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Article

Indonesia's financial resilience: Between optimism and risk

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Abstract: This study aims to evaluate the relationship between financial resilience, exchange rate, inflation, and economic growth from 1996 to 2022 using secondary data from the World Bank. The analysis method uses vector autoregressive to understand the causality dynamics between these variables. The results show that past economic growth positively impacts current economic conditions, but an increase in the exchange rate can hinder economic growth. The exchange rate also tends to be influenced by previous values, but high economic growth does not always increase the exchange rate. Previous conditions significantly affect financial resilience and can be strengthened by a strong currency. Meanwhile, inflation has an inverse relationship with economic growth, where past inflation seems to suppress current inflation, which price stabilization policies can cause. From an institutional economics perspective, this study provides an understanding of the interaction between various economic factors in the structural framework and policies that regulate economic activities. The impulse response function (IRF) shows that economic growth can react strongly to sudden changes, although this reaction may not last long. The exchange rate fluctuates with economic changes, reflecting market optimism and uncertainty. Financial resilience may be strong initially but may weaken over time, indicating the need for policies to strengthen the financial system to ensure economic stability. Furthermore, the role of social capital in economic resilience is highlighted as it can amplify the positive effects of a robust institutional framework by fostering trust and collaboration among economic actors. Inflation reacts differently to economic changes, challenging policymakers to balance growth and price stability. Overall, the IRF provides insights into how economic variables interact with each other and react to sudden changes, albeit with some uncertainty in the estimates. The forecast error decomposition variance (FEVD) analysis in this study reveals that internal factors initially influence economic growth, but over time, external factors such as the exchange rate, financial resilience, and inflation come into play. The exchange rate, which was initially volatile due to internal factors, becomes increasingly influenced by economic growth, indicating a close relationship between the economy and the foreign exchange market. From an institutional economics perspective, financial resilience, which was initially stable due to internal factors, becomes increasingly dependent on global economic conditions, suggesting the importance of a solid institutional framework for maintaining economic stability. In addition, inflation, which was initially explained by economic growth and exchange rates, has gradually become more influenced by financial resilience, indicating the importance of effective monetary policy in controlling inflation. This study highlights the importance of understanding how economic variables influence each other for effective economic governance. Integrating institutional economics and social capital perspectives provides a comprehensive framework for enhancing financial resilience and promoting sustainable economic development in Indonesia.

Keywords: financial resilience; economic growth; inflation; interest rates; Indonesia
JEL Classification: E44; F31; F43; G01; O53

1. Introduction

Financial resilience is a solid foundation for a nation's economic progress (Ahrens and Ferry, 2020). This topic has received particular attention in Indonesia, considering that almost half the country's population is financially vulnerable. However, this does not mean there is no hope, on the contrary, the potential to strengthen financial resilience is enormous. With proper financial education and access to better economic resources, Indonesian people can build a stronger foundation to face global economic uncertainty (Thouret et al., 2022).

The economic growth recorded in 2023, although lower than the previous year, still reflects the strength of the Indonesian economy. The growth rate of 5.05% is proof that the Indonesian economy is not only surviving but also developing despite being faced with significant global challenges. This resilience is rooted in strong institutional economics, which provides a robust framework for policy-making and economic stability. Moreover, the role of social capital cannot be overlooked. The interconnectedness and trust within communities play a crucial role in supporting economic activities and fostering a conducive environment for growth. By leveraging social capital, Indonesia can enhance cooperation and collective action, which are vital for economic development. This scenario illustrates that with the right strategy, supportive policies, and a focus on institutional economics and social capital, Indonesia can continue to move forward in the global economy. Strengthening institutional frameworks ensures that policies are effectively implemented, while building social capital reinforces the fabric of society, enabling more resilient and sustainable growth. The interplay of institutional economics and social capital is key to navigating global challenges and sustaining economic growth. By prioritizing these elements, Indonesia can maintain its development trajectory and achieve high-quality economic growth in the years to come (Anas et al., 2022).

Currency exchange rates are a crucial indicator of a country's economic health. The USDIDR spot rate, which shows the exchange rate between the U.S. dollar and the Indonesian Rupiah, is an essential barometer influencing economic decisions, especially regarding exports and imports. Exchange rate stability is important to maintain investor confidence and ensure the Indonesian economy remains competitive in the global market (Suradi et al., 2022).

Inflation is inevitable in every economy, and Indonesia is no exception. In 2023, inflation in Indonesia was recorded at 2.61% and increased slightly to 2.75% in February 2024. Despite the increase, this inflation rate is still within the range that is considered healthy for the economy. This shows that the monetary policy implemented by the government and the central bank is quite effective in maintaining price stability and people's purchasing power. Inflation in Indonesia has shown encouraging signs of stabilization. This stability reflects healthy economic conditions and indicates that the monetary policy has achieved its objectives (Hanitha et al., 2024).

Understanding the dynamics of financial resilience, exchange rates, inflation, and economic growth is essential to designing better economic policies and strategies. Financial resilience refers to the ability of a country or institution to withstand economic shocks. A stable exchange rate is important for international trade and investment. Inflation, the general increase in the prices of goods and services, affects

people's purchasing power. Economic growth measures the change in a country's gross domestic product (GDP) over time and involves factors such as investment, consumption, and productivity (Ali and Mohsin, 2023). By understanding these factors, governments and financial institutions can design effective policies to address economic challenges and achieve development goals. The dynamics of the Indonesian economy, which continues to develop, show extraordinary adaptation and resilience (Rosyadi et al., 2022). Previous research has not sufficiently explored the causal relationships between these variables in the Indonesian context. Research by Amhimmid et al. (2021) shows that the exchange rate and money supply significantly impact Indonesia's economic growth. However, Wahyudi's (2024) research found that money supply, investment, and the rupiah exchange rate had an insignificant influence on economic growth in Indonesia. Research by Klapper and Lusardi (2020) found that financial resilience impacts exchange rates, inflation, and economic growth. However, research by Setyawati et al. (2022) shows that financial resilience does not significantly impact exchange rates, inflation, and economic growth.

This study evaluates the relationship between financial resilience, exchange rates, inflation, and economic growth. With a deep understanding of various economic phenomena and responsive policies, Indonesia will maintain its growth momentum and increase its financial resilience. This will take Indonesia in a more prosperous direction, where every citizen can benefit from inclusive and sustainable economic growth. The following sections present the literature review, research methods, results and discussion, conclusions, and policy implications. The literature review summarizes research, theories, and studies related to the topic, provides context for the research, and highlights gaps or areas that need further exploration. The research methods describe the methods used in the research, including details about data collection, samples, instruments, and statistical analysis. The results and discussion present the research findings. The conclusion summarizes the main findings of the research and their significance. Policy implications discuss practical applications, explaining how the findings may impact policy, practice, or decision-making.

2. Literature review

Financial resilience, exchange rates, inflation, and economic growth are essential, interrelated elements in the Indonesian economy. Stability and effective policies contribute to the country's economic progress. By maintaining inflation within the desired range and managing the rupiah exchange rate, Indonesia can continue to strengthen its economy and support improvements in the welfare of its people (Anas et al., 2022). Research by Yu et al. (2024) shows that financial resilience is essential in promoting high-quality economic development. In this context, financial resilience refers to the ability of the financial system to withstand stress and overcome risks. In addition, stable economic growth is a beneficial link between financial resilience and high-quality economic development. The research results by Hunjra et al. (2024) Show that financial resilience plays a key role in facilitating high-quality economic development, and stable growth is an intermediary position connecting financial resilience with high-quality economic development. In addition, financial resilience and stable growth impact high-quality economic development and have heterogeneous

characteristics based on region, development stage, and industrial structure. From the perspectives of institutional economics and social capital, financial resilience and stable growth are crucial for the stability and robustness of economic systems. Therefore, increasing financial resilience and stable growth can support Indonesia's economy and accelerate high-quality economic development by leveraging institutional frameworks and enhancing social capital.

2.1. Financial resilience and economic growth in Indonesia

Financial resilience is an essential foundation for individuals' well-being, enabling them to persevere in the face of economic challenges (Szmigin et al., 2020). This challenge is real in Indonesia, with almost a third of the population still isolated from the formal financial system. Many people cannot secure their future or take important steps to improve their living conditions without access to services such as savings, credit, or insurance. This creates significant obstacles to economic progress because, without the right financial tools, it is difficult for individuals to escape the trap of poverty or invest in important aspects such as education and health (Sparrow et al., 2020).

The Indonesian government has recognized the importance of financial inclusion as the key to sustainable economic development. As a result, there has been a solid push to increase access to financial services nationwide. These efforts include introducing financial products that are more affordable and relevant to people's needs. Thus, more people now have the opportunity to open a bank account, which is an essential first step in building financial resilience (Ratnawati, 2020). This increasing bank account ownership is a local phenomenon and part of a global trend towards greater financial inclusion. From the institutional economics perspective, it's crucial to build strong frameworks and policies supporting this trend. However, much remains to be done to ensure every Indonesian citizen can take full advantage of financial services. Enhancing social capital by fostering community networks and trust can further amplify the benefits of financial inclusion, ensuring that these services reach and are effectively utilized by all population segments (Priyanto et al., 2022).

Financial education is the key to empowering individuals to make wise financial decisions. Additionally, technological innovations such as fintech can play an important role in bridging this access gap. By combining the efforts of the government, private sector, and civil society, Indonesia can move towards a future where financial security is not just for a few but a reality for all its citizens (Kumar et al., 2023). Based on the literature review, we can formulate the hypothesis H1 as follows:

H1. Increasing access to financial services and improving financial literacy will contribute positively to individual financial resilience and economic growth in Indonesia.

2.2. Increase in exchange rates and its effects

The rupiah exchange rate against the U.S. dollar has experienced dynamics since the 1997 Asian financial crisis. The crisis rocked the Indonesian economy, causing the rupiah exchange rate to plummet. In a short time, the Rupiah lost most of its value against the U.S. dollar, creating extraordinary economic pressure for Indonesia

(Bawono et al., 2019). The government and Bank Indonesia are trying hard to stabilize the currency, but the process is not easy and full of challenges. In recent years, the rupiah exchange rate has shown several periods of stability but remains vulnerable to external and internal shocks (Hudaya and Firmansyah, 2023).

Tight monetary policy, market intervention, and economic reform have helped strengthen the Rupiah, but this currency often fluctuates in line with changes in global economic conditions (Rifqi and Nihayah, 2020). Rupiah appreciation occurs occasionally, usually driven by increased exports or foreign capital flows, but long-term trends still show that the Rupiah tends to weaken against the U.S. dollar (Siddharth et al., 2024).

The factors that influence the rupiah exchange rate are very complex. Domestic factors such as fiscal and monetary policy, political stability, and economic growth play an important role in determining currency strength. Meanwhile, global factors such as the financial crisis, changes in commodity prices, and the monetary policies of large countries such as the United States have a significant impact. With the global economy closely interconnected, the rupiah exchange rate will continue to be influenced by various events and policies at home and abroad (Chasanah et al., 2022). Based on the literature review, we can formulate the hypothesis H2 as follows:

H2. The increase in the exchange rate affects Indonesia's exports and imports.

2.3. Dynamics of inflation in Indonesia

The monetary policy implemented by the Central Bank of Indonesia has become the foundation for building a stable economy. This effort is reflected in the successful control of inflation. By strategically adjusting interest rates and timely market interventions, Bank Indonesia kept inflation within reasonable limits and demonstrated its commitment to economic stability. Low and stable inflation is essential in maintaining people's purchasing power, which is one of the critical pillars in supporting sustainable economic growth (Suhendra and Anwar, 2022).

The impact of this policy is not only limited to economic figures but also on people's daily lives. The resulting price stability allows consumers to plan their finances better, ensuring that the value of the money they have today will be relatively the same tomorrow and beyond. More accurate cost predictions enable business people to make wiser investment decisions. This, in turn, creates a business environment conducive to growth and expansion (Balmford et al., 2020).

Furthermore, controlled inflation contributes to investor confidence. When investors see that a country can keep inflation low, they are more likely to invest their capital, which means more funds are available for development and innovation projects. Bank Indonesia's prudent and effective monetary policy maintains economic balance and attracts investment that can accelerate national economic growth. A controlled inflation rate signals stability and predictability, which is highly valued in an often uncertain global economy (Coibion et al., 2023). Based on the literature review, we can formulate the hypothesis H3 as follows:

H3. Effective and stable monetary policy implemented by Bank Indonesia contributes to sustainable economic growth.

2.4. Indonesian economic growth

The Indonesian economy has indeed shown impressive growth in recent years. Effective government policies have driven this growth, focusing on structural reforms, increasing infrastructure investment, and improving the investment climate. Initiatives such as deregulation, increased transparency, and eradicating corruption have created an environment more conducive to economic growth. In addition, the government has also taken steps to increase financial inclusion, allowing more citizens to participate in the economy and benefit from this growth (Al-Fadhat, 2022).

On the industrial side, rapid adaptation to market changes has played an important role. The technology sector has developed rapidly, as demonstrated by local startups and technology companies that are innovating and competing globally. Improvements in critical sectors such as manufacturing, agriculture, and tourism have also contributed significantly to Indonesia's GDP. This economic diversification reduces dependence on commodities and opens up new opportunities for jobs and investment, both domestic and foreign (Susilawati et al., 2020).

Increasing the standard of living of the Indonesian people is one of the most obvious impacts of this economic growth. Increasing per capita income means more families can access better education, quality health services, and job opportunities (Nugraha et al., 2020). This, in turn, creates a positive cycle in which increased prosperity encourages further consumption and investment, which then supports sustainable economic growth. However, challenges must be overcome, such as social and economic disparities and the need to ensure that economic growth can be enjoyed by all levels of society in Indonesia (Wahyuni et al., 2020). Based on the literature review, we can formulate the hypothesis H4 as follows:

H4. Effective government policies are key to driving Indonesia's economic growth.

3. Research method

This research utilizes secondary data from world banks, covering the observation period from 1996 to 2022. The study investigates the causal relationships among financial resilience, exchange rates, inflation, and economic growth using the vector autoregressive (VAR) method. The objective is to delve deeper into the connections between these variables. **Table 1** describes the variables.

Table 1. Variable description.

Variable	Variable description	Unit of analysis
Financial resilience	The ability of an organization to survive and bounce back after experiencing economic obstacles.	Percentage
Economic growth	The growth rate of a country's economic output.	Percentage
Exchange rate growth	Changes in the exchange rate of a country's currency against another currency.	Percentage
Inflation	The rate of increase in the general price of goods and services over some time.	Percentage

In vector autoregressive (VAR) analysis, several crucial assumptions require attention. First, the time series variables in the VAR model must exhibit stationarity, meaning their mean and variance remain constant over time. Second, the VAR model assumes mutual influence among all variables in the system, emphasizing the need to

establish relevant causal relationships. Finally, identifying these causal links involves methods such as impulse response function (IRF) and forecast error variance decomposition (FEVD) to enhance the validity and relevance of the analysis.

The initial step involves collecting relevant time series data when conducting research using the VAR method. This data should have consistent observation frequency and adequate data points for statistical analysis. After data collection, the next critical step is assessing stationarity using augmented dickey-fuller (ADF) tests. A differencing process is necessary to achieve stationarity if the data is not stationary. This step is crucial because the VAR model relies on stationary data for accurate estimates.

Once data stationarity is ensured, researchers must determine the optimal lag length. This decision is guided by information criteria such as the Akaike information criterion (AIC) or Schwarz Bayesian criterion (SBC). Choosing the appropriate lag significantly impacts the accuracy of the estimated VAR model. With the lag specified, the VAR model is estimated using the ordinary least squares (OLS) method for each equation in the system. These estimations yield coefficients that reveal the relationships between variables in the model.

Constructing an econometric model using the VAR approach begins with identifying relationships among the economic variables of interest. The VAR model allows dynamic observation of interactions between financial security variables, exchange rates, inflation, and economic growth. Researchers can estimate the model and derive coefficients that describe these relationships over time by selecting suitable lags based on information criteria. In this research, a VAR model is developed as follows:

$$\begin{bmatrix} \text{Financial resilience}_t \\ \text{Exchange rate}_t \\ \text{Inflation}_t \\ \text{Economic growth}_t \end{bmatrix} = \begin{bmatrix} c_1 \\ c_2 \\ c_3 \\ c_4 \end{bmatrix} + \begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} \\ a_{21} & a_{22} & a_{23} & a_{24} \\ a_{31} & a_{32} & a_{33} & a_{34} \\ a_{41} & a_{42} & a_{43} & a_{44} \end{bmatrix} \begin{bmatrix} \text{Financial resilience}_{t-1} \\ \text{Exchange rate}_{t-1} \\ \text{Inflation}_{t-1} \\ \text{Economic growth}_{t-1} \end{bmatrix} + \begin{bmatrix} \epsilon_{1t} \\ \epsilon_{2t} \\ \epsilon_{3t} \\ \epsilon_{4t} \end{bmatrix}$$

where c is the constant vector, a is the coefficient matrix, and ϵ is the error vector.

The final step in VAR analysis involves interpreting the results. This process includes using the Granger causality test to determine the direction of causal relationships between variables. Additionally, researchers utilize the impulse response function (IRF) and forecast error variance decomposition (FEVD) to analyze the dynamics of these relationships over time. The IRF allows us to observe how variables respond to shocks in other variables, while the FEVD helps us understand the contribution of variables in predicting future outcomes. Ultimately, the results of this analysis deepen our understanding of the phenomenon under study and inform the conclusions presented in the research report.

4. Results and discussion

After collecting the required data using secondary data from world banks, and to ensure that the data is stationary, a stationarity test is carried out, which is presented in **Table 2**.

Table 2. Stationarity test.

Method	Statistic	Prob.**	Cross sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin, and Chu *t**	−5.70900	0.0000	4	143
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin *W*-stat	−6.41897	0.0000	4	143
ADF—Fisher chi-square	54.5054	0.0000	4	143
PP—Fisher chi-square	52.8771	0.0000	4	144

The stationarity test results in **Table 2** consistently show rejection of the null hypothesis by all test methods, indicating that the data tested is stationary. The *t* statistic from Levin, Lin, and Chu of −5.70900 and a probability of 0.0000, together with the *W* statistic of Im, Pesaran, and Shin of −6.41897 and the same probability, provides strong evidence for a unit root process in all cross sections. This is reinforced by the chi-square values of ADF and P.P., respectively 54.5054 and 52.8771, with a probability of 0.0000, which supports data stationarity. This very low probability confirms the statistical significance of the results, indicating that the data have no unit roots and maintain constant mean and variance, making them suitable for autoregressive vector analysis. After ensuring that all data is stationary, the optimal lag is determined, presented in **Table 3**.

Table 3. Optimal lag determination results.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	−473.0727	NA	18104253	28.06310	28.24267	28.12434
1	−394.5568	133.9388*	461750.4*	24.38570*	25.28355*	24.69189*
2	−384.3500	15.01004	677803.0	24.72647	26.34262	25.27762
3	−375.0460	11.49319	1124131.	25.12035	27.45479	25.91646

The previous no-lagged model showed very low log likelihood (LogL) and high Akaike information criterion (AIC), Schwarz criterion (S.C.), and Hannan-Quinn criterion (H.Q.) values, indicating the inadequacy of the model. In contrast, the addition of one lag (Lag 1) results in a significant increase in LogL and a significant decrease in likelihood ratio (L.R.), final prediction error (FPE), AIC, SC, and H.Q., which marks a significant model improvement. However, adding a second and third lag does not significantly improve; instead, Lag 3 may lead to overfitting due to the minor increase in LogL and higher information criterion value than Lag 2. Thus, based on the lowest information criterion, Lag 1 is the optimal choice, providing the most significant increase in LogL and the largest decrease in the information criterion, making it the best fit for the data. After determining the optimal lag, estimates are carried out based on the model that has been developed and presented in the research method section. The auto-regressive vector estimation results are presented in **Table 4**.

Table 4. Vector autoregressive estimation results.

	Economic growth	**Exchange rate growth**	**Finance resilience**	**Inflation**
Economic growth	0.560580 (0.42791) [1.31004]	−2.624090 (4.70854) [−0.55730]	0.845353 (0.38760) [2.18100]	−0.273774 (1.07292) [−0.25517]
Exchange rate growth	−0.068153 (0.06132) [−1.11138]	0.706901 (0.67476) [1.04763]	−0.043462 (0.05555) [−0.78245]	0.168360 (0.15376) [1.09498]
Finance resilience	−0.096835 (0.21852) [−0.44314]	3.227302 (2.40450) [1.34219]	1.204291 (0.19793) [6.08428]	0.767574 (0.54791) [1.40092]
Inflation	0.443717 (0.22249) [1.99436]	−4.774922 (2.44813) [−1.95044]	−0.070497 (0.20153) [−0.34982]	−0.553719 (0.55785) [−0.99260]
C	4.203929 (2.70323) [1.55515]	−29.01720 (29.7451) [−0.97553]	0.463292 (2.44857) [0.18921]	−3.006635 (6.77793) [−0.44359]
R-squared	0.824105	0.833944	0.947141	0.826041
Adj. *R*-squared	0.863830	0.829004	0.930877	0.818669

The vector autoregressive (VAR) analysis in **Table 4** shows the dynamic relationship between economic growth, exchange rates, financial resilience, and inflation. In the context of economic growth, the coefficient of 0.560580 indicates that current economic growth has a significant positive correlation with past economic growth, with a *t*-statistic value of 1.31004, indicating that this relationship is statistically significant. However, economic growth seems to be negatively influenced by the exchange rate, with a coefficient of −2.624090, which indicates that an increase in the exchange rate can hinder economic growth.

In the exchange rate variable, the coefficient of 0.706901 indicates that the current exchange rate tends to be positively influenced by past exchange rates, with a *t*-statistic value of 1.04763 indicating statistical significance. However, economic growth has a small negative effect on the exchange rate with a coefficient of −0.068153, which may indicate that higher economic growth does not necessarily mean an increase in the exchange rate.

Financial resilience, as measured by the coefficient 1.204291, shows that current financial resilience is strongly influenced by past financial resilience, with a very high *t*-statistic value of 6.08428, indicating that this relationship is very significant. This shows that the history of financial resilience has an important role in determining current financial resilience. In addition, the exchange rate has a large positive influence on financial resilience, with a coefficient of 3.227302, which may indicate that a stronger currency can improve a country's financial resilience.

Conversely, inflation appears to have a significant negative relationship with economic growth, as shown by the coefficient of −4.774922, which suggests that higher economic growth can help suppress inflation. However, the coefficient of

−0.553719 for inflation alone indicates that past inflation negatively influences current inflation, which may indicate policy efforts to stabilize prices.

Overall, this VAR model provides insight into how these economic variables interact with each other. A high *R*-squared indicates that the model is a good fit for the data analyzed. The adjusted *R*-squared value provides a more conservative measure of model fit, considering the number of variables in the model. The Granger causality test is presented in **Table 5**.

Table 5. Granger causality test.

Null hypothesis	Obs	*F*-statistic	Prob.
Exchange rate growth does not granger cause economic growth	36	0.04133	0.8402
Economic growth does not granger cause exchange rate growth		0.55545	0.4614
Finance resilience does not granger cause economic growth	36	2.23441	0.1445
Economic growth does not granger cause finance resilience		93.6096	4×10^{-11}
Inflation does not granger cause economic growth	36	1.32637	0.2577
Economic growth does not granger cause inflation		0.03544	0.8518
Finance resilience does not granger cause exchange rate growth	36	6.36878	0.0166
Exchange rate growth does not granger cause finance resilience		72.8693	7×10^{-10}
Inflation does not granger cause exchange rate growth	36	1.86582	0.1812
Exchange rate growth does not granger cause inflation		2.45465	0.1267
Inflation does not granger cause finance resilience	36	46.2237	9×10^{-8}
Finance resilience does not granger cause inflation		6.26659	0.0174

Several significant relationships between economic variables were revealed in the granger causality analysis. First, there is insufficient evidence to state that exchange rate growth and inflation have a causal influence on economic growth or vice versa. This is indicated by a high *p*-value, which exceeds the threshold of 0.05, indicating that the causal relationship between these variables is not statistically significant. However, financial resilience appears to have a more complex role in these dynamics, with some results suggesting a significant causal influence.

Furthermore, financial resilience is proven to have a strong influence on exchange rate growth, with a significant *F*-statistic value and *p*-value below 0.05. On the other hand, economic growth also significantly influences financial resilience, with a very high *F*-statistic value and a *p*-value close to zero. These results show that financial resilience and economic growth influence each other in a mutually reinforcing relationship.

Finally, the relationship between inflation and financial resilience has also attracted attention. Inflation is proven to significantly cause financial resilience, characterized by a very high *F*-statistic value and a very low *p*-value. As a macroeconomic indicator, inflation can strongly impact a country's financial stability. In conclusion, this Granger causality test provides important insights into how various aspects of the economy interact and influence each other in macroeconomics. **Table 6** shows the results of the impulse response function (IRF).

Table 6. Impulse response function results.

Response to economic growth:				
Period	**Economic growth**	**Exchange rate growth**	**Finance resilience**	**Inflation**
1	3.529880	0.000000	0.000000	0.000000
	(0.42190)	(0.00000)	(0.00000)	(0.00000)
2	0.958839	0.615861	−0.496010	1.237838
	(0.73144)	(0.65625)	(0.66037)	(0.63806)
3	−0.424172	0.258992	−0.139788	0.509749
	(0.70454)	(0.63817)	(0.51692)	(0.56974)
4	−0.379882	−0.124878	−0.103283	0.144571
	(0.65920)	(0.51553)	(0.33353)	(0.43317)
5	−0.707804	0.155986	−0.237677	0.087151
	(0.52520)	(0.28142)	(0.28152)	(0.29397)
6	−0.535260	0.026844	−0.095611	−0.147102
	(0.49774)	(0.22981)	(0.24952)	(0.24241)
7	−0.309913	−0.034792	−0.076167	−0.109558
	(0.42118)	(0.20091)	(0.20481)	(0.20434)
8	−0.275146	0.034412	−0.063112	−0.071453
	(0.34776)	(0.13846)	(0.14476)	(0.17646)
9	−0.117541	−0.020567	−0.000661	−0.090665
	(0.25645)	(0.11259)	(0.11826)	(0.14624)
10	−0.027377	−0.016177	0.001610	−0.040708
	(0.20507)	(0.10769)	(0.09226)	(0.11117)
Response to exchange rate growth:				
Period	**Economic growth**	**Exchange rate growth**	**Finance resilience**	**Inflation**
1	−34.76266	17.32601	0.000000	0.000000
	(5.08334)	(2.07085)	(0.00000)	(0.00000)
2	5.614176	−7.040838	11.65718	−13.32060
	(8.15734)	(7.41596)	(7.35427)	(7.01266)
3	9.017830	2.202729	1.992100	2.359290
	(7.73845)	(7.08725)	(4.41021)	(5.59413)
4	3.589036	5.655958	3.135833	1.009906
	(6.70027)	(5.12571)	(3.38004)	(3.86313)
5	10.81553	−1.462246	4.562496	0.146882
	(5.49722)	(3.15509)	(2.96195)	(3.31822)
6	5.304007	2.337183	0.933957	3.896440
	(4.89984)	(3.42302)	(3.07277)	(3.32949)
7	2.538675	1.817291	1.405911	1.597302
	(4.24956)	(3.22058)	(2.49200)	(2.75737)
8	2.964691	0.095452	0.996859	1.189904
	(3.81043)	(2.60609)	(1.90425)	(2.29888)
9	0.247116	1.276833	−0.087946	1.515330
	(3.08326)	(2.10966)	(1.69490)	(1.90237)
10	−0.288194	0.608028	0.188162	0.394217
	(2.74090)	(1.86850)	(1.33781)	(1.46860)

Table 6. (*Continued*).

Response of finance resilience:				
Period	**Economic growth**	**Exchange rate growth**	**Finance resilience**	**Inflation**
1	1.363610	0.020928	2.891907	0.000000
	(0.51529)	(0.48883)	(0.34565)	(0.00000)
2	6.654499	−1.013590	3.517009	−0.196665
	(1.18071)	(0.82244)	(0.70484)	(0.56269)
3	6.707566	0.542087	2.181908	1.403046
	(1.81760)	(1.46942)	(1.53313)	(1.47849)
4	5.486705	0.699717	1.745237	1.432978
	(2.19111)	(1.86344)	(1.80739)	(1.85700)
5	4.258296	0.349553	1.148852	1.495785
	(2.37486)	(2.04862)	(1.75867)	(1.93247)
6	2.215957	0.637423	0.473258	1.428965
	(2.32708)	(2.06655)	(1.63330)	(1.80318)
7	0.973273	0.442009	0.243917	0.877256
	(2.24540)	(1.91911)	(1.37617)	(1.53234)
8	0.223460	0.293221	0.011221	0.570860
	(2.14399)	(1.61495)	(1.15698)	(1.20765)
9	−0.364943	0.297952	−0.121381	0.321389
	(1.94596)	(1.27497)	(0.94614)	(0.94872)
10	−0.505693	0.164275	−0.108724	0.079375
	(1.63044)	(0.99003)	(0.72897)	(0.77261)
Response to inflation:				
Period	**Economic growth**	**Exchange rate growth**	**Finance resilience**	**Inflation**
1	−7.340410	4.053711	−0.486736	2.789699
	(1.21176)	(0.68108)	(0.47512)	(0.33343)
2	−1.707847	0.688459	2.489266	−1.544709
	(1.78711)	(1.61431)	(1.61275)	(1.56714)
3	2.349573	0.248920	1.524793	0.051767
	(1.70293)	(1.53813)	(1.10980)	(1.28776)
4	1.076413	1.850451	0.818649	0.844984
	(1.62476)	(1.24780)	(0.83354)	(1.01148)
5	2.154679	0.475260	1.263720	0.235284
	(1.34679)	(0.82228)	(0.82212)	(0.85012)
6	1.725047	0.560812	0.595687	0.884998
	(1.30061)	(0.84927)	(0.74886)	(0.80544)
7	0.688547	0.767929	0.371944	0.693215
	(1.13359)	(0.82981)	(0.69505)	(0.73346)
8	0.660862	0.280243	0.357154	0.366882
	(1.00651)	(0.72383)	(0.55603)	(0.64410)
9	0.207595	0.352811	0.089873	0.416477
	(0.85038)	(0.63924)	(0.46371)	(0.53877)
10	−0.096148	0.302856	0.057255	0.212456
	(0.75435)	(0.54816)	(0.39355)	(0.41757)

The impulse response function (IRF) is an important analytical tool in econometrics that helps us understand how certain economic variables react to sudden changes or 'shocks' in other variables. In the context of economic growth, IRF can reveal complex dynamics between economic growth, exchange rates, financial resilience, and inflation. The initial response of economic growth to a positive shock may show a strong increase, but over time, this effect may diminish or even reverse. This suggests that the economy may only temporarily absorb the shock before returning to its original state or contracting.

Exchange rate growth, as one of the response variables, also shows significant volatility in its reaction to economic shocks. An initial sharp increase may reflect market optimism or policy intervention, but a rapid negative change may signal market uncertainty or adjustment. This variability is significant because fluctuating exchange rates can have far-reaching impacts on foreign trade and the stability of the domestic economy.

Financial resilience, often considered a barometer of economic health, also reacts to economic shocks. The strong positive response initially indicated that the financial system could withstand the shock. However, a decline in this response over time may indicate that the long-term effects of the shock are starting to weigh on the financial system, which may require policy interventions to strengthen financial resilience and prevent a crisis.

As an important indicator of price pressures, inflation also shows varying responses to economic shocks. Increased inflation after a shock may reflect higher cost pressures or increased demand. However, a negative or fluctuating response may indicate that there are other factors influencing prices, such as monetary policy or changes in inflation expectations. This inconsistent inflation response challenges policymakers to navigate between stimulating growth and maintaining price stability.

Overall, the IRF results provide valuable insight into the interactions between various economic variables and how they react to shocks. Although the relatively large standard error indicates uncertainty in the estimates, IRF analysis remains useful for understanding economic dynamics and assisting policymakers in formulating appropriate strategies. IRF results must be interpreted, considering the broader economic context and the assumptions underlying the econometric model used. The impulse response function (IRF) visualization is presented in **Figure 1** for better visualization.

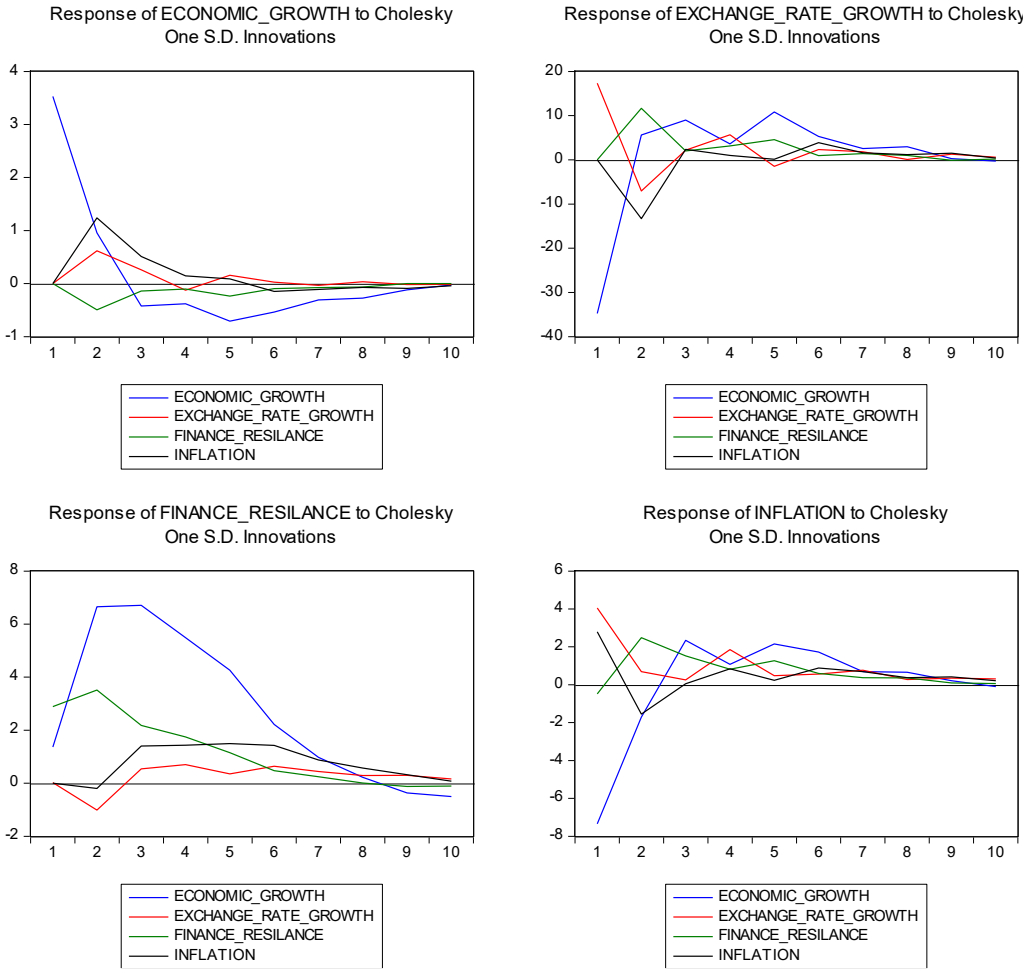

Figure 1. Impulse response function (IRF).

Forecast error variance decomposition (FEVD) helps understand the contribution of variables in predicting other variables in the future. Forecasting results using forecast error variance decomposition (FEVD) are presented in **Table 7**.

Table 7. Forecast error variance decomposition (FEVD).

Variance decomposition of economic growth:					
Period	**S.E.**	**Economic growth**	**Exchange rate growth**	**Finance resilience**	**Inflation**
1	3.529880	100.0000	0.000000	0.000000	0.000000
2	3.941697	86.11343	2.441174	1.583487	9.861906
3	4.007912	84.41164	2.778755	1.653244	11.15636
4	4.031728	84.30512	2.841961	1.699396	11.15352
5	4.104173	84.32939	2.886967	1.975301	10.80834
6	4.142733	84.43621	2.837673	1.991965	10.73415
7	4.156597	84.42980	2.825781	2.012278	10.73214
8	4.166927	84.44774	2.818609	2.025253	10.70840
9	4.169621	84.41811	2.817401	2.022639	10.74185
10	4.169941	84.40945	2.818473	2.022343	10.74973

Table 7. (*Continued*).

Variance decomposition of exchange rate growth:					
Period	**S.E.**	**Economic growth**	**Exchange rate growth**	**Finance resilience**	**Inflation**
1	38.84113	80.10182	19.89818	0.000000	0.000000
2	43.62400	65.15641	18.37909	7.140625	9.323870
3	44.70751	66.10507	17.74178	6.997252	9.155894
4	45.32644	64.93906	18.81764	7.286096	8.957200
5	46.84483	66.12808	17.71497	7.770017	8.386931
6	47.37180	65.91866	17.56645	7.636979	8.877918
7	47.52223	65.78735	17.60164	7.676228	8.934774
8	47.64001	65.84974	17.51512	7.682104	8.953035
9	47.68193	65.73671	17.55605	7.668944	9.038299
10	47.68868	65.72176	17.56734	7.668331	9.042574
Variance decomposition of finance resilience:					
Period	**S.E.**	**Economic growth**	**Exchange rate growth**	**Finance resilience**	**Inflation**
1	3.197342	18.18872	0.004284	81.80700	0.000000
2	8.242618	67.91475	1.512793	30.51553	0.056928
3	10.95241	75.97265	1.101794	21.25225	1.673303
4	12.47590	77.89183	1.163691	18.33562	2.608861
5	13.32143	78.53587	1.089510	16.82565	3.548965
6	13.60306	77.97132	1.264439	16.25721	4.507030
7	13.67534	77.65578	1.355576	16.11763	4.871017
8	13.69222	77.49108	1.398097	16.07798	5.032840
9	13.70463	77.42172	1.442834	16.05672	5.078725
10	13.71560	77.43385	1.454872	16.03733	5.073953
Variance decomposition of inflation:					
Period	**S.E.**	**Economic growth**	**Exchange rate growth**	**Finance resilience**	**Inflation**
1	8.850623	68.78487	20.97771	0.302440	9.934982
2	9.502990	62.89487	18.72124	7.123889	11.26000
3	9.910446	63.45020	17.27656	8.917354	10.35588
4	10.20705	60.92830	19.57373	9.049894	10.44808
5	10.52164	61.53314	18.62480	9.959392	9.882663
6	10.73001	61.75104	18.18161	9.884527	10.18282
7	10.80814	61.26739	18.42453	9.860571	10.44751
8	10.84405	61.23373	18.36951	9.903855	10.49290
9	10.86013	61.08902	18.42068	9.881388	10.60891
10	10.86701	61.01958	18.47504	9.871664	10.63371

Forecast error variance decomposition (FEVD) analysis provides deep insight into how the variables in the vector autoregression (VAR) model influence each other over time. In the case of economic growth, variability in growth is fully explained by shocks in the variable itself. However, as time passes, other factors, such as exchange rate growth, financial resilience, and inflation, begin making a more significant

contribution. This shows that economic growth is not only influenced by internal factors but also by complex external dynamics. Integrating institutional economics and social capital viewpoints provides a thorough framework for boosting financial resilience and encouraging sustainable economic development in Indonesia.

Initially, the exchange rate growth variable was dominated by shocks to the variable itself and economic growth. However, as time goes by, the influence of economic growth becomes stronger, indicating that economic growth has an increasing impact on exchange rate variability. This indicates a strong interaction between the macroeconomy and the foreign exchange market, where changes in one sector can affect the other. Strong institutional frameworks are crucial for preserving economic stability because, from the perspective of institutional economics, financial resilience—which was initially steady owing to internal factors—becomes more and more reliant on overall economic conditions.

In financial resilience, most of the variability is initially explained by shocks in the variable itself. However, over time, shocks in economic growth have begun to play a larger role, indicating that overall economic conditions increasingly influence financial resilience. This emphasizes the importance of economic stability in maintaining the financial sector's resilience.

Finally, inflation, economic growth, and exchange rate shocks initially explain most of the variability. However, over time, shocks in financial resilience become more important in explaining inflation variability. This shows that financial policy and financial sector stability influence the inflation rate. This overall FEVD analysis highlights how important it is to understand the interactions between economic variables to forecast and manage the economy effectively.

5. Conclusion

The study's conclusion confirms that past economic growth positively influences current economic conditions while highlighting potential constraints arising from exchange rate appreciation. Additionally, the impulse response function (IRF) and forecast error variance decomposition (FEVD) analyses provide valuable insights into the dynamic interactions between economic variables. Overall, this research enhances our understanding of how various economic factors interact. From the institutional economics perspective, the IRF reveals that the economy responds strongly to sudden changes, although these reactions may be short-lived. The exchange rate exhibits fluctuating responses to economic shifts, reflecting market optimism and uncertainty. Initially robust, financial resilience can weaken over time, emphasizing the need for policies to strengthen the financial system. The role of social capital becomes evident as policymakers face the challenge of balancing growth and price stability, with inflation reacting differently to economic changes. Strong social capital, characterized by trust and effective networks, can support financial resilience and mitigate the adverse effects of economic volatility. The FEVD analysis indicates that internal factors initially influence economic growth, but external factors such as the exchange rate, financial resilience, and inflation gradually come into play. The exchange rate, initially affected by internal factors, increasingly correlates with economic growth, highlighting the close relationship between the economy and the foreign exchange

market. Financial resilience, initially stable due to internal factors, becomes more dependent on general economic conditions, emphasizing the importance of overall economic stability as conceptualized in institutional economics.

Furthermore, inflation, initially explained by economic growth and the exchange rate, becomes increasingly influenced by financial resilience, underscoring the significance of effective monetary policy in controlling inflation. Understanding the intricate interactions among economic variables is crucial for effective economic management. Integrating institutional economics and social capital perspectives provides a comprehensive framework for enhancing financial resilience. Strengthening institutional frameworks and leveraging social capital can significantly support economic stability and promote sustainable growth. Therefore, increasing financial resilience and stable growth through the lenses of institutional economics and social capital can support Indonesia's economy and accelerate high-quality economic development.

6. Policy implications

This study emphasizes the importance of understanding how economic variables interact for effective economic management. Empirical findings must be directly linked to practical measures to improve policy recommendations. Policymakers can strengthen financial resilience by implementing targeted monetary policies, strengthening financial institutions, and closely monitoring exchange rate fluctuations. In addition, assessing the robustness of findings from the Impulse response function (IRF) and forecast error variance decomposition (FEVD) analyses is essential for adaptive policy. Furthermore, considering potential trade-offs and unintended consequences related to exchange rate and inflation management provides a more comprehensive policy perspective.

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