The Impact of Exchange Rate and Inflation on Composite Stock Price Index (IHSG) With Covid-19 As A Moderating Variable

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Abstract

Covid-19 pandemic had posed serious threats to business sustainability in Indonesia. The purpose of this study is to find empirical evidence on the impact of foreign exchange rates and inflation against composite stock price index (IHSG), with Covid-19 as the moderating variables. As such, this study seeks to understand the impact of Covid-19, whether an increase or decrease in the composite stock price index. The quantitative study uses secondary data sources, i.e. Indonesian Stock exchange monthly publications and BNPB (National Disaster Management Coordinating Board /Badan Koordinasi Nasional Penanggulangan Bencana) between 2020 and 2022. The study found that foreign exchange rates had a direct impact during the pandemic period while inflation did not. The study also found that Covid-19 had a direct impact on the composite stock price index, foreign exchange and inflation, although the impact was relatively insignificant due to the short term nature of the variable.

Keywords ***: Inflation, Exchange Rate, Stock Price Index, Covid-19***

INTRODUCTION

2019 was a great shock to the world as Covid-19 proliferated worldwide, from Wuhan in China to every corner of the world with serious threats to human health. A series of lockdowns and cross border mobility restrictions were crisis mitigation responses taken by countries across the globe as measures to control virus spreads.

Unprecedented scale and scope of disruptions caused by the pandemic had impacted businesses around the world as effects of access restrictions, work from home arrangements, school shutdowns, trade centers and airports shutdowns. These impacts to businesses in Indonesia was reflected in the decline of stock price index at the Indonesian Stock Exchange. At the end of 2019 the numbers were at 6.323.67, within months it went down to 5.866,95 by February 2020 together with the first identified cases in Indonesia. By March, prices were at 4194.95, the lowest recorded in the last nine years.

DOI :
ISSN :

In parallel, the foreign exchange rates in Indonesia also showed movements whereby Rupiah to US dollar rates were at 14.219 at the end of 2019, by april 2020 the rates spiked to 16.371, the highest since the economic crisis in 1999. These rates posed a significant impact to the Indonesian economy, particularly against the sharp decline of business activities, earning power, and price increase in basic goods and services.

The extent that macroeconomic levers influence composite stock price index have been the subject of research in several countries/markets. Clifford et al (2022) showed that in the case of Ghana, macroeconomic proxies such as GDP, interest rates, and money in circulation do not have significant impact towards price volatility. Suriani et al (2021) looked at monetary policy's impact and found that interest rates do not have causal effect, for example foreign exchange rates and inflation impact on stock prices.

Damodaran (2001) showed that in maximizing value for a business, there are three influence decisions namely financing decisions, investment decisions and dividend decisions. In this context, exchange rates influence spending decisions, particularly when the expense is using foreign exchange values. Exchange rates enable a business to translate a foreign currency to its local equivalent in currency value as a basis for decisions (Mahyus Ekananda (2014:168). Keynes's theory posited that when a group of people wishes to live beyond one's means, there will be over purchases in goods and services, and this in turn influences supply and demand dynamics. Interest rates in this context is a monetary phenomenon, whereby interest rates influence demand for certain currencies in the money market. Interest rates in this sense, is the price for funds, which can be lent, is determined by preferences and sources of loans in the market.

Although foreign exchange fluctuations have minimal impact on daily stock index closing prices in DJI, SSE, Nifty50, in USA, China and India (Krishnan and Dagar, 2022), foreign exchange movements influence volumes traded in the three exchanges. The GARCH model implies that there are unstable conditional variants for the volume at Nifty, but fluctuate for volumes at SSE and DJI.

Hung NT (2022) may have shed light on the reasons from another market. Hung analyzed empirically the effect of foreign exchange volatility and stock prices in five European countries in Central and East Europe (Hungary, Poland, Czech Republic, Romania and Croatia). In the period of 2000- 2017 found a two way volatility in two money markets in Hungary, Czech Republic, and Croatia prior to a crisis. A non-persistent volatility in the case of the three countries in post-crisis. No volatility transmission from the stock market to the foreign exchange market in Hungary, however the foreign exchange market to the stock market effect was found in Poland post crisis. Short financial impact given the duration and the findings, however, the results showed that the correlation could be dismissed between stock market and foreign exchange markets.

While trades occur in money and equity markets, disruptions at scale such as COVID-19 threw spanners to trade activities from reactionary policies and also

DOI :
ISSN :

business impacts in specific markets. Hunira et al (2021) for example, showed that government policies in containing the spread of COVID-19 in their jurisdictions have a direct impact on stock price volatility in different countries. Endri (2021) took a different angle, using GARCH method and came to a conclusion that abnormal returns have a negative reaction to COVID19, and IHSG volatility fluctuated widely during the height of COVID19 in Indonesia. Sun Liu and Prodromou (2021) exhibited that trade volumes determined stock price reactions when markets were on the move, showing moderate effects in reducing stock price reactive behaviors, but the effect was insignificant when tested against consumer basic needs sectors. The nature of basic needs sectors itself reduces the reactionary stock pricing.

As such, this study expands Clifford et al (2022)'s work, where its macroeconomic parameters were limited to indicators of money in circulation, interest rates and GDP, thereby limiting the ability to measure macroeconomic influences to stock price index. Therefore, this study seeks to experiment the expansion by including COVID-19 as a moderating variable, to enable viewing the impact od foreign exchange rates and inflation towards stock price indices – whether these variables strengthen or weaken Indonesia's stock price index.

This study is seen timely as the world faces an increasing range of disruptions and sources of crises. By looking at a crippling event/crisis such as Covid19 as moderating variables, this study seeks to assist investors in risk mitigation and improve investment decisions that may have been disrupted by global-scale incidents like COVID-19.

LITERATURE REVIEW

Bodies of literature have been produced regarding volatilities, COVID-19 reactions, and macroeconomic parameters' impacts on stock price index. Supanee Harnphattananusorn (2021) visited the asymmetrical relationships between foreign exchange rates and oil prices using *auto-regresif* nonlinear Lag (NARDL) distributions developed by Shin et al (2014). This methodology enables the estimation of asymmetrical coefficients in long term and short term periods using co-integration frameworks. For measurements of foreign exchange volatility, the study uses the GARCH (1,1) model, applying January 2000 to June 2021 data sets. The study showed that the asymmetry of impact from shocks in oil prices in Thailand swapped the two, long term running and short term running. Moreover, both positive and negative effects can be spotted in the stock prices due to volatility in foreign exchanges in the short run.

Beirne et al (2021) learnt about reactions of the global money market in 38 countries affected by COVID19 pandemic, focusing particularly on capital flow dynamics in 14 developing markets. The research showed that Covid19 had the most substantial effect in EMEA capital markets. The study also tested the effectiveness of fiscal and monetary policies towards COVID19, showing that the bond market in EME countries seemed to be the most affected by COVID19 compared to the impact towards stock prices and foreign exchange rates. Shaobo et al (2021) used both *Autoregressive Distributed Lag* (ARDL) and *Nonlinear* ARDL (NARDL) to explore the symmetrical and asymmetrical effects of the

DOI :
ISSN :

RMB rates and global commodities prices against Chinese stock prices. The study demonstrated that without critical variables of global commodities price, there is no cointegration correlation between the RMB and Chinese stock prices, furthermore the coefficient of RMB exchange rate was statistically insignificant. However, the moment global commodities prices were included in the NARDL model, the result showed that the TMB rates had negative effect on stock prices in China, that there are in fact long term cointegration relations between RMB rates, global commodities prices, and stock prices in NARDL modeling, and that the changes in the global commodities price had asymmetrical effects on Chinese stock prices in the long run. More specifically, China's stock prices are more sensitive to inclines than declines of global commodities prices.

In a different market, Alfredas Laurinavi et al (2021) used macroeconomic variables such as GDP, unemployment rates, inflation, wages, and internal migration to study house prices (purchase of a house and house rent rates) in Vilnius between 2006-2019. The conditions in which different macroeconomic factors influence housing prices were established in this study. Lower unemployment rates, higher GDP per capita and inflation rates all had correlations with higher nominal value of housing in Vilnius. Higher GDP per capita, wages and internal wages had positive correlation with rent prices in Vilnius. Overall the macroeconomic variables analyzed explain 88% nominal price variants for housing in Vilnius in the period of 2006-2019, and 80% variants in rent prices in the same period.

Wajdi Moussa et al. (2020) empirically analyzed the dependencies between exchange rates and stock prices in seven countries - Canada, Japan, Denmark, Hong Kong, Singapore, Mexico and Brazil; finding that asymmetrical responses in the relationship between stock prices-exchange rate, with high persistence from conditional correlations. The study also showed the two-way overflow effects between different series. In addition, the results also demonstrate different behaviors between exchange rate and stock prices during crisis period, showing the need for special policy interventions. Lastly, the findings also offer insights for investors, portfolio managers, and policy makers regarding international portfolios and monetary policies.

Meanwhile, Takeshi Hoshikawa et al (2021) studied the impact of Covid 19 towards equities markets and South Korean exchange rates. Daily data in the period from 2 January 2019 to 31 August 2020, new infection spikes increases volatility of stock price index and reduces foreign ownership over domestic stocks, which indirectly led to depreciation of South Korean Won. The study found that interventions by the Bank of Korea towards foreign exchanges had short term effects with limited impact. The intervention did not affect exchange rate volatility.

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METHODOLOGY

a. Research Method: Qualitative

DOI :
ISSN :

This paper seeks to find the impact of Indonesian Rupiah exchange rate against US Dollar, together with inflation, on the stock price index at the Indonesian Stock Exchange, with COVID19 as the moderating variable.

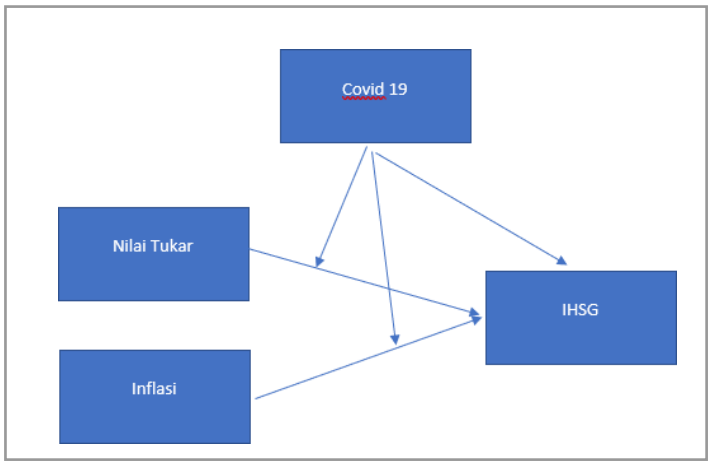


Image 1.1 Logical Framework
Correlation between Indonesian Rupiah exchange rate against US Dollar, together with inflation, on the stock price index at the Indonesian Stock Exchange, with COVID19 as the moderating variable

This study employs a quantitative approach, which tests the correlation to understand whether COVID19 as the moderating variable had a strengthening or weakening impact towards the stock price index in Indonesia.

b. Variables

1. Exchange Rate (x1) as a dependent variable, in this instance measured through IDR rates against USD.
2. Inflation (x2) as an Independent variable, in this instance obtained from Bank Indonesia publications, as the monetary authority institution in Indonesia
3. Stock Price Index (y) as an Independent variable, which is the composite stock price index of all companies listed in the Indonesian Stock Exchange.
4. *Covid*-19 (z) measured through level of positive cases in Indonesia published by the National Board for Disaster Management (BNPB)

DATA COLLECTION METHOD

This study uses secondary data from the stock exchange composite stock price index (IHSG), accessible through the stock exchange website www.idx.co.id, meanwhile inflation data and IDR-USD exchange rates are sourced from Bank Indonesia publications and Indonesian economic statistics. For COVID19 data, this study sources data from the National Board for Disaster Management (BNPB). The secondary data collected are monthly data in the period between 2020-2022. The reason for this data period is that the reported COVID19 outbreak in Indonesia started in 2020, not in 2019.

DATA ANALYSIS METHOD

DOI :
ISSN :

To test the hypothesis that exchange rates and inflation has effects on stock price index, with COVID19 as the moderating variable, the data collected is analyzed using *Moderated Regression Analysis* (MRA) - which is a specific application of double linear regression where in the regression equation, there are elements of interaction (multipliers of two or more independent variables), so that strengthening or weakening impacts can be observed in the case of Indonesia's stock price index.

FINDINGS AND ANALYSIS

Following the data analysis using MRA path analysis, the model generated are as follow:

The processed data in the above schematic shows that the exchange rate has a negative impact towards the composite stock price index (IHSG) at 0.714 or 71.4%, with a significant impact in the decline of the stock price index in the Indonesian Stock Exchange because the P value is <0.05. Inflation as a variable has a positive impact on IHSG, at 0.602 or 60.2%, and is not significant because the P value is >0.05. Meanwhile, COVID-19 rate of infection has a positive impact on the stock price index, at 0.225 or 22.5%, however it did not have a significant impact on IHSG with P value >0.05.

The findings also demonstrated that the impact of IDR exchange towards IHSG with COVID19 cases as moderator, has the ability to weaken IHSG by -0.142 but did not have significant impact. Whereas inflation variable towards IHSG with COVID19 as moderating variable weakened IHSG by -0.021, also with no significant impact. The MRA results show that there are simultaneous impacts between IDR exchange rate, inflation and COVID19 cases, observed from R-square at 0.627. On the other hand, the net influence can be observed in the *Adjusted* R *Square at 0.550.*

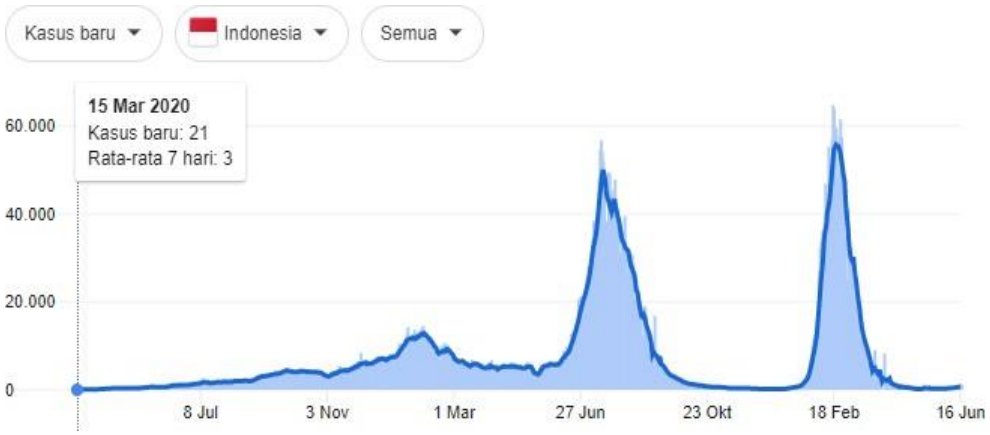
Variable	Coefficient	T-Statistics	P Value	Note
Effect Moderation X1	-0,142	0,316	0,752	Not significant
Effect Moderation X2	-0,021	0,036	0,972	Not significant
X1 → Y	-0.714	2.436	0,015	Significant
X2 → Y	0,602	1,787	0,075	Not significant
Z → Y	0,225	0,693	0,489	Not significant
R Square	0,627			
Adjusted R Square	0,550			

Based on the above table, IDR exchange has a negative impact but is significant towards the decline of the stock price index at the stock exchange, where IDR exchange rates during COVID19 pandemic experienced volatility, hitting IDR 16,000 per USD 1 in March 2020. These findings reaffirm the theory

DOI :
ISSN :

presented by Domadoran (2021) that exchange rates have an impact on stock price index.

Inflation did not have a significant impact towards composite stock price index suring COVID19 in Indonesia. The findings showed a different trajectory than that of Clifford et al (2022)'s. This study showed that inflation during COVID19 tends to be quite low, at an annual rate of 3.7%, thus no impact to volatility of stock prices at the stock exchange.



DOI :
ISSN :

COVID19 rate of infection did not have a significant impact towards stock price index at the stock exchange in Indonesia, which is the opposite of Takehi Hoshikawa et al. (2021)'s findings. Based on the number of COVID19 cases chart, the height of COVID19 in Indoensia was in July 2022 and February 2022 where the charts were inversely proportional with IHSG trends where IHSG only had declines at the beginning of COVID19, or in other words temporary effect, and afterwards the index inclined, peaking at 7,000 levels.

CONCLUSION

Based on this study's data analysis, and the discussions in aforementioned sections, the conclusions are as follow:

1. IDR exchange rates had a negative impact and were significant towards IHSG during COVID19 pandemic, where exchange rates tend to fluctuate during COVID19 period, and as such puts pressure on the stock price index in the Indonesian stock exchange.
2. Inflation had a positive impact but not significant to IHSG, as data showed inflation rates during COVID19 only took place at the beginning of the spread, and therefore did not carry impact in pressuring the stock price index.
3. COVID19 infection rates had a positive impact, but insignificant to IHSG, where COVID19 only had short term impact, thus limited influence towards the stock price index movements at the exchange.

SUGGESTIONS

Based on the conclusions, the following are recommendations from this study:

1. Investors should pay attention to IDR exchange rates during crises like COVID19 to anticipate the downfall of stock price index due to the weakening of IDR.
2. Government needs to control inflation as efforts to reduce investor panic reactions and prevent cross border capital outflow.

DOI :
ISSN :

3. Appropriate COVID19 management by authorities can support investor faith in the Indonesian stock exchange

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