

Analysis of the Influence of Bitcoin and Macroeconomic Fundamentals on the LQ45 Index for the 2018-2022 Period

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ABSTRACT

This study aims to understand the effect of bitcoin and macroeconomic fundamentals (inflation, exchange rate, BI Rate, money supply, and IDX) on the LQ45 index. The type of data used in this study is secondary data in the form of time series with a research period of January 2018 to December 2022. The data in this study consisted of quantitative data. The data analysis technique applies multiple linear regression which is processed using SPSS version 25. The results state that bitcoin has a negative effect on the LQ45 index, inflation has a positive effect on the LQ45 index, exchange rate has a negative effect on the LQ45 index, BI Rate has a negative effect on the LQ45 index, money supply has a negative effect on the LQ45 index, IDX has a positive effect on the LQ45 index.

INTRODUCTION

Every company activity can increase added value if it supports business success (Hariyati et al., 2022). Globalization and technological advancements drive significant changes in the global economy, forcing companies to adapt (Melnik & Vakulik, 2021; Rohmah et al., 2022). Effective adaptation allows companies to remain competitive and maintain long-term growth amid global market uncertainty. One of the modern financial phenomena that attracts attention is the growth of Bitcoin, which can affect stock prices through interaction with macroeconomic factors (Sovbetov, 2018; Ahmed, 2021). Investing in cryptocurrency assets is currently a relatively new and well-liked investment option in Indonesia (Rosmiwilujeng et al., 2023).

Bitcoin is considered an attractive speculative asset for investors due to its high volatility, however, it can make investing riskier if not managed properly. The financial theory explains that when investment risk increases, the level of profit required by investors is greater (Hidayat et al., 2024). Macroeconomic indicators such as inflation, exchange rates, BI Rate, money supply, and stock indices such as IDX and LQ45 remain the main benchmarks in assessing a country's economic condition (Olokoyo et al., 2020). Stock indices, such as the LQ45, reflect market performance by averaging stock prices of selected companies based on liquidity and market capitalization. These indices are influenced by financial performance and macroeconomic factors, which affect investor sentiment and market stability (Dewi et al., 2023). Recently, Bitcoin and cryptocurrencies have emerged as factors potentially impacting stock markets, though studies on their relationship with indices like the LQ45 have shown conflicting results, warranting further research. Sihombing et al. (2020) found a positive influence, while Fahrani and Bachtiar (2020) stated that Bitcoin fluctuations are insignificant to stock price movements. Robiyanto (2019) and Andi et al. (2022) found a negative influence between Bitcoin and the LQ45 index. Similarly, studies on macroeconomic factors like inflation and currency rates have produced conflicting findings; Khrisdayanti & Manunggal (2023) found that inflation positively influenced the LQ45 index, while Maniil et al. (2023) found a negative influence

Previous research has not fully uncovered how macroeconomic conditions and Bitcoin affect the LQ45 index, especially in the 2018-2022 period. Inconsistencies in findings, such as the effects of inflation and exchange rates, indicate the existence of research gaps. Previous research have found mixed results regarding Bitcoin's influence on the stock market. Sihombing et al. (2020) showed a positive influence, while Fahrani & Bachtiar (2020) stated that the influence was not significant, while Andi et al. (2022), Anggita (2020), and Robiyanto (2019) found a negative influence. Macroeconomic variables also show varying results, research by Khrisdayanti & Manunggal (2023), Oktavia & Khairiyah (2023) and Rimbano (2015) stated that inflation has a positive effect on the LQ45 index, while Maniil et al., (2023), Nurmansyah & Thamrin (2022), Ani & Andrian (2022) stated that inflation has a negative effect. There are also differences in exchange rate variables, the results of research by Andi et al., (2022), Pahlevi & Nurhadi (2022), Ristia Ilyas, (2022) stated that it had a negative

effect on the LQ45 index, in contrast to Oktavia & Khairiyah (2023), Wijaya & Priana (2023), Setiadi & Masdupi (2020) which stated that it had a positive effect. Regarding the BI Rate, the findings from Kurniawan & Nugroho (2022), Ristia (2022), Fatih & Ismiyanti (2016) stated that it had a negative influence on the LQ45 index, different from the results of the research of Prakoso et al., (2018), Kurniawan & Nugroho (2022), Ristia (2022) which stated a positive influence

The variable of the amount of money in circulation is also a debate, research by Khrisdayanti & Manunggal (2023), Nurmansyah & Thamrin, (2022), Yuniningsih et al., (2019) stated a negative influence, while the study of Fathorrahman & Suaydi (2018) found a positive influence on the LQ45 index. Related to IDX, Pratiwi & Hendrawan (2017), Pradita (2019) stated a positive and significant influence on the LQ45 index. However, the findings of Dewi (2020) stated that IDX did not influence the LQ45 index. This study addresses inconsistent findings by examining the impact of Bitcoin and macroeconomic variables such as inflation, exchange rates, the BI Rate, money supply, and the IDX on the LQ45 index from 2018 to 2022. It aims to fill gaps in the empirical literature, update knowledge on Indonesia's capital market, and contribute to the understanding of financial market complexity in the digital era.

LITERATURE REVIEW

Signal Theory

Spence (1973) presented Signal Theory, which explains how managers use signals to inform shareholders about company conditions, enabling informed investment decisions. Managers ensure these signals reflect real performance, while shareholders interpret them to reduce asymmetry. Signal theory also highlights how information sources indicate profitable opportunities (Saputri & Anwar, 2021). The owner sends signals, which are then analyzed. Investors receive announcements to support decisions, as every action conveys information, often assessed through market conditions like supply and demand (Saputra & Hidayat, 2024).

Arbitrage Pricing Theory (APT)

Ross (1976) proposed the Arbitrage Pricing Theory (APT), which relates expected returns to macroeconomic conditions. Each component's risk helps estimate stock returns. Several studies have examined macroeconomic impacts on stock returns in South Asia (Aquino, 2004; Barodawala & Ranawat, 2018). APT enables investors to understand how macroeconomic shifts affect portfolios, offering a comprehensive framework for investment strategy.

The Effect of Bitcoin on the LQ45 Index

Pamilangan & Robiyanto (2019) stated that cryptocurrencies negatively influence the LQ45 index, indicating an inverse relationship between their values. This may stem from differing market characteristics, as cryptocurrencies—being decentralized—are less affected by conventional economic shifts. Thus, they may serve as a potential hedging instrument against LQ45 fluctuations and other market risks.

H1: Bitcoin variables have a negative and significant effect.

The Effect of Inflation on the LQ45 Index

Inflation is a general rise in prices driven by demand and supply (Lee, 2022). It can boost company revenues and profits through higher product prices (Glover et al., 2023), potentially raising the LQ45 index. Investors also turn to stocks to hedge against currency value declines from inflation (Heryanto, 2016).

H2: Inflation variables have a positive and insignificant effect.

The Effect of Exchange Rate on the LQ45 Index

Investors view the rupiah's depreciation against the US dollar as a sign of Indonesia's economic challenges and instability. A stronger dollar can weaken the rupiah and negatively impact the LQ45 index. Anticipating risks, investors may sell off shares, potentially driving the index down (Terayana & Triaryati, 2018).

H3: Exchange rate variables have a negative and significant effect.

The Effect of BI Rate on the LQ45 Index

An increase in the BI Rate impacts capital and money markets. Highly leveraged companies face rising interest costs, while investors shift to higher-yield instruments, potentially triggering stock sell-offs (Suwandu, 2014). Banks may adjust deposit rates, affecting funding costs and performance (Suwandu, 2014), while investment and consumption levels may also decline.

H4: The BI Rate variable has a negative and insignificant effect.

The Effect of Money Supply on the LQ45 Index

Dao (2022) found that the money supply positively and significantly affects monetary policy. Expansionary policy increases money supply, boosts production, consumption, and use of financial assets. By lowering interest and credit growth rates, it reduces capital costs, raises investor expectations, and drives stock prices through increased market cash flow.

H5: The variable amount of money supply has a positive and significant effect.

The Influence of IDX on the LQ45 Index

Pratiwi & Hendrawan (2017) found that JCI movements significantly affect the LQ45 Index due to overlapping leading stocks. While the JCI reflects the broader market, LQ45 focuses on liquid, high-cap stocks causing both indices to rise when these shared stocks increase in value.

H6: IDX variables have a positive and significant effect

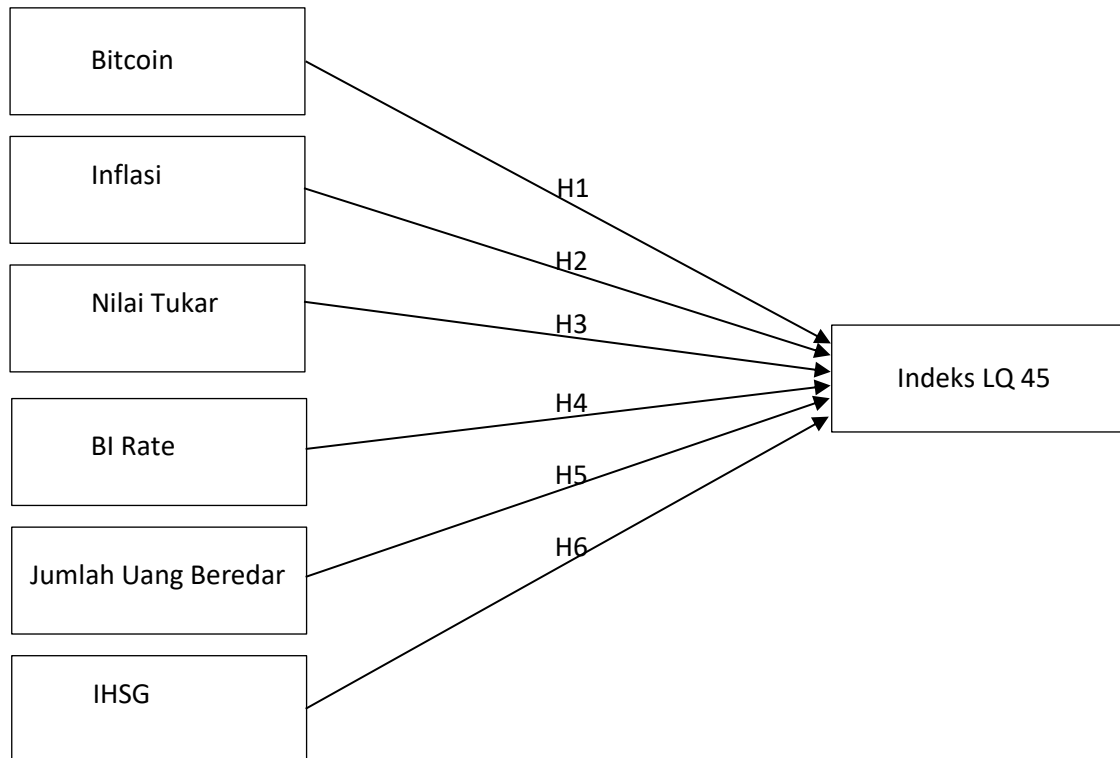


Figure 1. Conceptual Framework

METHODOLOGY

This study uses explanatory and confirmatory approaches to examine the influence of different factors on the LQ45 index. The explanatory approach aims to identify the influence of independent variables, such as bitcoin, inflation rate, exchange rate, BI Rate, money supply, and IDX on the LQ45 index, while the confirmatory approach is used to verify the theory in the specific context of the research through quantitative analysis using SPSS software version 25.0. The data utilized is descriptive quantitative data sourced from secondary data, covering the population of 45 companies in the LQ45 index during the monthly period 2018-2022. Information related to macroeconomic fundamentals is obtained from organizations including Yahoo Finance, the Central Statistics Agency, the Indonesia Stock Exchange, and Bank Indonesia. This study's objective is to give a thorough knowledge of how these factors affect the LQ45 index in the context of the financial market.

Data analysis techniques involve descriptive statistics forming a holistic view of the dataset, while multiple linear regression analysis is applied to test and explore relationships in various variables in a deeper context (Wardifa & Yanthi, 2022; Ghozali, 2018). To validate the model, traditional assumption tests like the heteroscedasticity, multicollinearity, and normality tests are employed (Pintarto & Pujiono, 2021; Ghozali, 2018). The F test is used in the model's feasibility test, and the coefficient of determination (R²) indicates the degree to which changes in the independent variable account for variations in the dependent variable, multiple linear regression, and hypothesis tests (Sugiyono, 2017).

RESEARCH RESULT

Table 1. Descriptive Statistical Test

	N	Min	Max	Mean	Std. Deviasi
BTC	60	3457,79	61318,96	20337,93	16957,86
INF	60	1,32	5,95	2,80	1,15
NT	60	13380,36	15867,43	14424,96	494,93
BI	60	3,50	6,00	4,50	0,92745
JUB	60	5351650,3	8528022,3	6617290,8	917515,79
IDX	60	4538,93	7228,91	6161,2952	648,18
LQ45	60	691,1	1105,76	938,3528	93,68

From the descriptive statistical data table 1. Bitcoin has significant fluctuations from its minimum to maximum value, indicating high volatility in the value of this asset. Average inflation is around 2.81%, signaling the general rate of price increases in the economy. Exchange rates have a more limited variation, with relatively low standard deviations, indicating relative stability in a currency's value. Additionally, there are significant fluctuations in the amount of money in circulation, indicating a change in the availability of money in the market. The IDX and the LQ45 index show an upward trend in the observed timeframe, which illustrates the relative growth in major stock market indices. Overall, this data reflects the variation in the economic variables observed, with some showing high volatility while others show a steady upward trend.

Table 2. Normality Test

Kriteria	Signifikansi
Asymp. Sig. (2-tailed)	0,200

A regression model is considered optimal when it shows a normal or near-normal distribution (Nurchayani, & Bhilawa, 2021). Statistical results with Asymp values were obtained from the normalcy test using the Kolmogorov-Smirnov Test. The 2-tailed sig. was 0.200. The significance level ($0.200 > 0.05$) is exceeded by the significance value of 0.200. Therefore, it is evident that every variable noted in this study show a tendency to the data distribution pattern that follows the normal distribution.

Table 3. Multicollinearity Test

Model	Collinearity Statistics	
	Tolerance	VIF
1 Bitcoin	,166	6,023
Inflation (%)	,204	4,914
Exchange rate	,291	3,440
BI Rate (%)	,240	4,168
Money Supply	,161	6,198
IDX	,201	4,972

Considering that each variable's Variance Inflation Factor (VIF) value is less than 10 and its tolerance value is greater than 0.1. There's not discernible multicollinearity between the variables in the analysis model in the tested data. Thus, the data are eligible to proceed to the advanced analysis stage without the risk of serious impact of multicollinearity on the results of statistical analysis.

Table 4. Heteroscedasticity Test (Glacier Test)

	t	Sig.
1 Bitcoin	-0,680	0,500
Inflation (%)	-1,457	0,151
Exchange rate	0,633	0,530
BI Rate (%)	-2,035	0,057
Money Supply	-0,598	0,552
IDX	1,673	0,100

An optimal regression model shows homoscedasticity, which indicates the absence of heteroscedasticity that can interfere with statistical validity and parameter estimation. Heteroscedasticity refers to the inconsistency of residual variants between various observations. Heteroscedasticity tests were performed to check for inconsistent variations of residuals between observations in the regression model. The heteroscedasticity test intends to identify differences in residual variation between different observations (Afriani & Satyawan, 2023). The analysis's findings, as displayed in Table 4, indicate that the significance value (Sig.) attained is higher than the 0.05 cutoff. Therefore, the conclusion is that no evidence was found to support the existence of heteroscedasticity in the regression model applied to the variables of this study.

Table 5. Goodness of Fit Test (Test F)

Model	F	Sig.
1 Regression	189,505	0,017
Residual		
Total		

With the significance value (Sig.) in Table 5 being 0.017 or less than 0.05, this shows that Bitcoin, Inflation, Exchange Rate, BI Rate, Money Supply, and IDX together have a significant impact on the LQ45 Index. This indicates that these factors have an important statistical impact on changes in the LQ45 Index.

Table 6. Multiple Linear Regression Test

Model	R	R Square	Adjusted R Square	Adjusted R Square
1	0,977	0,955	0,950	20,86050

Considering that the determination coefficient's (R Square) value reached 0.955, or comparable to 95.5%, which was recorded in the SPSS analysis output,

the conclusion of the analysis shows that the variables Bitcoin, Inflation, Exchange Rate, BI Rate, Money Supply, and IDX collectively contribute significantly to the observed variation in the movement of the LQ45 Index. That is, about 95.5% of the fluctuations of the LQ45 Index is explicable by the regression model's combination of these variables. The remainder, about 4.5%, could have been impacted by additional factors not considered in this study or by additional variables that were not studied.

Table 7. Multiple Linear Regression Test

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	624,812	139,810
	Bitcoin	-,001	,002
	Inflation (%)	,182	5,193
	Exchange rate	-,025	,010
	BI Rate (%)	-2,376	5,978
	Money Supply	-3,392E-5	,006
	IDX	,150	,009

Source: Secondary data, SPSS-25 output (Processed, 2025)

Based on Table 7. The linear regression model of the research was obtained as follows:

$$LQ45 = 624,812 - 0,001BTC + 0,182INF - 0,025NT - 2,376BI - 3,392JUB + 0,150IDX + \varepsilon$$

Table 8. Hypothesis Test (T-Test)

1		t	Sig.
		(Constant)	4,469
	Bitcoin	-2,119	0,039
	Inflation (%)	0,035	0,972
	Exchange rate	-2,440	0,018
	BI Rate (%)	-0,397	0,693
	Money Supply	-4,604	0,013
	IDX	16,043	0,011

Based on Table 8. The multiple linear regression test's findings indicated that the variables have a Sig value of < 0.05 are Bitcoin, Exchange Rate, Money Supply and IDX. This means that these variables have a significant effect on the LQ45 Index. However, the BI Rate and Inflation variables have a non-significant impact on the LQ45 Index, as indicated by their Sig values of > 0.05.

DISCUSSION

The Effect of Bitcoin on the LQ45 Index

The Bitcoin variable has a substantial negative influence on the movement of the LQ45 Index, this is indicated by the statistically significant negative influence of Bitcoin on the LQ45 Index based on the regression analysis results. Significant fluctuations in the value of Bitcoin are a major factor for investors in determining investment allocation, especially when the stock market is declining, which encourages a shift in investment to Bitcoin (Andi et al., 2022). This phenomenon could result in Bitcoin's value rising, which in turn makes Bitcoin not only an attractive digital asset for investors but also affects the dynamics of the capital market by providing attractive investment alternatives when conventional market conditions are unfavorable. In a diversification strategy, an optimal portfolio is obtained by diversifying into various investments, including certain securities that offer fairly high returns (Hidayat et al., 2023). In addition, before investing, investors consider the expected return to achieve optimal investment goals (Kristanti & Putra, 2022). The results align with previous studies indicating that Bitcoin negatively effects the LQ45 Index (Andi et al., 2022; Anggita, 2022; Pamilangan & Robiyanto, 2019).

The Effect of Inflation on the LQ45 Index

A general, gradual rise in the cost of goods and services over time is known as inflation, caused by demand and supply (Lee, 2022). If prices tend to fall, it is called deflation (Rokhim, 2016). The movement of the LQ45 Index was positively but insignificant impacted by the inflation variable, although the effect of inflation on the LQ45 Index was positive, it was not statistically significant. During the research period, Indonesia's yearly inflation rate remained consistently under 10%, therefore it had little effect on changes in the price of LQ45 shares. Low inflation can increase company profitability due to reduced production costs while selling prices remain stable (Nevada & Kusumaningtyas, 2020). As long as inflation stays within safe bounds, investors in LQ45 stocks don't need to keep a close eye on it, because these stocks have high liquidity and remain profitable despite changes in inflation (Rohmawati, 2017). The findings of this study support earlier research showing that state inflation positively affects the LQ45 Index (Rimbano, 2015; Rohmawati, 2017; Mirayanti & Wirama, 2017; Pradita, 2019; Yuniningsih et al., 2019; Pahlevi & Nurhadi, 2022; Ristia, 2022; Oktavia & Khairiyah, 2023; Khrisdayanti & Manunggal, 2023; Wijaya & Priana, 2023).

The Effect of Exchange Rate on the LQ45 Index

The exchange rate variable had a statistically significant negative influence on the fluctuations of the LQ45 Index. The rupiah weakens when the US dollar exchange rate rises, raising the cost of Indonesia's export goods and decreasing its ability to compete on the world market (Rudiansyah & Wuryani, 2014). This situation affects businesses that rely on exports and have foreign debt, causing potential financial losses as well as a decline in revenue and financial performance (Pahlevi & Nurhadi, 2022). This finding aligns with previous research on the LQ45 Index was negatively affected by the exchange rate

(Mirayanti & Wirama, 2017; Prakoso et al., 2018; Pradita, 2019; Utomo et al., 2019; Ilham et al., 2020; Situngkir & Batu, 2020; Pahlevi & Nurhadi, 2022; Kurniawan & Nugroho, 2022; Ristia, 2022; Ani & Andrian, 2022; Andi et al., 2022; Khridayanti & Manunggal, 2023; Winny & Yulfiswandi, 2022; Maniil et al., 2023).

The Effect of BI Rate on the LQ45 Index

The BI Rate variable had a negative influence on the movement of the LQ45 Index, although this effect was not statistically significant. The BI Rate's rise indicates deteriorating economic conditions, increasing borrowing costs, lowering corporate profits, and encouraging investors to switch to bonds (Huy et al., 2020). High interest rates also reduce the attractiveness of stock investment because it increases the cost of credit. This finding aligns with previous research that found the BI Rate and the LQ45 Index had a negative influence (Mirayanti & Wirama, 2017; Jannah & Nurfauziah, 2018; Utomo et al., 2019; Yuniningsih et al., 2019; Pradita, 2019; Setiadi & Masdupi, 2020; Dewi, 2020; Ani & Andrian, 2022; Andi et al., 2022; Nurmansyah & Thamrin, 2022; Maniil et al., 2023).

The Effect of Money Supply on the LQ45 Index

The money supply variable had a statistically significant negative impact on the movement of the LQ45 Index. People not only allocate money for consumption or investment in the stock market but also choose alternatives such as gold or property. Consequently, the LQ45 index is negatively impacted based on the total money circulating in the economy (Mirayanti & Wirama, 2017). The increase in the money supply has sparked investors' concerns about economic stability, prompting them to reduce their exposure in the stock market to mitigate the risk of investment value depreciation. The results of this study are in line with earlier research, confirming similar findings showing that the LQ45 Index is negatively affected by the amount of money supply (Mirayanti & Wirama, 2017; Yuniningsih et al., 2019; Nurmansyah & Thamrin, 2022; Khridayanti & Manunggal, 2023).

The Influence of IDX on the LQ45 Index

The IDX variable had a statistically significant positive influence on the fluctuations of the LQ45 Index. Since the IDX is the primary benchmark of the Indonesian stock market, its movement directly affects the performance of the LQ45's highly liquid stocks, as evidenced by the close relationship between the two indexes (Mulyono, 2015; Indriani & Mariana, 2021). The increase in the IDX increased investor confidence, encouraged market optimism, and strengthened the positive movement of the LQ45 Index. These findings align with previous researches that demonstrated a strong correlation between IDX and the LQ45 Index (Pratiwi & Hendrawan, 2017; Pradita, 2019)

CONCLUSIONS AND RECOMMENDATIONS

According to the study, bitcoin significantly and negatively impacted the LQ45 Index, suggesting that investors are more likely to turn to bitcoin when the index conditions are less favorable. Inflation has a positive but insignificant

effect, indicating that the index's movement is not significantly effected by Indonesia's low rate of inflation. The exchange rate had a negative and significant effect, indicating that the weakening of the rupiah's value weakened export competitiveness and harmed companies with external debt exposure. The BI Rate had a negative but insignificant effect, suggesting that the increase prompted a shift in investment to other instruments with minimal effect on the index. The amount of money supply has a negative and significant influence, as fluctuations in stock prices result from declining investor interest in the market. Meanwhile, the IDX has a positive and significant influence on the LQ45 Index, emphasizing the close relationship between the two in reflecting the trend of the Indonesian stock market. It is advised that more research be done to broaden the range of variables by taking into account outside variables like political and economic circumstances, as well as explore the impact of financial innovation and data-driven investment strategies to provide more comprehensive insights for stakeholders in investment decision-making.

ADVANCED RESEARCH

This study thoroughly examines the impact of Bitcoin, inflation, exchange rates, the BI Rate, money supply, and the IDX on the LQ45 Index. However, there are limitations that must be considered to fully understand the findings. The focus is restricted to these factors, and further research could address other potential influences, such as global market trends or sector-specific factors, for a more comprehensive analysis of the LQ45 Index's dynamics.

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