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THORBECKE, Willem
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Sectoral Evidence on Indonesian Economic Performance after the Pandemic※

Willem THORBECKE*

Research Institute of Economy, Trade and Industry

Abstract

The Indonesian economy has a long history of steady growth punctuated by times of turmoil and crisis. Recently Indonesia has faced the COVID-19 pandemic, inflation, contractionary U.S. monetary policy, and fluctuating commodity prices. To examine how the economy is faring since the pandemic began, this paper compares sectoral stock returns since COVID-19 hit the Indonesian economy with forecasted returns based on macroeconomic variables. The results indicate that coal, iron and steel, healthcare, and pharmaceuticals are outperforming more than three years after the coronavirus crisis began. Tobacco, industrials, and sectors related to construction are underperforming. The regression evidence also indicates that Indonesian sectors are primarily exposed to the Indonesian stock market. Coal, iron and steel and natural resources stocks are less exposed to the Indonesian stock market and more exposed to the world stock market. Almost no sectors exhibit exposure to contractionary U.S. monetary policy. The importance of the Indonesian stock market in explaining stock returns reflects the fact that the Indonesian economy is largely driven by domestic demand. To increase its resilience, Indonesia should also nurture labor-intensive exports.

Keywords: Indonesia, Domestic demand; Stock market exposures; Foreign direct investment; the COVID-19 pandemic; Exports

JEL classification: F10, G10

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* 1-3-1 Kasumigaseki, Chiyoda-ku Tokyo, 100-8901 Japan; Tel.: + 81-3-3501-0230; Fax: +81-3-3501-8414; Email: willem-thorbecke@rieti.go.jp

1. Introduction

Indonesia has a long history of trading in world markets. It is located on the shipping routes between China and India. Foreign merchants have coveted its spices for centuries. It is blessed with oil, natural gas, metals, palm oil, and other commodities.

As the price of crude oil increased almost tenfold between 1973 and 1981, Indonesia's oil exports soared. The government channeled the resulting windfall into irrigation, fertilizer, and farm-to-market roads, raising agricultural productivity and income (Yoshitomi, 2003). Wise investments during the boom period prevented the outbreak of a Dutch disease in Indonesia.

Oil prices then collapsed between 1981 and 1986 and Indonesia changed its strategy. It focused on attracting foreign direct investment (FDI) from advanced economies and exporting labor-intensive manufactures. As Azis (2022) discussed, Indonesia removed nontariff barriers, exempted firms exporting more than 85% of their output from import tariffs, issued FDI permits for 30 years, and allowed up to 95% foreign ownership in exporting firms. Attracting FDI and exporting textiles, footwear, and similar goods for multinational corporations (MNCs) proved successful. MNCs provided technical information and ensured that the technology worked. Indonesia workers and firms assimilated these technologies and learned new skills (Yoshitomi, 2003). Exporting oil and then labor-intensive goods and food and agricultural products contributed to economic growth averaging more than 7% per year between 1970 and 1996.

This economic miracle gave way to the 1997-98 Asian Financial Crisis (AFC). Capital outflows caused the Indonesian rupiah to collapse and domestic firms with unhedged foreign liabilities to go bankrupt. Firms could no longer borrow and stopped producing (Krugman 1999, 2001). Real output fell 14% in 1998. The crisis and accompanying riots and instability caused FDI from MNCs that used Indonesia as an export platform to dry up.

President Suharto resigned in 1998, and a nascent democracy emerged. The crisis left Indonesians suspicious of the International Fund (IMF) and its recommendations for policies such as free trade and free capital flows. With democracy came interest groups and rent seeking that generated protectionist policies. The Global Trade Alert found that Indonesia had twice as many protectionist interventions between 2009 and 2022 as Malaysia did and four times as many as Thailand did. Indonesia has thus turned away from the pre-crisis strategy of liberalizing trade in order to attract export-oriented FDI.

Since 2020 a new set of shocks has arrived. COVID-19, inflation, contractionary U.S. monetary policy, and rising commodity prices have all hit the Indonesian economy. To investigate how these have impacted Indonesia this paper investigates how they have affected Indonesian sectoral stock returns. Finance theory indicates that stock returns equal the expected present value of future cash flows. The sectoral behavior of stocks should thus shed light on the sectoral performance of output and profits.

The results indicate that, since COVID hit and commodity prices have risen, coal and iron and steel firms have done well. In addition, sectors that gained from the pandemic such as pharmaceuticals and health care continue to outperform. Telecommunications equipment stocks soared as people working from home upgraded their information and communications technology (ICT) equipment. Banks and the financial sector, after underperforming when the pandemic struck, are now behaving as predicted. Non-commodity manufacturing firms and sectors related to construction are performing badly.

The findings also indicate that Indonesian sectors are especially exposed to the aggregate Indonesian stock market. Their independent exposures to other variables such as exchange rates

and world demand are small. This is what would be expected of an economy whose growth is driven by domestic demand rather than net exports.

In previous work the IMF (2023) reported that domestic demand drove 70% of Indonesia's growth in 2021 and 80% of its growth in 2022. It also projected that between 92% and 102% of Indonesia's growth in 2023-2025 would come from domestic demand.

The World Bank (2023) noted that Indonesia's growth in 2022 was driven by consumption and high commodity prices. As prices of coal, metals, and palm oil are dropping in 2023, it forecasted that exports will play a smaller role in driving growth.

Blanchard et al. (2017) examined how capital outflows such as might arise from contractionary policy in advanced countries would impact emerging economies. They presented an extended version of the Mundell-Fleming model including both bonds and non-bonds. They found that outflows can increase the rate on non-bonds, exerting a contractionary effect by increasing the cost of financial intermediation.

Cho and Rhee (2014) investigated the impact of U.S. quantitative easing (QE) on Asian economies. They measured QE using dummy variables for ten weeks when important QE announcements were made. They examined the effect on China, Hong Kong, Japan, South Korea, Malaysia, the Philippines, Singapore, and Thailand. They found that QE over the 2008-2009 period strengthened Asian exchange rates and reduced local currency denominated bond yields on 5-year government bonds and credit default swap premiums on 5-year sovereign debt. They concluded that QE over this period redirected capital flows to Asian countries. They also found that QE after 2009 had a more muted effect on Asia.

Thorbecke (2016) examined how Federal Reserve Chairman Ben Bernanke's announcements in 2013 that he would taper bond purchases affected Indonesian stock prices.

Bernanke's announcement indicated that U.S. monetary policy would become more contractionary. Using an event study methodology, Thorbecke reported that tapering news harmed both the aggregate Indonesian stock market and capital-intensive sectors such as industrial metals and mines and heavy construction.

This paper finds little evidence that contractionary U.S. policy matters for most Indonesian firms. It also finds that world demand matters for metals, coal, and resources but not for most sectors. The overwhelming driver of growth for Indonesian sectors seems to be the Indonesian economy itself.

The next section describes the data and methodology. Section 3 contains the results. Section 4 discusses policy implications. Section 5 concludes.

2. Data and Methodology

One goal of this paper is to investigate how shocks including the COVID-19 pandemic, inflation, contractionary U.S. monetary policy, and world demand are affecting sectors of the Indonesian economy. To investigate the impact of the pandemic, it estimates a model of sectoral stock returns up to February 2020 when the pandemic began influencing Indonesian stock returns. It then uses actual out-of-sample values of the independent variables to forecast how sectoral stock returns are expected to perform and compares this with their actual performance. Sectors that benefitted after the pandemic began will outperform and sectors that suffered will underperform. Data on the returns on 26 sectors are obtained from the Datastream database.

The independent variables include six factors. The return on the Indonesian stock market is used to control for the influence of domestic macroeconomic factors on sectoral returns. The return on the world stock market is used to control for the impact of changes in the world

economy. The rupiah/dollar exchange rate is included to capture sectoral exchange rate exposures. The percentage change in the dollar spot price of Dubai crude oil is included to control for oil price changes. Unexpected Indonesian inflation is measured as the residuals from a regression of inflation on lagged values of inflation. The number of lags begins with six and is reduced until the last lagged value is statistically significant. Finally, the Bauer and Swanson (B&S) (2022) variable is used to capture U.S. monetary policy surprises. B&S measured innovations in monetary policy as the first principal component of the change in the first four Eurodollar futures contracts over the 30 minutes bracketing Federal Open Market Committee (FOMC) announcements. An increase in the B&S variable indicates that monetary policy is more contractionary.

Data on stock returns, the yen/dollar exchange rate, and the price of Dubai crude oil are obtained from the Datastream database. Data on Indonesian inflation are obtained from the CEIC database. Data on the B&S variable are obtained from the replication data accompanying Bauer et al. (2023).

The regression equations take the form:

$$\Delta R_{i,t} = \alpha_0 + \alpha_1 \Delta R_{m,Indonesia,t} + \alpha_2 \Delta R_{m,World,t} + \alpha_3 \Delta(\frac{rupiah}{dollar})_t + \alpha_4 \Delta Dubai_t + \alpha_5 Inf t_t + \alpha_6 B\&S_t, \quad (1)$$

where $\Delta R_{i,t}$ is the monthly stock return for Indonesian sector *i*, $\Delta R_{m,Indonesia,t}$ is the change in the log of the price index for Indonesia's aggregate stock market, $\Delta R_{m,World,t}$ is the change in the log of the price index for the world stock market, $\Delta(\text{rupiah/dollar})_t$ is the change in the log of the nominal rupiah per dollar exchange rate, ΔDubai_t is the change in the log of the spot price for Dubai crude oil, Inft_t represents news about inflation, and $B\&S_t$ is the Bauer and Swanson (2022) measure of U.S. monetary policy.

The B&S data are available until December 2019. Equation (1) is thus estimated over the April 2002 to December 2019 period.[1] To forecast returns after COVID-19 began, the model is estimated over the April 2002 to February 2020 period. In this case the B&S variable is excluded. This should not affect the results much as the B&S variable is almost never statistically significant in the regressions. Actual out-of-sample values of the five other right-hand side variables are then used to forecast sectoral returns over the March 2020 to June 2023 period. Actual returns are compared with expected returns over the period after the pandemic began.

3. Results

Figure 1 presents actual and forecasted sectoral stock returns from March 2020 to June 2023. The figure is ordered beginning with the sector that performed the best (coal) and ending with the sector that performed the worst (cement). Stock prices for coal first began increasing in September 2020 and increased logarithmically more than 250 percent between September 2020 and the end of 2022. The price of Indonesian coal in U.S. dollars increased by more than 170 percent over this period.[2] As the World Bank (2023) discussed, Indonesian coal exports in 2022 soared as Europe required alternatives to Russian natural gas and as demand from India and China spiked. Rising coal prices and exports provided a windfall for Indonesian coal companies over this period. The World Bank (2023) also noted that Indonesia coal exports moderated and coal prices fell in 2023. This helps explain the drop in coal stock prices in panel a) in 2023.

[1] In cases where the data are not available in April 2002, the regressions start of the first date when data are available.
[2] Data on Indonesian coal prices come from the CEIC database.

The second and third best performing sectors are pharmaceuticals and healthcare. They began to perform well as soon as the pandemic hit in March 2020 and continued to perform better than forecasted until the end of the sample period in June 2023.

The fourth best performing sector is telecommunications equipment in panel d). As people had to work from home, they upgraded their ICT equipment. Panel n) shows that telecommunications services performed as expected. Putting together the results in panels d) and n), the evidence indicates that people did not employ more telecommunications devices but upgraded the devices they had by purchasing new equipment.

Panels e), f) and g) shows stock prices for basic resources, iron and steel, and basic materials. The World Bank (2023) reported that high commodity prices in 2022 provided windfalls to Indonesian commodity exporters, with one-third of Indonesia's export growth being driven by steel. However, as commodity prices are moderating in 2023, stock price growth in these sectors has also stopped.

Food producer firms in panel h) have performed about as expected and food product firms in panel j) underperformed in 2022. Food product firms suffered from high commodity prices for food imports in 2022, depressing stock returns. Food producer firms produced goods largely in Indonesia so they did not suffer to the same extent.

The financial sector in panel l) and banks in panel m), after underperforming when the pandemic struck, are now behaving as expected. The IMF (2023) noted that the Indonesian financial sector remains resilient. The IMF (2023) noted that lending to mining and other commercial sectors grew in 2022 and that deposit funding also increased. Sectors such as automobiles, consumer discretionary, industrial materials, and industrial metals and mines are performing about as expected.

Industrials in panel u) have underperformed. The World Bank (2023) reported that non-commodity manufactures have performed badly. They have suffered from weakening global demand. The World Bank (2022) also documented areas where Indonesia's non-commodity industries lacked competitiveness.

Farming and fishing (panel t), tobacco (panel w), personal products (panel x), and sectors related to construction such as construction and materials (panel v), building materials (panel y), and cement (panel z) have performed the worst. The farming sector was harmed as fertilizer prices rose after the Ukraine War began. Tobacco has performed badly as people confronting the pandemic reacted to the dangers of combining catching COVID-19 and smoking. Personal products suffered as demand for cosmetics fell during the pandemic. Cement sales during the first six months of 2023 are at their lowest level since 2012. Many state owned enterprises involved road construction are also performing poorly (World Bank, 2023).

Table 1 presents the results from estimating equation (1). The model performs well, with adjusted R-squared values averaging 0.43. What is striking in Table 1 is how exposed all sectors are to the Indonesian aggregate stock market and how few exhibit additional exposure to any of the other macroeconomic variables. This reflects an economy where domestic factors play a dominant role.

Examining assets' betas to the Indonesian market portfolio in column (2), many sectors have betas close to unity. Those with lower betas include basic resources, iron and steel, and industrial metals and mines. In all three cases, these assets have statistically significant exposures to the return on the world stock market in column (4). This reflects the fact that Indonesia's exports of natural resources and metals increase as the world economy expands.

Similarly coal has a beta to the Indonesian economy that is less than one and a beta to the world stock market that is positive and significant at the 10% level.

Those with high betas to the market portfolio include automobiles, consumer discretionary, and telecommunications equipment. Their high betas reflect the fact that these are discretionary items that consumers are more likely to purchase when they have more income. Their personal incomes are correlated with the state of the Indonesia economy, proxied in equation (1) by the return on the market portfolio.

Apart from basic resources, iron and steel, and industrial metals and mines, there are only three sectors in column (4) that exhibit a statistically significant exposure at the 5% level to the world stock market. These are consumer staples, personal products, and tobacco. A stronger world economy will push up the price of basic consumer goods on world markets and reduce the profitability of these sectors.

Out of the 26 sectors in Table 1, there is only one in column (6) that exhibits a statistically significant exposure to U.S. monetary policy. This is about what would be expected due to random sampling errors alone. Thus there is no evidence in Table 1 that contractionary U.S. monetary policy harms the Indonesian economy.

In column (8), there is only one sector that is harmed by Indonesian inflation. This is the banking sector. Higher inflation can trigger contractionary monetary policy by Bank Indonesia. The IMF (2023) noted that rising interest rates can hurt Indonesian banks by causing more of the debt of its corporate customers to be at risk. Banks then need to increase their loan loss provisions. Food products and personal products in column (8) gain from inflation. This could reflect the fact that, when the general price level is increasing, firms in these sectors are able to raise their prices also. In column (10) there are only three sectors, all related to construction, that

are harmed by depreciations. In column (13) coal and basic resources stocks benefit from higher crude oil prices. Since coal and other natural resources are substitutes for crude oil, higher crude oil prices cause consumers to turn away from oil to other sources of energy such as coal.

The important implication of the results in Table 1 is that the domestic economy is crucial to the performance of Indonesian firms. Only a few sectors such as iron and steel, natural resources, and industrial metals and mines are significantly exposed to the world economy. Exposure to the other macroeconomic variables in Table 1 is limited.

4. Policy Choices for Indonesia

The results indicate that the Indonesian economy is driven largely by domestic factors. Indonesia has a large domestic market with hundreds of millions of consumers. Many firms depend on this for their profitability. In addition, the findings indicate that coal, iron and steel, and natural resource sectors have performed well.

Previous experience indicates that the Indonesian domestic economy can suffer sudden downturns as it did during the AFC. History also indicates that commodity booms can give way to commodity busts, as happened for in the 1980s.

It would be beneficial for Indonesia to diversify by having another possible growth engine. A natural candidate would be labor-intensive manufactures. If Indonesia could export these into world markets, the discipline of competition would also raise productivity. The World Bank (2023) has noted that low growth of labor productivity and total factor productivity has plagued the Indonesian economy.

Indonesia before the AFC succeeded in exporting labor-intensive goods by attracting FDI from MNCs. FDI acted as a vehicle for transplanting superior production technology to

Indonesia. Vietnam currently is succeeding by attracting export-oriented FDI. How can Indonesia attract FDI from MNCs participating in regional value chains?

Kimura and Ando (2005) modeled the factors driving MNCs to transfer production abroad. Firms decide to slice up the value chain when the cost saving arising from fragmenting production exceeds the cost of linking segregated production blocks (the service link cost). Two key service link costs are related to managerial influence and to distance. Costs along the managerial controllability dimension come from asymmetric information, incomplete contracts, and faulty dispute settlement mechanisms. Costs along the distance dimension can be lowered by strengthening corporate governance, improving infrastructure, expanding the knowledge base, and protecting intellectual property rights agreements (Yusuf et al., 2003). The service link cost can thus be lowered by improving information about counterparties, enforcing contracts, instituting dispute settlement mechanisms, strengthening the network of highways, ports, airports, and container yards, improving the ICT infrastructure, educating the workforce, and providing remedies when firms violate intellectual property rights agreements.

The World Bank (2023) noted that Indonesia has taken strides in terms of public sector governance and infrastructure. One key challenge that remains concerns education and human capital formation. Improvements in this area could help to attract FDI. Indonesia ranked 71st out of 78 countries in the 2018 Programme for International Assessment (PISA) tests of the educational attainment of 15-year-olds in math, science, and reading. It fell from 62nd in the PISA rankings in 2015. Educational shortfalls have since been aggravated by remote learning that occurred during the pandemic.

The World Bank (2023) noted that Indonesian students lost 21 months of in-person schooling due to the pandemic. Fourth graders lost on average 11 months of skills, with the

losses greater for poorer students and for students who rarely use the internet. The World Bank (2023) recommended that the Indonesian government allocate funds for educational recovery, increase school hours and remedial training, and enlist parents to help students learn more outside of classroom hours. It also commended the government's strategy of providing differential training to different students rather than focusing on completing the curriculum.

Even before the pandemic the educational system was not performing well. Providing prenatal care and healthcare during the first 1,000 days of life is crucial. Indonesia has made progress in this area, as evidenced by the fact that the percentage of children who are not stunted improved from 57.6% in 2000 to 72.3% in 2019.[3] While Indonesia has made progress, stunting still remains more prevalent there that in other countries at comparable levels of development. The government should consider providing subsidies to underprivileged families to fight stunting.

After the first five years, there are other steps that Indonesia could take to improve educational outcomes. According to Rosser (2018), Indonesia should train teachers better, reward good teaching, and avoid government overreach. According to the World Bank (2021), the government should improve internet access by increasing competition in the digital infrastructure sector. According to Yusuf et al. (2003), educating high school students in science and math and university students in engineering and technical fields can attract FDI. According to the World Bank (2018), to prepare workers for the digital economy schools should emphasize complex problem solving, teamwork, reasoning, and self-efficacy. Also, nurturing curiosity and a hunger for learning may motivate students.

[3] These data come from the World Bank's Human Capital Project. This project defines stunting as the percentage of children under 5 whose height is more than two standard deviations below the median for their age. The website for this project is: https://www.worldbank.org/en/publication/human-capital .

In addition to investing in human capital, Indonesia could attract FDI by resisting protectionism. The Global Trade Alert reported that Indonesia enacted 532 protectionist trade interventions between 2009 and January 2022, more than twice as many as Malaysia did and more than four times as many as Thailand did. As Cali and Montfaucon (2021) discussed, protectionist measures include import approvals, restrictions on the port of entry for imports, pre-shipment inspections, and mandatory certification with the Indonesian national standard. Since Indonesian exporters depend on imported inputs, restrictions on imports can reduce exports.

Cali and Montfaucon (2021) provided evidence of the deleterious effect of import restrictions on exports. They investigated monthly exports from all firms over the 2014 to 2018 sample period. They reported that a 1% increase in restrictions on port of entry for imports or mandatory certification with the Indonesian national standard reduces both the volume and value of exports by almost 1%. They also found that exposure to nontariff measures reduce the number of export destinations, the probability of firm survival, and the extensive margin of exports. Protectionism thus darkens the atmosphere for exporters and deters foreign investors.

Since protectionism benefits certain groups, the way to oppose it is to harness the lobbying power of the groups that are harmed by it. Exporters and businesspeople who want to partner with foreign firms should lobby against protectionism.

5. Conclusion

The Indonesian economy has weathered commodity booms and busts, crises, and transitions from dictatorships to democracy. Beginning in 2020, it faced the COVID-19 pandemic, inflation, contractionary U.S. monetary policy, and rising commodity prices. This paper investigates how these shocks after 2020 are affecting the economy.

To do this, it examines how sectoral stock returns have performed since the pandemic began. Finance theory indicates that stock prices provide information about investors' assessments of future cash flows and how they are affected by exogenous variables. The results indicate that coal and iron and steel firms have outperformed. In addition, sectors that gained during the pandemic such as pharmaceuticals and health care continue to do well. Telecommunications equipment stocks soared as people huddled at home upgraded their ICT equipment. Banks and the financial sector are behaving as predicted. Tobacco stocks lost during the pandemic as people avoided behaviors that increased their risk of catching COVID-19. Farming stocks suffered as the Ukraine War increased the price of fertilizer. Non-commodity manufacturing firms and sectors related to construction are performing badly.

The evidence also indicates that Indonesian sectors are highly exposed to the Indonesian economy and exhibit little exposure to domestic inflation, U.S. monetary policy, and other macroeconomic variables. Iron and steel, natural resource firms, and industrial metals and mines are less exposed to the Indonesian economy and more exposed to the world economy. However, for most sectors, exposure to the Indonesian economy is paramount.

The experience of the AFC indicates that the Indonesian economy could suddenly suffer a severe downturn. In addition, commodity prices can tumble. This makes it desirable to nurture another growth engine. This could be done if Indonesia can attract FDI to export labor-intensive manufactures. To attract FDI, it should improve its educational outcomes and resist protectionist pressures. In the 1980s, Indonesian policymakers focused on attracting export-platform FDI only after oil prices collapsed. As it is better to repair a roof on a sunny day, it is better to focus on promoting labor-intensive exports while the economy is doing well. The East Asian experience also indicates that exporting manufactured goods facilitates learning and productivity growth.

There are also lessons for Japan. The Japanese government provides Official Development Assistance (ODA) to Indonesia. For instance, it provided an ODA loan to help maintain economic activity, support the poor, and strengthen healthcare services during the pandemic.[4] Indonesian students, especially the most vulnerable, now need help to make up for the lost learning that occurred due to school closures during the pandemic. Many children also need good prenatal care and nutrition and healthcare when very young to guard against stunting and malnutrition. Japan should consider channeling ODA to these areas.

[4] Japanese ODA to Indonesia during the pandemic is discussed here: https://www.jica.go.jp/Resource/english/news/press/2020/20200803_10_en.html#:~:text=On%20August%203%2C%20the%20Japan%20International%20Cooperation%20Agency,COVID-19%20Active%20Response%20and%20Expenditure%20Support%20Program%20Loan.

Table 1

The exposure of Indonesian sectoral stock returns to macroeconomic variables

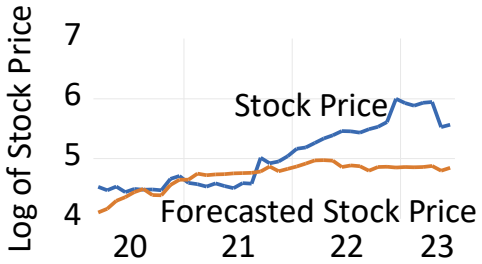
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sector	Exposure to Indonesian Stock Market	S.E.	Exposure to World Stock Market	S.E.	Exposure to Contractionary U.S. Monetary Policy	S.E	Exposure to Indonesian Inflation	S.E	Exposure to Rupiah/dollar Exchange Rate	S.E.
Automobiles	1.51***	0.12	-0.28*	0.17	0.11	0.11	0.01	0.43	-0.18	0.32
Banks	0.99***	0.09	0.14	0.10	0.07	0.06	-0.65***	0.24	-0.17	0.17
Basic Materials	0.98***	0.12	0.19	0.16	-0.08	0.13	0.24	0.82	-0.01	0.25
Basic Resources	0.85***	0.14	0.52***	0.18	-0.20	0.14	0.49	0.64	0.19	0.24
Building Materials	0.98***	0.11	-0.02	0.14	0.14	0.13	0.19	0.67	-0.59***	0.20
Consumer Staples	0.92***	0.06	-0.32***	0.09	-0.01	0.06	0.74	0.32	0.14	0.14
Cement	0.98***	0.11	0.10	0.16	0.18	0.12	0.38	0.62	-0.64***	0.20
Coal	0.94***	0.20	0.46*	0.26	-0.16	0.17	0.30	0.67	0.40	0.34
Construction & Materials	1.01***	0.10	-0.02	0.13	0.10	0.12	0.24	0.65	-0.51**	0.20
Consumer Discretionary	1.32***	0.10	-0.13	0.13	0.14	0.09	0.10	0.32	-0.15	0.22
Farming & Fishing	1.05***	0.27	-0.02	0.28	-0.05	0.19	0.89	0.76	-0.07	0.29
Financials	0.98***	0.08	0.12	0.09	0.07	0.05	-0.70	0.20	-0.16	0.15
Food Producers	1.09***	0.28	-0.16	0.18	-0.07	0.12	0.78	0.59	-0.20	0.20
Food Products	0.93***	0.13	0.03	0.16	0.04	0.18	1.09**	0.48	-0.38	0.23
Health Care	1.00***	0.18	-0.20	0.21	0.20**	0.09	0.79*	0.42	-0.12	0.27
Industrial Goods & Services	1.06***	0.24	0.13	0.17	-0.13	0.14	0.83	0.51	-0.01	0.27
Industrial Materials	0.98***	0.22	0.47*	0.28	0.02	0.20	0.49	1.36	-0.10	0.48
Industrial Metals & Mines	0.58**	0.25	1.07***	0.32	-0.14	0.22	-1.68	1.38	0.29	0.49
Industrials	0.86***	0.13	0.14	0.11	-0.09	0.10	0.11	0.37	-0.26	0.16
Iron & Steel	0.60**	0.25	1.05***	0.32	-0.14	0.22	-1.64	1.37	0.29	0.49
Paper	0.98***	0.22	0.47*	0.28	0.02	0.19	0.49	1.36	-0.10	0.48
Personal Products	0.52***	0.13	-0.31**	0.13	0.04	0.07	0.96***	0.34	-0.04	0.17
Pharmaceuticals	1.01***	0.20	-0.05	0.29	0.15	0.12	0.19	0.48	-0.23	0.32
Telecommunications Equipment	1.16***	0.27	0.00	0.34	-0.20	0.25	3.14*	1.82	0.84*	0.46
Telecommunications Services	0.94***	0.10	-0.22	0.14	-0.11	0.11	0.23	0.65	0.17	0.18
Tobacco	0.95***	0.13	-0.38**	0.16	0.08	0.09	0.57	0.54	0.32	0.25

Notes: The exposures represent the regression coefficients from a regression of stock returns for the sectors listed in column (1) on 1) the return on the Indonesian stock market (column (2)), 2) the return on the world stock market (column (4)), 3) the Bauer and Swanson (2022) measure of surprises to U.S. monetary policy (column (6)), 4) news about Indonesian consumer price index inflation (column (8)), 5) the change in the log of the rupiah/dollar exchange rate (column (10)), and 6) the change in the log of the dollar spot price for Dubai crude oil (reported on the next page). The regressions are run over the April 2002 to December 2019 period. S.E. stands for heteroskedasticity and autocorrelation-corrected standard errors. *** (**) [*] denote significance at the 1% (5%) [10%] levels.

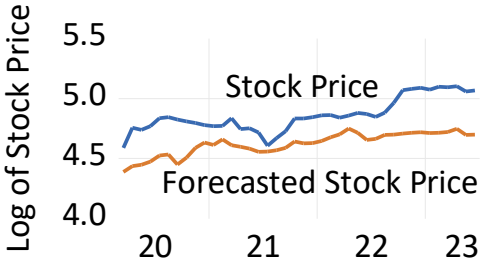
Table 1 (continued)

The exposure of Indonesian sectoral stock returns to macroeconomic variables

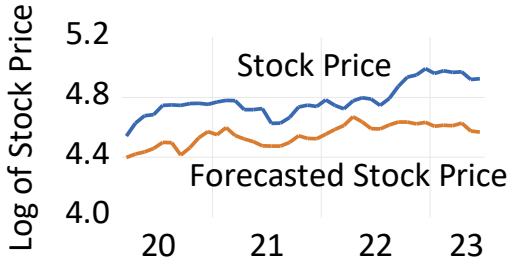
(12)	(13)	(14)
Sector	Exposure to Dubai Crude Oil Prices	S.E.
Automobiles	0.04	0.05
Banks	-0.11**	0.05
Basic Materials	0.26***	0.07
Basic Resources	0.26***	0.08
Building Materials	-0.06	0.06
Consumer Staples	0.03	0.04
Cement	-0.12*	0.07
Coal	0.32***	0.09
Construction & Materials	-0.06	0.06
Consumer Discretionary	-0.03	0.04
Farming & Fishing	0.10	0.10
Financials	-0.10**	0.05
Food Producers	0.08	0.07
Food Products	0.05	0.06
Health Care	0.02	0.07
Industrial Goods & Services	0.18**	0.08
Industrial Materials	0.16	0.17
Industrial Metals & Mines	0.12	0.11
Industrials	0.04	0.04
Iron & Steel	0.13	0.11
Paper	0.16	0.17
Personal Products	-0.05	0.05
Pharmaceuticals	-0.03	0.08
Telecommunications Equipment	0.23*	0.12
Telecommunications Services	-0.07	0.06
Tobacco	-0.00	0.06



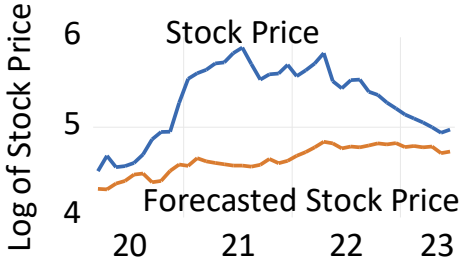
a) Coal



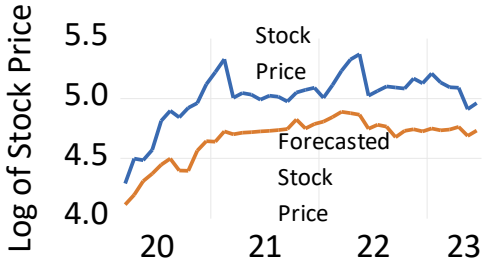
b) Pharmaceuticals



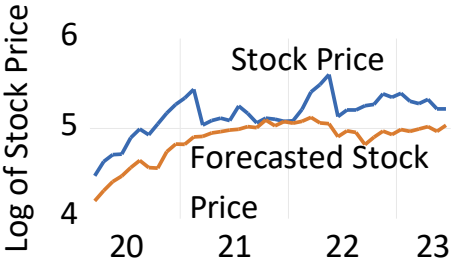
c) Healthcare



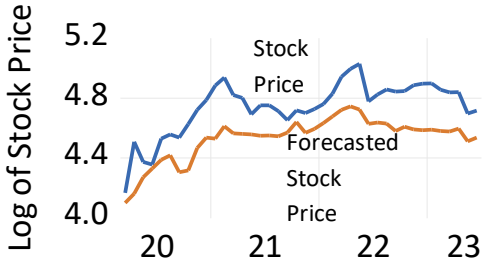
d) Telecommunications Equip.



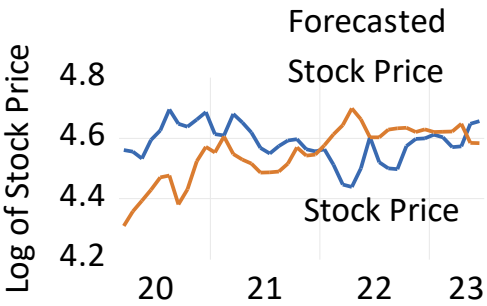
e) Basic Resources



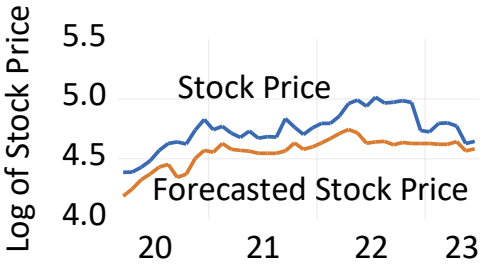
f) Iron and Steel



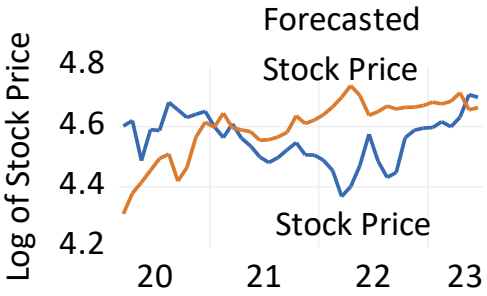
g) Basic Materials



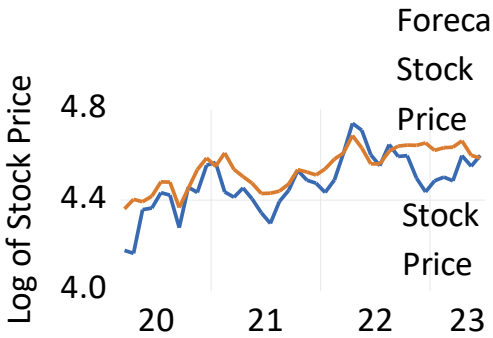
h) Food Producers



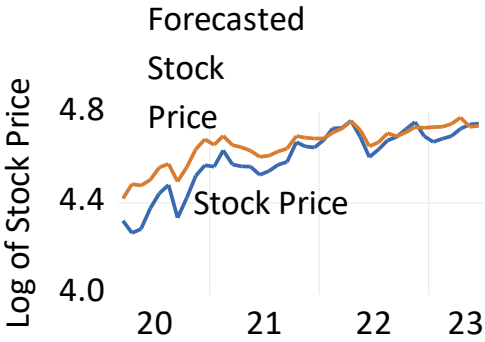
i) Industrial Goods and Services



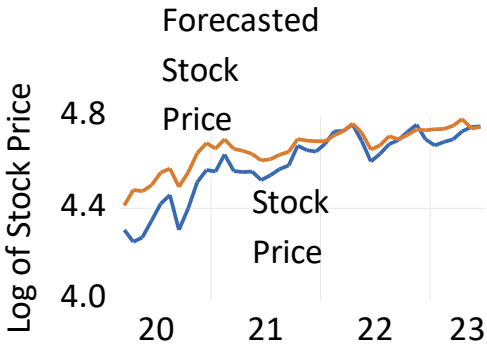
j) Food Products



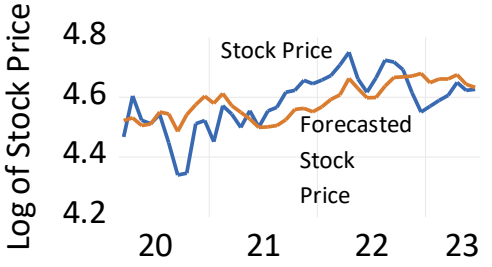
k) Automobiles



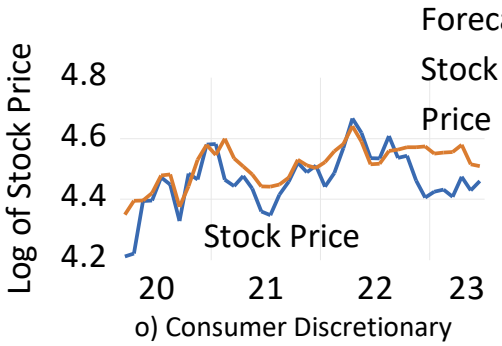
l) Financials



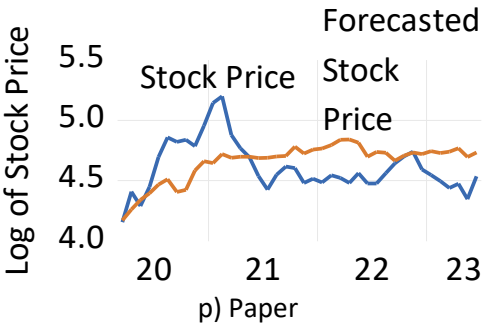
m) Banks



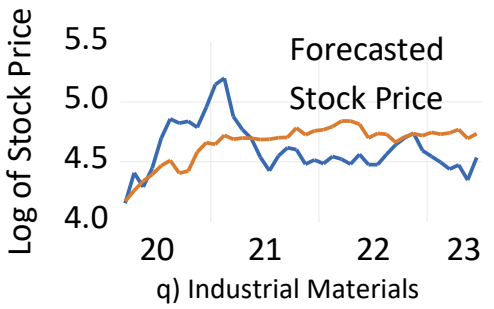
n) Telecommunications Services



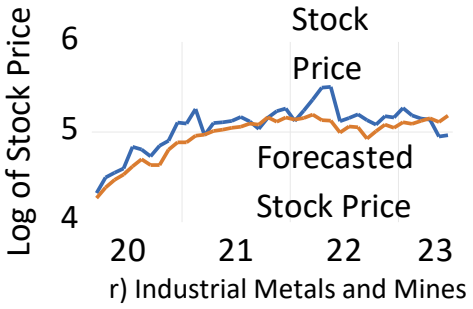
o) Consumer Discretionary



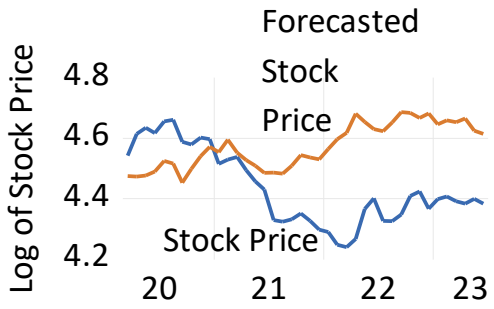
p) Paper



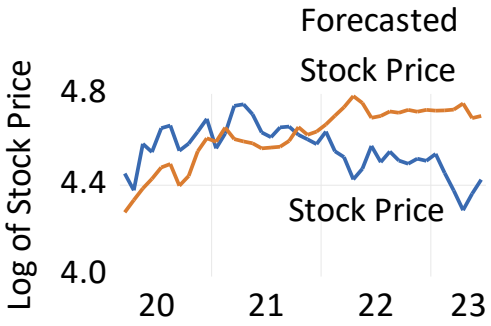
q) Industrial Materials



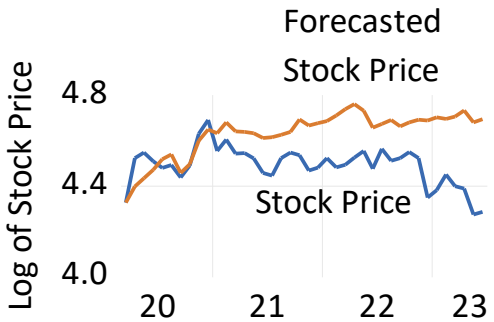
r) Industrial Metals and Mines



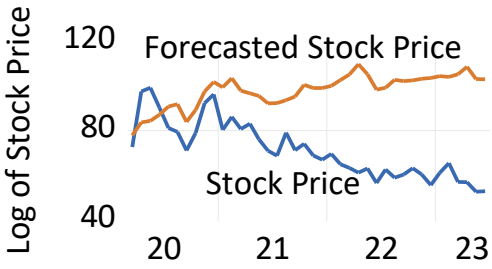
s) Consumer Staples



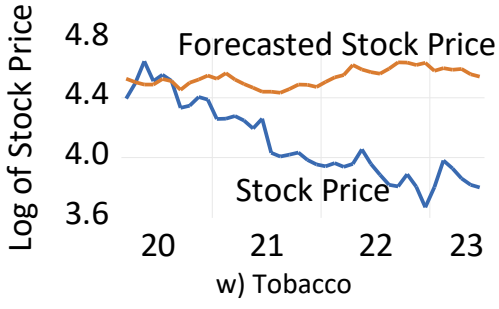
t) Farming and Fishing



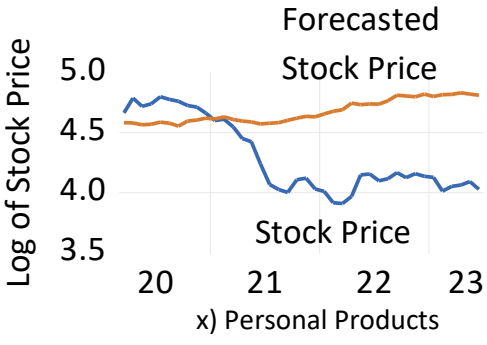
u) Industrials



v) Construction and Materials



w) Tobacco



x) Personal Products

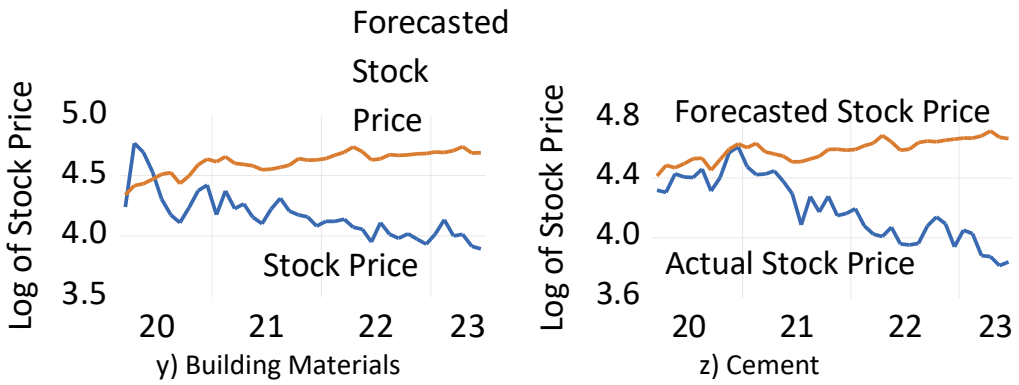


Figure 1. Actual and predicted Indonesian stock prices since the COVID-19 pandemic began.
Notes: The blue line represents actual sectoral stock prices and the orange line represents forecasted sectoral stock prices. Forecasted stock prices are obtained from a regression of the sectoral stock returns on 1) the return on the Indonesian stock market, 2) the return on the world stock market, 3) news about Indonesian consumer price index inflation), 4) the change in the log of the rupiah/dollar exchange rate, and 5) the change in the log of the dollar spot price for Dubai crude oil. The regressions are run over April 2002 to February 2020 period. Actual out-of-sample values of the right-hand side variables are then used to forecast stock prices (the orange line) over the March 2020 to June 2023 period.

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