

Changes in global, domestic, and stock price as a response to Indonesian CPO export ban: An opening door into a worldwide financial distress

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Abstract

In April 2022, Indonesian government decided to implement a policy to ban crude palm oil (CPO) exports due to the scarcity of cooking oil in domestic market, which was revoked after twenty-one days put into effect. Considering the important contribution of CPO trade particularly to food and consumer goods industries, a sudden cessation of CPO supplies might instigate financial distress across the globe. This research aims to measure changes in global and domestic CPO price as well as stock price of IDX-listed CPO companies in response to the enactment of CPO export ban under the Decree 22/2022. At the first stage, a descriptive measurement is employed to analyze the monthly changes in value for each price variable. At the second stage, the Pearson's correlation coefficient is applied to measure the statistical relationship between two price variables. The result shows that the domestic market responded more quickly with a 16.77% price drop in May 2022 while global price increased slightly by 2.03% due to the shortage of CPO supply. Nonetheless, a sharp decline in global price of 12.57% occurred in June 2021 shortly after the export ban policy lifted. A moderately strong correlation is found between domestic and global price, expressing a quite similar fluctuation trends for both. In relation to the stock price, neither global price nor domestic price is significantly correlated with. Notwithstanding, both variables are not significantly correlated with the stock price. Stock price shows a rapid return when the CPO trading reopened. This research may contribute to the development of science in economic and financial risk as well as to the government in making future CPO trade policies. As a relatively new issue, there is no similar scientific study to this research found which can be counted a novelty.

Keywords: crude palm oil (CPO), domestic price, export ban, financial distress, global price, stock price

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A. INTRODUCTION

In April 2022, Indonesian government announced the Decree No. 22 of 2022 on Temporary Export Ban on Crude Palm Oil, Refined, Bleached and Deodorized Palm Oil, Refined, Bleached and Deodorized Palm Olein, and Used Cooking Oil due to the issue of food security related to the availability of edible cooking oil. This Decree 22/2022 came into force on 28 April 2022. At that moment, the government was no longer able to control the increase in cooking oil prices in the local market. The severity of this scarcity was exacerbated by the period leading up to Eid al-Fitr which fell on

the first week of May 2022, where household food consumption predictably would jump up significantly (Teguh & Rapha, 2022). The Decree 22/2022 is expected to drive down the cooking oil price, as the government is responsible to fulfill the domestic needs as their first priority. Since October 2021, the trend for cooking oil prices has continued to increase until it reached its highest peak in April 2022. Bulk cooking oil experienced an increase of 16.6% (IDR 15,852 to 18,481) in April 2022 compared to March 2022, while it was 49.8% (IDR 17,232 to 25,798) for the premium cooking oil (PASPI Monitor, 2022a; SP2KP, 2023). The price changes of cooking oil in the local market are completely shown in Figure 1.

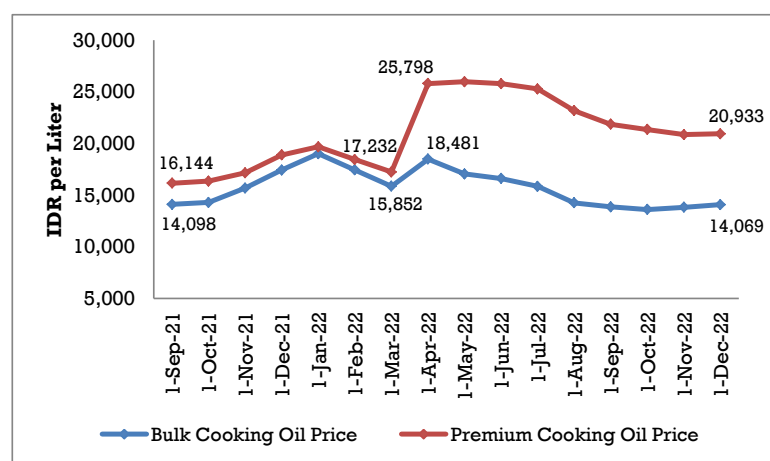


Figure 1 The Changes in National Cooking Oil Prices.

As the biggest supplier of crude palm oil (CPO) in the world, this decision has caused a big shock for the international market, particularly for countries which have a very high dependence on palm oil supplies from Indonesia. Bogheiry et al. (2023) and Ulfah et al. (2019) measured that Asian market has the biggest share of Indonesian CPO, followed by European, African, and American market in a respective order. Notwithstanding, the Indonesian government intended to enforce this temporary CPO export ban until the price of domestic cooking oil return to normal, around IDR 14,000 (US\$ 1) per liter (Teguh & Rapha, 2022). For the sake of national food security, the government is trying to keep the domestic price of staple foods stable, including CPO as the raw material to produce edible cooking oil. However, the increase of palm oil price globally creates a large gap between low domestic and astronomical price that a company might receive from the international market. This condition has stimulated exports of CPO beyond the obligation to fulfill national demand, which further led to stock shortage of domestic cooking oil (Pradina & Adhitya, 2023; Teguh & Rapha, 2022). Figure 2 shows the changes in Indonesian CPO total production from 2011 to 2021, further broken down into export volume and domestic consumption that was recorded by Indonesia Central Agency of Statistics (BPS, 2022).

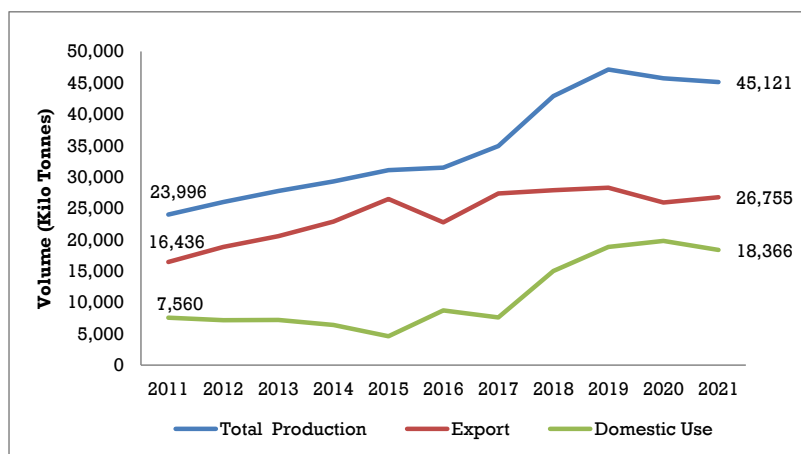


Figure 2 Changes in Indonesian CPO total production, export, and domestic use.

In the last five years, 2017 to 2021, the annual growth rate in CPO export value (14.55%) is significantly higher than its volume (3.68%). This condition becomes the fundamental reason that most CPO companies prefer to export their products rather than trading domestically. Table 1 displays the changes in export volume, value, and its each growth rate of Indonesian CPO (BPS, 2022).

Table 1 Export volume, value, and growth rate of Indonesian CPO, 2017-2021

Year	Volume (Thousand Metric Ton)	Volume Annual Growth Rate	Value (Million US\$)	Value Annual Growth Rate
2017	27,353	20.17%	18,513	28.86%
2018	27,899	1.99%	16,530	-10.71%
2019	28,279	1.36%	14,716	-10.97%
2020	25,935	-8.29%	17,364	17.99%
2021	26,755	3.16%	25,624	47.57%
Average Annual Growth Rate		3.68%		14.55%

Before enacting the Decree 22/2022 on 28 April 2022, Indonesian government had implemented several regulations to respond the soaring price of edible cooking oil in the local market due to a shortage of its supplies. Those regulations were issued by three Indonesian ministries, i.e. the Ministry of Trade (MOT), Ministry of Industry (MOI), and Ministry of Finance (MOF). Unfortunately, these government's efforts are not quite successful in controlling the price of cooking oil which continued to soar high (Amir et al., 2022; PASPI Monitor, 2022b). Table 2 shows some milestones of government's policy changes throughout 2022 to regulate the palm oil export as well as to ensure the adequacy of domestic supply and its acceptable price.

Table 2 Regulation milestones of palm oil products

Date of Issuance	Issuer	No.	Highlight
11 Jan 2022	MOT	1/2022	Fixing cooking oil in simple packaging at IDR 14,000 per liter as the maximum retail price (MRP).
1 Feb 2022	MOT	6/2022 (replacing 1/2022)	Detailing MRP prices for each type of cooking oil packaging such as bulk at IDR 11,500 per liter; simple at IDR 13,500 per liter; and premium at IDR 14,000 per liter.
15 Feb 2022	MOT	129/2022	Introducing the DMO (Domestic Market Obligation) and DPO (Domestic Price Obligation) policies. DMO required 30% of the export volume of crude palm oil (CPO) and refined, bleached, and deodorized (RBD) palm olein to be allocated for the local supplies. Meanwhile, DPO mandates those palm oil products to be disposed at affordable prices.
18 Mar 2022	MOF	23/PMK.05/2022	Adjusting maximum CPO export levy to US\$ 375 per MT if the reference price exceeded USD 1,500 US\$ per MT.
18 Mar 2022	MOI	8/2022	Fixing provisions of subsidized bulk cooking oil for Micro and Small Enterprises (MSEs) to ensure its safe distribution to the registered recipients.
28 Apr 2022	MOT	22/2022	Suspending the export of CPO, RBD palm oil, RBD palm olein, and used cooking oil.
19 May 2022	MOT	30/2022	Lifting Decree 22/2022 on the export ban of CPO and its derivatives.
23 May 2022	MOT	33/2022	Resuming DMO policy after the export ban of CPO and its derivatives was revoked.
8 Jun 2022	MOT	38/2022	Fixing the “flush-out” policy to accelerate the export of CPO and its derivatives. It allows CPO exporters to not participate in fulfilling the domestic demands by compensating an additional fee of US\$ 200 per MT on top of the export duty.
13 Jun 2022	MOT	102/2022	Adjusting the rate of export duty according to the “flush-out” policy.
15 Jul 2022	MOF	115/PMK.05/2022	Fixing the zero-levy policy for the export of CPO and its derivatives from 15 Jul to 31 Aug 2022. Starting from 1 Sep 2022, a maximum tariff of US\$ 240 was applied for CPO prices above US\$ 1500, with progressive tariff changes to price (ad valorem).
1 Nov 2022	MOF	145/PMK.05/2022	Fixing the zero-levy policy for CPO prices below US\$ 800 per MT.

During the implementation of Decree 22/2022, several pros and cons came from various parties, mainly the CPO organizations, industries, and farmers. Indonesia Palm Oil Framers Association measured that the total income loss which had to be borne by palm oil farmers for 20 days after the CPO export ban enforced was

approximately IDR 11.4 trillion (US\$ 750 million). The fall in price of fresh fruit bunches (FFB) from IDR 4,800 to 1,000 per kg (-79%) becomes the major factor causing this financial distress (Laia, 2022). PASPI Monitor (2022a) estimated that the value of opportunity loss from foreign exchange was approximately at US\$ 4 billion. Teguh and Rapha (2022) stated that the export ban on CPO has also affected Indonesia's reputation among global traders and investors amid high worldwide instability due to Russia-Ukraine war and COVID-19 pandemic after-effect. With the consideration that domestic CPO needs has been fulfilled, the Decree 22/2022 was revoked on 19 May 2022.

As an essential traded commodity in the future exchange, repeated substitution of Indonesian CPO regulations might affect the economic stability across the world. Domestically, local industries and farmers will suffer huge financial losses due to erratic price fluctuations which are unpredictable in advance. Globally, many countries with high dependence on Indonesian CPO supplies might also experience a sudden inflation in foods and consumer goods, which is able to trigger long-term financial stress at the county level (PASPI Monitor, 2022a; Nguyen, 2022). Referring to its short implementation (effectively 21 days), this research aims to quantitatively measure the carryover effect of Decree 22/2022 on CPO prices and its stock prices, where many large-capacity CPO companies in Indonesia have been registered as public companies on Indonesian Stock Exchange (IDX). As a novelty, no other studies have been found that are similar to the object and purposes of this research. Recent palm oil discussions are more focusing on the RSPO (Roundtable on Sustainable Palm Oil) issues on Indonesian palm oil production which is still considered environmentally unfriendly particularly by European Union (EU) countries, imposing trade barrier against Indonesian CPO imports (Hidayat et al., 2015; Rifin et al., 2020; Rosyadi et al., 202; Salman et al., 2017; Tandra et al., 2021). This study might offer a prominent contribution to the development of science in the economic and financial risk as well as to the government in making crucial policies for CPO trade in the future.

B. METHOD

Three types of data groups, which are directly related to crude palm oil (CPO) as a commodity or its manufacturing companies, are used in this study. Those are Global Price, Domestic Price, and Stock Price of IDX-Listed CPO Company. Global Price reflects CPO price that is internationally announced in commodity market or future exchange. Domestic price reflects CPO price that is published by Indonesian State-Owned Agricultural Enterprise named PT Perkebunan Nusantara (PTPN) which has the authority to determine Indonesian CPO prices in the domestic market. Meanwhile, data of Stock Price is accessed through Yahoo Finance (<https://finance.yahoo.com/>) from 19 public palm oil companies listed in Indonesia Stock Exchange or IDX, i.e. AALI, BWPT, CSRA, DSNG, FAPA, GZCO, JAWA, LSIP, MGRO, PALM, PGUN, PNGO, PSGO, SGRO, SIMP, SMAR, SSMS, TAPG, and TBLA. Each group displays a data series in months, starting from January 2022 to August 2023.

Both descriptive and inferential statistics approaches are employed to analyze the implication of Decree 22/2022 enactment which might potentially initiate financial distress in the global CPO industry, as Indonesia is currently the largest CPO producer in the world. The analysis sequence is divided into two stages. Firstly, changes in values are descriptively measured in percentages from month to month for each data group. This stage also includes additional significance test for the stock price using paired sample t-test (Rowe, 2015) between two adjacent months. Secondly, the Pearson's correlation coefficient (Schober et al., 2018) is applied to measure the statistical relationship between two data groups. The Shapiro-Wilk test for normality (Hanusz et al., 2016) is also run as a preliminary test to determine the type of correlation test to be applied. R statistical tools and Microsoft Excel are used to perform all quantitative measurements in this research.

C. RESULTS AND DISCUSSION

This section consists of two parts. First, the results obtained from descriptive and paired sample t-test to examine the significance of average percentage change in value between two adjacent months. Second, the results of normality test and Pearson's correlation coefficient which is plotted on an XY chart.

Average percentage change in monthly value and the test of significance

For each group of data, the average percentage change is calculated as the difference in a month's value from the previous month, starting from January 2022 to August 2023. The descriptive outcomes of all data groups are arranged in Table 3.

Table 3 Average percentage change in monthly value

Period	Average Change (%)		
	Global Price	Domestic Price	Stock Price
Jan-2022	5.86%	7.82	0.90
Feb-2022	13.20%	4.56	16.83
Mar-2022	16.72%	6.48	0.79
Apr-2022	-5.30%	-0.56	0.92
May-2022*	2.03%	-16.77	2.59
Jun-2022	-12.57%	-23.69	-10.45
Jul-2022	-29.61%	-20.16	6.62
Aug-2022	-2.90%	32.26	-2.35
Sep-2022	-11.37%	-0.80	-4.81
Oct-2022	-2.24%	8.80	0.85
Nov-2022	6.38%	4.96	1.53

Dec-2022	-0.57%	-5.60	-3.08
Jan-2023	0.17%	-1.92	6.53
Feb-2023	0.85%	4.77	0.61
Mar-2023	2.32%	4.13	-5.80
Apr-2023	3.41%	-6.15	-2.61
May-2023	-7.08%	-12.17	-7.47
Jun-2023	-12.54%	-0.90	3.47
Jul-2023	7.53%	6.58	3.77
Aug-2023	-6.62%	0.28	-0.20

*The month in which the Decree 22/2022 was enforced.

Table 3 indicates a steep decline occurred in May 2022 (domestic price) and June 2022 (global price and stock price), affected by the enactment of Decree 22/2022. The domestic price in May 2022 shows 16.77% lower in average monthly change than one month before. A similar trend is also perceptible in global price which drops 10.79% as well as 10.45% stock price in June 2022. Due to an unexpected ban in Indonesian export that causes CPO supply shortages, the global price rose slightly in May 2022 (2.03%) but its price experienced a sudden decline following the revocation of the Decree 22/2022 on 19 May 2022. Furthermore, this revocation also affects stock price and domestic price which reveal a sharp incline in July and August 2023. Meanwhile, global price shows a longer distressing period which has just started to climb up in November 2022. A full chart that exhibits the changes of value in months of each data group is respectively depicted in Figure 3, Figure 4, and Figure 5.

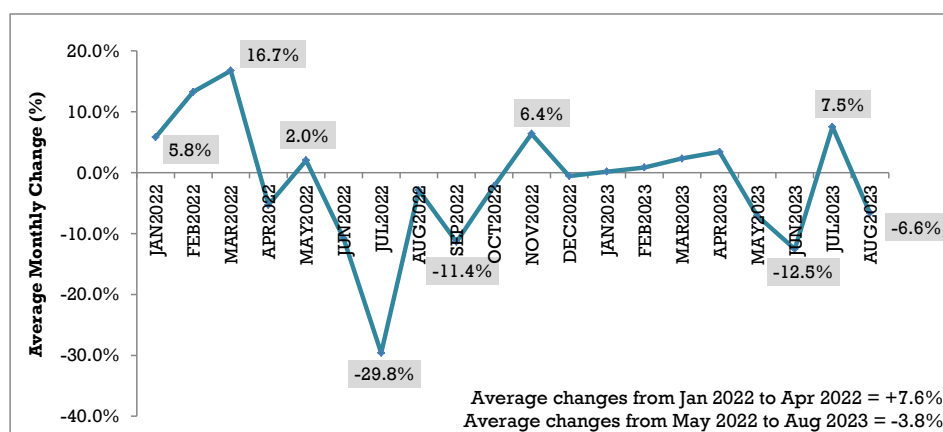


Figure 3 Average monthly changes of CPO global price

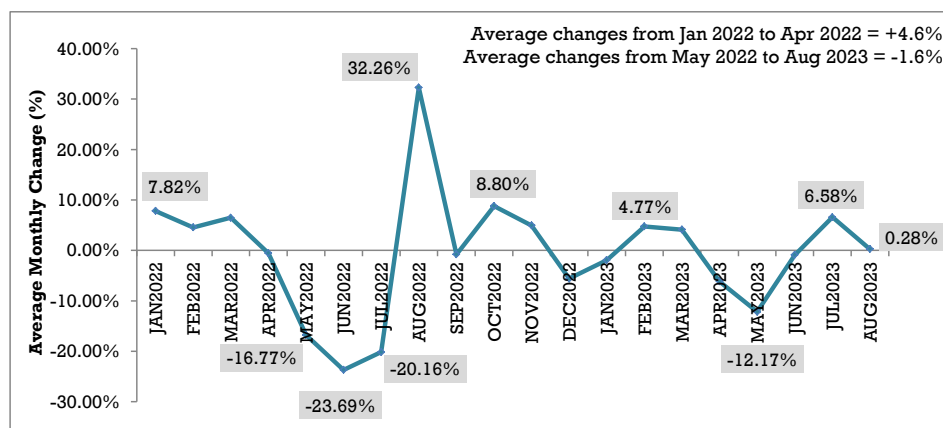


Figure 4 Average monthly changes of CPO domestic price

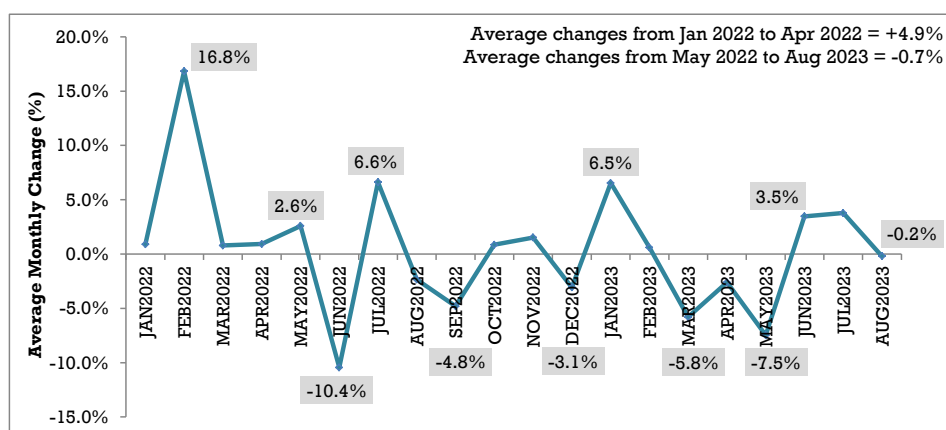


Figure 5 Average monthly changes of stock price of CPO listed companies

Table 4 shows the outcomes of pair sample “significance” t-test for the stock price average change in monthly value of CPO listed companies, applying 95% confidence interval or an alpha of 0.05. The principle of hypothesis testing with p-value approach is applied to reject or accept null hypothesis. The smaller the p-value indicates the greater the statistical significant difference between two adjacent months. The p-value less than 0.05 ($p\text{-value} < 0.05$) reflect there is no significant difference of changes in value of an observed month compared to the previous one. In other words, there is no statistical change in value between the two observed months. Meanwhile, how much the sample data differs from the null hypothesis is represented by t-value or T. The greater the magnitude of T, the greater the evidence against the null hypothesis (Rowe, 2015). Referring to Table 4, a very significant drop in stock price occurred between May and June 2022, at the moment that the Decree 22/2022 was enacted. In July 2022, the stock price shows a significant positive rise compared to the value in June 2022, as the Decree 22/2022 withdrawn on 19 May 2022 after 21 days were put into effect.

Table 4 Significance test output of the stock price average change in monthly value (Jan’22 to Aug’23)

Observed Data	p-value	$\alpha=0.05$	T *	Judgement
Jan-2022 & Feb-2022	0.030	sig	2.011	Feb-2022 reflects significantly an increased change in value of stock price than Jan-2022
Feb-2022 & Mar-2022	0.036	sig	1.907	Mar-2022 reflects significantly a decreased change in value of stock price than Feb-2022
Mar-2022 & Apr-2022	0.488	not sig	0.031	Apr-2022 reflects no significant change in value of stock price than May-2022
Apr-2022 & May-2022	0.306	not sig	0.516	May-2022 reflects no significant change in value of stock price than Apr-2022
May-2022 & Jun-2022**	0.000	sig	5.447	Jun-2022 reflects significantly a decreased change in value of stock price than May-2022
Jun-2022 & Jul-2022	0.000	sig	4.749	Jul-2022 reflects significantly an increased change in value of stock price than Jun-2022
Jul-2022 & Aug-2022	0.004	sig	2.990	Aug-2022 reflects significantly a decreased change in value of stock price than Jul-2022
Aug-2022 & Sep-2022	0.060	not sig	1.629	Sep-2022 reflects no significant change in value of stock price than Aug-2022
Sep-2022 & Oct-2022	0.016	Sig	2.334	Oct-2022 reflects significantly an increased change in value of stock price than Sep-2022
Oct-2022 & Nov-2022	0.374	not sig	0.326	Nov-2022 reflects no significant change in value of stock price than Oct-2022
Nov-2022 & Dec-2022	0.012	sig	2.467	Dec-2022 reflects significantly a decreased change in value of stock price than Nov-2022
Dec-2022 & Jan-2023	0.020	sig	2.222	Jan-2022 reflects significantly an increased change in value of stock price than Dec-2022
Jan-2023 & Feb-2023	0.074	not sig	1.508	Feb-2022 reflects no significant change in value of stock price than Jan-2022
Feb-2023 & Mar-2023	0.013	sig	2.421	Mar-2022 reflects significantly a decreased change in value of stock price than Feb-2022
Mar-2023 & Apr-2023	0.101	not sig	1.322	Apr-2022 reflects no significant change in value of stock price than Mar-2022
Apr-2023 & May-2023	0.018	sig	2.261	May-2022 reflects significantly a decreased change in value of stock price than Apr-2022
May-2023 & Jun-2023	0.000	sig	4.109	Jun-2022 reflects significantly an increased change in value of stock price than May-2022
Jun-2023 & Jul-2023	0.452	not sig	0.121	Jul-2022 reflects no significant change in value of stock price than Jun-2022
Jul-2023 & Aug-2023	0.020	sig	2.221	Aug-2022 reflects significantly a decreased change in value of stock price Jul Apr-2022

*T is given in absolute value

**The month in which the Decree 22/2022 was enforced

Pearson correlation coefficient, plotted diagram, and the test of significance

The Pearson correlation coefficient measures of the strength of the linear relationship among data groups (as continuous variables) in pairs. It represents values in the closed interval $[-1, +1]$. The value $r = +1$ reflects a perfect positive correlation, whereas $r = -1$ reflects a perfect negative correlation between two data groups. The value $r = 0$ indicates that no correlation is detected. A strong positive correlation is testified by r value between 0.6 and 1 ($0.6 < r < 1$); $0.3 < r < 0.6$ testifies a moderate positive correlation; $0 < r < 0.3$ testifies a weak positive correlation between the observed variables or groups. The negative sign of r value indicates the similar range of strength to the positives but in opposite direction. It is also renowned as inverse correlation (Schober et al., 2018). Table 5 displays the output of Pearson correlation coefficient of average monthly change in value between two groups of data, including the judgement for its significance test. The plotted correlation diagram of each pair is simultaneously shown in Figure 6. The Shapiro Wilk test of normality is conducted before running the correlation test. All data groups show the normality of data distribution where p -value is greater than 0.05 (Hanusz et al., 2016).

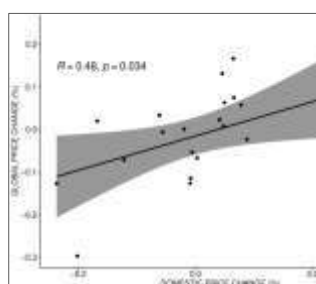
Table 5 Pearson correlation coefficient among data groups in pairs

Variable 1	Variable 2	r	p -value	$\alpha=0.05$	Judgement
Global price*	Domestic price**	0.48	0.034	sig	There is a significant moderate positive correlation between global price and domestic price
Global price	Stock price***	0.24	0.300	not sig	There is no significant correlation between global price and stock price
Domestic price	Stock price	0.16	0.500	not sig	There is no significant correlation between domestic price and stock price

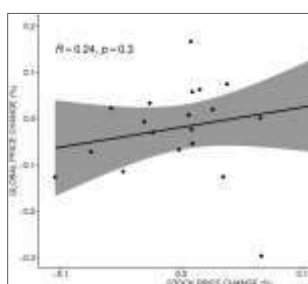
*Global price data is normally distributed ($W = 0.953$; p -value = 0.424)

**Domestic price data is normally distributed ($W = 0.917$; p -value = 0.085)

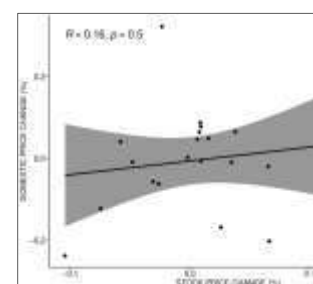
***Stock price data is normally distributed ($W = 0.939$; p -value = 0.229)



(a)



(b)



(c)

Figure 6 Plotted correlation diagram between (a) global price and domestic price; (b) global price and stock price; (c) domestic price and stock price

Referring to Table 5, there is a significant moderate positive correlation between global price and domestic price ($r = 0.48$; $p\text{-value} = 0.034$) using a 95% confidence interval. Conversely, stock price reflects no correlation with both global and domestic price which is represented by a small r coefficient and $p\text{-value}$ greater than 0.05.

DISCUSSION

The promulgation of Temporary Export Ban on Crude Palm Oil, Refined, Bleached and Deodorized Palm Oil, Refined, Bleached and Deodorized Palm Olein, and Used Cooking Oil under the presidential Decree 22/2022 has shaken up global CPO trade, considering Indonesia as the biggest palm oil producer in the world. It takes up to 59% of the global palm oil production or 46 million metric ton (MT) in 2022, followed by Malaysia (24% or 18.4 million MT) and Thailand (4% or 3.4 million MT) in the second and third rank respectively (IPAD-USDA, 2023). This action needed to be taken by government at that moment as a reaction against intense protests from the local people who were facing difficulties to purchase affordable cooking oil (Teguh & Rapha, 2022; Nguyen, 2022).

Referring to the chart in Figure 3, after the Decree 22/2022 enacted, CPO global price in May experienced a slight increase of 2.03% compared to price in April 2022. In accordance with market equilibrium theory, a decrease in supply at a constant demand will lead to an increase in selling price particularly for the product classified as a commodity that is traded by all countries in the world (Trinh, 2018, 2021). After 21 days put into effect, a new presidential decision was announced to withdraw export ban on CPO and its derivatives under the Decree 30/2022 on 19 May 2022. This government's action has triggered the global CPO price to drop by 10.79% in June 2022. The worst fall occurred in July 2022 where global CPO prices dropped by 29.61% compared to the previous month. Data and System Center of Indonesian Ministry of Trade (PDSI Kemendag, 2023) monitored global CPO prices from April to June 2022 respectively at US\$ 1,683; US\$ 1,717; US\$ 1,501, and US\$ 1,057 per MT (Table 6). The reopening of Indonesian CPO trades has caused an oversupply in the market which stimulates price reduction, implying a dynamic facet of perfectly competitive market (Ahmed & Nawaz, 2023). In 2021, Indonesia Central Agency of Statistics (BPS, 2022) reported that 27.04 million MT of CPO aimed for export purposes. This export volume took about 60% of the total national CPO production. The remaining 40% are used to fulfill domestic demands or stored as inventory by the producers or manufacturing companies. As the export ban lifted up in 19 May 2021, after going through a sustained downturn, the global price finally returned to stability in November 2021 with an increase of 6.38% compared to the previous month (Table 3).

In addition, a trend of global CPO price changes during January 2022 to April 2022 shows a positive increase of 7.6% on average. Conversely, changes in price from May 2022 to December 2022 show a downward trend of 6.4 on average as an unfavorable impact of the enactment of Decree 22/2022 on 28 April 2022. Even though

the export ban is finally lifted, global CPO price cannot return to the same level as before the ban was implemented. The prices do not fluctuate much from January 2023 to August 2023, implying a state of stability. Nonetheless, a declining trend of 1.8% on average does still occur.

In contrast to global price, the domestic CPO price immediately experienced a sharp reduction of 16.77% in May 2022 that continued to decline in June 2022 and July 2022 by 23.69% and 20.16% respectively. By forcing CPO export ban to come to a halt, there was an excessive volume of the domestic stocks by the end of May 2022. Ministry of Agriculture reported that only around 37% of total national CPO production (16.75 million MT in 2021) demanded by domestic industries. This condition has created a flood of products that cannot be absorbed by the market, accounting to a drastic fall in its selling price (Trinh, 2017). Apart from industry, farmers were also badly affected where the price of the FFB (fresh fruit bunch) dropped up to 79%, from IDR 4,800 to IDR 1,000 per kg. This action to sell at a loss shall be taken to dispose a heap of ripe FFB before those are getting rotten. Farmers try hard to attract industries which have been reluctant to buy FFB because their stock is surged of unsold CPO products (IPOA, 2022).

Expressing a similar trend to global price, the domestic CPO price changes from January 2022 to April 2022 display an increase of 4.58% on average, while declining by 2.63% from May 2022 to December 2022 and 0.67% from January 2023 to August 2023 (Table 3). After the enactment of Decree 22/2022, domestic CPO price is only offered at an average of IDR 11,300 per kg (May 2022 to Aug 2023), while previously it could reach an average of IDR 15,800 per kg (Jan 2022 to Apr 2022). Slightly faster than global price, the domestic price returned to its stability by presenting a significant increase of 32.26% in August 2022. Table 6 displays both global CPO price in US\$ per metric ton and domestic CPO price in IDR per kg in a monthly basis, starting from January 2022 to August 2023.

Table 6 Monthly global and domestic CPO price

Period	Global Price (US\$/MT)	Domestic Price (IDR/kg)	Period	Global Price (US\$/MT)	Domestic Price (IDR/kg)
Jan-2022	1,345	14,820	Nov-2022	946	12,467
Feb-2022	1,522	15,497	Dec-2022	940	11,769
Mar-2022	1,777	16,501	Jan-2023	942	11,543
Apr-2022	1,683	16,409	Feb-2023	950	12,094
May-2022*	1,717	13,658	Mar-2023	972	12,593
Jun-2022	1,501	10,423	Apr-2023	1,005	11,819
Jul-2022	1,057	8,322	May-2023	934	10,380
Aug-2022	1,026	11,006	Jun-2023	817	10,287
Sep-2022	909	10,918	Jul-2023	879	10,963

Oct-2022	889	11,878	Aug-2023	820	10,994
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*The month in which the Decree 22/2022 was enforced

Apart from its direct effect on global and domestic prices, this export ban under the Decree 22/2022 also instigated an indirect effect on the declining stock prices of CPO companies listed on IDX. Referring to the chart on Figure 5 and results of significance test in Table 4, stock price was experiencing a significant upsurge of 16.83% in February 2021 (p-value = 0.036). Its movements in the following months were quite stable until the CPO export ban put into effect in May 2021 which caused stock prices to drop drastically a month later by 10.45% in June 2022 (p-value = 0.000). Unlike the global and domestic price, the stock price reacted more responsively to the reopening of Indonesian CPO export with an increase of 6.62% in July 2022 (p-value = 0.000) although it dropped again by 2% in July 2022 (p-value = 0.004) before reaching its movement stability. Since the data of stock prices are collected from many listed companies with a broad range in value, this research only reveals the average percentage change in value between two adjacent months. Collectively, this measure explains the way the enactment of Decree 22/2022 has affected the changes in stock price of CPO listed companies on IDX.

As a country with the biggest production of palm oil in the world, the Indonesian government's decisions to regulate domestic CPO supply chains might have a broad impact on its trading activities globally. In Indonesia, the authority to set a daily CPO price is given to the State-Owned Agricultural Enterprise, namely PT Perkebunan Nusantara (PTPN). In this study, this set of data from PTPN is used to institute domestic CPO price. According to Table 5, domestic price has a moderate correlation to the global price ($r = 0.48$, p-value = 0.034). This proves that the national CPO pricing policy might significantly affect the development of CPO global price and vice versa. The war between Ukraine and Russia is also indirectly the cause of high CPO prices in early 2022. These two countries accounted for about 80% of the global sunflower oil market, as an alternative vegetable oil to replace CPO. Since lots of food and consumer products require vegetable oil as one of its raw material, most countries which have banned the use of palm oil shall return to buy due to the scarcity of non-CPO vegetable oil supplies (Hassen & Bilali, 2022).

In relation to the stock price, neither global price ($r = 0.24$, p-value = 0.300) nor domestic price ($r = 0.16$, p-value = 0.500) are significantly correlated with. Through a study on behavioral factors in making investment decisions, Keswani et al. (2019) explained that market condition is not the only determinant, but rather a combination with other factors such as heuristic experiences, gain or loss prospects, and herding effects from other investors. Price changes, market information, past trends of stocks, fundamentals of underlying stocks, customer preference, and over-reaction to price changes are included in market factor. Logiatama et al. (2021) added firm level corporate governance, company's financial statement, and financial literacy as someone's knowledge about financial instruments also positively affect in making

decision on investment. Referring to Table 3, changes in stock price are also influenced by fluctuations in CPO prices, but its movements in the following month are not influenced solely by price factors. Other research has demonstrated a broad diversity of investor's behaviors in making investment decisions.

The short implementation of Decree 22/2022 was declared by economic experts as a right presidential decision. If continued in the long term, this CPO export ban could initiate financial distress, both for Indonesia and CPO importing countries in the world (Nguyen, 2022). The sudden cessation of palm oil supplies might potentially create a big financial loss for countries with a high dependence on Indonesian CPO such as India which has been the biggest Indonesian CPO importer since 2000 (Nurcahyani et al., 2017; Shigetomi et al., 2020). In 2024, India is still projected to be the Indonesia's largest palm oil buyer. Its import volume is estimated at 4 million MT or around 60% of India's total vegetable oil demand (GAIN-USDA, 2023).

It is reported by Global Agricultural Information Network USDA (GAIN-USDA, 2023) that after the Decree 22/2022 revoked, international palm oil shipments from Indonesia during October 2022 to May 2023 had reached 17.6 million MT. This volume reflects 43% higher than the corresponding period last year. Of those shipments, 35% went to India, Pakistan, and Bangladesh; 15% to China, and 6% to the United States. Palm oil is renowned as the most widely used vegetable oil which is used as a raw material in broad range of industries such as foods, households, cosmetics (Barriuso et al., 2013; Mba et al., 2015), and biodiesel as a renewable energy resource (Farobie & Hartulistiyoso, 2022). This commodity is mandatorily needed due to the scarcity of several types of oilseed, such as sunflower oil, soybean oil, canola oil, and rapeseed oil (McCollum et al., 2021).

With regard to national income, Indonesian Center Agency of Statistics reported that palm oil has become the largest contributor to Indonesian GDP from the sector of agriculture, forestry, and fishing in 2021. Its role reaches 3.5% of the total GDP. In 2021, the manufacturing sector made the largest contribution to GDP at 19.2%, followed by the agriculture, forestry, and fishing sector in second place at 13.28%. Thus, palm oil's contribution was accounted for 26.4% in its own sector. Annually, up to 60% of palm oil volume production aims for export purposes (BPS, 2022). In addition to that, it is predictable that several social issues related to labor will also be at the poise. Ministry of National Development Planning reported that in 2018, the total number of laborers in the palm oil plantation sector was estimated around 16.2 million workers, consisting of 4.4 million direct field workers and 12 million indirect workers who worked in the palm oil companies (BPDPKS, 2018). Therefore, suspending CPO export activities will certainly cause disruption to the stability of Indonesia's national economy and finances. Indonesia will lose more income from foreign exchange, while CPO importers will experience a severe shortage of industrial raw materials in their country.

Consequently, this unfavorable situation might potentially cause a sudden inflation, especially in food and household products, deteriorating the stability of global economy and leading into a global financial distress phase, introducing new political and social issues across the world (Nguyen, 2022; Shofa, 2022). A condition that leads to financial distress is indicated by the inability of a company to fulfill its current obligation due to insufficient operating cash flow (Zhou et al., 2021). Applied to the case of the CPO export ban, financial distress conditions will be stimulated by the lack of income from sales at both the industrial and farmer levels. Government's enforcement to sell CPO in the domestic market at a cheaper price incurs the company's operating costs more expensive, thereby reducing firm's net profits and potentially causing high losses. For the government itself, there will no longer be any direct income from the CPO export levy as well as taxes originating from corporate and personal income involved in the CPO supply chain will decline sharply.

D. CONCLUSION

On 28 April 2022, Indonesia government officially announced the Decree No. 22 of 2022 on Temporary Export Ban on Crude Palm Oil, Refined, Bleached and Deodorized Palm Oil, Refined, Bleached and Deodorized Palm Olein, and Used Cooking Oil as a quick response to the soaring prices cooking oil in the domestic market. Since October 2021, the trend for cooking oil prices has continued to increase until it reached its highest peak in April 2022 with an upsurge of 50% compared to the previous month. The high global selling price of CPO is the main cause driving this national incident so that local industries are more interested in exporting their products. The heavy war between Russia and Ukraine was also responsible in creating a scarcity of global vegetable oil supplies in early 2022. These two countries accounted for about 80% of the global sunflower oil market, as one of CPO substituents.

As the Indonesian CPO export ban was enacted, both global and domestic market exhibited slightly different responses in the beginning. In May 2022, the domestic market was experiencing excessive supplies of CPO which had triggered the drop in its selling price about 16.77% compared to price in April 2022. Conversely, the global market was experiencing shortages in CPO supplies which caused a 2.03% price increase in the same month. Both prices finally shows the similar declining trends after Indonesian government decided to revoke the Decree 22/2022 on 23 May 2022 after 21 days put into effect, reopening the CPO export with a contrast "flush-out" policy to accelerate more international shipments. The worst fall of global CPO price by 29.61% occurred in July 2022 while domestic CPO prices dropped the lowest by 23.69% in June 2022 compared to the previous month. These declining trends were sustained for several months until it returned to a more stable condition in October or November 2022. This similar fluctuation pattern between global and domestic price proves that both instruments are correlated with each other ($r = 0.48$, $p\text{-value} = 0.034$). In relation to the stock price, neither global price ($r = 0.24$, $p\text{-value} = 0.300$) nor

domestic price ($r = 0.16$, $p\text{-value} = 0.500$) are significantly correlated with. Stock prices fell by 10.45% in June 2022, but immediately rose by 6.62% in July 2022.

A presidential decision to lift the Decree 22/2022 on 19 May 2022 is considered the right action by many economic experts. If prolonged, this CPO export ban might instigate a global financial distress, particularly for countries which have a high dependence on CPO imports from Indonesia. Included in the vegetable oil group, palm oil has become one of the most essential raw materials in almost all food and consumer goods industries. Therefore, a sudden cessation of palm oil supplies will put a country in a serious problem to provide basic human needs for its citizens. The scarcity of other alternative vegetable oils such as sunflower oil, soybean oil, canola oil, and rapeseed oil has increased the demand for CPO throughout the world. In 2021, palm oil trade contributed to around 3.5% of the total Indonesia's GDP. Banning CPO exports in the long term definitely will chop a huge revenue stream from this industrial line which takes up to 60% of total national production to fulfill export needs. Government itself will also lose direct earnings from CPO export levy and taxes originating from corporate and personal income. This perturbation will potentially drive Indonesia into a perilous financially-distressed state in addition to the many pressures from international trade organization to reopen its CPO exports.

Taking into account that palm oil trade has become one of the most renowned international topics, there are many opportunities to create a wide range of research regarding the effect of recent export ban policies on economic growth globally. Thus, this research can be considered as a preliminary study to enter into more detailed measurements of financial, social and political impacts. Older series of data collection is also suggested in the future to conduct deeper analysis over time. It is also recommended to append more variables into the research framework such as inventory level, export levy, or other government's recent policies that fluctuates domestic, global, and stock prices of CPO.

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