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Research Paper

Effectiveness of Islamic Monetary Policy Transmission on Inflation and Economic Performance

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ABSTRACT

The most crucial part for the economic development of a country is maintaining the stability of inflation to create a positive climate for economic and business activities. A number of efforts can be performed to achieve stable inflation and increase economic growth by designing monetary policy incorporating the variables of Bank Indonesia Sharia Certificate (SBIS), Islamic Interbank Money Market (IIMM), and Financing. Drawing on this issue, the in-hand study aims to examine the effectiveness of Islamic monetary policy transmission, using the instruments of SBIS, IIMM, and Financing, on inflation and economic performance (GDP) from the period of January 2011 to December 2020. Using secondary data, this study employs VAR/VECM approach by the assistance of Eviews program. The results reveal that in the short term period, inflation is significantly influenced by the IIMM, while GDP t is affected by the GDP t-1 and financing activities. In the long term period, both inflation and GDP are determined by SBIS and financing activities. In general, this study results in a conclusion that the variables of IIMM, financing activities, and GDP t-1 influence the economic performance both in short and long term periods. These results contribute as fruitful insights to developing financial strategies and monetary policy to maintain stable inflation and improve economic performance of a country.

Introduction

Economic system, which is playing a crucial role in a country, is divided into two sectors, i.e. fiscal and monetary (Cochrane, 2021). The two sectors contribute to realizing a country's economic goals to generate sustainable community welfare (Chugunov et al., 2021; Ismail et al., 2014; Tamai, 2021); hence, they must go hand-in-hand in a mutual direction (Yankovyi et al., 2021). The quality of economic management should also be carried out to maintain inflation stability and economic growth (Abdullah, 2014; Utami, 2012). Therefore, the two sectors have to be structured in a policy and are ideally managed by separated institutions.

Policies in the fiscal domain are prepared to answer any emerging economic problems, such as high unemployment, low economic growth, poverty, and inequality problems through the management of the state budget. Fiscal policies are also formulated to develop the real sector economy, i.e. increasing the productivity of goods and services (economic output). Meanwhile, monetary policy is an action taken by monetary authorities to regulate the money supply (Anik, 2018) and credit (Salem et al., 2020). In Indonesia, monetary policy is regulated by Bank Indonesia as the Central Bank with the aim of achieving and maintaining stability in the value of rupiah (Bank Indonesia, 2018).

In order to create an economy that improves the society welfare, the monetary and fiscal sectors must be interrelated. Therefore, developments in the monetary sector, such as increased assets, loan distribution, and financial inclusion must have a positive influence on economic performance (Song et al., 2021). Bank Indonesia through its various instruments can indirectly influence the rate of the economic performance (Basmar et al., 2021). The influence exerted by monetary policy is indirect, or it is called as a transmission mechanism.

The mechanism of monetary policy transmission describes the influence of monetary policy on various economic and financial activities so that they can achieve the specified goals (Warjiyo, 2004). The main issue that needs attention in monetary policy is whether the process of transmission has a positive relationship to the real sector (Sugianto et al., 2015). The transmission of monetary policy involves two interactions, i.e. interaction between the central bank and other banks and financial institutions, and interaction between banks and other financial institutions and economic actors (Acharya et al., 2020; Warjiyo, 2004).

In fact, the transmission mechanism of monetary policy is a complex process, and therefore in monetary economic theory it is often referred to the "black box" (Li et al., 2019; Mischenko et al., 2021; Mishkin, 1995). The transmission of monetary policy to the economic performance and inflation has long been acknowledged to take place with long and varied deadlines (Berg et al., 2019; Binici et al., 2019). Overall, the effect can

take place for about 6-8 quarters long (Warjiyo & Juhro, 2017). This is the reason why monetary has always been a major problem (Ismail et al., 2014).

Furthermore, to be able to see the impact of monetary performance on economic growth and inflation, a transmission mechanism is needed. In contrast to the conventional monetary policy transmission system that uses the Bank Indonesia Certificate (SBI) instrument, in 2000, Bank Indonesia introduced a sharia monetary instrument called the *Sertifikat Wadiah Bank Indonesia* (SWBI) (Certificate of Wadiah Bank Indonesia). Along with the rapid development of Islamic banking, in 2008 it was changed to Bank Indonesia Sharia Certificate (SBIS) by using a *ju'alah* contract (a supplementary contract in the Islamic finance industry) (Sugianto et al., 2015), a reward given by Bank Indonesia to Islamic banking which has assisted monetary control through funds placed at Bank Indonesia with the purchase of SBIS *Ju'alah* (Majelis Ulama Indonesia, 2007).

The transmission of monetary policy also involves interaction between Islamic banks through the Islamic Interbank Money Market (IIMM). IIMM is a short-term interbank transaction in the form of rupiah or foreign currency based on sharia principles (Ginting et al., 2013). IMM transactions are very important to maintain bank liquidity so that operations are smooth and healthy, including to cover clearing losses and can be used as earning assets for banks with excess funds (Maulidya, 2012). Furthermore, the mechanism of monetary policy transmission involves interaction between banks and economic actors through financing. In Islamic banking, the financing system is divided into three types, i.e. profit sharing, buying and selling, and leasing (Arshed et al., 2020; Miah & Suzuki, 2020; Widarjono et al., 2020). If the sector of financial services increases, the economic performance indicated by Gross Domestic Product (GDP) will also increase (Atika, 2018; Silva et al., 2021; Swamy & Dharani, 2021).

SBIS, IIMM, and Financing activities are instruments in the transmission of sharia monetary policy which in turn will affect economic performance as represented by the GDP and price stability as proxied by inflation. This is in accordance with the framework of Bank Indonesia which applies a flexible ITF (Inflation Targeting Framework) (Bank Indonesia, 2018). The transmission line for monetary policy uses the BI 7 Day Repo Rate instrument through interest rates, credit, asset prices, exchange rates and inflation expectations. This path will then affect consumption and investment as well as exports which then affect GDP and ultimately affect the stability of price. The inflation rate is then used to determine the next BI policy, whether to raise or to lower interest rates.

This study will discuss the effectiveness of monetary instruments in influencing the economy. Research on the transmission of monetary policy explains changes in

monetary policy instruments that affect the variables of macroeconomics so that monetary policy targets can be realized (Buch et al., 2019; Egea & Hierro, 2019; Miranda-Agrippino & Ricco, 2021). Research related to the effectiveness of the transmission of Islamic monetary policy has been widely carried out. The findings yielded in significant positive and negative results (Hassan et al., 2021; Selim, 2020; Suriani et al., 2021). Studies conducted by Ascarya (2012), Bassar et al. (2021), and Madani and Widiastuti (2021) show that SBIS has a positive impact on the economic performance, while research by Wibowo and Mubarok (2017) shows the opposite result. In terms of IIMM instrument, a study conducted by Setiawan and Karsinah (2016) showed a positive relationship on the performance of economic, while the research of Zaelina (2018) showed a negative correlation.

From the previous studies' results, a research gap is observable. We found an inconsistency of the results among the precedent studies in terms of the empirical connection among the variables of SBIS, IIMM, and economic performance. Drawing on the gap, the present study sheds some light on the effect of Sharia Bank Indonesia Certificate (SBIS), Sharia Interbank Money Market (IIMM), and financing activities in the transmission of sharia monetary policy on Inflation and economic performance indicated by the Gross Domestic Product (GDP). The novelty of this study lies on the use of GDP as the proxy of economic performance, while most of the previous studies utilized Industrial Production Index (IPI). The reason of GDP utilization is that it can calculate the total income and expenditure of an economy; hence, it has accessibility to measure people's welfare properly even though it is not perfect and absolute (Ahmadvand et al., 2021; Atika, 2018). In addition, this study also examines monetary instruments with an inflation target, so as to be able to explain their impact on the price stability, which is represented by CPI inflation.

Hypotheses Development

During inflation, a country is required to carry out a contractionary policy – a monetary measure referring either to a reduction in government spending or a reduction in the rate of monetary expansion by a central bank. One of the instruments that can be applied is the sale of securities through Open Market Operations. This is performed by selling Bank Indonesia Sharia Certificate (SBIS) as Sharia Monetary Operations (OMS). Thus, the availability of money is limited, and it is expected to reduce the amount of money circulating in the community (Bayuni & Srisusilawati, 2018; Fikri et al., 2021; Ramadhan & Beik, 2013; Yangucu & Saiti, 2016); hence, it also reduces economic output permanently (Ashraf et al., 2016). In addition, the SBIS interest rate instrument is able to affect loan demand which in turn will affect the aggregate demand (Wibowo & Mubarok, 2017).

The policy of IIMM is also used to regulate Islamic and conventional commercial banks to invest in short-term Islamic banks that require liquidity using profit sharing principle (Hanafi, 2021). In terms of the calculation of liquidity as well as the profit sharing indicator in IIMM, it is estimated that excess liquidity, which is indicated by a sharp decline in the interbank money market rate, and the OPT Absorption policy will be implemented. Meanwhile, if it is seen from the estimated liquidity calculation as well as from interest rate indicators in the IIMM, it is estimated that there is a liquidity shortage, which is indicated by a sharp increase in the interbank money market interest rate and the implementation of the OPT injection policy. All of which are regulated under the implementation of Sharia Monetary Operations (Saputro & Sukmana, 2019).

This research is expected to enrich the study in the matters that affect the transmission of monetary policy. SBIS is a benchmark for the Islamic banking sector to determine the level of profit sharing for loans and savings. Thus, an increase in the rate of SBIS profit sharing will encourage banks to invest their capital in Bank Indonesia rather than channeling their funds in the form of loans. This will further have an impact on decreasing the inflation rate due to a decrease in the money supply (Bayuni & Srisusilawati, 2018). Therefore, the following hypothesis is formulated.

H1: *SBIS has a significant effect on inflation*

Expansion of money market financing will increase deposits and credit. An increase in the profit-sharing rate at IIMM was able to suppress inflation, because the level of production also increased as a result of the high supply of goods (Saiti et al., 2016; Soemitra et al., 2021). IIMM transactions come in the form of moving money from one bank to another bank continuously. Previous studies have revealed that the relationship between IIMM and inflation is positive and unindirectional (Magdalena & Pratomo, 2012; Saputro & Sukmana, 2019). Hence, a hypothesis is formulated as follows.

H2: *IIMM has a significant effect on inflation*

Islamic banking financing is used to support the real sector through profit loss sharing cooperation agreements (Mubarok, 2021; Supriani et al., 2021). Financing with the sharia principle will increase the productivity of the community so as to enhance the real outputs (Bananuka, et al., 2020; Meslier et al., 2020). Studies have shown that in the monetary sector, financing activities will increase the amount of money circulation (Asnuri, 2013; Sudarsono, 2017). Hence, a hypothesis is postulated.

H3: *Financing has a significant effect on inflation*

As presented in hypothesis 1, changes in the rate of profit sharing for SBIS will affect the behavior of Islamic banking (Bahrul et al., 2018; Bassar et al., 2021). From the view of real sector, the higher the profit sharing rate determined by the monetary

authority on SBIS will cause a reduction in the amount of money disbursed in financing activities because of the behavior of banks that choose to invest capital in Bank Indonesia. This will certainly affect the decline in productivity and the overall GDP (Eregha & Mesagan, 2020; Sukiyat & Anwar, 2021). Therefore, this study tests the hypothesis below.

H4: *SBIS has a significant effect on economic performance*

IIMM affects banking behavior in the short term where transactions are carried out overnight (Saiti et.al, 2016; Soemitra et al., 2021). Monetary operations are carried out by controlling the IIMM profit sharing rate to manage money market liquidity. Previous studies have depicted that interest rates or profit sharing could affect the output gap and inflation (Umar & Putri, 2013). In a similar direction, we would say that profit sharing has an influence on the economic performance (Doucouliagos et al., 2020; Hafizh et al., 2020). Hence, this study proposes the following hypothesis.

H5: *IIMM has a significant effect on economic performance*

In the real sector, the disbursed financing will surely continue to increase the real output, and as the result it increases the economic performance (Ahmadvand, et al., 2021; Asnuri, 2013). Studies have revealed that financing activities have a significant effect on the economic performance (Nofrianto et al., 2021; Shi et al., 2021). Related to this connection, this study tries to test the hypothesis below.

H6: *Financing has a significant effect on economic performance*

Method

Research Design

The present study depicted the effect of Sharia Bank Indonesia Certificate (SBIS), Sharia Interbank Money Market (IIMM), and financing activities in the transmission of sharia monetary policy on Inflation and economic performance (GDP). To reach the aim, this study employed quantitative approach using time series data. Time series analysis is a specific way of analyzing a sequence of data points collected over a particular interval of time (Hamilton, 2020; Kirchgassner et al., 2012). In the context of this study, time series analysis was applied to shed some light on the influence of Islamic monetary policy transmission on the inflation and the economic performance.

Sample Selection and Data Sources

The population of this study was data published in Indonesian Economic and Financial Statistics, Islamic Banking Statistics, and statistical data of Bank Indonesia. Document analysis was conducted through the related websites and reports as the data sources. The samples involved in this study were Islamic Interbank Money Market (IIMM), Bank Indonesia Sharia Certificate (SBIS), and the financing activities as the indicator of

monetary operation and economic performance. This study also took into account the CPI as an indicator of Open Market Operation. The period of the data analyzed in this study was from January 2011 to December 2020.

Estimating Model

To answer the hypotheses, this study utilized Vector Auto Regression (VAR) or Vector Error Correction Model (VECM) method by the assistant of software Eviews 9. In general, the model of this study is formulated as follows.

$$GDPyt = C + a1i\Sigma GDPyt\text{-}k + a1i\Sigma CPIyt\text{-}k + a1i\Sigma SBISyt\text{-}k + a1i\Sigma IIMMyt\text{-}k + a1i\Sigma FINyt\text{-}k + et \quad (1)$$

$$CPIyt = C + a1i\Sigma CPIyt\text{-}k + a1i\Sigma GDPyt\text{-}k + a1i\Sigma SBISyt\text{-}k + a1i\Sigma IIMMyt\text{-}k + a1i\Sigma FINyt\text{-}k + et \quad (2)$$

Results

Cointegration Test

Table 1 shows the result of cointegration test. It reveals that the model of this study has two cointegration relationships based on the assumption of trace statistics which is greater than the critical value of 5%. The conintegration value could also be seen from the value if MacKinnon probability (0.0000 < 0.05) (see Table 1).

Table 1. Results of Cointegration Test

Number of CE(s)	*Trace statistic*	*Critical value 0,05*	*Prob. MacKinnon*
None *	170.7019	88.80380	0.0000
At most 1 *	97.43411	63.87610	0.0000
At most 2	42.21987	42.91525	0.0586
At most 3	17.83205	25.87211	0.3553
At most 4	2.820843	12.51798	0.8971

*Cointegration relationship

Vector Error Correction Model (VECM) Test

The VECM model uses a significant level of 5% and t table value of 1.99. The value of the t-table is used to observe the effect between variables, where if t-statistic is higher than t-table (>1.99), there is a significant effect on the variable. Meanwhile, if t-statistic is lower than t-table (<1.99), the observed variables have no significant effect. In addition, the long-run coefficient is described in the following equation.

$$LnCPI = -20.852 - \mathbf{0.598SBIS} + 0.091IIMM + \mathbf{4.081lnFIN} \quad (3)$$

$$LnGDP = -14.171 - \mathbf{0.040SBIS} + 0.004IIMM + \mathbf{0.233lnFIN} \quad (4)$$

In the CPI model, SBIS and FIN (financing) have a significant effect on inflation with coefficient values of -0.598 and 4.081, respectively. The coefficient explains that an

increase in the SBIS profit-sharing rate of 1% will reduce inflation by 0.598%, and an increase in Islamic banking financing by 1% will also increase inflation by 4.081%. In the GDP model, an increase of 1% in SBIS will reduce the economic performance by 0.04% and an increase of 1% in distributed financing will increase the economic performance by 0.23%.

Furthermore, in the long term the cointegrated variables adjust towards equilibrium. This adjustment coefficient is hereinafter referred to ECT (Error Correction Term) which indicates that the short-term balance of cointegration of equations 1 and 2 will correct the long-term adjustment. The long-term coefficients and their adjustments are described in Table 2.

Table 2. Long Term Coefficient

Variable	**LnCPI**	**lnGDP**	**SBIS**	**IIMM**	**lnFIN**
CoinEq 1	1.000	0.000	-0.598	0.091	4.081
			[-2.480]	[0.415]	[4.084]
C	-20.852				
CoinEq 2	0.000	1.000	-0.040	0.004	0.233
			[-2.515]	[0.245]	[3.545]
C	-14.171				
			Adjustment Coefficient		
CoinEq 1	0.01	0.035	0.282	0.205	0.325
	[0.373]	[7.074]	[2.143]	[0.350]	[0.743]
CoinEq 2	-0.221	-0.554	-1.748	-0.257	-5.095
	[-0.533]	[-7.388]	[-0.884]	[-0.029]	[-0.776]

In the short term, there has been an effect between the variables as described in Table 3. Table 3 shows that the length of the lag used is 4 according to the optimal lag that has been determined. The CPI model depicts that in the short term, the variable that has a significant effect is only IIMM in the 3 previous periods, meaning that changes occurred in the recent 3 periods of IIMM by 1% will reduce inflation by 0.011%.

The GDP model further reveals that the variables having a significant effect on the short term are GDP t - 1, 2, and 4 and financing t - 1, 2, 3 and 4. Changes in GDP by 1% in t - 1, 2, and 3 will increase the current economic performance by 0.616%, 0.470% and 0.379%, respectively. Meanwhile, changes in financing t - 1, 2, 3, and 4 in advance will reduce the economic performance by 0.02%, 0.24%, 0.03%, and 0.035%, respectively.

The SBIS model shows that the variables having a significant effect in the short term are GDP t - 1, 2, 3, and 4, SBIS t - 1, and financing t - 1, 2, 3, and 4. It explains that a 1% change in economic performance for the 4 periods in advance will increase SBIS

by 7.307% and a 1% change in SBIS t - 1 will increase the SBIS t by 0.291%. In addition, a 1% change in distributed financing t - 1, 2, 3, and 4 will reduce the SBIS profit sharing rate with the values 0.665%, 0.691%, 0.745% and 0.805%, respectively.

Furthermore, in the IIMM model, the variables that have a significant influence are GDP t - 1, 2, and 3 and the level of IIMM profit sharing t – 1, 2, 3 and 4. This explains that an increase in GDP by 1 unit in the previous 3 periods contributed to an increase in IIMM profit sharing by 33.301%. Moreover, changes of IIMM t - 1, 2, 3 and 4 will reduce the IIMM profit sharing by 0.454%, 0.562%, 0.224%, and 0.311%, respectively.

Finally, in the Financing (FIN) model, the variables that have an effect in the short term are only GDP t - 1, IIMM t – 1, 2, 3, and 4 and the financing t – 1 and 2. Changes occurred in the GDP t - 1 will increase the distributed financing by 17.457 units. Changes in IIMM in the 4 periods in advance by 1% will increase the distributed financing by 0.151 units. In addition, changes in FIN in the first and second periods in advance will reduce the distributed financing by Islamic banking of 1.137 units and 1.254 units, respectively.

Table 3. Short Term Coefficient

	D(LNCPI)	**D(LNGDP)**	**D(SBIS)**	**D(IIMM)**	**D(LNFIN)**
D(LNCPI(-1))	-0.054	-0.011	-0.568	1.104	1.826
	[-0.507]	[-0.589]	[-1.122]	[0.490]	[1.085]
D(LNCPI(-2))	-0.035	0.010	0.227	0.362	0.083
	[-0.354]	[0.532]	[0.474]	[0.170]	[0.053]
D(LNCPI(-3))	0.003	0.031	-0.298	-3.423	1.041
	[0.030]	[1.726]	[-0.626]	[-1.618]	[0.659]
D(LNCPI(-4))	0.002	0.027	0.127	-0.087	0.089
	[0.022]	[1.475]	[0.258]	[-0.040]	[0.054]
D(LNGDP(-1))	0.491	0.616	-0.300	2.983	17.457
	[1.056]	[7.314]	[-0.135]	[0.302]	[2.366]
D(LNGDP(-2))	-0.161	0.470	3.368	-13.753	-4.010
	[-0.271]	[4.360]	[1.185]	[-1.087]	[-0.425]
D(LNGDP(-3))	0.919	0.090	-1.189	33.301	8.281
	[1.460]	[0.788]	[-0.396]	[2.490]	[0.829]
D(LNGDP(-4))	0.217	0.379	7.307	-20.214	-12.507
	[0.337]	[3.252]	[2.380]	[-1.479]	[-1.226]
D(SBIS(-1))	0.003	0.002	0.291	0.517	0.132
	[0.120]	[0.416]	[2.808]	[1.121]	[0.383]
D(SBIS(-2))	0.013	-0.002	0.128	0.223	-0.319
	[0.602]	[-0.462]	[1.213]	[0.472]	[-0.907]
D(SBIS(-3))	0.010	-0.000	0.117	0.524	0.148

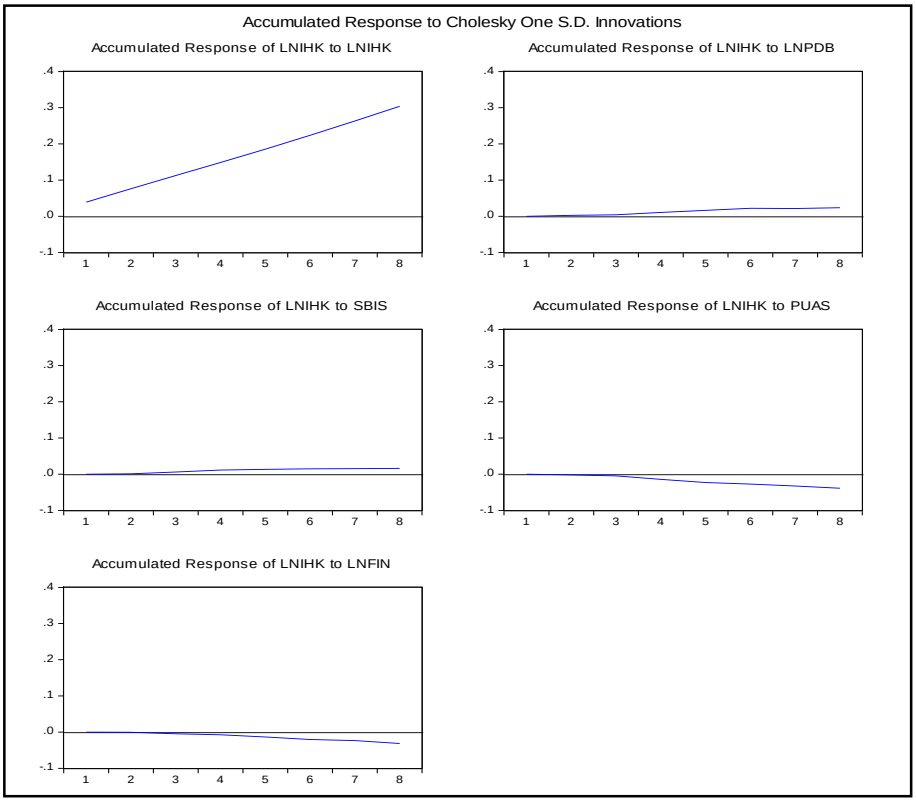
	D(LNCPI)	D(LNGDP)	D(SBIS)	D(IIMM)	D(LNFIN)
	[0.448]	[-0.091]	[1.137]	[1.143]	[0.433]
D(SBIS(-4))	-0.033	-0.004	0.003	0.653	-0.040
	[-1.634]	[-1.166]	[0.032]	[1.530]	[-0.125]
D(IIMM (-1))	-0.003	-0.001	0.002	-0.454	-0.057
	[-0.519]	[-0.840]	[0.096]	[-4.335]	[-0.726]
D(IIMM(-2))	-0.002	-0.001	-0.007	-0.562	-0.036
	[-0.368]	[-0.918]	[-0.295]	[-5.241]	[-0.451]
D(IIMM(-3))	-0.011	2.7E-05	0.006	-0.224	-0.057
	[-2.268]	[0.030]	[0.262]	[-2.107]	[-0.722]
D(IIMM(-4))	-0.005	2.9E-05	-0.028	-0.311	0.151
	[-0.980]	[0.034]	[-1.240]	[-3.129]	[2.031]
D(LNFIN(-1))	0.008	-0.020	-0.665	-1.007	-1.137
	[0.234]	[-3.116]	[-4.011]	[-1.364]	[-2.063]
D(LNFIN(-2))	0.002	-0.024	-0.691	-1.048	-1.254
	[0.055]	[-3.588]	[-3.921]	[-1.336]	[-2.141]
D(LNFIN(-3))	0.002	-0.030	-0.745	-0.927	-1.158
	[0.044]	[-4.097]	[-3.896]	[-1.088]	[-1.822]
D(LNFIN(-4))	-0.005	-0.035	-0.805	-0.760	-1.212
	[-0.111]	[-4.599]	[-4.001]	[-0.848]	[-1.812]
C	-0.008	0.001	0.034	0.054	0.127
	[-1.454]	[1.145]	[1.312]	[0.462]	[1.458]
R-squared	0.154	0.678	0.507	0.426	0.631

Impulse Response Function (IRF) Analysis

Figure 1 demonstrates the Impulse Response Function (IRF) analysis according to the CPI model. It is shown that the changes occurred in the CPI, GDP, and SBIS will be responded positively by the CPI, and changes in IIMM and FIN will be responded negatively.

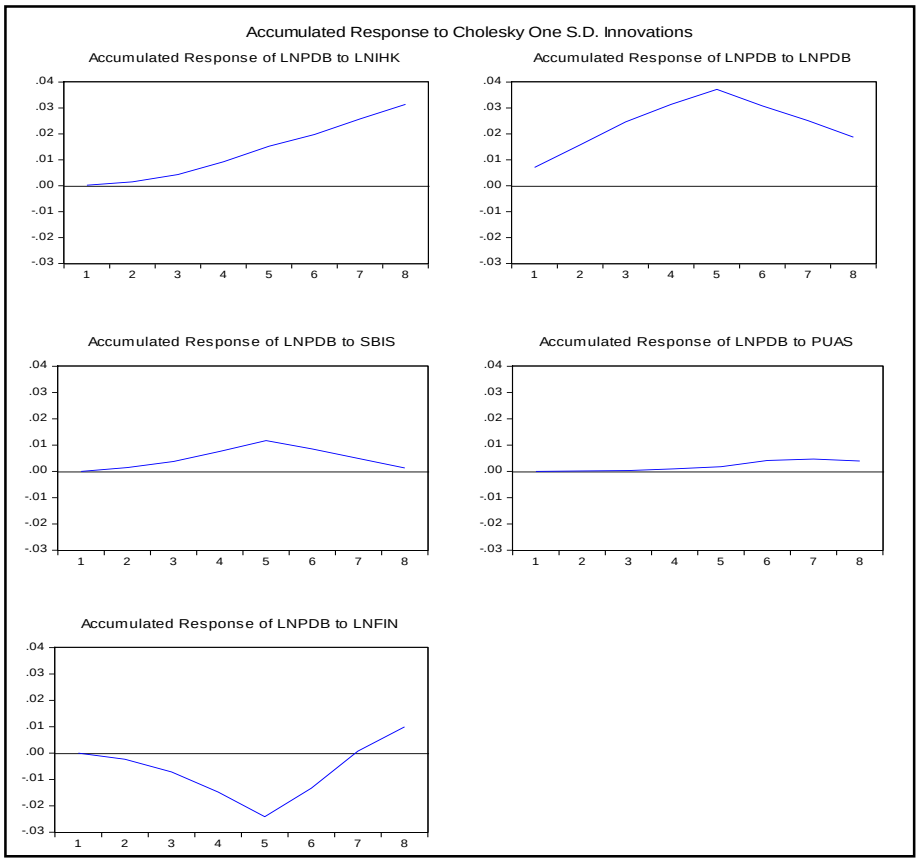
In the GDP model of IRF analysis, changes in the CPI, GDP, IIMM, and SBIS will be responded positively by the GDP. A change in financing will reduce GDP up to the period 5, and the value will continue to increase. Hence, by the period 7, financing activities channeled by Islamic banks will increase the GDP (see Figure 2).

In the SBIS model of IRF analysis, changes occurred in the CPI, FIN, SBIS and IIMM will be responded positively by SBIS. Meanwhile, the changes in GDP is initially responded positively by the SBIS until the period 6; however, it then shows that a change in GDP reduce the SBIS yields (see Figure 3).



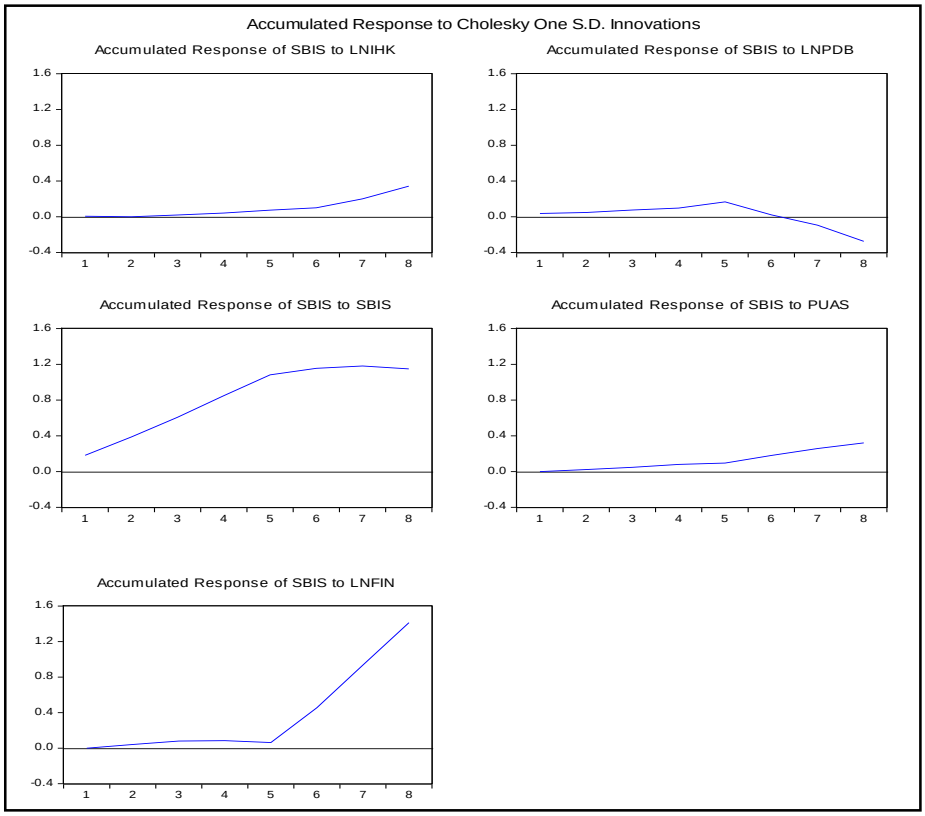
Notes: PUAS: IIMM; PDB: GDP

Figure 1. IRF Analysis CPI Model



Notes: PUAS: IIMM: PDB: GDP

Figure 2. IRF Analysis GDP Model

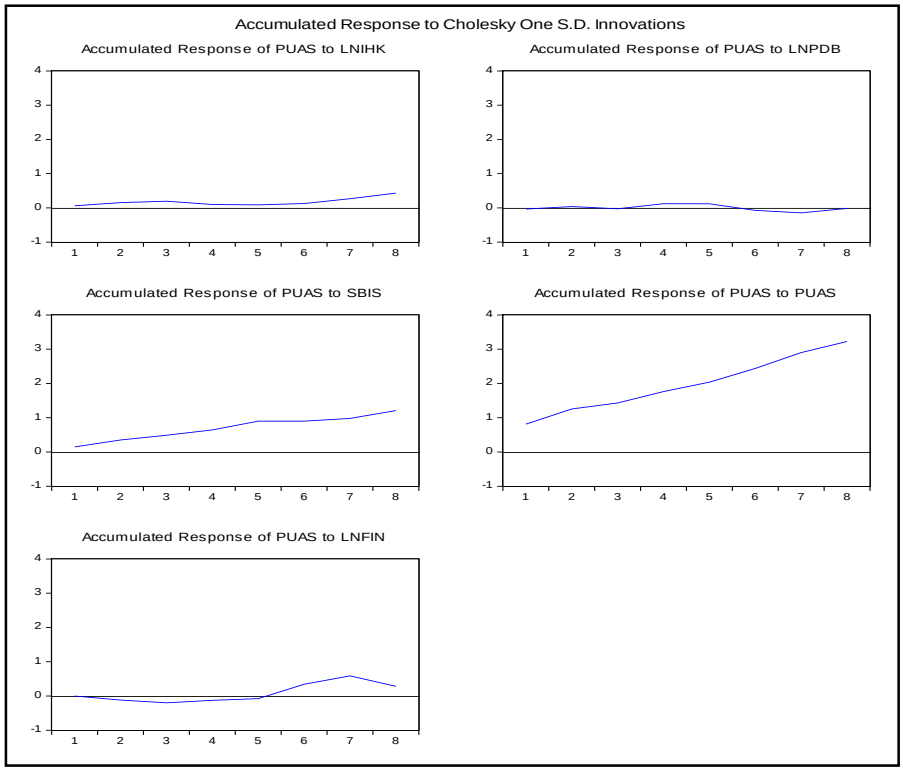


Notes: PUAS: IIMM; PDB: GDP

Figure 3. IRF Analysis SBIS Model

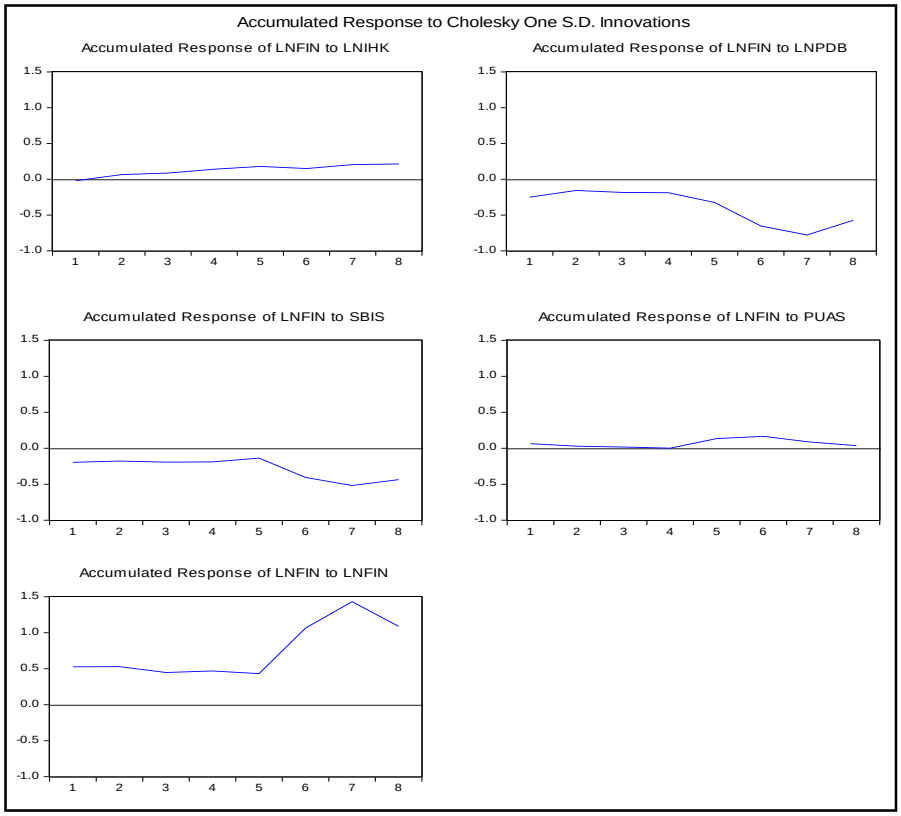
In the IIMM model of IRF analysis, the changes in CPI, IIMM, and SBIS will be responded positively by IIMM. The IIMM response to the GDP change was quite stable in the first to third period and continued with a slight positive and negative responses of less than 1%. Moreover, changes in financing will reduce IIMM yields up to the 5 periods, and increase the IIMM yields in the next period (see Figure 4).

According to the FIN model of IRF analysis, changes occurred in CPI, IIMM, and FIN will be responded positively by the CPI, and the changes in GDP and SBIS will be responded negatively (see Figure 5).



Notes: PUAS: IIMM; PDB: GDP

Figure 4. IRF Analysis IIMM Model



Notes: PUAS: IIMM; PDB: GDP

Figure 5. IRF Analysis FIN Model

Forecast Error Variance Decomposition (FEVD) Analysis

Forecast Error Variance Decomposition (FEVD) analysis on the CPI model shows that the most contribution which influences changes in the CPI t is the CPI t-1 at 100% in period 1, and is continuing to decline (see Table 4). The decline in the CPI contribution was also followed by an increase in the contribution of the other variables such as GDP, SBIS, IIMM, and FIN. The most contribution that affects changes in CPI apart from the CPI itself is IIMM, while other variables only affect as many as 0-1%.

Table 4. FEVD Model IHK

Period	LNCPI	LNGDP	SBIS	IIMM	LNFIN
1	100.0000	0.000000	0.000000	0.000000	0.000000
2	99.60577	0.213730	0.024652	0.140735	0.015113
3	98.53574	0.220630	0.605983	0.256312	0.381337
4	95.87343	0.849087	0.990093	1.860020	0.427373
5	94.68467	1.143393	0.828626	2.501792	0.841517
6	94.50110	1.311948	0.711088	2.262684	1.213185
7	94.96441	1.112658	0.602939	2.191884	1.128111
8	94.78197	0.997006	0.520629	2.199387	1.501003

FEVD analysis on the GDP model shows that the most contribution to changes in GDP is the GDP itself at 99.9%, the rest is influenced by the CPI of 0.093% at the beginning of the period (see Table 5). In subsequent periods, the distributed financing had a high impact on GDP, reaching 47.3% in the 8th period, while in the same period CPI contributed 13% and SBIS 6.23%. In addition, the contribution of IIMM to changes in GDP is very low, which is less than 1% in the entire observed period.

Table 5. FEVD Model PDB

Period	LNCPI	LNGDP	SBIS	IIMM	LNFIN
1	0.092996	99.90700	0.000000	0.000000	0.000000
2	1.278607	92.99720	1.529460	0.011437	4.183301
3	3.752395	81.74272	2.966594	0.018984	11.51931
4	8.622551	63.59907	5.602952	0.118584	22.05685
5	12.28601	49.94268	6.892745	0.204451	30.67412
6	11.86618	42.52367	6.475835	0.885366	38.24894
7	12.17194	34.23253	6.006353	0.675372	46.91380
8	13.04666	32.79609	6.229758	0.628240	47.29925

Moreover, Table 6 presents that FEVD analysis on the SBIS model shows that the largest contribution to changes in SBIS yields is SBIS itself at 95.95%, CPI 0.08%, and GDP 3.97% in the initial period; while IIMM and FIN do not have contribution. In the next period, the largest contribution besides the SBIS was GDP, which contributed up

to 7.58% in the 8th period, CPI reached 3.36% in the 8th period, and IIMM and FIN contributed around 1-2%. Along with the current period, the contribution of SBIS decreased and was followed by the contribution of the other variables, where FIN had a high contribution reaching 62% in the 8th period.

Table 6. FEVD Model SBIS

Period	LNCPI	LNGDP	SBIS	IIMM	LNFIN
1	0.080429	3.966878	95.95269	0.000000	0.000000
2	0.073936	1.850649	95.27823	0.646932	2.150248
3	0.335761	1.721416	94.68341	0.858171	2.401245
4	0.491514	1.417073	95.29096	1.136300	1.664149
5	0.764337	3.006943	93.83298	0.961398	1.434341
6	0.598668	6.507000	55.05942	2.175661	35.65925
7	1.797094	5.973691	34.59319	2.214137	55.42189
8	3.363288	7.584298	24.67089	1.975035	62.40648

In terms of IIMM model, the largest contribution to changes in IIMM besides the IIMM itself is SBIS contributing to up to 9.98%, GDP 3.93%, FIN 15% and CPI 3.11% in the 8th period (see Table 7).

Table 7. FEVD Model PUAS

Period	LNCPI	LNGDP	SBIS	IIMM	LNFIN
1	0.517438	0.162940	3.227222	96.09240	0.000000
2	1.257728	0.670757	6.635526	89.90857	1.527419
3	1.361463	1.043135	8.064471	87.45419	2.076743
4	1.944538	2.722131	8.948119	84.13622	2.248991
5	1.745456	2.430991	12.87683	80.75311	2.193603
6	1.446423	4.081070	10.04808	72.48495	11.93948
7	2.234671	3.698837	8.832095	72.10198	13.13241
8	3.113494	3.930329	9.984261	67.48776	15.48415

With regard to the FIN model as presented in Table 8, the variable having highest contribution to changes in FIN is the FIN itself in the first period, which is 72.47%. This value is continuing to decrease until the 8th period by 68.18%. The decline in FIN's contribution to the FIN itself was followed by an increase in the contribution of other variables, i.e. CPI with the contribution of 1-2%, GDP with the contribution of 19%, SBIS with the contribution of 9-10% and IIMM with the contribution of 1-5%.

Table 8. FEVD Model FIN

Period	LNCPI	LNGDP	SBIS	IIMM	LNFIN
1	0.098027	16.31588	10.05505	1.056579	72.47447

Period	LNCPI	LNGDP	SBIS	IIMM	LNFIN
2	1.878094	17.77313	9.699469	1.342326	69.30698
3	1.939005	17.61097	9.572994	1.342251	69.53478
4	2.641999	17.45539	9.492496	1.384828	69.02529
5	2.734543	19.99029	9.190711	5.171206	62.91325
6	1.277228	19.11634	10.99386	2.344464	66.26811
7	1.336412	17.71670	10.45803	2.516909	67.97194
8	1.178466	18.59571	9.651606	2.392975	68.18124

Discussion

First, this study's result shows that in the short term SBIS does not significantly affect the CPI. However, in the long term SBIS has a significant effect on the CPI. Hence, the first hypothesis (H1) of this study is accepted. This evidence is due to the Bank Indonesia Sharia Certificate (SBIS) as the Sharia Monetary Operation is one of the instruments applied at the time of economy is experiencing inflation (Bayuni & Srisusilawati, 2018).

The IRF analysis further reveals that changes occurred in SBIS will be responded positively by the CPI. This result supports the finding of Magdalena and Pratomo (2012) that SBIS has a significant effect on the CPI. This findings explains that the effectiveness of monetary instruments in influencing the inflation rate is not only affected by the increase and decrease of SBIS rate, but also determined by the condition of financial sector and real sector.

Moreover, the FEVD analysis depicts the contribution of SBIS yields to changes in CPI is lower than 1% (<1%). It is understandable because the contribution that affects CPI is not only on the monetary side (such as core inflation), but also on non-core with very high volatility (including volatile component inflation and government-regulated price component inflation). Because core inflation tends to be persistent, non-core inflation more often contributes to the changes of CPI.

Second, the result of this study demonstrates that in the short term CPI is influenced by the variable of IIMM; however, in the long term IIMM does not have a significant effect on the CPI. Hence, it does not reject H0. This evidence is due to the fewer transactions performed by Islamic banks compared to the conventional banks. Thus, in terms of the effect on inflation through interbank interactions, IIMM is less significant.

The IRF analysis portrays that changes in the IIMM will be responded negatively by the CPI. This result is in contrast to the findings of Magdalena and Pratomo (2012) and Saputro and Sukmana (2018). It is reasonable because when IIMM yields are low, banks prefer to invest their funds in the instruments of conventional banks that

will provide potential returns. Furthermore, the FEVD analysis shows that the contribution of IIMM to the changes on CPI is 0.1-2%. This evidence is due to inflation that is more influenced by changes outside the financial sector.

Third, this study yields a result that FIN in the short term does not affect the CPI significantly. As for the long term, FIN has a significant influence on the CPI. Hence, the third hypothesis (H3) is accepted. The explanation of this significant effect is that financing is a series of final stages in the transmission of Islamic monetary policy. Thus, financing can directly affect the economic performance and inflation. This also proves that Islamic banking financing is related to the financial sector, or changes in the financial sector are also followed by the real sector.

Financing and inflation has a positive relationship, suggesting that an increase in financing will also be followed by an increase of the CPI. This result is similar to the findings of Asnuri (2013) and Sudarsono (2017). It is understandable that the increase in distributed financing by Islamic banks, both consumptive (*murabahah*) and productive (*profit sharing*), will improve the power of purchasing and the money supply in society. Thus, it will also increase the inflation as proxied by the CPI.

The IRF analysis further shows that changes occurred in the financing activities will be responded negatively by the CPI. The influence of financing which causes an increase in inflation can be understood that the distributed financing by banks is more dominated by the contract of consumptive (*murabahah)* than productive (profit sharing). Moreover, the FEVD analysis shows that the contribution of financing to the changes in CPI is lower than 2% (<2%). It indicates that the higher the distributed financing by banks, the higher the contribution to inflation. In short, financing can be used by the monetary authority through banks to influence the inflation rate.

Fourth, this study results in a finding that the rate of return in SBIS in the short term does not have a significant effect on economic performance. However, in the long term, it was found by the VECM analysis that SBIS has a significant effect on the economic performacne. Hence, the fourth hypothesis (H4) is accepted. This significant influence of SBIS can be explained by the reason that SBIS is an instrument used by the monetary sector to regulate the circulation of money that will be used by banks to distribute financing. So, if interest rates are low, banks will provide financing which will affect the economic growth rather than investing in SBIS instruments.

According to the IRF analysis, an increase in SBIS has a positive effect on economic performance. This research contradicts to the findings of Asnuri (2013), Bassar et al. (2021) and Wibowo and Mubarok (2017). In a nutshell, it can be said that the increase in SBIS used by the monetary authority is effective in increasing the economic performance. Furthermore, the contribution of SBIS to economic performance based on the results of the FEVD analysis shows that the SBIS contributes to economic

performance at 1-6%. It can be understood that the high and low of interest rates for SBIS have a great influence on changes in banking behavior, whether it will be used for financing or invested in SBIS instruments.

Fifth, the return of IIMM in the short term does not have a significant effect on economic performance. Moreover, in the long term, IIMM also does not have a significant effect on GDP. Hence, it does not reject the H0. It can be understood that IIMM is a short-term instrument to fulfill banking liquidity. Thus, changes in IIMM will only affect banking behavior in the short term so that in order to influence the economic performance, transmission must be in the form of financing.

According to the IRF analysis, changes occurred in the IIMM was responded positively by the GDP. This result supports the research conducted by Umar and Putri (2013). It shows that the increase in IIMM used by the monetary authority is effective in increasing the economic performance. Furthermore, the results of the FEVD analysis shows that the contribution of IIMM to the changes of economic performance is 0.1-6%. This is due to, as previously noted, the IIMM is a short-term transaction so that it only affects the behavior of Islamic banking in the short time. In addition, the number of IIMM transactions is also lower than the conventional instruments.

Sixth, the financing rate in the short term has a significant effect on economic performance, and so does in the long term, according to the VECM analysis. Hence, the sixth hypothesis (H6) of this study is accepted. This is due to Islamic banking financing is closely related to the real sector. Thus, changes in total financing will affect the level of economic performance which in this study is proxied by GDP.

The results of the IRF analysis show that the changes in financing is responded negatively by GDP. This result supports the findings of Baehaqy and Cahyono (2020) which states that financing in Islamic banking prioritizes returns. It is also in a similar direction with the finding of Asnuri (2013) who provides an explanation that the market share of Islamic banking is less and the domination of *murabahah* contracts causes financing activities to have a negative effect on the GDP. Furthermore, the result of the FEVD analysis shows that the contribution of financing to the changes of economic performance is the largest after the contribution of the GDP t - 1, which is 4-47%. Although Islamic banking financing has a lower value than the conventional, it still makes a large contribution to the changes of GDP.

Conclusion

In conclusion, this study explores the effect of Islamic monetary policy transmission using the instruments of SBIS, IIMM, and Financing on inflation and economic performance (GDP). Employing VAR/VECM method, this study reveals that inflation is influenced by IIMM and GDP t is affected by the GDP t - 1 and financing activities.

While in the long term, inflation and the economic performance are influenced by SBIS and financing activities. According to the results of IRF, changes in CPI, GDP, and SBIS will be responded positively by the CPI; while changes in in FIN (financing) and IIMM will be responded negatively by the CPI. Moreover, changes in CPI, GDP, IIMM and SBIS will be responded positively by GDP; while changes in FIN will be responded negatively by GDP. Furthermore, based on the FEVD analysis results, IIMM variable has the greatest influence on the CPI compared to the other variables; while the variable that has the greatest influence of GDP is financing.

The results can be taken into consideration by the government to maintain the inflation rate and to increase the economic performance. These results can be used as reference for designing and establishing policies in order to overcome the economic problem encountered by the country. As for the limitations, this study focuses on the transmission of Islamic monetary policy. Hence, further research is suggested to analysis this issue by including variables in conventional transmission as a comparison. In addition, future studies are encouraged to consider other economic variables such as the level of financing return to determine the relationship between SBIS and IIMM.

Authors' Declaration

The authors made substantial contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation and discussion of results. The authors read and approved the final manuscript.

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