

ANALYSIS OF EXPECTED STOCK RETURNS IN 2020 - 2022 USING ARBITRAGE PRICING THEORY (STUDY ON STOCKS INCORPORATED WITH THE IDX-30 INDEX ON THE INDONESIA STOCK EXCHANGE)

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ABSTRACT

This study aims to determine which IDX-30 member stock issuers have the highest expected return values in 2020, 2021, and 2022, and macroeconomics which have a high influence on the expected returns of IDX-30 member stock issuers in 2020, 2021, and 2022. The population in this study is all stock issuers who are registered as IDX-30 members in 2020, 2021, and 2022, and the stock data taken is the issuer's stock data from 2020, 2021, and 2022. Stock price data and prices The JCI index is taken from the Investing.com website, and data on stock issuers who are members of the IDX-30 2020 – 2022 are taken from the doctorsaham.com website. Bond data is obtained from the KSEI website. Inflation data and USD exchange rate data taken are monthly data from December 2019 – December 2022. Inflation data is taken from the BI.go.id website, and USD exchange data is taken from satudata.kemendag.go.id website. The sample in this study is all members of issuer shares who consistently join as IDX-30 members in 2020, 2021 and 2022. The number of IDX-30 samples in 2020 is 27 issuers of shares, in 2021 there are 26 issuers of shares, and in 2022 there are 26 stock issuers. Calculating expected stock returns using the Arbitrage Pricing Theory, and ranking expected stock returns is done in the Microsoft Excel application, and Linear Regression is used to test the hypothesis in the JASP application

KEYWORDS *IDX-30, linear regression, Arbitrage Pricing Theory, JCI, inflation, USD exchange*



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INTRODUCTION

In early 2020, the whole world experienced the spread of a new virus called COVID-19 because this virus was only discovered at the end of 2019 in Wuhan City, People's Republic of China, and then spread to all over the world. The rapid spread of the COVID-19 virus around the world has resulted in most countries around the world imposing lockdown policies to inhibit the spread of the COVID-19 virus (Chakraborty & Maity, 2020). The lockdown policy resulted in several industrial sectors, such as the tourism industry, aviation industry, retail industry, automotive industry, and aircraft assembly industry experiencing a decline. Economic activity is due to lockdown policies (Yunus & Rezki, 2020). However, not all industries experienced a decline in economic activity, the technology industry, and the pharmaceutical and medical device industries, greatly benefiting during the lockdown policy applied. During 2020 – 2021, several countries in the world implemented policies in the form of subsidies to private companies, state companies, and the general public to maintain economic activities. It remains ongoing as long as the lockdown policy is in place (Hastuti et al., 2020). One such policy is the provision of low-interest loans and high profits of companies in the technology sector at the time the lockdown was imposed. Technology sector companies are expanding massively by utilizing capital flows provided by retail investors and institutional investors such as venture capitalist companies. Economic policies implemented around the world are not able to help the world economy escape from economic recession.

Initially, 2022 was expected to be the year when the global economy recovered from the impact of lockdowns carried out from 2020 – 2021 to overcome the spread of COVID-19 (Kusno, 2020). After most of the world's population is injected with vaccines and the rate of spread of the COVID-19 virus decreases by the end of 2021, it is expected that in 2022 economic activity will slowly – land is recovering as it was before the COVID-19 pandemic (Tavilani et al., 2021). However, the reality that has occurred throughout 2022, makes the optimist turn pessimistic with the forecast that in 2023 most countries in the world, especially countries that are included in EU (European Union) members, the United Kingdom, the United States, Japan, Australia, and Canada will enter periods of economic recession that may exceed or be equivalent to the economic depression period in the 1920s – 1930s.

The main cause of the difficult economic recovery occurred in 2022, due to the Russian-Ukrainian war in February 2022 (Nasir et al., 2022). The result of this war is that all western countries, including the EU, carry out economic sanctions, such as freezing Russian-owned foreign exchange reserves stored in western countries, limiting prices. Buy oil and gas from Russia, many companies from western countries exit the Russian market, cancel the operation of the Nord Stream 2 gas pipeline, and others. The purpose of these economic sanctions is to restrict Russia from funding its military campaign in Ukraine, and then make Russia make peace and withdraw its soldiers from Ukraine. However, Russia retaliated by refusing to sell petroleum, natural gas and other mineral commodities to western

countries, and shifting sales to Asian countries, such as India and China that bought most of Russia's petroleum and natural gas at low prices and then sold it at the prevailing prices on the market to the EU which before the war was the main consumer of the commodity produced by Russia.

The economic war waged by western countries and Russia led to an increase in prices for raw mineral goods, petroleum and natural gas on the world market (Mahendra, 2022). This price increase has caused high inflation in countries that have the status of the most advanced economies in the world, such as the United States which is experiencing inflation was 7.1% in November, down from 7.7% in October. Declining inflation in the United States, due to the actions of the Federal Reserves which raised the interest rate between 4.25% - 4.50% (Oktorino, 2022). The act of raising interest rates is also carried out by European and Asian countries.

Indonesia has also experienced the impact of the economic turmoil caused by the Russian-Ukrainian war and the economic sanctions from western countries to Russia (Zehfri, 2022). The impact that has occurred so far is generally positive because Indonesia is one of the largest exporters of mineral materials in the world, such as coal. Coal prices that rise in 2022 become a durian collapse for mining companies in Indonesia such as BUMI Resources, ADARO, Bayan Corporation, and other mining companies. The increase in prices of other commodities in the international market, such as bauxite, tin, aluminum and nickel, makes Indonesia's trade balance positive during 2022. The negative impact experienced by Indonesia is in the form of an increase in the price of Pertalite subsidized fuel from Rp. 7,500.00 to Rp. 10,000.00 because Indonesia is one of the countries importing raw oil and fuel from abroad. The increase was also experienced by semi-finished goods and finished goods that were still imported from abroad due to the dollar value that rose against the Rupiah to Rp. 15,630.00. The increase in fuel and some imported products caused Indonesia's inflation to rise to 5.42% in November, down from October and September of 5.71% and 5.95 %. However, it is still higher than in August where the fuel increase has not been announced, which is 4.69%. The steps taken by BI to reduce inflation and protect the rupiah by raising the benchmark interest rate starting from August to December, which are 3.75%, 4.25%, 4.75%, 5.25%, and 5.5%, respectively.

The Indonesian government's economic policies and international economic conditions affect the share prices of Indonesian companies on the Indonesia Stock Exchange. Several issuers in the mining sector have felt the positive impact of the increase in the price of mining products in the international market. However, some companies that rely on cheap funds, such as technology companies, have experienced negative impacts from rising inflation and interest rate hiking policies. by the majority of central banks around the world. The macroeconomic impact that occurred during 2020 - 2022, had a great influence on the expected returns given to investors. This study uses the APT calculation method to calculate the expected return of the stocks studied throughout 2020 - 2022.

Arbitrage Pricing Theory (APT), is the only stock calculation model that includes inflation, the amount of money in circulation, interest rates, and macroeconomic components in its calculations. The reasons mentioned in the previous sentence, caused the APT calculation method to be chosen as a method

that calculates the expected return of shares. Macroeconomics used as a component in the APT formula will be tested to determine which macroeconomics has a high influence on the expected return of stocks generated to investors.

This study uses issuers included in the IDX-30 index which is an index that measures the stock price performance of 30 stocks that are members. The stock issuers listed in IDX-30 are stock issuers that have the largest liquidity value and stock capitalization value on the Indonesia Stock Exchange. IDX-30 members are screened from members of the LQ-45 Index, in other words, the stocks included in the IDX-30 are blue chip stocks, and the composition of stock issuers in the IDX-30 index comes from various business sectors, so it is very suitable to be the object of research to find out the current macroeconomic impact on expected stock returns.

Research conducted by Vian Riska Ayuning Tyas, Komang Dharmawan, and Made Asih (2014), who conducted research on the application of the Arbitrage Pricing Theory model with the Vector AutoRegression approach in estimating the expected return on shares of KOMPAS 100 shares in 2010 – 2013 . The results of their study showed that out of 10 KOMPAS100 index stock issuers that were the object of the study, there was one stock issuer, namely LPKR whose value was influenced by changes in inflation and currency exchange rates. Keuda research, namely research conducted by Fitri Halimatus Sadiah, and Esi Fitriani Komara (2022), which conducted research on the use of Arbitrage Pricing Theory to analyze stock returns on banking sub-sector companies listed on the Indonesia Stock Exchange for the period 2015 – 2022. The results of the study using simultaneous hypothesis testing showed that inflation, exchange rates, and Gross Domestic Product (GDP) had a significant influence on stock returns . Partial testing of the hypothesis shows that the exchange rate negatively affects stock returns. inflation and GDP do not have a significant influence on stock returns

RESEARCH METHOD

Research is a type of quantitative research . This type of research data is secondary data, that is, data obtained from the second party, not the first party to issue the data. Data on stock prices and IDX-30 index prices are obtained from the Investing.com website, data on stock issuers included in the IDX-30 2020 – 2022 members are taken from thedoksaham.com website, issuer data on inflation and BI-7 Days Repo Rate data is taken from BI.go.id website, USD exchange rate data is taken from satudata.kemendag.go.id website, and bond data is obtained from KSEI's website. The data collection method is carried out by collecting data from the internet (IDX-30 Index, stock prices of selected IDX-30 issuers, inflation, USD exchange rate, BI-7 Days Repo Rate, bonds, and previous research articles), and through books on Arbitrage Pricing Theory models, investment, capital markets, and macroeconomic variables that were used as objects in this study (inflation, currency exchange rates for money, and interest rates). Stock data, IDX-30 index, inflation, USD rate, and BI-7 Days Repo Rate taken are monthly data. The coupon bonds taken come from the Indonesian Retail National Bond with the FR0044 series, and then divided by 12 months to get an ORI monthly coupon with the FR0044 series. The population in this study is all stock issuers who are members of IDX-30 from 2020 – 2022. Evaluation and replacement of members in the IDX-30

index is carried out once every 6 months, meaning that in a year there are twice (February – July, and August – January), and because the calculation is done annually, it is not calculated from the entire year. So, I decided to use IDX-30 issuer member data in the period February 2020 – July 2020, August 2020 – January 2021, February 2021 – July 2021, August 2021 – January 2022, February 2022 – July 2022, and August 2022 – January 2023. The sample determination method in this study uses the purposive sampling method by determining the sample criteria for this study, as follows:

1. Stock issuers who consistently become members of the IDX-30 within a one-year period, namely:
 - a) 2020 (February 2020 – July 2020, and August 2020 – January 2021)
 - b) 2021 (February 2021 – July 2021, and August 2021 – January 2022)
 - c) 2022 (February 2022 – July 2022, and August 2022 – January 2023)
2. It has conducted an IPO on the Indonesia Stock Exchange in 2020.

The free variables in this study are Actual Return (R_i), Excess Return, Risk-free Return (R_f), Market beta, inflation beta, interest rate beta, USD rate beta, Market (R_m) return, inflation return, interest rate return, and USD rate return

RESULT AND DISCUSSION

Beta Value of JCI, Beta Inflation, and Beta Exchange Rate of US Dollar in 2020, 2021, and 2022

The table below shows the Beta values of macroeconomic factors in stock issuers belonging to IDX-30 members in 2020, 2021, and 2021

Table 1 Macroeconomic Beta Value of each stock issuer in 2020

Issuer	β_M	β_i	β_K
ACES	0.021004	-0.151139	-0.976194
ADRO	1.469543	0.060340	0.869510
ANTM	4.080549	0.149118	2.316756
ASII	1.321108	-0.287486	-0.158245
BBCA	1.267490	-0.048203	0.722845
BBNI	1.456949	0.259036	-1.226988
BBRI	1.300532	0.057996	-0.193708
BBTN	1.964195	-0.147152	-1.134848
BMRI	1.517595	-0.135411	-0.085427
CPIN	0.803234	-0.432348	0.175400
ERAA	1.466372	-0.150226	-0.951450
GGRM	0.210908	-0.243958	-0.995381
HMSP	0.412081	-0.355874	-0.784804
ICBP	0.221566	-0.045674	0.151597
INCO	1.847938	-0.424613	0.774610
INDF	0.353120	-0.283954	0.024927
INKP	1.447871	-0.683036	-0.319409
INTP	1.699010	0.132849	0.840711
JPFA	0.998096	0.280925	-1.223039
KLBF	0.352531	-0.351388	-0.056565
MNCN	1.674788	0.321064	-0.395896
PGAS	3.100648	-0.043603	0.395439
PTBA	1.750786	0.374596	1.673895
SMGR	0.831578	-0.093058	-1.104131

Issuer	βM	βi	βK
TLKM	1.031487	0.334074	0.031985
UNTR	1.903970	-0.348482	2.283559
UNVR	0.129505	-0.284833	0.185208

Source: Researcher's Processed Data Results, 2023

Table 2 Macroeconomic Beta Value of each stock issuer in 2021

Issuer	βM	βi	βK
ADRO	1.035641	0.316853	0.131536
ANTM	2.172154	-0.209529	-2.348547
ASII	-0.507626	-0.133063	-4.563142
BBCA	0.479014	-0.041861	-3.551386
BBNI	2.951131	0.453421	0.700098
BBRI	1.635977	0.057544	-0.793454
BBTN	4.851604	0.355127	1.089064
BMRI	-0.043825	-0.131329	-2.993353
CPIN	0.788509	0.355985	5.239313
EXCL	0.880550	0.279654	-0.137933
GGRM	-0.647849	-1.075326	-2.809993
HMSP	0.766748	0.057111	2.160557
ICBP	0.056443	0.100373	1.400219
INDF	0.502288	0.274953	3.470000
INKP	-0.318695	-0.681014	-9.909450
KLBF	0.374361	0.014054	0.269273
MDKA	1.657536	-0.245356	-4.650334
PGAS	3.606749	0.338885	1.602202
PTBA	1.867898	0.360798	2.259957
SMGR	0.524396	-0.174686	-1.543852
TBIG	-3.330886	-1.388099	-10.206542
TKIM	0.184096	-0.934723	-12.095214
TLKM	1.721412	0.430712	2.464396
TOWR	2.603215	0.096349	3.808216
UNTR	0.606943	0.254713	-1.287898
UNVR	1.258433	0.176043	0.550989

Source: Researcher's Processed Data Results, 2023

Table 3 Macroeconomic Beta Value of each stock issuer in 2022

Issuer	βM	βi	βK
ADRO	2.43275	0.30827	-0.99047
ANTM	2.73155	-0.15759	-3.06205
ASII	2.43579	0.21891	-2.68811
BBCA	2.16581	-0.09715	2.63000
BBNI	2.88833	-0.00647	2.01558
BBRI	1.71949	-0.07660	1.46192
BMRI	2.60272	0.07782	3.57791
BRPT	0.84211	0.00859	1.15455

Issuer	βM	βi	βK
OPEN	1.86091	0.11051	0.17635
CPIN	-1.23972	-0.08865	-0.11865
EMTK	6.00180	0.41726	-1.07745
ICBP	-0.56671	-0.18280	5.77253
INCO	3.06056	0.01480	-1.35598
INDF	-0.79137	-0.01263	1.13053
INKP	2.21887	-0.22728	5.02172
KLBF	0.62458	-0.10140	3.52800
MDKA	2.29726	0.11017	-5.06603
PGAS	1.56531	-0.25931	1.31532
PTBA	1.27214	0.14317	-3.13909
SMGR	1.63342	-0.18047	6.78229
TBIG	-0.45091	0.21989	-2.09527
TINS	2.65814	-0.02336	-3.52936
TLKM	1.80835	0.10793	-0.85890
TOWR	-0.42292	0.04430	-1.17124
UNTR	3.19582	0.21110	0.96306
UNVR	-0.93595	0.04587	-0.18487

Source: Researcher's Processed Data Results, 2023

1. The results of the calculation and ranking of expected returns from the highest to the lowest based on the Arbitrage Pricing Theory model in 2020, 2021, and 2022.

The table below displays the results of the calculation and ranking of expected returns based on Arbitrage Pricing Theory in 2020, 2021, and 2022, as follows:

Table 4 Arbitrage Pricing Theory Calculation Results and Rankingsa 2020

Number	Issuer	<i>E. Return</i>
1	INKP	0.291438
2	HMSP	0.282906
3	GGRM	0.265414
4	ACES	0.240260
5	KLBF	0.237463
6	UNVR	0.213968
7	CPIN	0.208518
8	INDF	0.198135
9	SMGR	0.124226
10	ASII	0.098021
11	ICBP	0.086109
12	ERAA	0.067107
13	INCO	0.039723
14	BBTN	0.019335
15	BMRI	-0.006100
16	BBRI	-0.069417
17	JPFA	-0.073803

Number	Issuer	<i>E. Return</i>
18	BBCA	-0.075782
19	UNTR	-0.109000
20	BBNI	-0.116896
21	ADRO	-0.163945
22	TLKM	-0.190863
23	INTP	-0.225270
24	MNCN	-0.230953
25	PGAS	-0.272351
26	PTBA	-0.409465
27	ANTM	-0.616976

Source: Researcher's Processed Data Results, 2023

Table 5 Arbitrage Pricing Theory Calculation Results and Their 2021 Rankings

Number	Issuer	<i>E. Return</i>
1	TKIM	0.981836
2	TBIG	0.829238
3	INKP	0.821160
4	MDKA	0.438168
5	ASII	0.429140
6	BBCA	0.356642
7	BMRI	0.313028
8	GGRM	0.286754
9	ANTM	0.268020
10	SMGR	0.205516
11	UNTR	0.191834
12	BBRI	0.154440
13	EXCL	0.106945
14	ADRO	0.087599
15	KLBF	0.072449
16	UNVR	0.055027
17	BBNI	0.050353
18	BBTN	0.023595
19	ICBP	-0.011341
20	PGAS	-0.017082
21	HMSF	-0.067244
22	PTBA	-0.068959
23	TLKM	-0.083603
24	INDF	-0.162631
25	TOWR	-0.186227
26	CPIN	-0.292963

Source: Researcher's Processed Data Results, 2023

Table 6 Arbitrage Pricing Theory Calculation Results and Their Rankings in 2022

Number	Issuer	<i>E. Return</i>
1	TBIG	0.378188
2	ADRO	0.313402
3	EMTK	0.235023
4	ASII	0.214504
5	UNVR	0.205322
6	PTBA	0.195192
7	TOWR	0.176015
8	UNTR	0.156955
9	INDF	0.128747
10	TLKM	0.121328
11	OPEN	0.119683
12	MDKA	0.102684
13	CPIN	0.06985
14	BRPT	0.06027
15	BMRI	0.035328
16	INCO	-0.05445
17	KLBF	-0.05584
18	TINS	-0.07159
19	BBNI	-0.07403
20	ICBP	-0.08417
21	BBRI	-0.08652
22	BBCA	-0.13692
23	SMGR	-0.20769
24	ANTM	-0.22872
25	PGAS	-0.28481
26	INKP	-0.29122

Source: Researcher's Processed Data Results, 2023

The table above displays the results of arbitrage pricing theory calculations in 2020, 2021, and 2022. In table 4, it can be concluded that H1 was rejected, because there were no mining sector stock issuers who were in the top 5 stock issuers that gave the highest expected return to investors. The top five stock issuers are INKP (PT. Indah Kiat Pulp & Paper Tbk), HMSP (PT. Hanjaya Mandala Sampoerna Tbk), GGRM (PT. Gudang Garam Tbk), ACES (PT. Ace Hardware Indonesia Tbk), and KLBF (PT Kalbe Farma Tbk). The high expected return provided by INKP is due to INKP's ability to score a net profit in 2020 of IDR 43.29 trillion, an increase of 7.17% from the year's profit in 2019 amounted to IDR 3.97 trillion. INKP's management ability increased net profit at a time when world pulp prices were declining throughout 2020, and declining paper demand was due to the COVID-19 pandemic. HMSP provides a high expected return in 2020 due to HMSP's ability to continue to distribute dividends from 2019 net profit results even though in 2020 it experienced a decline in net profit, due to the COVID-19 pandemic, and HMSP maintained its position as the ruler of cigarette market share in 2020 by 28.8%.

GGRM provides high expected returns in 2020 due to GGRM's ability to increase revenue in 2020 by IDR 144.47 trillion, an increase of 3.57% from revenue in 2019 which amounted to IDR 110.52 trillion. ACES provides a high expected return in 2020 due to ACES' ability to continue distributing dividends in 2020, the exchange rate of IDR to USD which tends to be stable in 2020. 2020, namely at the position of IDR 14,000.00, the implementation of tax amnesty on imported goods helped ACES to sell its products at competitive prices, ACES's status as a market leader in the household sector with less intense competition, and a less severe decline in net sales during the COVID-19 period, namely in the third quarter of 2020 of IDR 5.48 trillion compared to the third quarter of 2019 of IDR 5.97 trillion. KLBF provides high expected returns due to the demand for medicinal products to treat COVID-19 disease, which in 2020 there is no commercialized vaccine because it is still in the trial phase in the lab of a global pharmaceutical company. KLBF's profit in 2020 was IDR 2.733 trillion, an increase of 9.05% compared to 2019's profit of IDR 2.506 trillion.

In table 5, it can be concluded that H1 is accepted, because there is one of the mining sector issuers that is included in the top five positions, namely the MDKA issuer (PT Merdeka Copper and Gold Tbk). MDKA provides high expected returns due to the increase in revenue in 2021 of USD 381 million compared to USD 321.9 million in 2020. This increase in revenue led to an increase in net profit obtained by MDKA from USD 28.9 million to USD 33.4 million. The cause of this increase was due to the increase in revenue from the Wetar copper mine from USD 31 million to USD 162 million. The increase in revenue from copper was also influenced by copper prices soaring throughout 2021 above USD 9,000 per Metric Ton. TKIM (PT Kertas Tjiwi Kimia Tbk) gave a high expected return because the company recorded an increase in net sales in 2021 of 18.24% to US\$ 1.02 billion compared to US\$ 866.45 million in 2020. Revenue from jug exports increased, from revenue in 2020 from US\$ 563.12 million to US\$ 634,644 million in 2021. TBIG (PT Tower Bersama Infrastructure Tbk) provides a high expected return because it posted a net profit throughout 2021 of IDR 1,548 trillion, an increase compared to net profit in 2020 amounted to Rp. 1.009 trillion. INKP also provides high expected returns such as TKIM which is the same as a paper mill issuer due to an increase in net sales of US\$ 3.51 billion in 2021, an increase of 17.75% compared to 2020 of US\$ 2.98 billion. The long-term prospects of these two issuers (TKIM and INKP) are also considered good due to improving global economic conditions and increasing demand for paper products. Such as shopping bags from paper materials to replace plastic bags because paper materials are considered environmentally friendly materials compared to materials from plastic. ASII (PT Astra International Tbk) provides a high expected return in 2021 because ASII obtained the Group's consolidated net revenue in 2021 of IDR 233.5 trillion higher 33% compared to 2020 with the group's net profit in 2021 reaching IDR 20.2 trillion, 25 % higher than in 2020. The increase in ASII's performance is inseparable from government programs that provide incentives to the luxury tax that helps increase sales of ASII automotive products, rising prices of commodities in global markets, and the easing of pandemic prevention efforts, which led to better performance of all of the

Group's business lines, particularly the automotive, heavy and mining tools divisions, as well as financial services.

In table 6, it can be concluded that H1 is accepted, because one of the mining sector issuers, namely ADRO (PT Adaro Energy Indonesia Tbk) is included as one of the issuers that provides high expected returns in 2022. ADRO provides high expected returns because in 2022 the demand for mining commodities, namely coal, begins to increase, and is followed by high price increases, causing ADRO to experience an increase in revenue of 130% as of September 2021 compared to revenue in the same period in 2020 with details, revenue as of September 2022 of US\$ 5.91 billion compared to revenue as of September 2021 was US\$2.56 billion. TBIG maintains a high expected return performance in 2022 as in 2021 . This is due to three things, namely: (1) TBIG which scored a net profit in semester 1 2022 of IDR 3.3 trillion, an increase of 11.18% compared to semester 1 2021 of IDR 2.97 trillion, (2) TBIG's financial resilience in the face of an increase in the benchmark interest rate throughout 2022 due to TBIG's ability to reduce the portion of its debt and the decline in interest on bonds in US Dollars in 2020 in the range of 2.75% - 4.25%, lower than in 2015 - 2019 at a level of 5.25%, and bonds in Rupiah in 2020 in the range of 3.60% - 8.00% per year, lower than in 2015 - 2019 in the range of 8.00% - 9.25%, and (3) remains strong demand for high data in Indonesia, helping TBIG to obtain rental contracts of telecommunication towers and fiber optic cables from telecommunications operators. UNVR (PT Unilever Indonesia Tbk) provides high expected returns in 2022 due to net sales reaching IDR 10.8 trillion in the first quarter of 2022, an increase of 5.40% compared to net sales of IDR 10.28 trillion in the first quarter of 2021 with a net profit in the first quarter of 2022 of IDR 2.02 trillion, an increase of 19.02% compared to a net profit of IDR 1.69 trillion in the first quarter of 2021 . This increase was triggered by the recovery of the economy, the return of public mobility which encouraged an increase in consumer purchasing power, and was driven by the company's efforts to build fundamentals. strong company throughout 2021. EMTK (PT Elang Mahkota Teknologi Tbk) provides a high expected return in 2022 due to the increase in EMTK's net profit in 2022 by 922.3%, which is IDR 2.70 trillion compared to semester 1 of 2021 of IDR 265 billion. The drastic increase in net profit was caused by investment activities carried out by EMTK in several companies in Indonesia, such as PT Bukalapak.com Tbk, PT RANS Satu Bunda, and PT PSIM Jaya Jogjakarta. ASII provides a high expected return in 2022 the same as in 2021 because ASII's net profit in the third quarter of 2022 is IDR 22.2 trillion , 49% higher compared to the third quarter of 2021. This increase in net profit was not only supported by an increase in automotive sales, but also supported by an increase in commodity prices in the global market which caused demand for transportation equipment rentals the mine, which is one of ASII's business lines, is getting higher and higher

Linear Regression results using JASP on Independent Variables (JCI, Inflation, and USD Exchange Rate) against Dependent Variables (Expected Return) in 2020, 2021, and 2022.

The table below shows *Linear Regression* in 2020, 2021, and 2022.

**Table 7 Linear Regression In 2020
Model Summary - E. Return**

Model R	R ²	Adjusted R ²	RMSE
H ₀	0.000	0.000	0.237
H ₁	0.830	0.688	0.571

ANOVA

Type		Sum of Squares	Df	Mean Square	F	p
H ₁	Regression	0.424	3	0.141	5.885	0.020
	Residual	0.192	8	0.024		
	Total	0.616	11			

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients

Type		Unstandardized	Standard Error	Standardized	t	p	95% CI	
							Lower	Upper
H ₀	(Intercept)	-0.013	0.068		0.184	0.858	-0.163	0.138
H ₁	(Intercept)	0.003	0.051		0.062	0.952	-0.115	0.121
	JCI	0.704	0.981	0.228	0.718	0.493	-1.558	2.966
	Inflation	0.592	0.427	0.281	1.388	0.202	-0.391	1.576
	USD Exchange Rate	-2.757	1.334	-0.653	2.067	0.073	-5.833	0.318

Table 7 above explains that based on the R result of 0.830 (83%), it can be concluded that the correlation between the dependent variable (expected re-turn) and the independent variable (JCI, inflation, and the USD rate) has a strong relationship of 83%. The R² result of 0.688 (68.8%) can be concluded that the three independent variables (JCI, inflation, and USD rate) can explain 68.8% variance of the expected return. Adjusted R² is used to eliminate the bias present in R². In the Model Summary table, the Adjusted R² value of 0.571 (57.1%) which can be concluded that the three independent variables (JCI, inflation, USD rate) can explain 57.1% variance of expected return after deducting the bias present in R².

The Anova table shows a calculated F value of 5.885 greater than the table F of 4.0652 with a value of $\alpha = 0.05$ (5%), $df1 = 3$ and $df2 = 8$, and a p value of $0.020 <$ the value of the α g used in The study was 0.050. The results of this F calculation and p value show that all independent variables (JCI, Inflation, and USD rate) have a significant influence on the dependent variable (expected return).

The Coefficients table shows the value of t and the coefficients of each independent variable (JCI, inflation, and USD rate) against the dependent variable (expected return). Based on the value of t in the table above, the USD rate has a stronger influence than the JCI and inflation so that H 4 is accepted, and H5 is accepted due to the influence of the exchange rate USD and inflation are higher than JCI. The hypotheses H2 and H3 are rejected. The re-gression formula based on unstandardized columns is described below:

$$Y = 0,003 + 0,704X_1 + 0,592X_2 - 2,757X_3$$

The interpretation of the regression above is as follows:

1. Constant (a)

It has a meaning, that if all free variables are valued at 0, then the value of the dependent variable (*expected return*) is equal to the value of the constant, which is 0.003.

2. JCI (X_1) to Y (*expected return*)

The value of the JCI coefficient is 0.704 which shows a positive relationship between JCI and *expected returns*. This means, that every increase in one unit of JCI will cause the *expected return* to rise by 0.704 assuming another free variable of the regression model is fixed.

3. Inflation (X_2) against Y (*expected return*)

The value of the inflation coefficient is 0.592 which shows a positive relationship between inflation and *expected return*. This means, that every increase in a unit of inflation will cause the *expected return* to rise by 0.592 assuming another free variable of the regression model is fixed.

4. USD (X_3) rate against Y (*expected return*)

The value of the USD rate coefficient of -2.757 indicates a negative relationship between the USD rate and *the expected return*. This means, that every increase in one unit of the USD rate will cause the *expected return* to fall by 2,757 assuming another free variable of the regression model is fixed.

Table 8 Linear Regression In 2021

Model Summary - E. Return				
Type	R	R ²	Adjusted R ²	RMSE
H ₀	0.000	0.000	0.000	0.203
H ₁	0.485	0.236	-0.051	0.208

ANOVA

Type		Sum of Squares	Df	Mean Square	F	p
H ₁	Regression	0.107	3	0.036	0.822	0.518
	Residual	0.347	8	0.043		
	Total	0.454	11			

ANOVA							
Type		Sum of Squares	Df	Mean Square	F	p	
<i>Note.</i> The intercept model is omitted, as no meaningful information can be shown.							
Coefficients							
Type		Unstandardized	Standard Error	Standardized	t	p	95% CI Lower Upper
H ₀	(Intercept)	0.143	0.059		2.438	0.033	0.014 0.272
H ₁	(Intercept)	0.208	0.080		2.590	0.032	0.023 0.394
	JCI	-0.673	2.479	-0.094	0.271	0.793	-6.390 5.044
	Inflation Data	0.124	0.752	0.065	0.165	0.873	-1.610 1.859
	Dollar Exchange Rate	9.013	7.664	0.479	1.176	0.273	-8.660 26.686

The table above shows that the 2021 R is 0.485 (48.5%) which concludes that the correlation between independent variables (JCI, inflation, and dollar exchange rate) and dependent variables (*expected return*) is more weak compared to the correlation in 2020. An R² value of 0.236 (23.6%) indicates that the independent variables (JCI, inflation, and dollar rate) can only explain 23.6% of the variance of the dependent variable (*expected return*). However, adjust R²'s value of -0.051 (-5.1%) explains that free variables cannot explain the variance of dependent variables at all.

The ANOVA table shows that the calculated F value of 0.822 is smaller than the table F of 4.0652 with a value of $\alpha = 0.05$ (5%), $df_1 = 3$ and $df_2 = 8$, and a p value of 0.518 > the α value used in this study of 0.050. The results of this F calculation and p value show that all independent variables (JCI, Inflation, and USD rate) have an insignificant influence on the dependent variables (*expected return*).

The *Coefficients* table shows the value of t and the coefficients of each independent variable (JCI, inflation, and USD rate) against the dependent variable (*expected return*). Based on the t value in the table above, the USD rate has a stronger influence than the JCI and inflation so H₄ is accepted, but H₂, H₃, and H₅ are rejected because the influence of JCI is higher than the influence of inflation. The regression formula based on *unstandardized columns* is described below:

$$Y = 0,208 - 0,673X_1 + 0,124X_2 + 9,013X_3$$

The interpretation of the regression above is as follows:

1. Constant (a)
It has a meaning, that if all free variables are valued at 0, then the value of the dependent variable (*expected return*) is equal to the value of the constant, which is 0.208.
2. JCI (X₁) to Y (*expected return*)
The value of the JCI coefficient of -0.673 indicates a negative relationship between the JCI and *the expected return*. This means, that every increase in one

unit of JCI will cause the *expected return* to fall by 0.673 assuming another free variable of the regression model is fixed.

3. Inflation (X2) against Y (*expected return*)

The value of the inflation coefficient is 0.124 which shows a positive relationship between inflation and *expected returns*. This means, that every increase in a unit of inflation will cause the *expected return* to rise by 0.124 assuming another free variable of the regression model is fixed.

4. USD (X3) rate against Y (*expected return*)

The value of the USD exchange rate coefficient of 9.013 indicates a positive relationship between the USD rate and the *expected return*. This means, that every increase in one unit of the USD rate will cause the *expected return* to rise by 9.013 assuming another free variable of the regression model is fixed.

Table 9 Linear Regression In 2022

Model Summary - E. Return

Type	R	R ²	Adjusted R ²	RMSE
H ₀	0.000	0.000	0.000	0.165
H ₁	0.233	0.055	-0.300	0.188

ANOVA

Type	Sum of Squares	Df	Mean Square	F	p
H ₁ Regression	0.016	3	0.005	0.154	0.924
Residual	0.282	8	0.035		
Total	0.299	11			

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients

Type	Unstandardized	Standard Error	Standardized	t	p
H ₀ (Intercept)	0.036	0.048		0.767	0.459
H ₁ (Intercept)	0.033	0.068		0.482	0.643
JCI	1.202	2.902	0.176	0.414	0.690
Inflation	0.105	0.404	0.092	0.261	0.801
USD Exchange Rate	4.126	7.390	0.243	0.558	0.592

The table above shows an R result of 0.233 (23.3%), which shows the correlation between independent variables (JCI, Inflation, USD Exchange Rate) and dependent variables (*expected return*) lower than in 2020 and 2021. An R² value of 0.055 (5.5%) indicates that the independent variables (JCI, inflation, and dollar rate) can only explain 5.5% of the variance of the dependent variable (*expected return*), and the rest is explained by other variables. However, adjusted R²s value of -0.300 (-30%) explains that free variables cannot explain the variance of dependent variables at all.

The ANOVA table shows that the calculated F value of 0.154 is smaller than the F of the table of 4.0652 with a value of $\alpha = 0.05$ (5%), $df_1 = 3$ and $df_2 =$

8, and a p value of $0.924 >$ the α value used in this study of 0.050. The results of this F calculation and p value show that all independent variables (JCI, Inflation, and USD rate) have an insignificant influence on the dependent variables (*expected return*).

The *Coefficients* table shows the value of t and the coefficients of each independent variable (JCI, inflation, and USD rate) against the dependent variable (*expected return*). Based on the t value in the table above, the USD rate has a stronger influence than the JCI and inflation so H_4 is accepted, but H_2 , H_3 , and H_5 are rejected because the influence of JCI is higher than the influence of inflation. The regression formula based on *unstandardized columns* is described below:

$$Y = 0,033 + 1,202X_1 + 0,105X_2 + 4,126X_3$$

The interpretation of the regression above is as follows:

1. Constant (a)

It has a meaning, that if all free variables are valued at 0, then the value of the dependent variable (*expected return*) is equal to the value of the constant, which is 0.033.

2. JCI (X1) to Y (*expected return*)

The value of the JCI coefficient of 1.202 indicates a negative relationship between JCI and *expected return*. This means, that every increase in one unit of JCI will cause the *expected return* to rise by 1,202 assuming another free variable of the regression model is fixed.

3. Inflation (X2) against Y (*expected return*)

The value of the inflation coefficient is 0.105 which shows a positive relationship between inflation and *expected return*. This means, that every increase in a unit of inflation will cause the *expected return* to rise by 0.1 05 assuming another free variable of the regression model is fixed.

4. USD (X3) rate against Y (*expected return*)

The value of the USD rate coefficient of 4.126 indicates a positive relationship between the USD rate and the *expected return*. This means, that every increase in one unit of the USD rate will cause the *expected return* to rise by 4,126 assuming another free variable of the regression model is fixed.

DISCUSSION

This research was conducted to determine IDX-30 member stock issuers in 2020, 2021, and 2022 that provide *expected returns* based on the *Arbitrage Pricing Theory* calculation model to investors, and find out independent variables (JCI, inflation, and USD exchange rate) which most influence the *expected return* of IDX-30 stock issuers throughout 2020, 2021, and 2022. The results of the research above, I can explain as follows:

In 2020, the five stock issuers that provide high *expected returns* are INKP, HMSP, GGRM, ACES, and KLBF. INKP, HMSP, and GGRM have good management so that they are able to maintain profits during the peak of the COVID-19 pandemic. ACES, in addition to being supported by good management, also gets benefits from the USD exchange rate which tends to be stable, and the government's policy of providing *tax amnesty* for imported goods helps ACES in

the face of the peak period of the COVID-19 pandemic. KLBF, which is a red plate drug company, earned a high net profit due to the high demand for drugs during COVID-19.

In 2021, five stock issuers that provide high *expected returns* are TKIM, TBIG, MDKA, INKP, and ASII to get high profits due to recovered product demand and soaring higher compared to 2020. Khusus TBIG, in addition to the increase in tower rental demand due to high internet data demand from consumers, also due to the success of TBIG management in management their debt that is able to reduce coupon bonds, both denominated in US\$ and Rp. is lower than before 2019. ASII received an increase in demand because it was supported by the government through a program to eliminate VAT on luxury goods for automotive products.

In 2022, the five stock issuers that provide high *expected stock returns* are TBIG, ADRO, EMTK, ASII, and UNVR. These five stock issuers have good financial performance reports because they benefit from the current world conditions. ADRO benefited from the increase in demand for coal exports and rising coal prices due to the geopolitical conditions of the Ukraine-Russian war. TBIG results from the company's ability to control the debt burden with cheaper bond interest than bond interest before 2020, and management's growth-making decisions organic that does not spend the funds owned by the company to buy expensive rival companies. EMTK benefits from investment policies in other companies that provide high returns. ASII Ddan UNVR is supported by improving economic conditions due to the easing of *lockdown* policies by the government.

The results of the study above concluded that the USD exchange rate has a significant influence on the *expected returns* of all IDX-30 issuers throughout 2020, 2021, and 2022. Issuers included in IDX-30 are issuers that carry out raw material import activities from abroad, such as KLBF or ACES which make their products in the People's Republic of China and import them back to Indonesia, issuers that export their products abroad, such as INKP, TKIM or INDF, and issuers whose transactions his business uses US\$ such as ADRO which sells its mining products in US \$, and rents mining equipment in the form of US\$.

Inflation does not have a significant impact because there are issuers included in IDX-30 that are not directly affected by inflation, such as ADRO, ITMG, ASII, TOWR, TBIG, TLKM, ANTM, and PGAS that sell commodity products such as coal, cellular data, and gas whose demand is fixed. However, high inflation will make it difficult for these issuers to borrow because high interest rates follow inflation, and if it lasts for a long time, the demand for their products will decrease because consumers must prioritize their primary needs. Issuers such as INDF, CPIN, ICBF GGRM, HMSP and UNVR that sell products such as instant noodles, cut chicken, and daily necessities products that have become the main consumer products. Such products are resistant to inflationary pressures. If inflation is high, companies such as HMSP, GGRM, and UNVR can simply shrink the size of the products sold or reduce the number of cigarettes in the cigarette pack to keep them sold at prices before high inflation.

JCI has a strong influence on the *expected returns* of all IDX-30 issuers in 2021yy, and 2022. This shows that the share price of IDX-30 members is the most

traded stock by investors on the Indonesia Stock Exchange. In 2020, the majority of investors implemented a *wait-and-see* tactic of waiting for the right time to make a transaction. The implementation of *wait-and-see* tactics was influenced by the COVID-19 pandemic which caused economic activity to decline sharply due to the *lockdown*, and investors were better off waiting until the issuance of financial statements from companies.

CONCLUSION

The conclusions of the study are as follows based on the calculation results of the Arbitrage Pricing Theory model, new mining sector issuers will provide high expected returns in 2021 and 2022. The USD exchange rate is an independent variable that has a high influence on the expected returns of stock issuers in 2020, 2021, and 2022. JCI in 2021 and 2022 has a higher influence than inflation in the formation of expected returns of IDX-30 stock issuers.

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