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Beyond Immediate Needs: An Analysis of Social Insurance and Its Behavioral Economic Impact in Indonesia

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Abstract: Despite the relatively high GDP growth of around 5.3 in 2022, Indonesia still faces high inequality (Gini index 37.9), which challenges social-economic-security instruments. In January 2023, the government spent around IDR 5.3 trillion to protect public health, a 12% increase compared to last year (2022), making Badan Penyelenggara Jaminan Sosial Kesehatan shortened by BPJS Kesehatan as a medic-aid social insurance manager need to keep evolving to suffice the need. In this research, we investigate the potential impact of social insurance in Indonesia to determine the possible direction of the relationship between the adequacy of social-economic-security instruments and spending. The study utilises a vector error correction model (VECM) test as a tool to analyse quarter data from several online source datasets, including household consumption expenditures, gross national income, and capital stock from bps.go.id, social insurance participations from djsn.go.id, inflation and national savings proxy by broad money M2 from bi.go.id in the form of quarterly data, starts from 2016 Q1 until 2023 Q3. The regression result shows no immediate and significant relationship between social insurance and consumption. However, the analysis reveals that social insurance might contribute to economic resilience, potentially leading to higher productive spending and a potential behavioural transformation towards risk.

Keywords: Social Insurance; Consumption; Saving; Investment; Behavioral Impact

INTRODUCTION

Indonesia has a population of more than 273 million with a 37,9 Gini index, which will be a significant force in establishing a solid healthcare system to promote economic resilience. UU No. 24 of 2011 concerning the Badan Penyelenggara Jaminan Sosial (BPJS) in English, called Social Security Administering Body, became a turning point in overcoming the Indonesian inability to access comprehensive health facilities. One pivotal concern is the government's expenditure on Contribution Assistance Recipients (Penerima Bantuan Iuran, short PBI) within BPJS Kesehatan (Sopiah and CNBC Indonesia 2023). While independent contributors continue to show their existence, PBI beneficiaries constitute a sizeable portion of the program. Nowadays, BPJS is trying to make a big step to overcome this issue; the class classification system is projected to be erased in

2025 and will be replaced by one class standard service called Kelas Rawat Inap Standard (KRIS) (CNN Indonesia 2023). However, this approach still faces pros and cons.

Huda dan Kurnia (2022) Highlight the contrasting approaches of Malaysia and Indonesia to social insurance management and their implications for economic resilience. Their research shows Malaysia's pension system has an investment purpose from the social-fund-premium management, while currently, in Indonesia, the initiation has not reached that stage. Social insurance is often utilised as a tool for fiscal policy, serving as a revenue-raising institution and promoting state-building by legitimising tax collection and creating capital reserves for economic investment. (Koreh 2017a; Koreh 2017b; Béland dan Koreh 2019).

This also explains the findings of Huda and Kurnia regarding the different implications concerning fund managerial policy that could be seen from the causality of the behavioural response of society and the policy. Despite the necessitated adjustments in policy design to account for heterogeneous responses across the population (Sébastien dan Joseph 2017), we should take into consideration that behavioural responses to fiscal and monetary policy are influenced by biases and transaction costs (micro-fictions) (ibid.). The rising question regarding this issue is how to capture externalities to address the micro-frictions.

Several behavioural experiments demonstrate that utility functions reflect risk aversion and risk-seeking behaviours, which vary depending on the context and the individual's initial risk attitude. Jung and Tran (2022), for instance, explain how utility function could be affected by social insurance. The purpose of the model is to quantify the welfare effects of public insurance for idiosyncratic income and longevity risks with proxies consumption (c), leisure (l), and labour-force participation status on their utility function (ibid.). The discussion is weighted on how consumption, savings, and labour supply jointly determine US citizen participation in Health Insurance. Marginal Propensity to Consume (MPC) is a critical concept in economics that measures the change in consumption resulting from a change in income. Marginal Propensity to Consume and Utility relationship represent the satisfaction or benefit derived from the consumption factors.

Jung and Tran's (2022) study implied that social insurance can reduce consumption variability and lead to a more stable long-term consumption pattern. The effectivity of specific risk management policies also depends on society's behavioural variable, represented by perception and attitude towards risks. Risk-averse individuals are more likely to participate in insurance programs, including public health insurance and crop insurance, as they seek to mitigate potential losses. (Ali *et al.* 2021; Asuming dan Deborah 2023).

Utility function also enables measurement of an individual's "utility" or degree of satisfaction that could be derived from various degrees of wealth or consumption. At first glance, the perception of utility stands in a concept of "the more, the merrier" principle, which means, in certain conditions,

individuals enjoy having more than others only when the gap between them and others is not too large (Hadad dan Malul 2016). However, a study shows when a utility function creates a concave function, the perception of utility will be different; a study shows the extra satisfaction (marginal utility) gained from each more unit of wealth reduces as wealth rises (Jarrow dan Li 2021). Regarding the discussion of BPJS Kesehatan's policy regarding the one-class system, the previous statement about utility implies the possibility of moving in the right direction towards social insurance product management.

Therefore, to validate the literature review findings, this paper will explore these relationships and the trend of social insurance's relationship to consumption, savings, investment, and inflation in Indonesia. The research aims to figure out the short-term and long-term relationship as well as the causality relationship between social insurance and economic proxies proposed in this study.

METHOD

STUDY DESIGN AND SETTING

This research employs a time-series analysis to investigate the relationship between social insurance and economic welfare in Indonesia. The study is set in the context of Indonesia's economy, focusing on data from 2016 Q1 to 2023 Q3. The analysis specifically examines the impact of social insurance on economic variables such as household consumption expenditures, gross national income, national savings, capital stock, and inflation. Data were sourced from public records and statistical databases provided by the Indonesian government and financial institutions.

DATA COLLECTION AND PROCESS

The study relies on macro-level economic and insurance data from time-series data from publicly available sources. Key variables include:

Table 1. Data description and source

Variable	Definition	Data Source
HCE	Household Consumption Expenditures in normal goods category	Statistik Makroekonomi - BPS (bps.go.id)
GNIB	Gross National Income Bruto	Statistik Makroekonomi - BPS (bps.go.id)
SIR	Social Insurance specific on Medicaid i.e. BPJS Kesehatan Indonesia	SISMONEV TERPADU JKN | Aspek Kepesertaan (djsn.go.id)
NS	Savings Account Withdrawals (Broad Money M2)	Statistik Ekonomi dan Keuangan Indonesia - Desember 2023 (bi.go.id)
CS	Capital Stock Registered on *Bursa Efek Indonesia*	Transaksi dan Indeks Saham di Bursa Efek - BPS (bps.go.id)
INFL	Inflation	Statistik Ekonomi dan Keuangan Indonesia - Desember 2023 (bi.go.id)

The time-series data were gathered from several official and publicly accessible databases, such as the Badan Pusat Statistik (bps.go.id) for national accounts, household consumption and capital stock records, Bank Indonesia (bi.go.id) for national savings and inflation data. These datasets span the period from 2016 Q1 to 2023 Q3 and are available at daily intervals, while only Social Insurance data is available from Dewan Jaminan Sosial Nasional. (sismonev.djsn.go.id) It is available at

quarterly intervals. Therefore, the data needs to be processed through cleaning and converting to get a similar form of data for all variables used.

STATISTICAL ANALYSIS

The research employed a Vector Error Correction Model (VECM) to analyse the data. This model allows the exploration of long-term and short-term dynamics among the variables. The Johansen cointegration test was used to verify the presence of long-run relationships, while Granger causality tests were applied to investigate causal relationships between the variables. A sequential process must be done before getting to the final result to run the Vector Error Correction Model. The sequential process includes unit root tests, lag selection criteria, impulse response function (IRF), and variance decomposition (VD). As VECM runs under the assumption all the variables are dependent. Imply the model ability to provides insights from the dynamics between social insurance and economic indicators, offering both short-term and long-term as well as direct and indirect relation.

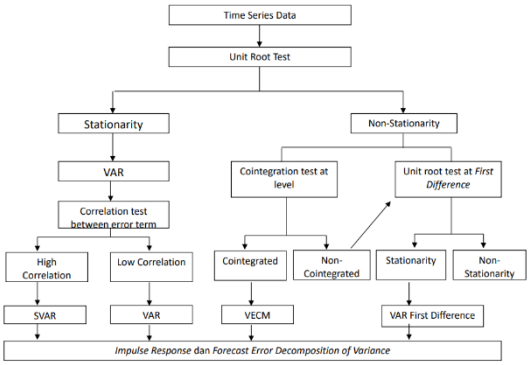

Figure 1. Sequential steps to conduct VEC estimation

MODEL SPECIFICATION

In this section, we develop a simple model of the macroeconomy that relates consumption specific to household consumptions to income, savings, capital stock, social insurance, and inflation. The consumption function is given by:

$$HCE = f[GNI, SIR, NS, CS, INFL] \quad \text{eq. (1)}$$

When the marginal propensity to consume increases, the ability to consume will increase, increasing aggregate output, using the Keynesian multiplier theory, which creates more demand in response to higher consumption. However, at a certain point, increasing disposable income could also lead to diminishing utility of consumptions and encourage more savings. Therefore, we will run the VECM model to see the interactions between variables and, ultimately, to test the effect of social insurance shock on consumption behaviour.

In the application of Vector Error Correction estimation, the consumption function will be developed to be:

$$HCEt = \beta 0 + \beta 1\ \Delta \text{GNIBt} + \beta 2\ \Delta \text{SIRt} + \beta 3 \Delta \text{NSt} + \beta 4\ \Delta \text{CSt} + \beta 5\ \Delta \text{INFLt} + \beta 6\ \text{xt} - 1 + \varepsilon t \quad \text{eq. (2)}$$

Where t denotes the selected optimal time trend from the determined optimum lag from the Lag Order Selection Criterion Test and εDenotes standard deviation or error term from the model. As a result, this study developed two sets of hypotheses to be tested. The null and alternative hypotheses for the study are as follows:

H0P1: There is neither a long-term nor a short-run relationship between household consumption expenditures, gross national income bruto, social insurance, national savings, capital stock, and inflation.

H1P1: There is a long-run or short-run relationship between household consumption expenditures, gross national income bruto, social insurance, national savings, capital stock, and inflation.

H0P2: There are no causal relationships between household consumption expenditures, gross national income bruto, social insurance, national savings, capital stock, and inflation.

H1P2: There are causal relationships between household consumption expenditures, gross national income bruto, social insurance, national savings, capital stock, and inflation.

RESULT

UNIT ROOT TEST RESULT

A unit root process analysis, a difference stationary process, is a stochastic trend in a time series. Time series data was analysed using the Augmented Dickey-Fuller (1979) and Phillips–Perron (1988) unit root tests to test for its stationarity. The unit toot test result shows all the variables within

Table 2. Unit root test

Variables		Augmented Dickey Fuller (ADF)				Phillips-Perron (PP)			
		Constant		Constant and Trend		Constant		Constant and Trend	
		t-statistic	p-value	t-statictic	p-value	t-statictic	p-value	t-statictic	p-value
HCE	Level	-1,073566	0,7129	-2,506994	0,3227	-0,912988	0,77	-2,46398	0,3421
GNIB		-1,702855	0,417200	-2,636998	0,268700	-3,971743	0,004800	-5,130911	0,001300
SIR		-0,435000	0,890100	-2,127385	0,505700	-0,693555	0,833500	-1,717110	0,718500
NS		0,373180	0,977500	-1,389673	0,838900	-0,446488	0,888300	-1,652526	0,747100
CS		-2,046461	0,266600	-3,762029	0,033800	-1,956699	0,303300	-2,601166	0,282400
INFL		-3,096179	0,038400	-3,214374	0,102100	-2,105504	0,244000	-2,064397	0,543800
HCE	First	-6,100768	0,000000	-5,989603	0,000200	-6,621042	0,000000	-6,494629	0,000000
GNIB	dif.	-6,754917	0,000000	-7,416175	0,000000	-16,052810	0,000000	-29,652600	0,000000
SIR		-4,235511	0,002500	-4,122834	0,015300	-4,359578	0,001900	-4,261064	0,011200
NS		-3,014610	0,047200	-2,784357	0,215200	-5,872578	0,000000	-5,757595	0,000000
CS		-5,901385	0,000000	-5,828411	0,000000	-7,608229	0,000000	-7,612047	0,000000
INFL		-3,715238	0,009200	-3,546176	0,053000	-3,715238	0,009200	-3,546176	0,053000

Notes: when the p-value less than 0,05 means the data stationare

Source: Author's Eviews Unit Root Test Result

the model are unit root at level but stationary at the first difference, that means at the level, the series exhibits unstable statistical properties, and after going through the first differencing, the series exhibits stable statistical properties (constant mean, variance, and covariance) which also indicate the possibility of long-term correlation within the model. Non-stationary series can lead to spurious regressions and unreliable results.

The Augmented Dickey-Fuller (ADF) test advantaged bigger and more complex models. In contrast, the Philips-Perron (PP) test is the extended ADF test that takes autocorrelation and heteroscedasticity into the error term. The computed results show HCE, GNIB, SIR, NS, CS, and INFL were unit roots at the level but stationary at the first difference with a p-value less than 0,05. Therefore, the model will use the first difference for the rest of the test.

VECTOR ERROR CORRECTION MODEL (VECM) ANALYSIS

Lag Length Selection Criterion

Several criteria exist for choosing the optimal lag, such as the Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hannan-Quinn Information Criterion (HQ). Based on the computed result from our model, the FPE, AIC, and HQ criteria suggest a lag length of two (2), which is ideal for the vector error correction model (VECM).

In addition, this paper weighted the interpretation of the lag length result based on AIC or Akaike Information Criterion because AIC has a minor penalty term compared to the Schwarz Criterion (SC), also known as Bayesian Information and Hannan-Quinn Information Criterion (HQ). Therefore, AIC favoured slightly more complex models, which will give a potentially better-fit result.

Table 3. Lag length selection test

Lag length test	Final Prediction Error error (FPE)	Akaike information criterion (AIC)	Schwarz information criterion (SIC)	Hannan-Quinn information criterion (HQ)
0	5.23e+46	124,6011	124,8866*	124,6884
1	2.57e+46	123,8255	125,8238	124,364
2	1.53e+46*	122,9071*	126,6183	124,0417*

* indicates lag order selected by the criterion

Source: Author's Eviews VAR Lag Order Selection Criteria

Table 3 displays the computed result of the VaR Lag Order Selection Criterion that has been conducted. The result from Akaike Information Criteria (AIC) could be seen. It shows the minimum value; the literature said to choose the optimum lag. First, we have to see which lag gives the optimum result from all the criteria; from our data, we could see that it shows various optimum lags. This means we have to use the second step, which focuses on the AIC minimum value and uses that

lag to be the optimum one. From Table 3, the minimum value from AIC is 122,9071*, located from lag 2, which implies lag two will be chosen as the optimum lag for our VEC Model.

Stability Test

Unit root test enables us to recognise which lag gives better stability for the model, expecting that our model's pattern will behave more predictably. Later, it will benefit us to know the relationship between social insurance from financial aspects to the extension of macroeconomic conditions. Figure 2 shows the stability of the data; the circle represents the border of volatility or stochastic movement that is still considerably acceptable, while the dots represent the modulus. From the stability test, we could conclude that our data is ideal for proceeding with the VEC model because the modulus was within the range of stable area or, in other words, the data was stable with the first difference estimation with optimum lag 2.

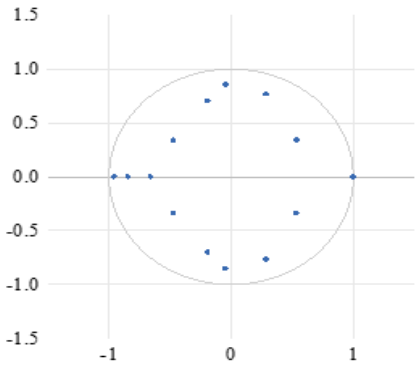

Figure 2. Stability condition check

The Cointegration Test

According to the null hypothesis, no cointegration should exist among the variables. In this paper, we use the Johansen cointegration test. From the Johansen cointegration test, three sections should be paid attention to: the p-value, the trace statistic value, and the maximum eigenvalue. First, the computed Trace Statistic at None, which represents the null hypothesis, and the first trace statistic result, which means the first alternate hypothesis, show that the value of the trace statistic for both are more significant than their critical value, the null hypothesis is rejected, and the alternate hypothesis is accepted. Second, we could also see from the p-value of the hypothesis that when the p-value is less than 0,05, the null hypothesis will be rejected.

Table 4. Cointegration test

Johansen Cointegration test					
Variables: HCE, GNIB, NS, CS, SIR, INFL					
Lags interval (in first differences): 1 to 2					
Trend Assumption: Linear deterministic trend (restricted)					
Number of cointegrating vectors	Eigenvalue	Trace Statistic	0,05 Critical Value	Max-Eigen Statistics	0,05 Critical Value
r ≤ 0 *	0,9583430	225,4679	117,7082*	85,8137	44,4972*
r ≤ 1 *	0,9196600	139,6542	88,8038*	68,0802	38,33101*
r ≤ 2 *	0,7473100	71,5741	63,8761*	37,1409	32,11832*
r ≤ 3	0,5162780	34,4331	42,9153	19,6086	25,8232
r ≤ 4	0,3702000	14,8245	25,8721	12,4835	19,3870
r ≤ 5	0,0830510	2,3410	12,5180	2,3410	12,5180

* indicates 3 cointegration equation at 5% level and rejection of the hypothesis at 5% level.
Source: Author's Eviews Johansen Cointegration Test Result

From the computed p-value result, we could see the p-value at none, most of which are less than 0,05, which means rejecting the null hypothesis and two cointegration equations exist. Having two cointegrating equations implies there are possibilities where the variables could influence each other outside the initial model that we have and still could have a good influence on each other.

The third value is the value from the maximum eigenvalue statistic test from the Johansen cointegration test, which shows whether the maximum eigenvalue is greater than the critical value. The computed result shows that the null hypothesis is rejected because it shows more than one vector whose Max-Eigen values are more than its Critical value, which also means that cointegration exists. In this case, the Max-Eigen test result also indicates at least two cointegration equations.

The Causality

The VEC model enables us to see the relationship between gross national income, national savings (liquid), and capital stock (registered on Bursa Efek Indonesia), which could influence household consumption capability, which is notated as HCE. The capability of household consumption could also be extended to Marginal Propensity of Consumption, which also could be represented as the indicator of welfare by reflecting consumption responses to income changes. The variables said significant if the causal pair variable received feedback impact.

Table 5. VEC Granger Causality/Block Exogeneity Wald Tests

Dependent variable	Independent variables - Chi-square (Wald test)						Error Correction Term
	ΔHCE	ΔGNIB	ΔSIR	ΔNS	ΔCS	ΔINFL	t-statistic
ΔHCE		6,902530	0,307534	0,101810	0,994365	0,007046	10,638860
		(0,0317)**	(0,8575)	(0,9504)	(0.6082)	(0,9965)	(0,3863)
ΔGNIB	13,037440		0,167844	0,697380	7,607371	0,501611	28,649610
	(0,0015)***		(0,9195)	(0,7056)	(0,0223)	(0,7782)	(0,0014)***
ΔSIR	0,266776	0,739241		2,251959	0,686339	0,199422	5,177734
	(0,8751)	(0,6910)		(0,3243)	(0,7095)	(0,9051)	(0,8790)
ΔNS	0,744399	12,633790	3,896286		45,581400	8,075301	87,857550
	(0,6892)	(0,0018)***	(0,1425)*		(0,0000)***	(0,0176)**	(0,0000)***
ΔCS	18,118580	1,709381	3,907450	1,116344		7,888720	34,647890
	(0,0001)***	(0,4254)	(0,1417)*	(0,5723)		(0,0194)**	(0,0001)***
ΔINFL	0,123461	1,839168	2,325094	2,981000	2,566935		10,101080
	(0,9401)	(0,3987)	(0,3127)	(0,2253)	(0,2771)		(0,4317)

Notes: p-value shown in parentheses, ECT are all Granger Causality in long run, number in parentheses of ECT are t-statistics
*** indicates significance at an alpha of 1% level, ** indicates significance at an alpha of 5% level, * indicates significance at an alpha of 15% level
Source: Author's Eviews Granger Causality Wald Test Result

Focusing on Social Insurance, we can see that Social Insurance (SIR) has a causal relation with National Savings (NS) and Capital Stock (CS) at α 15%. The result indicates that social insurance participation contributes positively to public involvement in the capital market, which means social insurance does give the public more capability to save and invest in the short term at α 15%.

DISCUSSION

The Relationship between Social Insurance and Economic Proxies

Short-run causality. Based on the computed result of the Granger causality test, we could see some causal relationship with several significant levels, i.e. at α 15%, at α 5%, and α 1%. The lesser α, the stronger the causality relation is. Table 5. present all possible causality relationships among the variables, and only 8 out of 30 possible causal ties exist. Where the most robust causal relation happened between household consumption and capital stock and between capital stock and national savings at α 1%.

Long-term causality. ECT is the long-term coefficient of the cointegrated model. It implies the speed of adjustment toward long-run equilibrium. The coefficient must be negative and significant to prove that long-run causality runs from each variable. However, the ECT coefficient can be positive; some studies have found countries whose financial sectors are still at a developmental stage to portray a finance-led growth response. (Odhiambo *et al.* 2018). It indicates that deviations from the long-run equilibrium that, in the typical case, should be adjusted back towards it in the following period in the positive ECT might suggest anticipation of future shocks rather than correction towards equilibrium. Our VEC model shows three significant long-term equilibrium equations at α 1% where the dependent variables are Gross National Income Bruto (GNIB), National Savings (NS), and Capital Stock (CS) (all equations consist of social insurance participation as their independent variables). Similar to cointegration results that were conducted using the VAR model. The ECT shows a significant but positive value from the three long-term equilibrium correlations.

Based on the computed causality result, we can accept the alternate first hypothesis suggesting that social insurance has short-term and long-term relationships with consumption, savings, investment, and inflation. We also take the second alternate hypothesis, suggesting a causal relationship between social insurance and other macroeconomic variables (immediate and un-immediate response causal relation). The following analysis steps need to be conducted to understand the trend created from the causal relationship, especially the existence of significant but positive ECT.

The Nuance Impact of Social Insurance

We conducted an Impulse Response analysis to better understand the aggregate public economic response. The study used social insurance as the variable to receive a shock, and we analysed the responses of consumption, saving, investment, and inflation to the shock given. Figure 3 shows how one-unit standard deviation shock in social insurance responded by household consumption, gross national income, national savings, capital stock and inflation. We could see that

HCE, GNIB, and NS show similar trends until the 4th period, where at the first 2 periods, aftershock, there is a sharp upward slope followed by a sharp downward slope at the 4th period. CS also show similar responses as HCE, GNIB and NS but with a slight 1-period delay.

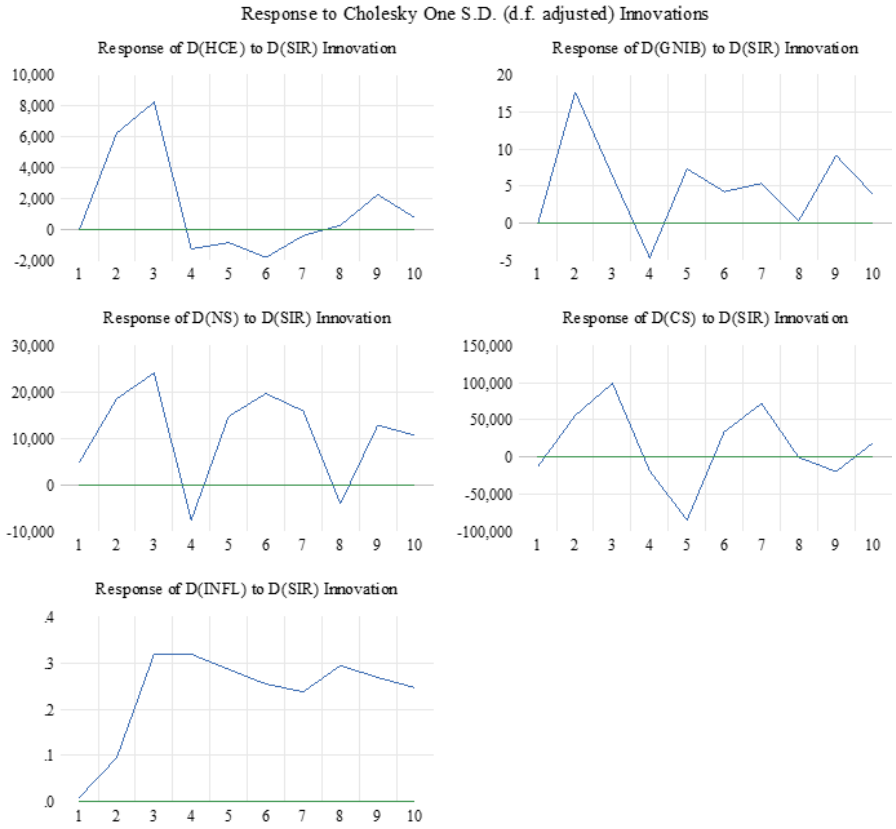

Figure 3. Impulse Response

The exciting part was the responses afterwards for HCE, GNIB, NS, and CS. NS, CS, and GNIB immediately responded to the critical trend with a relatively different trend. NS and SIR have sharp drawbacks after experiencing great shock, while GNIB also has sharp drawbacks, although not as high as NS and CS. This means that when the income increases, it will also be followed by an increase in savings and investment. On the other hand, HCE is still experiencing a negative trend. This phenomenon might become an indication of conservative risk behaviour.

After experiencing the tail effect of shock on social insurance, the public prefers to allocate their money to savings and investment instruments. Many empirical studies show income elasticity significantly influences expenditure patterns, with changes in income driving variations in spending across different goods (Patel dan Amlung, 2023). Previous statement could be an answer to why social insurance shocks initiate savings and investment intention. We could see the consumption pattern changes across time from the impulse response result, and the first shock from the computed result shows an immediate increase in income and consumption. During this phase, there is a

tendency for the market's circulation velocity to increase, as evidenced by the rising trend in INFL occurring over the same period until it peaks and encounters a critical downturn.

The Impulse Response results show that when the model simulates a shock to social insurance, society tends to shift its risk appetite afterward. Such events lead individuals to reassess their financial plans, making them more conservative and risk-averse in their economic behavior. The public recognizes the importance of social insurance coverage after experiencing the significant consequences of lacking it and wishes to establish a safety buffer. The results also provide additional empirical evidence supporting Jarrow and Li (2021), which states that risk aversion is typically associated with a concave utility function.

CONCLUSION

The reaction of consumption and savings represents the diminishing utility of consumption and substantiates a possible shock-induced savings pattern. Furthermore, the lag of a one-period response in capital stocks, followed by a similar pattern with savings, indicates income elasticity due to decreasing welfare instruments (in this case, Medicaid social insurance by BPJS), possibly creating a risk attitude shift. More specifically, the three variables which are; consumption, savings, and stock market, are consistent with the notion of concave utility function, where individuals will prioritise long-term financial security over immediate consumption as their perceived wealth or risk exposure changes.

This implies that the connection between vector error correction model results and utility concavity theory relies on interpreting behaviours under risk. Therefore, findings suggest that, over time, households will likely modify their behaviour to reduce their exposure to hazards as a response to income changes. Therefore connecting the findings with ongoing debates regarding the new BPJS Kesehatan policy regarding the one-class system. This analysis acknowledges the possibility of shock-induced behavioural changes in social insurance participation aftershocks. These shocks in the social insurance policy might shift society's behaviour towards risk. However, the degree of acceptance will rely on how the premium contribution adjustment addresses the utility function to maintain it adequately. Moreover, the findings could also highlight the importance of prioritizing social security distributions. This approach aims not only to create a safer society by providing an inclusive safety net but also to foster more conservative attitudes toward risks. To conclude, besides the economic and behavioural shifting that occurs as a response to social insurance shock proxied by social insurance participation, this paper acknowledges the limitation in accurately measuring the actual utility function of how social insurance is perceived precisely. This restriction thus offers a chance for subsequent studies to investigate and statistically project the exact form of the social insurance utility function.

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