

# INDONESIA'S FINANCIAL SYSTEM STABILITY: EFFECTS OF DOMESTIC AND GLOBAL FACTORS



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## ABSTRACT

**Background:** Financial system stability is essential for ensuring efficient financial intermediation and sustainable economic growth. With increasing global financial integration, the stability of a country's financial system is no longer determined solely by domestic conditions, but is also influenced by global factors through various transmission channels such as capital flows, exchange rates, and financial markets.

**Purpose:** This study aims to examine the effects of both domestic and global factors on Indonesia's financial system stability and to distinguish their impacts in the short run and the long run.

**Design/methodology/approach:** This study employs monthly time series data from July 2003 to November 2022. Financial system stability is proxied by the Financial Stress Index (FSI). The analysis uses the Auto Regressive Distributed Lag (ARDL) model and Error Correction Model (ECM) to capture both short-run dynamics and long-run relationships.

**Findings/Result:** The results show that, in the short run, Indonesia's financial system stability is significantly influenced by domestic lending rates, exchange rates, money supply, U.S. financial stress, and crisis conditions. In the long run, exchange rates, money supply, and foreign exchange reserves are found to have significant effects on financial system stability. The model also indicates a speed of adjustment toward long-run equilibrium of approximately 19.9 percent per period.

**Conclusion:** Indonesia's financial system stability is jointly determined by domestic and global factors, with distinct roles across time horizons. These findings highlight the importance of policy responses that are not only domestically oriented but also responsive to global economic and financial developments.

**Originality/value (State of the art):** This study contributes to the literature by integrating domestic and global determinants of financial system stability within a unified ARDL-ECM framework. Unlike prior studies that typically focus on either domestic or external factors, this research provides a more comprehensive perspective by demonstrating the combined and time-varying influence of both, particularly in the context of a small open economy like Indonesia.

## ARTICLE INFO

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## INTRODUCTION

The financial system consists of banks, non-bank financial institutions, financial markets such as securities, mutual funds, and other investment instruments, pension funds, insurance companies, payment facilities, central banks and regulators and

supervisors of other financial institutions (IMF 2021). The financial system has a role in distributing capital from owners to debtors and as an intermediary in economic transactions. Therefore, financial system stability is needed to support economic growth. Currently, the integration between financial sectors across countries has been increasing as globalization

develops over the years. Financial openness facilitates the flow of capital and financial services across countries. This can be achieved by broadening and deepening cross-border financial ties and implementing policies that reduce barriers to foreign investors and capital (Herrero and Wooldridge, 2007).

Indonesia has been opening its financial sector for a long time and receives benefits from financial transactions conducted between Indonesia and partner countries such as attracting foreign investment to fund projects in Indonesia. On the other hand, the openness of Indonesia's financial sector causes financial system stability to not only influenced by domestic factors such as domestic economic growth, inflation, and domestic interest rates, but also influenced by international factors such as the state of the world economy, interest rates of developed countries, and the stability of the financial system of other countries (Balakrishnan et al. 2011; Park and Mercado, 2014; Vo et al. 2019)

As was the case in 2008, the financial system in America experienced a crisis as a result of financial institutions not applying the precautionary principle in providing credit to the real estate sector. The impact of the financial crisis that occurred in the country was transmitted to other countries including Indonesia. This illustrates that financial openness increases vulnerability to financial system stability. The crisis caused the stress in the financial sector in Indonesia increased. Figure 1 shows the Financial Stress Index (FSI) of Indonesia and several other countries that experienced increased financial stress during the US financial crisis.

The FSI is an index that measures the stress that occurs in various financial markets. Park and Mercado (2014) formulated that the FSI consists of four main financial markets: stress in the banking sector, stress in the stock market, stress in the debt market, and stress in the foreign exchange market. The advantage of the FSI as a proxy for financial system stability are: (i) the FSI has combined various financial market indicators into an aggregate index to measure the pressure on the financial system so that there is no need to use several indicators to measure financial system stability; and (ii) the FSI makes it possible to determine the severity of instability in the financial system. A high spike in the FSI value indicates that the stress on the financial system is getting higher.

In line with the conditions in 2008, a study conducted by Lau (2008) explained that the vulnerability of the financial system increased along with the opening of the financial system from foreign capital flows. This can be explained through the transmission of global factor shocks to the domestic financial system. The shocks can be transmitted through international trade and exchange rates. This statement is supported by a number of financial crises that occurred through these channels such as the Asian financial crisis in 1997-1998, the Latin American financial crisis in 1825, and the great depression in 1929.

Masson and Mussa (1995) revealed that external shocks such as an increase in global interest rates, contraction of global aggregate demand, significant changes in exchange rates or changes in commodity prices can cause shocks to the financial system in various countries. Research conducted by Qin (2020), explains that the price of petroleum has an impact on the stability of the financial system in both petroleum exporting and petroleum importing countries. For petroleum exporting countries, declining petroleum prices cause state revenues to decline so that, will have implications for the depressed financial sector. For petroleum importing countries, increasing oil prices hamper economic growth and can put pressure on the financial sector (Elsayed et al. 2022).

The stability of the financial system of a country with an open economy cannot be separated from domestic factors such as money supply, currency exchange rates, foreign exchange reserves, and interest rates. Vo et al. (2019) explained that rising interest rates are a sign of instability in the financial system in developing Asian countries. Meanwhile, the decline in foreign exchange reserves triggers financial system instability. A study by Klein (2013) emphasizes that currency depreciation will shake the stability of the country's financial system. Based on the description above, financial system stability is currently not only influenced by domestic factors but also globally as a result of increasing financial integration. Some previous studies that have been conducted related to financial system stability in Indonesia mostly only focus on one of the factors, namely only analyzing domestic factors or global factors. Therefore, this study was conducted to analyze the development of financial system stability in Indonesia and the domestic and global factors that influence it.

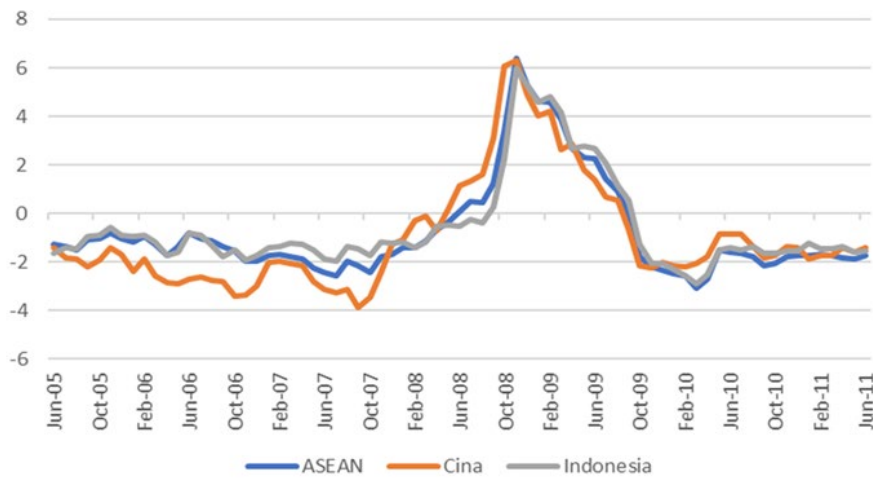


Figure 1. Financial stress index of Indonesia, ASEAN, and China

## METHODS

This study uses secondary data with monthly time series from July 2003 - November 2022. The dependent variable in this study is Indonesia's FSI. Meanwhile, the independent variables are Brent oil price, index of global real economic activity proposed by Kilian (2009), Indonesian lending rate, LIBOR, American FSI, money supply, foreign exchange reserves, rupiah exchange rate, and crisis dummy.

The analysis in this study made use of an Auto Regressive Distributed Lag (ARDL)/Error Correction Model (ECM). The ARDL is a model consisting of the lag of the dependent variable, independent variables, and the lag of the independent variables. This model can be used when variables of the model are stationary, I(0) or non-stationary, I(1).

Pesaran et al. (2001) proposed a cointegration test for the ARDL. The proposed cointegration test, so-called the bound test, is to test cointegration in variables with different stationarity orders, between I(0) and I(1). If there is cointegration in the model then there is a long-run relationship driving dynamics of the model. The purpose of cointegration is to obtain information on adjustment effects from the short run to the long run. Information about short-term parameters and adjustment coefficients from short-term to long-term effects can be obtained through the ECM. The following is the research model used:

$$\begin{aligned} \Delta FSI_t = & A_0 + CRISIS_t + \sum_{i=1}^n \gamma_i \Delta FSI_{t-1} + \sum_{i=1}^0 \beta_1 \Delta ECON_{t-1} \\ & + \sum_{i=1}^p \beta_2 \Delta L_{BRT_{t-1}} + \sum_{i=1}^q \beta_3 LIBOR_{t-1} + \sum_{i=1}^r \beta_4 \Delta AMC_{FSI_{t-1}} \\ & + \sum_{i=1}^s \beta_5 \Delta LENDING_{t-1} + \sum_{i=1}^t \beta_6 \Delta L_{FRGRSV_{t-1}} + \sum_{i=1}^u \beta_7 \Delta L_{EXC_{t-1}} \\ & + \sum_{i=1}^u \beta_8 \Delta L_{M2_{t-1}} + \theta_1 ECON_{t-i} + \theta_2 L_{BRT_{t-i}} + \theta_3 LIBOR_{t-i} \\ & + \theta_4 AMC_{FSI_{t-i}} + \theta_5 LENDING_{t-i} + \theta_6 L_{FRGRSV_{t-i}} + \theta_7 L_{EXC_{t-i}} \\ & + \theta_8 L_{M2_{t-i}} + \theta_9 FSI_{t-i} + \varepsilon_t \end{aligned}$$

Where:  $\Delta$  (Difference);  $FSI_{t-1}$  (Indonesia's financial stress index in month t-i);  $ECON_{t-1}$  (World economic index in month t-i);  $L_{BRT_{t-1}}$  (log of brent oil price in month t-i);  $LIBOR_{t-1}$  (London interbank offered rate in month t-i);  $AMC_{FSI_{t-1}}$  (America's financial stress index in month t-i);  $LENDING_{t-1}$  (Indonesia's lending rate in month t-i);  $L_{FRGRSV_{t-1}}$  (Log of Indonesia;s foreign exchange reserves in month t-i);  $L_{SXC_{t-1}}$  (Log of Indonesia's exchange rate against USD in month t-i);  $L_{M2_{t-1}}$  (Log of Indonesia's money supply in month t-i);  $CRISIS_t$  (Crisis dummy (1=crisis; 0=otherwise));  $A$  (Constant);  $n, o, p, \dots, v$  (Lag variables);  $\gamma, \beta$  (Short-term parameters).

## RESULTS

### Indonesia's Financial System Stability Development

In 1997 Indonesia experienced a monetary crisis as a result of accumulated problems in the financial system over the years. The monetary crisis started with the crisis in Thailand which then transmitted to other

Asian countries including Indonesia. This reduced the confidence of foreign investors in putting their funds in Asia (Nasution, 2000).

Since October 1978, Indonesia had used a managed floating exchange rate system, which is an exchange rate maintained by the government at a certain level. The implication of this policy is the rupiah exchange rate relatively stable and does not fluctuate. On the one hand, the policy caused the rupiah exchange rate to be overvalued. This then led to other problems, namely the increase in foreign debt.

A strong exchange rate and high domestic interest rates made foreign credit much cheaper than domestic credit. The purpose of high domestic interest rates was to make people willing to put their funds in rupiah. This condition is very favorable for entrepreneurs because the rupiah exchange rate rarely depreciates. Therefore, more and more foreign private debt has accumulated.

The foreign private debt of 1,800 companies reached USD 64 billion in May 1998. High domestic interest rates and a relatively stable exchange rate also encouraged foreign investors in the Indonesian capital market. In addition, banks channel foreign loans and public funds in an unvaried and non-foreign exchange generating manner such as housing projects, hotels, and amusement parks. Therefore, little foreign exchange is earned to repay foreign debt.

The transmission of the crisis from Thailand to Indonesia and the accumulation of financial system problems had occurred over the years resulted in the

monetary crisis in 1997. Bank Indonesia was forced to implement a floating exchange rate system which caused the rupiah to depreciate massively. Both domestic and foreign investors lost confidence in Indonesia's financial capability, resulting in massive capital outflows. The impact of this crisis on the Indonesian economy included a soaring foreign debt burden, layoffs, and an increasing inflation rate due to the soaring prices of imported goods (Tarmidi, 1999).

In order to recover from the monetary crisis, Bank Indonesia (BI) implicitly implements Macroprudential policy. Macroprudential policy is the application of prudential principles to the financial system in order to maintain a balance between macroeconomic and microeconomic objectives (Bank Indonesia, 2016). The implementation of this policy can be seen from the establishment of the Financial System Stability Bureau and the preparation of the financial system stability framework in 2000. Since 2003, BI has been actively publishing monitoring results on financial system stability every semester through the Financial Stability Review. Over the time, macroprudential policy was further developed especially after the Global Financial Crisis

Figure 2 shows Indonesia's FSI from 2003 to 2022. The FSI illustrates the level of stress in the financial sector and can be a reference to see the stability of the financial system. In 2008, it can be seen that Indonesia's FSI experienced a sharp increase. This indicates during that period there was instability in the Indonesian financial sector.

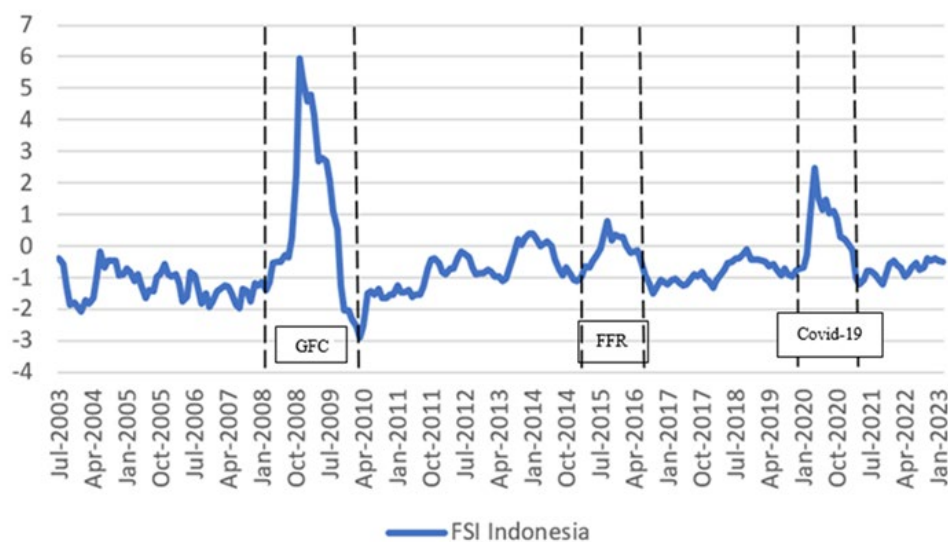


Figure 2. Indonesia's financial stress index

The high FSI in 2008 was caused by the financial crisis in the US. This financial crisis began with the emergence of an innovative investment instrument, namely a collection of debt securities with house collateral. This instrument managed to become a favorite investment for investors because house prices have an increasing trend. The high demand for this investment instrument encouraged banks to provide housing loans to the entire community without considering the possibility of default. As a result, many borrowers defaulted and house prices fell drastically. America was faced with a financial crisis with many financial institutions going bankrupt. This resulted in a sluggish American economy with rising unemployment and declining economic growth.

The financial crisis affected many countries as the United States had financial and economic ties with other countries. Global liquidity and declining investor confidence made it difficult to obtain funding during this period. Gurtner (2010) reported that capital inflows to developing countries declined in 2008 to USD 727.3 billion compared to 2007 when foreign capital inflows reached USD 1,157.7 billion. Indonesia was not free from the impact of this crisis, namely the decline in the stock price index on the stock exchange, rupiah depreciation, decreased banking sector liquidity, and increased unemployment.

The relatively tight money market conditions encouraged banks to be more aggressive in mobilizing public funds. Since the end of July 2008, banks tended to compete to attract customers with large funds by offering high deposit rates. BI's policy response in overcoming financial system problems that occurred included (Bank Indonesia 2008):

1. Intervene in the forex market to maintain exchange rate stability.
2. Easing reserve requirements to increase transactions in the interbank money market
3. Adjustments to the provisions of the Short-Term Funding Facility (FPJP) in order to make it easier for commercial banks and rural banks (BPR) to access the facility so as to strengthen the resilience of the banking system.

The transmission of shocks put Indonesia in a financial crisis alert situation. During that year, Indonesia did not yet have a legal basis regarding extraordinary measures in order to overcome the threat of financial crisis. Hence, the government issued Regulation Law

No.4 of 2008 regarding the financial system safety net. The purpose of the regulation is to provide a legal basis for the mechanism of preventing and handling the financial system from crisis. The crisis prevention and handling referred to in this regulation is to overcome the problems of banks and non-bank financial institutions that can cause systemic risk. Systemic risk is defined as an event that can eliminate public confidence and increase uncertainty in the financial system that makes financial system does not function properly.

The Financial System Stability Committee (KSSK) was formed through this mandate. The KSSK consists of the Minister of Finance who serves as the chairman and the Governor of Bank Indonesia as a member. This committee has the function and task of evaluating, determining problems, and making policies related to systemic risk. The KSSK can bail-out banks and non-bank financial institutions that have the potential to have a systemic impact.

Shortly after the issuance of Regulation of Law No.4/2008, KSSK took over most of the shares of Bank Century in November 2008. This action was caused by liquidity problems with a low capital adequacy ratio (CAR) and the inability of the bank to pay its obligations. KSSK defined Bank Century as a bank with systemic impact that needed to be rescued in order not to shock the financial system.

Law No.4 of 2008 was revoked and replaced by Law No.9 of 2016 on the Prevention and Handling of Financial System Crises (PPSK). This law revised the KSSK members, which initially consisted only of the Ministry of Finance and Bank Indonesia, to include Financial Services Authority (OJK) and the Deposit Insurance Corporation (LPS). The Ministry of Finance acts as coordinator and member, while BI, OJK, and LPS act as members. The formation of four institutions in the KSSK is expected to help coordinate policies in maintaining financial system stability. The four institutions have an important role in maintaining and achieving financial system stability.

Fears of an increase in the US Federal Funds Rate (FFR) and slowing global economic growth put pressure on Indonesia's financial sector in 2015. The issue of FFR hike in 2015 triggered speculative behavior of investors resulting in capital outflows in the Indonesian capital market. Recorded as of September 2015, capital outflows in the Indonesian capital market amounted to

Rp 7.18 trillion causing the Jakarta Composite Index (JCI) to fall to 4,223 points. The decline in the JCI has occurred since the beginning of 2015.

The predicted FFR hike and China's slowing economic growth have put pressure on the rupiah exchange rate. Indonesia's condition as a small open country that has little influence on the world economy causes investors to prefer holding a relatively safe currency, namely the dollar, in this uncertain condition. As a result, the rupiah exchange rate against the USD touched the highest rate since the monetary crisis at IDR 14,396 per USD in September 2015. The depreciation of the currency was followed by a decline in foreign exchange reserves during the third quarter of 2015. Foreign exchange reserves as of September 2015 were recorded at IDR101.7 billion or decreased by 3.5 percent from the previous month. The decline in foreign exchange reserves was driven by exchange rate stability policies as well as foreign debt repayments. Liquidity declined again, increasing risks in the financial markets. This can be seen from the overnight interbank money market (PUAB) interest rate which increased sharply from 5.74 percent in August 2015 to 8.12 percent in September 2015. The increased interbank rates were driven by the greater need for rupiah to hedge in the forex market as the rupiah exchange rate depreciated (Ministry of National Development Planning, 2015).

Increased pressure on Indonesia's financial sector occurred again in 2020 due to the Covid-19 pandemic. The Covid-19 pandemic has had a tremendous effect on the economy and financial system both globally and domestically. The global and domestic economies contracted due to limited economic activity during the Covid-19 pandemic. This has led to massive layoffs and a decrease in demand for goods and services. In 2020, the world economy declined by 3.1 percent. Sluggish economic conditions increased pressure on the financial sector. Companies are postponing expansionary measures amid contracting economic growth. Investors also tend to withdraw their investment funds and reallocate to assets that are considered safe during a crisis such as gold.

During this period, the government strives to maintain financial system stability through various policy synergies between stakeholders. The following are the steps taken by the government (Bank Indonesia 2021):

1. Implement the National Economic Recovery program in an effort to boost the national economy through

- job creation, social protection, improving the investment ecosystem, and empowering MSMEs.
2. Burden sharing between the government and Bank Indonesia through the mechanism of purchasing national securities by Bank Indonesia in the primary market.
3. Easing of Loan to Value (LTV) for home ownership loans and down payments for motor vehicle loans.
4. Lower the monetary policy rate.
5. BI injected a large amount of liquidity into the banking system.
6. Launched the Macroprudential Inclusive Financing Ratio (RPIM) to improve access to credit for Micro, Small, and Medium Enterprises.

The government implemented a financial sector omnibus law in 2023 which amended 17 laws related to the financial sector. The financial sector omnibus law or Law No. 4 of 2023 establishes the Crisis Management Protocol (PMK). The existence of FMD in the financial system is very important in crisis resolution efforts to help financial authorities react and take appropriate and coordinated steps quickly. A crisis condition worthy of being handled by the FMD is a crisis status announced by the president. PMK coordinates between the government, KSSK, and related institutions. Based on the regulation, during a crisis Bank Indonesia can:

1. Purchase long-term Government Securities (SBN) in the primary market to handle financial system problems that endanger the national economy.
2. Purchase / reverse repurchase agreement (repo) SBN owned by LPS to finance bank problems.
3. Provide access to funding for corporations/privates by repoing SBN owned by corporations/privates through banks.

### **Domestic and Global Factors Influenced on Indonesia Financial System Stability**

The results of the estimation using the ARDL/ECM method show that the domestic factors that affect the stability of the Indonesian financial system in the short term are the lag of the Indonesian FSI, the interest rate on domestic loans, the rupiah exchange rate, and the money supply. Table 1 shows that the lag of Indonesia's FSI has a positive effect on Indonesia's financial sector stress level. If the FSI in the previous period increases by 1 point, it will increase the current Indonesian FSI by 0.216, *ceteris paribus*. This means that the impact of financial sector instability in the previous period will have an impact on the next period. This indicates

that there is inertia in financial system instability, i.e. financial system instability that occurs in the current period is an accumulation of shocks that occurred in the previous period.

In line with this, Cismaş and Donath (2008) emphasize that the key to achieving financial system stability is to build a financial system that is able to parse various shocks so as to minimize the risk of financial system instability.

A 1 percent increase in Indonesia's lending rate increases financial sector stress by 0.286, ceteris paribus. Interest rates are the cost of borrowing money so high interest rates indicate the higher cost of borrowing money. Therefore, higher interest rates discourage people from borrowing money from banks. Not only that, increasing loan interest rates can make it difficult for borrowers to repay loans, so that it can increase non-performing loans at banks. These results are in line with research conducted by Park and Mercado (2014).

If the money supply in the market changes by 1 percent, the stress in the financial sector in Indonesia decreases by 0.0892, ceteris paribus. Money supply reflects liquidity in the market. Increased liquidity in the market encourages economic growth and increases investor confidence so as to reduce stress in the financial sector. An increase in money supply can occur through expansionary monetary policy or an increase in transactions in the financial sector. The significant result on loan interest rate and M2 variables indicate that in the short term, monetary intervention by the central bank can affect the condition of financial system stability in Indonesia.

If the rupiah exchange rate depreciates by 1 percent, in the same period the stress on the financial sector in Indonesia increases by 0.1152, ceteris paribus. However, in the next period, the effect of rupiah depreciation actually has a positive impact on financial system stability which is reducing stress in the financial sector in Indonesia by 0.0457, ceteris paribus. Currency depreciation increases the competitiveness of Indonesian products in the international market. Basically, currency depreciation results in products from the country being relatively cheaper than their counterparts. Therefore, Indonesian products become more desirable, which will increase the volume of Indonesian exports. The increase in exports has a positive impact on the financial system in Indonesia.

The amount of foreign money flowing into Indonesia increases along with the increase in export volume.

Global factors that affect the stability of the Indonesian financial system in the short term are the American financial system and crisis dummy. If there is an increase in stress in the US financial system by one unit, it can increase stress in the Indonesian financial sector by 0.116, ceteris paribus. This indicates that there is a transmission from the US financial sector to the Indonesian financial sector. The openness of the financial sector between Indonesia and the US increases Indonesia's vulnerability to financial shocks that occur in the US. Financial sector linkages between the two countries are established through trade, stocks, debt, and other financial channels. Not only that, America is a country that has a great influence on the global economy, so that the financial conditions in the country can affect the financial stability of small open economies such as Indonesia.

Table 1. Estimation result

Variable	Coeff	Std. Error	Prob.
<b>Short term</b>			
$\Delta FSI_{t-1}$	0.216***	0.065	0.000
$\Delta AMC\_FSI_t$	0.116***	0.024	0.000
$\Delta AMC\_FSI_{t-1}$	0.087***	0.020	0.000
$\Delta LIBOR_t$	-0.120	0.108	0.270
$\Delta LENDING_t$	0.286***	0.101	0.005
$\Delta L\_M2_t$	-8.920***	2.756	0.001
$\Delta L\_FRGRSV_t$	-0.898	0.549	0.103
$\Delta L\_SXC_t$	11.518***	1.260	0.000
$\Delta L\_SXC_{t-1}$	-4.574***	1.059	0.000
$CRISIS_t$	0.414***	0.112	0.000
CointEq(-1)	-0.199***	0.034	0.000
<b>Long term</b>			
AMC_FSI	0.093	0.011	0.104
ECON	-0.001	0.000	0.512
LIBOR	-0.055	0.015	0.477
L_BRENT	1.231	0.205	0.233
LENDING	0.090	0.0225	0.423
L_M2	-5.689*	0.609	0.063
L_FRGRSV	1.899**	0.192	0.050
L_EXC	5.195**	0.479	0.031
C	-7.284***	2.619	0.006
Number of Obs.	231		
F(19.211)	17.13		
Prob > F	0.000		
R-squared	0.785		
Root MSE	0.220		

Diplomatic relations between Indonesia and the United States have been established since 1949. Through these diplomatic relations, Indonesia and the United States have carried out various cooperation in both the economic and non-economic sectors to support the interests of the two countries. In the scope of trade, Indonesia and the US have implemented the Trade Investment Agreement Framework since 1998. The United States is Indonesia's second largest trading partner with total Indonesian exports to the United States amounting to 28,202 million USD or growing by 9.34 percent from 2021. Apart from the dominance of the trade sector, Indonesia has foreign debt to America reaching 31,667 million USD as of April 2023. On the one hand, America has also realized investment in Indonesia of 4,810.50 million USD in 2022. America's large role in Indonesia's economy and finance poses a risk of transmission of shocks from America to Indonesia. Historically, the influence of US financial system shocks on Indonesia's financial system can be seen through the Global Financial Crisis in 2009. The financial crisis that occurred in the US shook the Indonesian financial system which was characterized by a decrease in financial market liquidity and depreciation of the rupiah exchange rate.

Balakrishnan et al. (2011) revealed that the transmission of financial sector stress in developed countries to developing countries can be through capital outflows in developing countries initiated by developed country investors after a shock to the financial system. Second, financial sector stress in developed countries can result in losses for developing countries through the economic assets of developing countries invested in these countries. Third, financial stress can be transmitted through trade linkages between developing countries and developed countries. Export revenues of developing countries may decline as a result of the decline in demand from developed countries that are experiencing a financial crisis.

The crisis dummy also affects the stability of the financial system in the short term where the average difference of Indonesia financial stress during a crisis condition and a non-crisis condition is 0.414, *ceteris paribus*. Robinson (1952) argued that there is a demand-following response hypothesis between economic growth and the financial sector where the development of the financial sector follows economic growth. A crisis event signifies the sluggishness of the economy, therefore, demand for the financial sector will decrease and increase stress in the sector.

These short-term results are in line with arguments by Lau (2008) and Dehesa (2008) about globalization increases vulnerabilities in financial system stability. Economic and financial openness causes the contagion effect not only to occur between domestic financial institutions/markets but extends to the global scope. Financial openness provides benefits for financial institutions/investors to reduce investment risk through asset diversification through various investment instruments spread across various countries. However, the benefits received are often accompanied by information asymmetries faced by financial institutions and investors. Calvo and Mendoza (2000) revealed that financial institutions/investors tend to do less research related to financial markets in foreign countries and tend to only follow investment trends in these markets. When there is news related to the preferred investment instrument, investors most likely will have a following attitude.

Changes in investor attitudes toward receiving bad news can trigger a contagion effect, potentially leading to a financial crisis, as anticipated by investors. When investors receive negative news, such as the outbreak of a crisis in a particular country, they often withdraw their funds from that country to limit their losses. The contagion effect can extend beyond the affected country, as foreign investors may also withdraw their investments from countries that are not experiencing a crisis to compensate for losses incurred in crisis-hit countries. Furthermore, foreign investors tend to withdraw their investments from countries they perceive as vulnerable to a crisis, a phenomenon known as the 'wake-up call' effect. The receipt of negative news alters investors' behavior, making them more cautious about where they allocate their funds. This caution can have a significant impact on global liquidity (Obstfeld 1996; Goldstein 1998; Lau 2008; Dehesa 2008).

The ECM model provides information related to the speed of adjustment of the dependent variable from short-term shocks to return to the equilibrium value in the long run. Based on Table 1, it is known that 19.9 percent of shocks in the short term will return to long-term equilibrium conditions in the same month. Therefore, the condition of financial system stability will be achieved after five months from the occurrence of shocks to the financial system.

In the long run, the factors that influence Indonesia's SSK are money supply, rupiah exchange rate, and foreign exchange reserves. If the money supply increases by 1 percent, the stress in Indonesia's financial sector will decrease by 0.0569, *ceteris paribus*. The money supply represented by M2 indicates that economic transactions are increasing therefore, in accordance with the demand-following response hypothesis the financial sector is growing as the economy increases. Currency depreciation in the short term has a positive impact on financial system stability. However, currency depreciation that occurs in the long run causes instability in the financial system. Based on Table 2, it can be seen that the depreciation of the rupiah against the US dollar by 1 percent increases the stress in the financial sector by 0.0519, *ceteris paribus*. Currency depreciation causes the amount of debt in foreign units to increase so that it will be more difficult for the government or institutions to repay the debt. Not only that, the rupiah is less valuable than other currencies can encourage domestic / foreign people to sell rupiah to secure their assets. For example, the monetary crisis in 1997 provide illustration on financial system instability because of exchange rate depreciation. The exchange rate of the rupiah against the US dollar depreciated from IDR2,302/USD in June 1997 to IDR14,436/USD in June 1998. This condition resulted in swelling foreign debt and massive capital outflows.

If Indonesia's foreign exchange reserves increase by 1 percent, the stress in the Indonesian financial sector will increase by 0.0189, *ceteris paribus*. Foreign exchange reserves are the accumulation of foreign currency and certain assets received by the central bank. The increase in foreign exchange reserves can be through increased exports, foreign direct investment, and foreign indirect investment. Currently, Indonesia's foreign exchange reserves are supported by the trade balance surplus and foreign direct investment.

This result aligns with the post-Keynesian perspective, which suggests that large foreign exchange reserves can potentially lead to instability in the financial system. According to this viewpoint, rapid growth in foreign capital inflows can foster market optimism, leading to excessive credit expansion. The ultimate consequence of such expansion is a significant decline in both credit and asset prices (Phat, 2018). This situation can arise when the cash flows generated by investment projects fall short of covering the interest payments on foreign currency debt. High foreign exchange reserves,

acquired from foreign investments, can increase the financial system's vulnerability, especially when foreign investors react to adverse news by abruptly withdrawing their investments.

Expanding on the above description, while the long-term stability of Indonesia's financial system may be influenced solely by domestic factors, some of these factors are sensitive to external changes. Exchange rate volatility, for instance, can be driven by speculative activities in the foreign exchange market, often triggered by various factors such as expectations regarding future global economic conditions. Throughout history, financial crises have propagated through exchange rate channels, exemplified by events like the Asian financial crisis in 1998 and the Latin American crisis in 1825. Additionally, foreign exchange reserves are influenced by the risk of external changes, with a country's reserve levels tied to international trade performance and foreign capital. As Indonesia heavily relies on commodities, it faces the risk of foreign exchange reserve volatility stemming from fluctuations in commodity prices.

## CONCLUSIONS

Indonesia's financial system has evolved over the years through various implemented policies. Financial system stability refers to a state in which the financial system operates smoothly and can withstand shocks that might otherwise cause instability. Instances of financial instability in Indonesia occurred in 2008, 2015, and 2020. These experiences of instability have served as valuable lessons for the government to enhance regulations aimed at maintaining stability within the Indonesian financial system.

Based on our findings, the stability of Indonesia's financial system is influenced by both domestic and global factors. Short-term factors affecting Indonesia's financial system stability include Indonesia's own financial system, domestic interest rates, the exchange rate of the rupiah, money supply, crises, and financial pressures in America. In the long term, variables such as foreign exchange reserves, the rupiah exchange rate, and money supply play significant role on influencing Indonesia's financial system stability.

Drawing from the research results, therefore, the government could adopt strategies to uphold financial system stability. One approach through the real sector

involves promoting downstream industrial activities to enhance the value of Indonesia's export products, reducing dependence on commodity price trends. This can help mitigating the risks associated with fluctuations in Indonesia's foreign exchange reserves. Secondly, monetary policy has short-term effects on financial system stability. Consequently, shifts in monetary policy direction should be gradual and transparently communicated to the public to avoid triggering instability in the financial system.

Thirdly, the Ministry of Finance can reduce foreign debt, particularly that owed to the United States, to lessen relatively high dependence on the U.S. dollar denominated debts. It should also prioritize increasing state revenue through tax optimization.

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