruption	Continuous variable	Percentage of total sales to pay for informal payments from firms to government officials to "get things done".
Age	Continuous variable	The firm's age is calculated by subtracting from the year 2020, the year in which the firm first started operating.
Foreign Ownership	Continuous variable	The proportion of the firm which is owned by private foreign individuals, companies, or organizations
Technology	Dummy variable	Technology used by the firm: 1 if the firm uses a foreign technology; 0 if otherwise
Size	Dummy variable	The business scale of the firm: 1 if the firm is medium (20-99 employees) or large (>=100 employees); 0 if it is small (5-19 employees)
Extractive Sector	Dummy variable	The firm's business sector includes extraction activities in the process or includes materials taken by extraction: 1 if the firm business is an extraction business or using raw materials taken by extraction processes, 0 if otherwise
Extractive Sector * Corruption	Interaction variable	Variables interaction between extraction sector and corruption

3.2. Methodology

This study modeled the research methodology after Krammer *et al.* (2018), who adopted a probit regression to analyze export decisions to enter the export market and answer the research question. Probit regression will be used in this research because the dependent variable, the export decision, is binary (1 for deciding to export or enter the export market and 0 for trade within the domestic market only). Therefore, it is predicted that a better estimate would be obtained from this approach. This study will use the probit method to process the cross-sectional dataset. The model is estimated as Model (1).

$$\begin{aligned} Export_i \; = \beta_0 &+ \beta_1 Corruption_i + \beta_2 Age_i + \beta_3 Foreignownershio_i \\ &+ \beta_4 Technology_i + \beta_5 Size_i + \beta_6 Extractive\ Sector_i \\ &+ \beta_7 Extractive\ Sector * Corruption_i + \mu_i \end{aligned} \quad (1)$$

Export is the dummy variable for the firm that exports, 1 is for the firm that exports and 0 if otherwise. *Corruption* is the independent variable of interest measured by informal payments to government officials. β_2 until β_7 is a set of firm-level control variables that includes the firm's age, foreign ownership, domestic ownership, state ownership, the technology used by the firms, the firm's sector, and the interaction of extractive sector and corruption. This research will run two models. The first is the probit model without variable interactions, and the second one is with the interaction variables.

In addition, this research also examines the effect of corruption to export decisions using a panel dataset. This research implements the random effects regression model using the logit method using firm-level data from 2009 and 2015 (Model (2)).

$$\begin{aligned} Export_{it} &= \beta_0 + \beta_1 Corruption_{it} + \beta_2 Age_{it} + \beta_3 Foreignownership_{it} \\ &\quad + \beta_4 Technology_{it} + \beta_5 Size_{it} + \beta_6 Extractive\ Sector_{it} \\ &\quad + \beta_7 Extractive\ Sector * Corruption_{it} + \mu_{it} \end{aligned} \qquad (2)$$

where $Export_{it}$ represents the export measure for firm *i*, for period *t*. By construction, the random effects capture the substantial heterogeneity across firms that would otherwise go unaccounted for in a standard cross-sectional model.

This study tries to answer the limitations of Krammer *et al.* (2018). The cross-sectional nature of the data makes them unable to account for additional time-variant variables that may influence the firm's export behavior, so panel approaches may be used in future studies to control this unobserved heterogeneity.

IV. Results, Analysis, and Discussions

4.1. Summary Statistics

Descriptive statistics of all variables used from the Enterprise Survey cross-sectional data of 2009 and 2015 are shown in Table 3. The average dummy export is 0.164, which means that most firms in the nine provinces of Indonesia used as the research sample are domestic-oriented firms. The majority of firms primarily serve the local market, consistent with prior findings (Bernard *et al.* 2007; Olney, 2016). The average value of dummy export indicates that only 16.4% of firms in this dataset are exporters. This study's primary variable of interest, corruption, has an average of 0.407. On average, the surveyed firms pay 0.407% of their total sales as informal payments to government officials.

Table 3. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Export	2,738	0.164	0.371	0	1
Corruption	2,157	0.407	2.029	0	30
Age	2,701	27.1	11.464	7	108
Foreign ownership	2,732	5.222	19.768	0	100
Size	2,738	0.545	29.643	0	1
Technology	2,210	0.208	0.406	0	1
Extractive sector	2,738	0.159	0.366	0	1
Extractive sector x corruption	2,157	0.055	0.886	0	27

Source: World Bank Enterprise Survey 2009 and 2015 (processed)

The firm's age average is 27 years in control variables and ranges from a 7-year-old to a 107-year-old firm. The average foreign ownership is 5.22%. This result means that most of the firms in this survey are domestic-owned. The dummy technology ranges from 0 to 1, where 1 means the firm uses foreign technology, and 0 means otherwise. Based on the

statistics, the average value of dummy technology is 0.208, which means that the firms in Indonesia's 2009 and 2015 Enterprise Surveys mostly use local technology rather than foreign technology. According to the 2009 and 2015 Indonesian Enterprise Surveys, companies are distributed equally, with an average of 0.545 in medium or large and micro or small businesses. The statistical description of the extractive sector dummy shows that most of the firms work in sectors other than the extractive sector, while the rest are in extractive sectors with an average of 0.159.

4.2. Firm-level Analysis

This research runs two models. The first one is a probit model without variable interaction, and the second one is with variable interaction. Table 4 shows the regression results on cross-sectional data between corruption, the firm's characteristic as control variables to the firm's decision to export or enter a foreign market, and interaction between the variable corruption and extraction sector. The results consist of probit regression of both models. Each variable also has a marginal effect.

Table 4. Cross-section Regression Result

	Model 1		**Model 2**	
Export	**Probit**	**Marginal Effect (dy/dx)**	**Probit**	**Marginal Effect (dy/dx)**
Corruption	0.0463***	0.0076***	0.0335*	0.0055*
	(0.0162)	(0.0027)	(0.1785)	(0.0029)
Age	0.0160***	0.0026***	0.0158***	0.0026***
	(0.0033)	(0.0006)	(0.0035)	(0.0006)
Foreign ownership	0.0168***	0.0027***	0.0167***	0.0028***
	(0.0018)	(0.0004)	(0.0018)	(0.0004)
Size	1.0842***	0.1694***	1.0852***	0.1708***
	(0.0082)	(0.0156)	(0.1222)	(0.0157)
Technology	0.5275***	0.1063***	0.5104***	0.1029***
	(0.0943)	(0.0230)	(0.0948)	(0.0229)
Extractive sector	-0.1969*	-0.0298*	-0.2664**	-0.0395**
	(0.1192)	(0.0165)	(0.1248)	(0.0164)
Extractive sector x corruption	-	-	0.1992*	0.0330*
			(0.1075)	(0.0181)
Constanta	-2.5571***	-	-2.5381***	-
	(0.1464)		(0.1469)	
No. of observations	1,724	-	1,724	-
Log-likelihood	-541.6497	-	-538.8238	-
Pseudo R-squared	0.2761	-	0.2799	-

Standard errors in parentheses *** p<0.01, ** p<0.05, *p<0.1

Table 4 shows that practically all variables bear the same significant results in both models, except the extractive sector and corruption as the dependent variable. Both variables are statistically significant but have different levels of significance where for corruption, the significant decreases in Model 2, while for the extractive sector, it increases in Model 2.

The probit regression result shows that the primary variable of interest, corruption, has a positive and quite significant effect on the firm's decision to export. Corruption enhances the chances of a firm becoming an exporter in both models compared to being entirely domestic. This result means that corruption in the home country makes the firm's probability of exporting higher. The result is quite the same compared to several previous studies that show that corruption has a significant and positive correlation with the firm's decision to be involved in other international trade. (Olney, 2016; Qi *et al.*, 2018).

Similar to the primary interest variable, the control variables, such as age, the share of foreign ownership, size, and technology, play a significant role in influencing the company's decision to export. Specifically, these variables indicate a positive and significant effect on the firms' decision to enter the foreign market. The regression results in Table 4 suggest that the older the firms, the more they tend to export than younger firms. Exporting firms are also older and owned by a foreign entity, consistent with the previous findings (Krammer *et al.*, 2018; Olney, 2016). Firms that decide to export are most likely older enterprises when compared to domestic enterprises. Olney (2016) found that age is directly proportional to the probability of a company becoming an exporter.

Likewise, firms with foreign ownership and foreign technology have a similar result. Companies with a higher percentage of foreign ownership tend to increase the likelihood of these companies exporting. Foreign-owned firms are often more likely to have resources and networks developed by foreign partners, benefiting the new firms' export projects (M. Lee *et al.*, 2014). Firms that adopt foreign technology are also more likely to export. In addition, companies with a large scale of business (size) also tend to increase the possibility of export. This result aligns with M. Lee *et al.* (2014), who found that small businesses have a lower export intensity than large businesses.

Furthermore, the extraction sector's dummy indicates an expected result. Statistically, it indicates a negative and weakly significant impact on the firm's decision to export. This finding shows that companies involved in the extraction sector have an increased possibility of selling domestically rather than exporting. The result is partially the same, with an interaction term between the extraction sector and corruption that shows a positive yet weak correlation to a firm's decision to export. The positive coefficient of the interaction variable has a meaning. Although the marginal effect of 3.3% is small, the ratio of export companies is 0.164; therefore, the number is equivalent to 20%. An increase of 3.3% in the probability of export is entirely meaningful in the value of Indonesian exports.

The marginal effects finding will be used to investigate the variables further. The marginal effects of both models, which indicate the magnitude effect of each independent variable on the dependent variables, are also shown in Table 4. From the marginal effect, corruption in the home country might increase the probability of the firm's decision to export as much as 0.76% at a 1% significance level in the first model but only 0.55% at a 10% significance level in the second model. Note that corruption is measured by the percentage of sales used to make informal payments to government officials to deal with export issues.

The firms' experience, reflected by the age variable, shows that an increase in age increases the probability of firms exporting by 0.26% at a level of 1% significance in both models. The age variable, which has statistically significant impacts on export probability, indicates that older firms are more likely to engage in exporting. This result corresponds with Krammer *et al.* (2018), M. Lee *et al.* (2014), and Olney (2016). Moreover, foreign-owned firms are also more likely to engage in exporting, which is in line with the literature (Krammer *et al.*, 2018; M. Lee *et al.*, 2014). The result shows that an increase of 1% in the share of foreign ownership will increase the likelihood to export by 0.27% at a 1% significance level in the first model. It increases 0.28% likelihood to export in the second model. Likewise, a 1% increase in the firm size increases the likelihood of the firms exporting by 16.94% in the first model and 17.04% in the second model.

The marginal effect of technology shows that the availability of foreign technology in a firm's business process increases the probability of firms entering the export market by 10.63% and 10.29% in the first and second model, respectively, compared to the former firm that does not use any foreign technology. These results are statistically robust at a significance level of 1%. Unlike technology, the marginal effect of the extraction sector shows that a firm in the extractive sector decreases the likelihood of the firm's decision to export by 2.98%, with a 10% significance in the first model. It decreases by 3.95% in the second model compared to the firm not in the extraction sector. The second result is

statistically strong at a significance level of 5%. Furthermore, the marginal impact of the interaction term shows that the probability of export will increase by as much as 3.30% when the percentage of total sales for informal payment (corruption) increases in the extraction sector.

Panel approaches were also utilized to account for unobserved heterogeneity. Since the data were cross-sectional, this study cannot account for other time-variant variables that may influence a firm's export behavior. The regression results of the panel dataset that consists of data from 900 firms show the correlation between corruption, the firm's characteristics as control variables to the firm's decision to export or enter a foreign market, and the interaction between variable corruption and extraction sector are presented in Table 5.

Table 5. Panel Data Regression Using Logit Model 1

Export	**Fixed Effect**	**Random Effect**	**Odds ratio**	**Marginal Effect (dy/dx)**
Corruption	1.0200	0.1541*	1.1666*	0.1541*
	(0.7717)	(0.0864)	(0.1007)	(0.0864)
Age	0.0169	0.0285*	1.0289*	0.0285*
	(0.0307)	(0.0167)	(0.01722)	(0.0167)
Size	0.2049	2.9257***	18.6479***	2.9257***
	(1.0798)	(0.6648)	(12.3962)	(0.6648)
Foreign ownership	0.0666*	0.0555***	1.0571***	0.0555***
	(0.0344)	(0.0120)	(0.0126)	(0.0120)
Technology	1.1475	1.2424***	3.4641***	1.2424***
	(0.8458)	(0.4413)	(1.5287)	(0.4413)
Extractive sector	-1.7443	-0.8170	0.4417	-0.8170
	(1.9767)	(0.6467)	(0.2857)	(0.6467)
Constanta	-	-6.1835***	0.0021***	-
		(1.0477)	(0.0021)	
No. of observations	76	590	590	-
Log-likelihood	-15.2322	-271.2708	-200.1461	-
Standard errors in parentheses *** p<0.01, ** p<0.05, *p<0.1				

As shown in Table 5, almost all variables bear the same significant results, except the extractive sector in the random effect method. Those variables are statistically significant but have different significance levels, whereas, for corruption and age, the significance is only 10%. In comparison, the other variables are significant at 1%. This result is quite the same in Model 2, where the interaction variable is inserted in the model. The result (Table 6) shows th*et al*most all variables are statistically significant, except the extractive sector and its interaction with corruption.

Table 6. Panel Data Regression Using Logit Model 2

Export	Fixed Effect	Random Effect	Odds ratio	Marginal Effect (dy/dx)
Corruption	1.0010	0.1447*	1.1558*	0.1448*
	(0.7682)	(0.0866)	(0.1002)	(0.0867)
Age	0.0168	0.0278*	1.0281*	0.0278*
	(0.0307)	(0.0167)	(0.0172)	(0.0167)
Size	0.2042	2.9193***	18.5279***	2.9193***
	(1.0797)	(0.6634)	(12.2927)	(0.6648)
Foreign ownership	0.0651*	0.0555***	1.0571***	0.0555***
	(0.0355)	(0.0119)	(0.0126)	(0.0119)
Technology	1.1570	1.1993***	3.3177***	1.1993***
	(0.8482)	(0.4416)	(1.4651)	(0.4416)
Extractive sector	-1.6536	-9.5867	0.3834	-0.9587
	(2.0513)	(0.6854)	(0.2614)	(0.6818)
Extractive sector x corruption	-12.3505 (3553.96	0.5090 (0.6854)	1.6636 (1.1403)	0.5090 (0.6855)
Constanta	-	-6.1327***	0.0021***	-
		(1.0429)	(0.0023)	
No. of observations	76	590	590	-
Log-likelihood	-15.2158	-199.8393	-199.8393	-

Standard errors in parentheses *** p<0.01, ** p<0.05, *p<0.1

The odd ratio and marginal effect, values for each variable, show similar results. From the marginal effect, corruption in the home country might increase the probability of the firm's decision to export as much as 15.41% at a 10% significance level in the first model but only 14.46% at a 10% significance level in the second model. The same result is shown by the odds ratio value, which shows a value of 1.15, which signifies that a one-time increase in corruption will increase exports by 1.15 times.

The firms' experience, reflected by the age variable, shows that an increase in age increases the probability of firms exporting by 2.85% and 2.76% at a level of 10% significance in both models, respectively. Moreover, foreign-owned firms are also more likely to engage in exporting, which is in line with the literature (Krammer *et al.*, 2018; M. Lee *et al.*, 2014). The result shows that an increase of 1% share of foreign ownership will increase the likelihood of export by 5.55% at a 1% significance level in both models. Likewise, a 1% increase in the firm size increases the likelihood of the firms exporting by 292.57% in the first model and 291.93% in the second model.

The marginal effect of technology shows that the availability of foreign technology in a firm's business process increases the probability of entering the export market by 124.24% and 119.93% in the first and second model, respectively, compared to the firm not using any foreign technology. These results are statistically robust at a significance level of 1%. Unlike technology, the marginal effect of the extraction sector shows that a firm in the extractive sector decreases the likelihood of the firm's decision to export by 81.70% in the first model and by 95.87% in the second model, compared to the firm which is not in the extraction sector. However, these results are not statistically significant.

Furthermore, the marginal impact of the interaction term shows that the probability of export will increase as much as 50.90% when the percentage of total sales for informal payment (corruption) increases in the extractive sector industry. All these results imply that the variable that most influences the company's decision to export is the size of the company. The larger its size, the more likely it is for the company to expand its market internationally.

4.3. Discussion

The findings on corruption are in line with some of the previous literature. The regression results on both cross-section and panel datasets are consistent and reveal a similar result for both models. From the regression results, corruption positively affects the firm's decision to export. Corruption also has a significant positive impact on the firm's decision to export when the firms in the extractive sector encounter it. Businesses may decide to export because corruption makes it easier to access international markets. Bribes against government companies may make it easier for employers to access export licenses or permits, as indicated in research by Olney (2016), resulting in increased exports.

It is still debatable if corruption has a grease effect on the economy. Based on this research, corruption has a grease effect in Indonesia that increases the export probability, but the effect is not too significant. The findings of this study indicate that the effect of corruption on companies' export decisions is not too significant, as indicated by the value of the marginal effect. This finding is probably due to the level of corruption in Indonesia, which is currently in the middle range of the Corruption Index. This value shows that corruption in Indonesia is not too severe, but it cannot be denied that corrupt behavior still exists in the government. That is why corruption is correlated with export decisions but to a lesser extent.

Although corruption plays a role in the export decisions of companies, these decisions are primarily determined by the characteristics of the companies themselves. For example, large companies tend to be more efficient in the production process, so their production exceeds the domestic demands. As a result, they need to enter the international market to market their products which the local market can no longer absorb. As Melitz (2003) suggested, more efficient organizations will capture and relocate their resources to improve their competitiveness in overseas markets.

V. Conclusion and Recommendation

This paper develops a model that predicts how corruption influences a company's choice to enter the export market. The impact of corruption on a firm's decision to export is investigated using probit regression in cross-section and logit regression in panel data analysis. The theoretical framework generates several specific and testable predictions in general.

The model's hypotheses are tested using a unique and extensive dataset covering over 2700 companies in Indonesia in 2009 and 2015. The empirical study confirms the model's predictions. This research discovered that firms are more likely to become exporters if they perceive higher levels of corruption in their home country. The intensity of their exporting operations is related to business characteristics, such as age, size, foreign ownership, and access to foreign technologies. This study also finds that businesses in the extractive sector tend to lower the likelihood of companies deciding to export. However, this changed when the extractive business was accompanied by corruption.

Exporting to overseas markets necessitates compliance with specific regulatory requirements, including transportation arrangements, export documentation assembly, duty settlement, inspections, and clearance. Even though these regulations are relatively specific and more anticipated, bribes are frequently used to ensure that these processes are completed regularly or quicker than usual.

Based on the analysis result, it is known that the incidence of corruption (especially bribery) in Indonesia increases the possibility of companies exporting. This finding indicates that companies get certain conveniences to export, such as the ease of obtaining export licenses and permits, by giving a certain amount of money to government employees. Therefore, this has implications for the export policy imposed by the government. First, the

government should consider reducing the requirements or completeness of documents for export purposes. It can become one of the possibilities where corruption occurs (during the processing of export documents). The government should be able to increase the ease for entrepreneurs to export by not requiring too many documents and complicated requirements.

In addition, the government needs to be more careful in drafting regulations related to exports so that there are no articles that open opportunities for corruption. Suppose there are inaccuracies or loopholes in preparing these regulations. In that case, it will be an opportunity for mischievous government employees to ask for several benefits from entrepreneurs trying to export by promising export convenience. The government should also supervise the existing export policies and check whether they are appropriately implemented or not.

Overall, this paper made two significant contributions. First, this study analyzes the business sector in general. It looks at the condition of the extractive sector in terms of exports concerning corruption, considering that the extractive sector involves many licenses that can foster corruption. Second, this study also analyzes the data on a panel basis for the 2009 and 2015 surveys. In general, previous studies only analyzed cross-sectional data. It is hoped that the findings would be helpful to better describe the actual conditions by observing panel data.

Despite these contributions, this research has a few notable limitations. First, this research solely uses a single-country context (Indonesia), which dramatically limits the generalization of its outcomes. Second, the analysis related to the extractive sector is limited to a sample of companies in the Enterprise Survey whose business activities are only indirectly related to the extractive sector because most of the companies in the survey are manufacturing companies. Lastly, the panel data regression only consists of two years (2009 and 2015), so it may not optimally capture any dynamic effects of the relationship between corruption and export.

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