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Information of Covid-19 and its Impact on Stock Return

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Abstract. This paper study the impact of information on the internet regarding Covid-19 and vaccination on the stock return. The pandemic itself has affected the world in every sector and market, including the stock market. Investors take information from the internet to make investment decision and during pandemic covid-19 and vaccination are the interest of investors around the world. This research takes sample of Indonesia, Malaysia, Singapore, and Thailand's stock market return from March 2020 until February 2022. This study applied random effect to test the model. Findings from this research show that GSV (Google Search Volume) of Covid and Vaccine simultaneously didn't affect the stock return. However, GSV Vaccine has positive impact on Indonesian stock return.

Keywords: GSV; stock return; Covid-19; Vaccine

1. Introduction

At the beginning of 2020 the whole world was faced with the Covid-19 virus pandemic which began to hit rapidly, starting from the city of Wuhan in China and spreading to many other countries through people traveling whether business, tourism or personal from countries that had exposed to this new virus. The Covid-19 virus had a negative effect on the world economy where this pandemic caused economic activity in the world to almost completely stop at first because the spread of the virus was very fast which made countries start to lock down. At the beginning of the pandemic, Covid-19 had a direct negative effect on liquidity and market returns (Zhang et al., 2020 & Baig et al., 2020), the main effect was based on reports of covid cases where investors themselves felt great fear of the condition the market at that time where the rapid spread of Covid-19 news made the stock market itself immediately respond and made market conditions very volatile compared to the previous time period (Corbet et al., 2020). With market conditions that are very uncertain and fluctuating, this makes investors monitor more closely the news presented by the media, which has an impact on the price of the stock return, this is because investors use news information to minimize the risk of the stock they have. So from this study using Google Search Volume (GSV) to see how much attention people use the internet to find existing information about Covid-19. According to Choi and Varian (2012) Google search volume can also review many economic activities and can also be a study in reviewing economic developments. There are many opinions that Google search volume is very useful for reviewing investor attention, according to (Da et al., 2011) investors can use the GSV to build the Financial Economic Attitudes Revealed by Search (Fear) index and find that an increase in the anxiety sentiment index has an impact on lower returns today followed by a reversal in the following days. The reversal pattern was also noted by Tang and Zhu (2017) and Cheng et al. (2019) who show that a reversal occurs when a price shock is not accompanied by new, more accurate information for the related stock.

2. Literature Review

The Covid-19 pandemic has had a negative effect on the world economy, where almost all world economic activity has come to a complete halt, due to the implementation of social distancing by every country. As a result of this pandemic, business actors, workers and business owners have experienced an immediate economic shock throughout the world. The Supply Chain is challenged to provide large quantities of essential pandemic needs in a short time such as masks, sanitizers, medical oxygen, personal protective equipment and food (Singh et al., 2021). As a result of supply chain imbalances, a number of industries are closed due to a shortage of raw materials so that manufactured goods stop and the global supply chain is disrupted. (Demir et al., 2021a) The

pandemic created unprecedented supply and demand side shocks, resulting in a sharp contraction in economic activity.

In several countries, the impact of Covid-19 on the stock markets of G7 countries has been tried to be overcome by government policies, as studied by Narayan et al. (2021). They found that government policies were effective and lockdowns resulted in a cushioning effect and also appeared to have had a positive impact on rising stocks. Rizwan et al. (2020) estimated systemic risk in countries affected by COVID-19. Zhang et al. 2020 found that greater pandemic uncertainty is associated with volatility in markets and unpredictability

Ortmann et al., (2020) finds investor behavior regarding trading level transaction data showing that the arrival of the Covid-19 virus made the volume of trade transactions increase very significantly using margin. In their research, they showed that the arrival of Covid-19 increased new investors opening their stock brokerage accounts and old investors continued to make transactions which, if measured on a weekly basis, the transactions that had been made reached 13.9% from the previous weekly transactions. the emergence of news from media reports, the opinions of financial and investment experts as well as all opinions related to current issues make investor transaction activities changeable and it is even unclear which of all the negative information such as terrorist bomb attacks, pandemics and others can be give a shock to each Investor.

(Preis et al., 2010) also conducted research using the Google search engine to examine how population information from 2004 to 2010, the Lehman Brothers financial crisis affected stock returns and the volume of American stocks such as the S&P 500, in his research showed that Google search information affect fluctuations in stock market volume but there is no correlation with transaction volume and also stock returns, according to (Preis et al., 2010) Google search volume can be used as stock trading because it can measure search volume and trading volume. Yoshinaga & Rocco, 2020) stated that Google search volume can measure investor attention on a stock market and it is very beneficial for investors to trade stocks which are in accordance with the volume of transactions predicted by Google trends. (Smales, 2021) sees that this Google trend has become a figure for investors in taking action to buy & sell their stock to reduce the risk they bear in a pandemic situation that is still unknown and also Google Trend can be a warning to investors in trading on the stock market. Thus this research is testing the effects of Covid-19‘s information towards stock market returns.

3. Research Method

This research took the data sample from four countries in Asia, namely Indonesia, Malaysia, Singapore, and Thailand. Research period is from March 2020 until February 2022. The data used for each variable are discussed in table 1. Data used in this research are secondary data and are collected through S&P Capital IQ platform, yahoo finance, dan available data in the internet.

Table 1.
Operational Variables

Variables	Variables Type	Formula	Sources
Stock Return ($r_{i,t}$)	Dependent variable	$(P_1-P_0)/P_0$	Smales (2021)
GSV Covid-19 ($\Delta GSV_{i,t}$)	Independent variable	$(GSV_1– GSV_0)/GSV_0$	Smales (2021)
Covid Cases ($logCases_{i,t}$)	Independent variable	Log covid cases	Smales (2021)
Oil Price ($Oil_{i,t}$)	Control variable	Daily price	Rakhit et al (2021)
Exchange rate ($Exchange_{i,t}$)	Control variable	(Exchange $rate_1$ -exchange $rate_0$)/exchange $rate_0$	Rakhit et al (2021)
GSV Vaksin ($GSVvaksin_{i,t}$)	Control variable	$(GSV_1– GSV_0)/GSV_0$	Smales (2021)
Vaccine rate ($Vaccinerate_{i,t}$)	Control variable	Daily Vaccine rate	Smales (2021)
Lagged return ($r_{i,t-1}$)	Control variable	Lagged stock return	Smales (2021)

Empirical Model

Research model to test the information of COVID-19 information was determined as follow:

$$r_{i,t}=\beta_1 + \beta_2 \Delta GSV_{i,t} +\beta_3 \log Cases_{i,t} + \beta 4 Oil_{i,t} + \beta 5 Exchange_{i,t} + \beta 6\ GSVvaksin_{i,t} + \beta 7 Vaccinerate_{i,t} + \beta 8 r_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

4. Result and Discussion

Table 2 shows the statistic descriptive of all the variables. The regression model that was used is Random Effect Model through testing of panel data.

Table 2.
Statistics Descriptive

	Mean	SD	Min	Max
Stockindex~n	0.0002701	0.0100369	-0.1079935	0.1019069
Gsv	0.0156421	0.2002215	-.744186	3.666667
Covidcases	2.674555	1.241193	0	4.81103
Oilprice	-0.0029742	0.127968	-3.059661	0.3766234
Exchangerate	.0023878	.0490724	-0.0246909	0.0357055
Gsvvaksin	15.45673	30.7168	-0.9705882	18
Vaccinerate	22.34011	0.8391721	0	96.3
Laggedreturn	0.0002581	0.0100435	-0.1079935	0.1019069
Observation	2,912			

Table 2 shows the statistics value of mean, standard deviation, minimum and maximum value of each variables. All variables went through winzor process of 1% to reduce the outlier data.

4.1 Panel Data Result

4.1.1 Uji Hausman

Table 3
Hausman Test

Hausmant Test	Chi2	Prob > Chi2	Result
Model Panel	0.46	0.9996	Random Effect Model

Based on Hausman test result in table 3, it can be concluded that the model is best to use random effect mode.

4.1.2. Langrage Multiplier Test

Table 4
LM test

LM Test	Chi2	Prob > Chi2	Result
Model Panel	108.03	0.0000	Random Effect Model

Based on LM test, it suggest that the research model should use random model.

4.2 Diagnostic Test

This diagnostic test is used to ascertain whether the parameter estimates and regression coefficients are unbiased and also a condition for multiple regression and meet the criteria of the BLUE (Best Linear Unbiased Estimator). This diagnostic test will carry out normality tests and multicollinearity tests.

4.2.1 Normality Test

Table 5
Normality test

Normalitas Test	Z	Prob > Z	Result
Model Panel	15.205	0.00000	abnormal

If seen from the table above, it shows that the probability of the normality test is 0.0000, which is less than alpha 0.05, the results obtained from the normality test are that accepting H1 means that there is a problem of normality/abnormality.

4.2.2 Multicolienarity Test

Table 6
Multicollinearity Test

Multicollinearity Test	VIF	1/VIF	Result
Model Panel	1.18	0.846130	No multicolienarity

Based on the Multicollinearity Test table 6, it shows that the VIF value in the regression model is less than 10, so the results there is no multicollinearity.

4.3 Regression Result

Of all the testing processes that have been carried out, it was found that in the normality test there is a problem of the absence of normality in the regression model of this study. So to overcome this problem of normality, a cure cross-sectional time series was carried out for this study, which used a random effect model as the research model. Then the results obtained after using the cure cross-sectional time series are as follows:

4.3.1 Regression Result of Individual Country

Table 7
Regression Result - Indonesia

stockindexreturn	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
GSV	-.0058601	. .0033025	-1.77	.076	-.0123437	.0006236	*
Covidcases	.0005079	. .0008424	0.60	.547	-.001146	.0021618	
Oilprice	. .0062371	.002111	2.95	.003	.0020926	.0103817	***
exchangerate	-.6928977	.2275664	-3.04	.002	-1.139671	-.2461248	***
GSVvaksin	.0022723	.0008669	2.62	.009	.0005703	. .0039743	***
vaccinerate	4.89e-06	.0000144	0.34	.735	-.0000234	.0000332	
laggedreturn	-.0286872	.0515815	-0.56	.578	-.1299552	.0725809	
Constant	-.0014696	.0032088	-0.46	.647	-.0077692	.0048301	

Mean dependent var	0.000	SD dependent var	0.011
R-squared	0.088	Number of obs	728

F-test	3.568	Prob > F	0.001
Akaike crit. (AIC)	-4569.621	Bayesian crit. (BIC)	-4532.899

*** p<.01, ** p<.05, * p<.1

Based on the regression test on Indonesia presented in table 7, information about Covid-19 don't have significant effect to stock return in Indonesia, but vaccine does.

Tabel 8
Regression Result – Malaysia

stockindexreturn	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
GSV	-.0014976	.0024468	-0.61	.541	-.0063013	.0033061	
Covidcases	.0002109	.0003484	0.61	.545	-.0004731	.0008948	
Oilprice	.0008282	.002446	0.34	.735	-.0039741	.0056304	
exchangerate	-1.188346	.2131294	-5.58	0	-1.606776	-.769917	***
GSVvaksin	-.0003223	.0003386	-0.95	.342	-.0009872	.0003425	
vaccinerate	-3.83e-06	9.07e-06	-0.42	.673	-.0000216	.000014	
laggedreturn	.006144	.0439904	0.14	.889	-.0802208	.0925089	
Constant	-.0003317	.0010516	-0.32	.753	-.0023963	.0017328	

Mean dependent var	0.000	SD dependent var	0.008
R-squared	0.122	Number of obs	728
F-test	5.002	Prob > F	0.000
Akaike crit. (AIC)	-5026.348	Bayesian crit. (BIC)	-4989.626

*** p<.01, ** p<.05, * p<.1

Findings in table 8 shows that in Malaysia, information about Covid-19 don't significantly affect stock return.

Tabel 9
Regression Result - Singapore

stockindexreturn	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
GSV	.0021187	.0032547	0.65	.515	-.0042712	.0085085	
Covidcases	.0000241	.0003701	0.07	.948	-.0007025	.0007507	
Oilprice	.0023257	.0015879	1.46	.143	-.0007917	.0054431	
exchangerate	-1.50721	.2558476	-5.89	0	-2.009506	-1.004913	***
GSVvaksin	.0001461	.0008857	0.16	.869	-.0015928	.001885	
vaccinerate	1.68e-06	9.93e-06	0.17	.865	-.0000178	.0000212	
laggedreturn	-.037939	.0895689	-0.42	.672	-.2137863	.1379083	
Constant	-.0000188	.0007563	-0.02	.98	-.0015035	.001466	

Mean dependent var	0.000	SD dependent var	0.010
R-squared	0.131	Number of obs	728
F-test	7.391	Prob > F	0.000
Akaike crit. (AIC)	-4769.809	Bayesian crit. (BIC)	-4733.086

*** p<.01, ** p<.05, * p<.1

Findings in table 9 shows that in Singapore, information about Covid-19 don't significantly affect stock return.

Tabel 10
Regression Result - Thailand

stockindexreturn	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
GSV	-.0020154	.0013051	-1.54	.123	-.0045776	.0005468	

Covidcases	.000221	.0003333	0.66	.507	-.0004334	.0008754	
Oilprice	-.0034304	.0031826	-1.08	.281	-.0096787	.0028179	
exchangerate	-.843449	.2023967	-4.17	0	-1.240807	-.4460907	***
GSVvaksin	.000058	.0003333	0.17	.862	-.0005964	.0007124	
vaccinerate	-.0000119	.0000136	-0.87	.382	-.0000385	.0000148	
laggedreturn	.0543416	.0483936	1.12	.262	-.0406678	.149351	
Constant	.000137	.0008914	0.15	.878	-.0016129	.001887	

Mean dependent var	0.000	SD dependent var	0.011
R-squared	0.061	Number of obs	728
F-test	3.295	Prob > F	0.002
Akaike crit. (AIC)	-4505.675	Bayesian crit. (BIC)	-4468.953

*** p<.01, ** p<.05, * p<.1

Findings in table 10 shows that in Thailand, information about Covid-19 don't significantly affect stock return.

4.3.2 Regression Result all countries

Table 11
Cross-sectional time-series FGLS regresion

stockindexreturn	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
GSV	-.0002531	.0008804	-0.29	.774	-.0019787	.0014725	
Covidcases	-.0000164	.0001157	-0.14	.888	-.0002431	.0002103	
Oilprice	. .0024934	.0019291	1.29	.196	-.0012876	.0062745	
exchangerate	-.5455964	.0553067	-9.86	0.000	-.6539956	-.4371972	***
GSVvaksin	.0000867	.0002005	0.43	.666	-.0003063	.0004796	
vaksin	-1.43e-06	6.04e-06	-0.24	.814	-.0000133	.0000104	
laggedreturn	.021877	.0160854	1.36	.174	-.0096498	.0534038	
Constant	.0002806	.0004312	0.65	.515	-.0005646	.0011257	
Mean dependent var		0.000	SD dependent var			0.010	
Number of obs		2912	Chi-square			103.755	
			Prob > chi2			0.0000	

*** p<.01, ** p<.05, * p<.1

Regression result in table 11 shows that information about Covid-19 don't influence the stock return of all countries. There's only one control variable—exchange rate that is significant to stock return. Based on the panel regression result from table 7-11 on overall and individual countries, there's a consistency findings that stock index return is not influenced by information about COVID-19. The research see that over time the impact of the Covid turmoil on society has begun to be adapted by many interventions that have been carried out by each country, such as reducing central bank interest rates, liquidity injections, tax subsidies, and vaccinations. All of this makes market conditions more conducive so that the Covid information will no longer have a significant impact.

5. Conclusion and Recommendation

Result from this research show that information about Covid-19 don't affect stock return in all four countries. We assume that information about covid become something usual to the society overtime. However, there's a positive significant effect of vaccination information to stock return in Indonesia. Vaccination is perceived as a solution to the pandemic situation, thus, the information about vaccine gives positive effect to the market. Researchers who are interested in this topic may continue the analysis with different method, such as event study analysis to see the difference and impact in a certain window period.

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