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Unraveling the Effects of Indonesia's Oil Palm Export Ban on Global Stock Markets

Tim Ölkers

Selected presentation for the International Agricultural Trade Research Consortium's (IATRC's) 2023 Annual Meeting: The Future of (Ag-) Trade and Trade Governance in Times of Economic Sanctions and Declining Multilateralism, December 10-12, 2023, Clearwater Beach, FL.

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Unraveling the Effects of Indonesia's Oil Palm Export Ban on Global Stock Markets

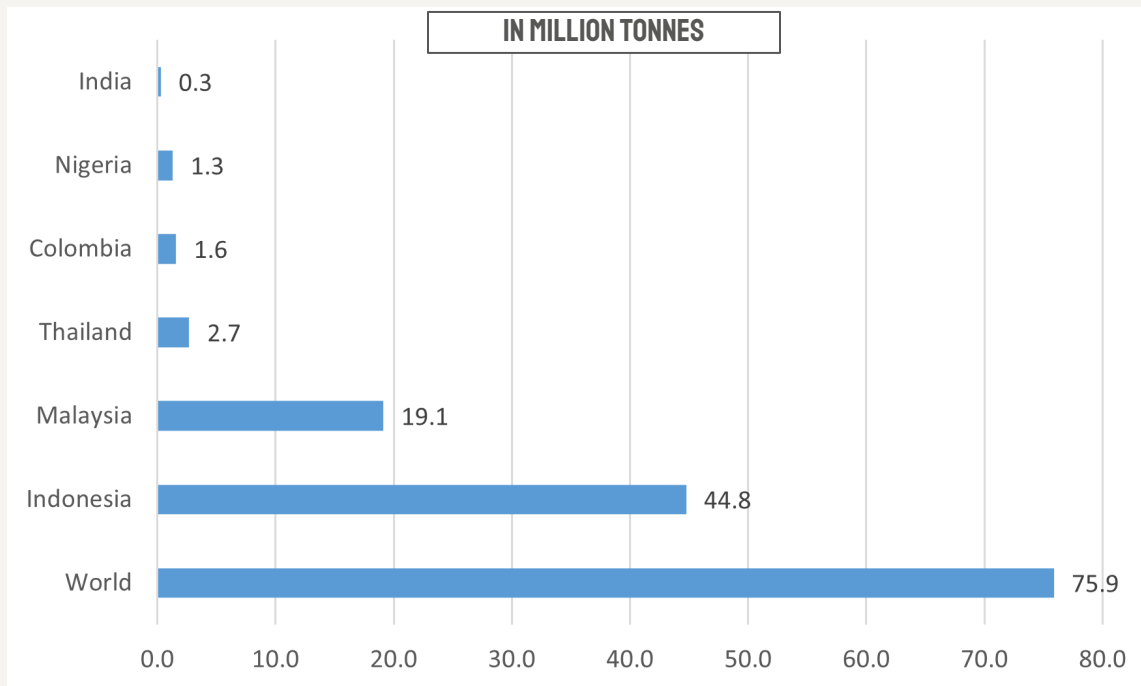
2023 IATRC Annual Meeting

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- (2) Research Question
- (3) Data
- (4) Estimation strategy
- (5) Results
- (6) Conclusion

1. Motivation

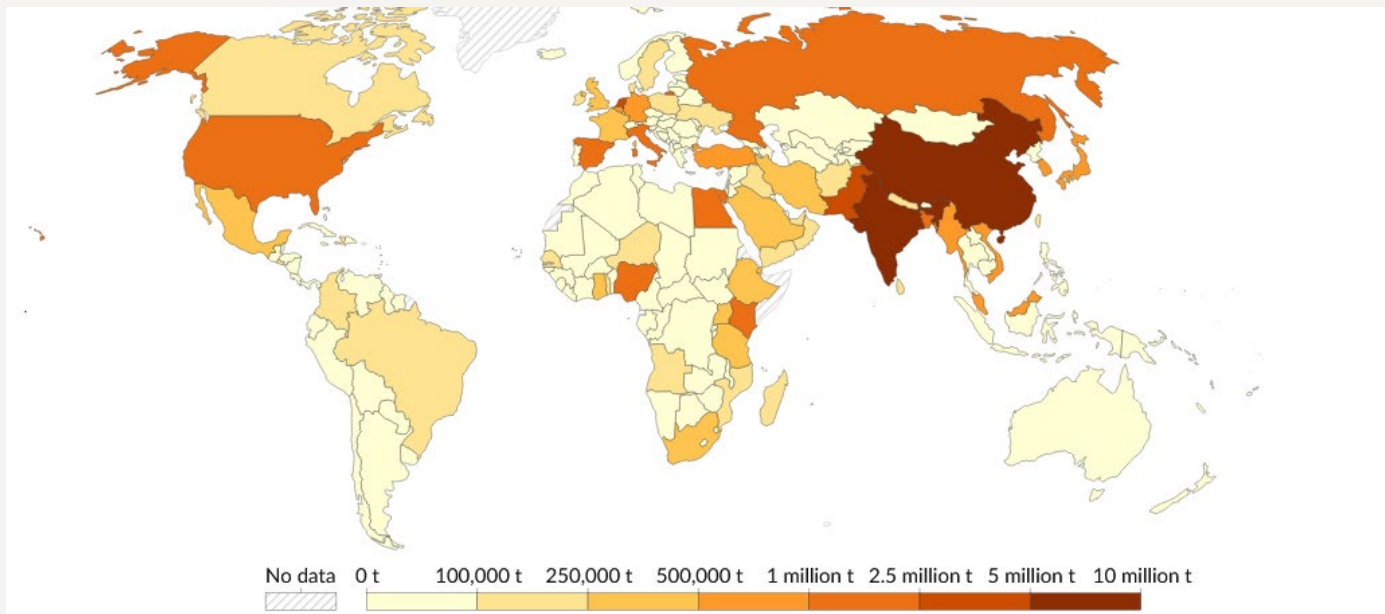
Global palm oil production in 2020



SOURCE: OURWORLDINDATA

1. Motivation

Global palm oil imports 2020



SOURCE: OURWORLDINDATA

1. Motivation

Palm oil industry Indonesia

17% of GDP, when including downstream processing

10% of Exports

13 Mio People employed, (working population is 195.000.00)
(Indo Palm Oil 2022)



1. Motivation

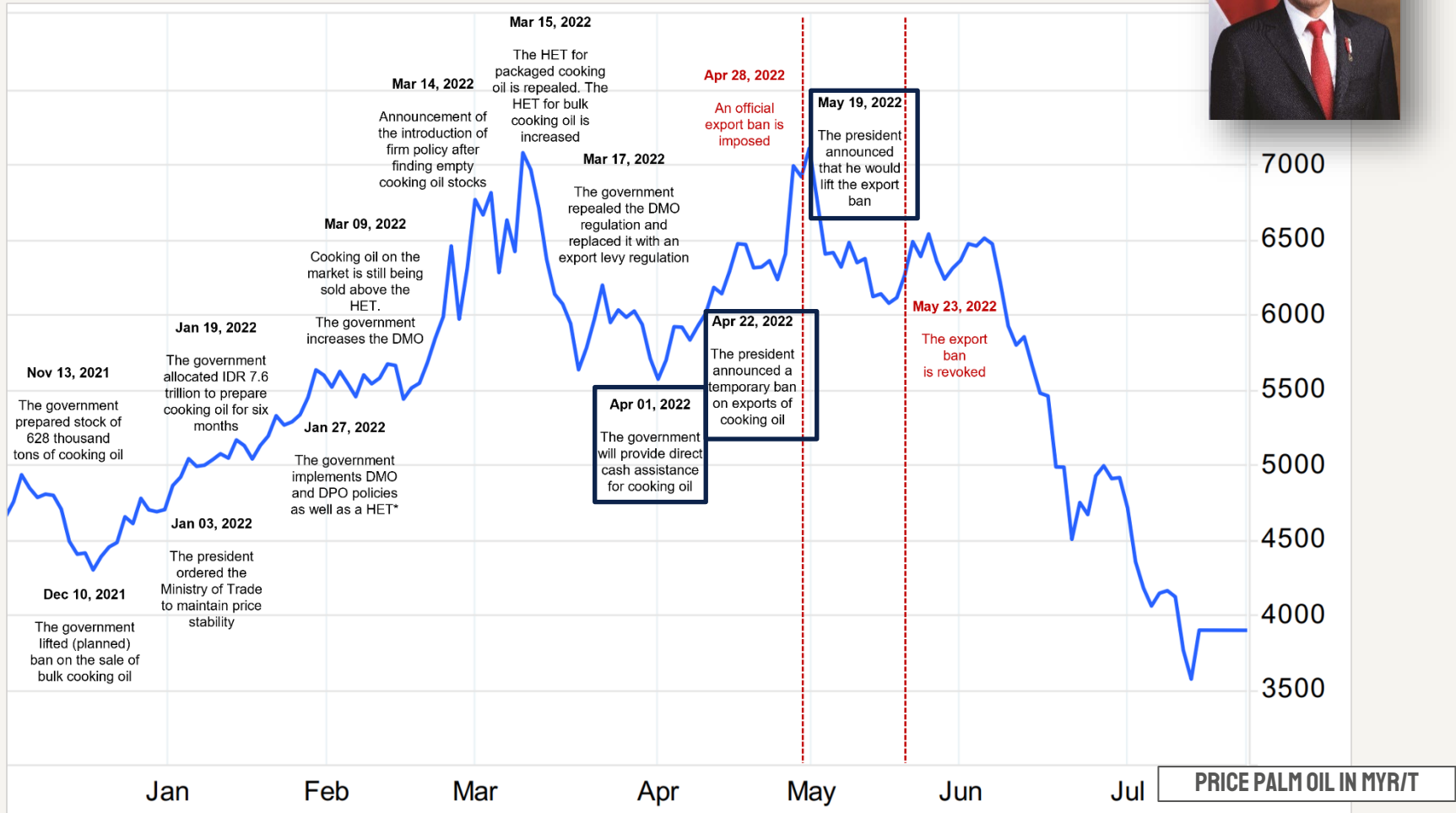
The palm oil industry in Indonesia...

- stimulates rural **economies**
(Qaim et al. 2020, Sibhatu 2023)
- provides **employment** opportunities
(Qaim et al. 2020 , Chrisendo et al. 2022)
- leads to rural **poverty reduction**
(Mehraban et al. 2021, Chrisendo et al. 2022)
- improves **food security** and diets for rural households
(Sibhatu 2023)



1. Motivation

TIMELINE OF PALM OIL EXPORT BAN



1. Motivation



Shares of top Indonesian palm oil companies tumble after export ban



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Business News • Markets • Stocks • News • Indonesia palm oil export ban dents FMCG stocks, oil companies rally

Indonesia palm oil export ban dents FMCG stocks; oil companies rally

By Pawan Nahar, ETMarkets.com • Last Updated: Apr 25, 2022, 01:06 PM IST

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News / MARKETS / Company Stock / Edible oil stocks rise up to 10% after Indonesia

Edible oil stocks rise up to 10% after Indonesia bans export of palm oil

While shares of Raj Oil Mills climbed 10% to Rs 82.75, Adani Wilmar stock zoomed 5% to hit an all-time high of Rs 802.80 in early trade.

Gro Intelligence GRO PLATFORM CLIMATE AGRICULTURE RESOURCES

Indonesia Lifts Palm Oil Export Ban, Easing Global Supply Worries and Prices

2. Research Question



**Are the observed changes at the
stock market statistically significant
or just random fluctuations?**

3. Data



Morgan Stanley Capital International (MSCI) data

- Leading provider of global equity indexes
- Covering various equity markets (developed and emerging markets)
- Indexes are comprehensive and representative

MSCI data used to analyze:

- Effects of **attending WEF** in Davos (Fuchs et al. 2022)
- Effects of **regional trade agreements** (Moser and Roser 2014)

3. Data

Daily values of 5 MSCI indexes over a period of 5 years (March 2018-2023), converted to US-Dollar using daily exchange rates

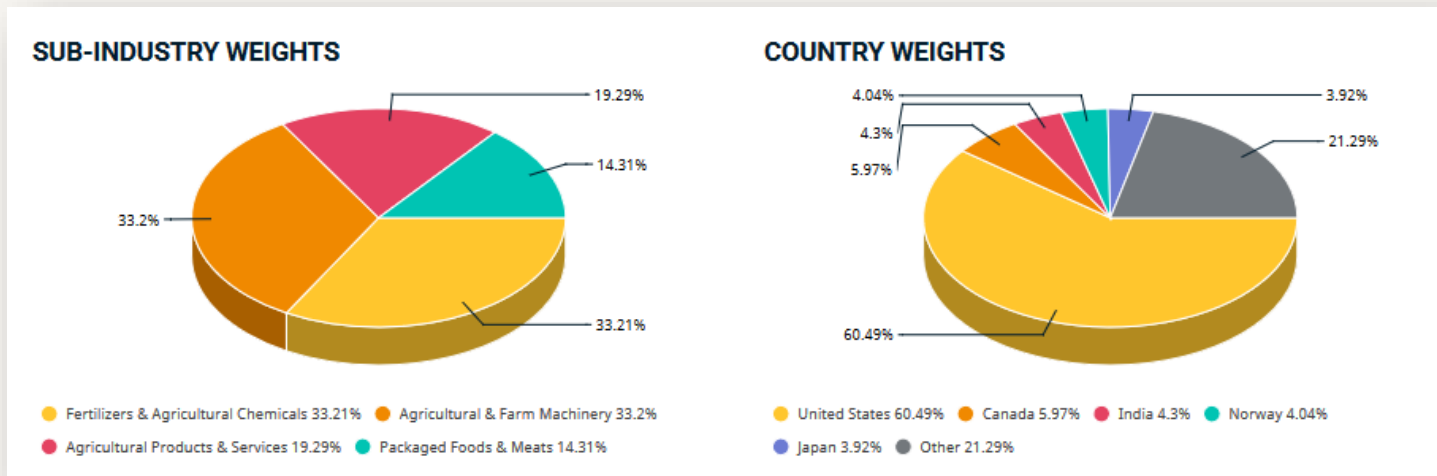


What about Nigeria and Colombia?

MSCI	NO. OF COMPANIES
1. MSCI ACWI SAP IMI	136
2. MSCI Indonesia	22
3. MSCI Thailand	43
4. MSCI India	114
5. MSCI Malaysia	34

3. Data

1. MSCI ACWI Select Agriculture Producers Investable Market Index (USD)

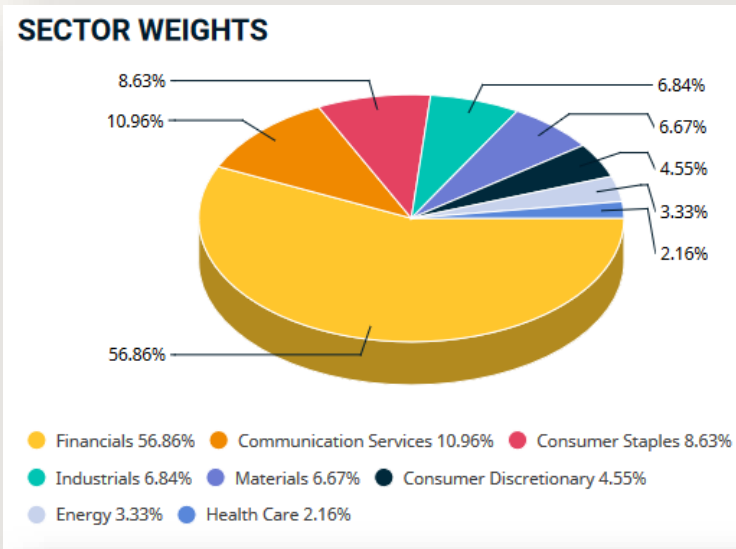


Source: [MSCI](https://www.msci.com/).

3. Data

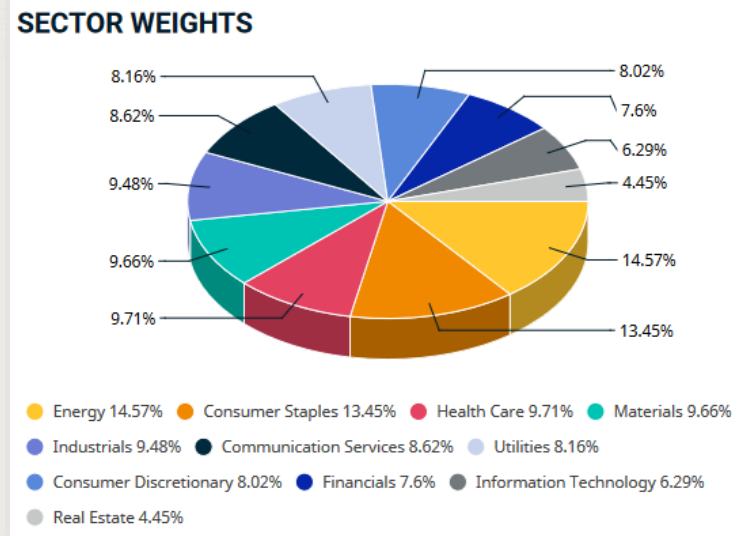
2. MSCI Indonesia Index

(22 constituents)



3. MSCI Thailand Index

(43 constituents)

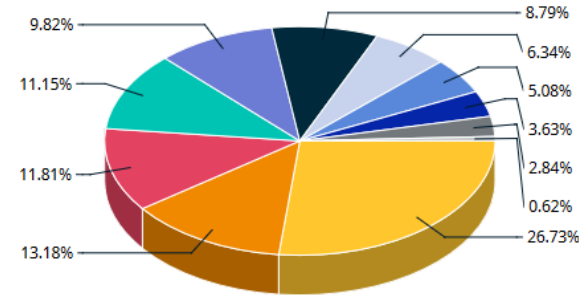


3. Data

4. MSCI India Index (114 constituents)



SECTOR WEIGHTS

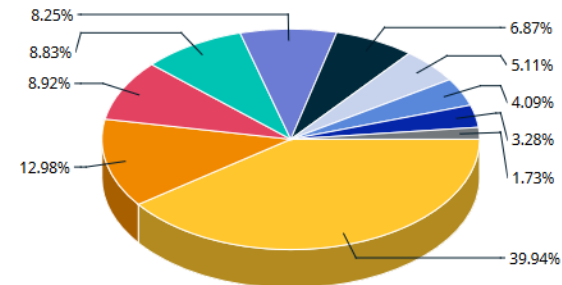


- Financials 26.73%
- Information Technology 13.18%
- Energy 11.81%
- Consumer Discretionary 11.15%
- Consumer Staples 9.82%
- Materials 8.79%
- Industrials 6.34%
- Health Care 5.08%
- Utilities 3.63%
- Communication Services 2.84%
- Real Estate 0.62%

5. MSCI Malaysia Index (34 constituents)



SECTOR WEIGHTS



- Financials 39.94%
- Consumer Staples 12.98%
- Communication Services 8.92%
- Utilities 8.83%
- Materials 8.25%
- Industrials 6.87%
- Consumer Discretionary 5.11%
- Health Care 4.09%
- Energy 3.28%
- Information Technology 1.73%

4. Estimation Strategy

EVENT STUDY

Assess the impact of a specific event on a particular variable of interest over a defined time period around the event.

GOAL

Quantify the impact of introduction and lifting of the export ban on MSCI performance and evaluate whether observed changes are statistically significant or random fluctuations.

4. Estimation Strategy

(1) Event Study: Steps

I. Define the event(s)

- Announcement of the temporary palm oil export ban (April 22, 2022)
- Announcement of lifting of the palm oil export ban (May 19, 2022)

II. Identify the event window

- 2 days prior, 2 days post event ($t-2$; $t+2$)

4. Estimation Strategy

(1) Event Study: Steps (continued)

iii. Measure the abnormal returns

- Estimate expected normal return for firm i
- Estimate abnormal return $AR_{i,t}$, where $R_{i,t}$ is the actual return
- Calculate CAR by accumulating AR over 5-day event window $(T_0 - 2; T_0 + 2)$

$$E(R_{i,t}|X_t)$$

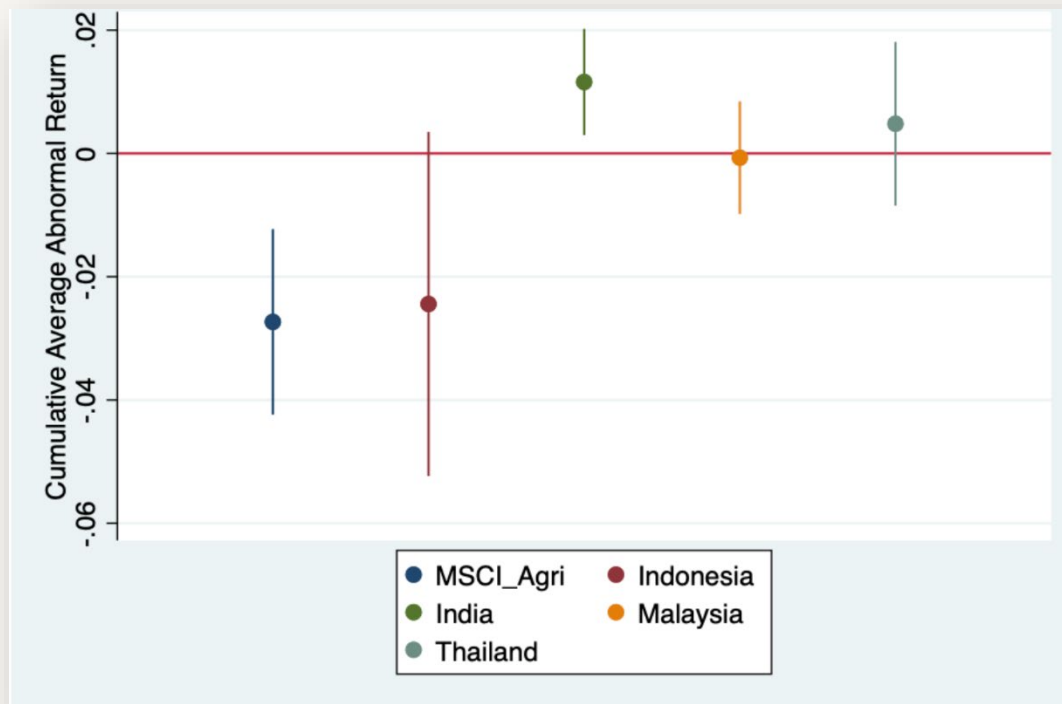
$$AR_{i,t} = R_{i,t} - E(R_{i,t}|X_t)$$

$$CAR_i = \sum_{t=1}^5 AR_{i,t}$$

iv. Estimate event study

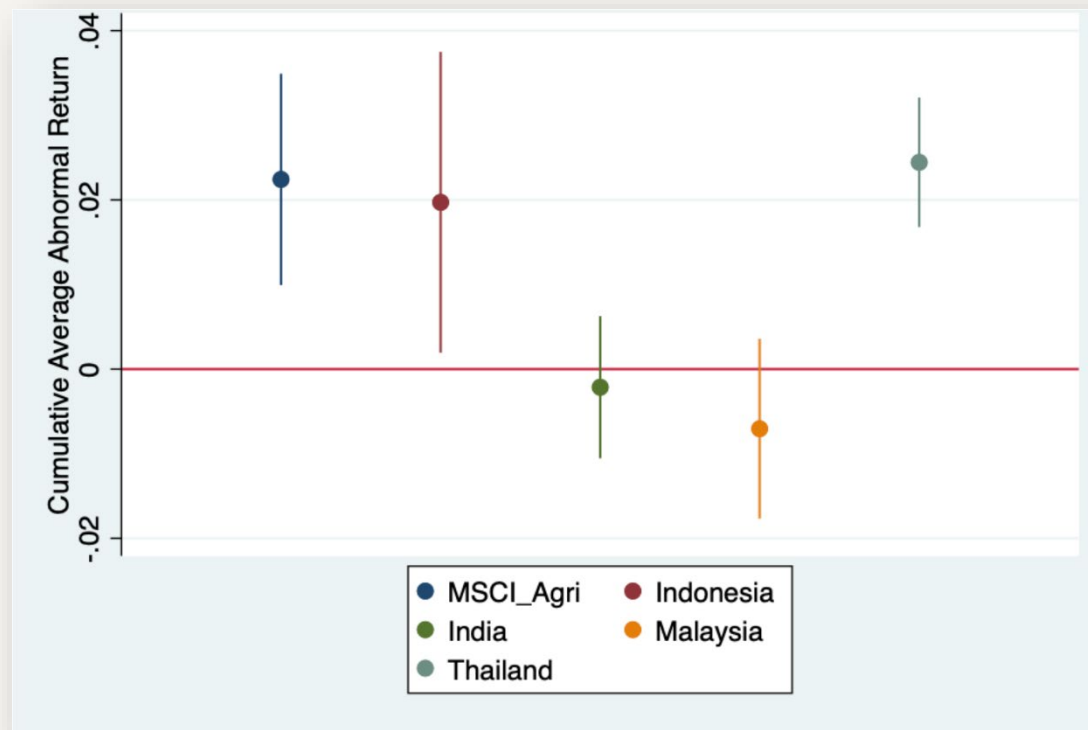
5. Results – Eventstudy

ANNOUNCEMENT OF EXPORT BAN (APRIL 22, 2022)



5. Results – Eventstudy

ANNOUNCEMENT OF LIFTING OF EXPORT BAN (MAY 19, 2022)



5. Results – Robustness

EVENT STUDY WITH DIFFERENT EVENT WINDOWS

- Event window of different lengths ($t=9$ and $t=13$)
- With increasing event window statistically significant association diminishes

RD IN TIME

- Results remain robust

EVENT STUDY WITH AUTOREGRESSIVE DISTRIBUTED LAGS

- Results remain robust

EVENT STUDY WITH PLACEBO EVENTS

- Dates from one year earlier and later (*April 22, and May 19, 2021; April 22, and May 19, 2023*)
- For majority of outcomes statistically insignificant CAR

6. Conclusion

TAKE AWAYS

- The national and international stock market responded to changes in the Indonesian introduction and lifting of the export ban (MSCI Indonesia)
- Indonesian trade policy has effect on the global agricultural sector (MSCI ACWI SAP IMI)
- Effects do not balance out → net negative effect of the export ban for MSCI Indonesia and MSCI ACWI SAP IMI



6. Conclusion

IMPLICATIONS

- Policy did not take the needs of all stakeholders into account:
Urban vs rural poor vs. FDI vs. people employed in palm oil sector
- Other policies are needed to reduce the pressure on national edible oil prices

FUTURE RESEARCH

- Effect of export ban on domestic commodity prices as well as global prices of other vegetable oils such as coconut, canola and annatto oil



Thank you for your attention.
Any questions or comments?

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Sources

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Credits pictures slides 1,2,4,5,28 : unsplash.com, Picture Joko Widodo (slide 7): Wikipedia

Appendix

AI. RESULTS - EVENT STUDY (MSCI ACWI SAP IMI & INDONESIA)

Table A.1: Event study MSCI ACWI SAP IMI, 5 days event window.

	(1) CAR April 22, 2022	(2) CAR April 25, 2022	(3) CAR April 26, 2022	(4) CAR May 19, 2022	(5) CAR May 20, 2022	(6) CAR May 23, 2022
Constant	-0.027*** [-0.042,-0.012]	-0.025*** [-0.036,-0.014]	-0.018*** [-0.027,-0.009]	0.018*** [0.007,0.029]	0.010 [-0.002,0.022]	-0.001 [-0.012,0.011]
Observations	131	133	141	139	132	140

Confidence intervals in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own illustration.

Table A.2: Event study MSCI Indonesia, 5 days event window.

	(1) CAR April 22, 2022	(2) CAR April 25, 2022	(3) CAR April 26, 2022	(4) CAR May 19, 2022	(5) CAR May 20, 2022	(6) CAR May 23, 2022
Constant	-0.024* [-0.053,0.005]	-0.018 [-0.041,0.005]	-0.013 [-0.036,0.009]	0.020** [0.001,0.038]	0.017** [0.001,0.033]	-0.005 [-0.020,0.010]
Observations	28	28	28	28	28	28

Confidence intervals in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own illustration.

Appendix

A2. RESULTS - EVENT STUDY (MSCI INDIA & MALAYSIA)

Table A.3: Event study MSCI India, 5 days event window.

	(1) CAR April 22, 2022	(2) CAR April 25, 2022	(3) CAR April 26, 2022	(4) CAR May 19, 2022	(5) CAR May 20, 2022	(6) CAR May 23, 2022
Constant	0.012*** [0.003,0.020]	-0.004 [-0.013,0.005]	-0.013*** [-0.0208,-0.00436]	-0.002 [-0.011,0.006]	-0.011** [-0.019,-0.002]	-0.046*** [-0.056,-0.037]
Observations	133	133	133	133	133	133

Confidence intervals in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own illustration.

Table A.4: Event study MSCI Malaysia, 5 days event window.

	(1) CAR April 22, 2022	(2) CAR April 25, 2022	(3) CAR April 26, 2022	(4) CAR May 19, 2022	(5) CAR May 20, 2022	(6) CAR May 23, 2022
Constant	-0.001 [-0.010,0.009]	-0.009 [-0.020,0.002]	-0.013** [-0.024,-0.003]	-0.007 [-0.018,0.004]	-0.009* [-0.019,0.001]	-0.018*** [-0.026,-0.011]
Observations	37	37	37	37	37	37

Confidence intervals in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own illustration.

Appendix

A3. RESULTS - EVENT STUDY (MSCI THAILAND)

Table A.5: Event study MSCI Thailand, 5 days event window.

	(1) CAR April 22, 2022	(2) CAR April 25, 2022	(3) CAR April 26, 2022	(4) CAR May 19, 2022	(5) CAR May 20, 2022	(6) CAR May 23, 2022
Constant	0.005 [-0.009,0.018]	-0.007 [-0.020,0.005]	-0.018*** [-0.029,-0.006]	0.024*** [0.017,0.032]	0.013*** [0.006,0.020]	-0.001 [-0.008,0.006]
Observations	44	44	44	44	44	44

Confidence intervals in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own illustration.

Appendix

A4. RESULTS - PLACEBO EVENTS

Table A.16: Event study MSCI ACWI SAP IMI, 5 days event window, one year placebo regression.

	(1) CAR April 22, 2021	(2) CAR May 19, 2021
Constant	-0.004 [-0.012,0.003]	0.028 [-0.026,0.083]
Observations	128	119

Confidence intervals in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own illustration.

Table A.17: Event study MSCI Indoneisa, 5 days event window, one year placebo regression.

	(1) CAR April 22, 2021	(2) CAR May 19, 2021
Constant	-0.011* [-0.023,0.002]	-0.036*** [-0.055,-0.017]
Observations	28	28

Confidence intervals in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own illustration.

Table A.18: Event study MSCI India, 5 days event window, one year placebo regression.

	(1) CAR April 22, 2021	(2) CAR May 19, 2021
Constant	-0.002 [-0.010,0.007]	0.026*** [0.017,0.035]
Observations	133	133

Confidence intervals in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own illustration.

Table A.19: Event study MSCI Malaysia, 5 days event window, one year placebo regression.

	(1) CAR April 22, 2021	(2) CAR May 19, 2021
Constant	-0.002 [-0.008,0.005]	-0.025*** [-0.036,-0.015]
Observations	36	36

Confidence intervals in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own illustration.

Table A.20: Event study MSCI Thailand, 5 days event window, one year placebo regression.

	(1) CAR April 22, 2021	(2) CAR May 19, 2021
Constant	-0.001 [-0.024,0.021]	-0.018** [-0.036,-0.000]
Observations	42	42

Confidence intervals in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own illustration.

Appendix

A5. ESTIMATION - RDIT

- Policy change at T_0 determines discontinuous treatment threshold
- Bandwidth of 2 days (5-day event window)

$$Y = \alpha + \tau D + \beta_1 X_{above} + \beta_2 X_{below} + \epsilon$$

Return Estimated discontinuity Controls for distance in days to cutoff Error term

The diagram shows the regression equation $Y = \alpha + \tau D + \beta_1 X_{above} + \beta_2 X_{below} + \epsilon$ in a white box. Below the box, four labels are positioned: 'Return' under α , 'Estimated discontinuity' under τD , 'Controls for distance in days to cutoff' under $\beta_1 X_{above}$ and $\beta_2 X_{below}$, and 'Error term' under ϵ . Arrows point from each label to its corresponding term in the equation.

Appendix

A6. RESULTS - RDIT

	(1) Return: Introduction export ban (April 22, 2022)	(2) Return: Lifting of export ban (May 19, 2022)
MSCI ACWI Agri IMI	-0.036 (0.558)	0.001 (0.966)
MSCI Indonesia	-0.054*** (0.001)	0.070*** (0.000)
MSCI India	-0.077** ((0.000)	0.064*** (0.000)
MSCI Malaysia	-0.018** (0.030)	-0.003 (0.703)
MSCI Thailand	-0.011 (0.801)	- 0.017** (0.012)

The sample sizes for the different estimations and based on the bandwidth of two days around the respective event are the following: MSCI India: 142, MSCI Indonesia: 39, MSCI Malaysia: 37, MSCI Thailand: 44, MSCI ACWI SAP IMI: 141. The dependent variable are the returns.

p-values in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Own illustration.