INFLATION CONTROL IN ASIA: EMPIRICAL STUDY OF THE INFLUENCE OF DIGITAL TECHNOLOGY AND TRADE OPENNESS POST THE GLOBAL FINANCIAL CRISIS

Moch Zaka Amar M
Universitas Trunojoyo Madura
zakaamar@gmail.com

Alvin Sugeng Prasetyo
Universitas Trunojoyo Madura
alvin.prasetyo@trunojoyo.ac.id

Vinda Yulinda
Universitas Trunojoyo Madura
vindayulinda05@gmail.com

Abstract - *This study aims to test and analyze the role of trade openness in controlling inflation and to test and analyze the role of ICT indicators in controlling inflation after the global financial crisis in Asia. As well as to measure and analyze the inflation rate in developing Asian countries in moving towards the balance line (Asian inflation average). The variables of this study use CPI, trade, fixed broadband subscription, fixed telephone subscription, mobile cellular subscription, individuals using the internet, foreign direct investment, exchange rate, GDP, and unemployment. Time series data from 2010 to 2021 and cross-section data of 22 developing countries on the Asian continent. The method used is the General method moment (GMM), while the analysis technique is SYS-GMM. Results The estimation results indicated that Trade openness could decrease but not significantly. The SYS-GMM results of the four ICT indicators fixed broadband, fixed telephone, mobile cellular, and individuals using the internet have different effects on inflation. SYS-GMM results of the four ICT indicators fixed broadband, fixed telephone, mobile cellular, and individuals using the internet have a different effects on inflation. Only ICT 4 individuals using the internet can significantly reduce inflation in ASIA after the global financial crisis..*

Keywords: ***ICT, Inflation, SYS-GMM, ASIA, Trade Openness.***

I. INTRODUCTION

Many economic researchers have expressed the definition of inflation, so there are many views regarding the explanation of inflation. According to Islam et al. (2017), inflation is when all prices of goods and services simultaneously continue to increase. Kantur & Özcan (2022) added that if there is an increase in several commodities that does not occur continuously, then it cannot be said to be inflation. Kose et al. (2020) view that inflation is an indicator of a country's standard cost of living. Rising inflation means that a country's standard of living is falling because people spend a lot of money to get the same amount of goods or services in the period before the increase in inflation. Khan et al. (2021) also argue that inflation means a decline in consumer purchasing power and real income.

The views of economic researchers that have been expressed make inflation an important economic issue to research. Inflation is an important issue in the economy because it affects all aspects of the economy, starting from consumer spending, business investment, etc., therefore controlling inflation needs to be carried out by policymakers (Galati et al., 2011). Inflation control aims to stabilize macroeconomic conditions, both in the short and long term, so that it does not hamper a country's economic performance (Iqbal et al., 2022). Hall et al. (2022) say that controlling inflation can be seen from the factors that cause inflation, for example, supply-side factors or demand-side factors. Supply-side factors or what is called supply shocks are economic factors that cause inflation due to increased production costs (Ahmadian & Gorji, 2015). Several important supply-side factors include investment, technological changes, oil prices, food prices, international trade, taxes, wages, and exchange rates.

On the other hand, demand-side factors are economic factors that cause inflation due to a shortage of goods and services in the country (Moessner, 2022). This means that demand continues to expand, but is not followed by an increase in supply. Some demand side factors are growth in the money supply, household, private and government consumption expenditure. If inflation is caused by the supply side, policymakers must formulate appropriate and appropriate policies to reduce the effects of supply shocks, and vice versa. This is a general step in a country to control inflation.

Inflation control is implemented by countries in the Asian region, but before explaining inflation control in Asia, first look

at the development of inflation in Asia after the global financial crisis. Based on statistical data, the inflation rate in Asia is much higher than the average inflation in the world. Several phenomena occur on a global scale that cause inflation to rise high in certain years. Things that happen globally will of course also affect Asian countries, global crises, and epidemics cause inflation that exceeds the world inflation average.

One of the factors that causes fluctuating inflation performance is due to developments in information and technology. The role of information technology is to create transparent market price information in food commodity businesses. The government by using information technology through applications can reduce price uncertainty in society thereby helping to control prices, therefore inflation can be controlled (Lv et al., 2019). Information and Communication Technology (ICT) is a technology used to communicate create, manage, and distribute information. Generally, ICT includes computers, internet, telephone, television, radio, and other audiovisual tools.

According to Goolsbee & Klenow (2018), the influence of ICT on inflation can be explained through two channels. The first path is the direct path, technological advances have contributed directly to reducing the price of goods which can then control inflation. As ICT advances, it encourages increased productivity, so that consumption patterns shift towards technological goods because new products incorporate various functions performed by other goods. Therefore, it can reduce the demand for goods.

The second channel, namely the indirect channel, ICT influences inflation through the behavior of buyers and sellers (Goolsbee & Klenow, 2018). The emergence of online platforms can change consumer behavior. The existence of online platforms has broader implications in price setting, thereby influencing inflation performance. ICT innovation allows consumers to more easily observe product price distribution and verify the quality of the product they want to buy, therefore information related to the product price and quality reduces the seller's pricing power, conversely, for sellers, the ability to change prices is more flexible in responding to shifts in demand. This means that sellers quickly assess demand for their products based on competitors' pricing. This condition increases market efficiency and makes inflation more controllable (Lieber & Syverson, 2012).

The inflation rate in Asia is not only influenced by technological developments, however, several important factors can also

influence the high and low levels of inflation in a country, one of which is trade openness. Romer (1991) states that trade openness can have a significant effect on the level of inflation. Romer (1993) believes that trade openness functions to control inflation fluctuations, so policymakers feel it has a beneficial impact because it can limit the incentives given to economic actors. Rogoff (1995) also shows that as a country's trade openness becomes more open, the country tends to experience less inflation.

This differs from Johar et al., (2020) who state that trade openness can increase inflation instability. This is because it increases vulnerability to exchange rate fluctuations so that inflation stability will also be disrupted. The exchange rate can influence inflation through net exports and is a component of aggregate demand, an increase in aggregate demand will cause the AD curve to shift to the right in the AD-AS model, thus increasing prices and causing an increase in inflation (Hoang et al., 2020).

The issue of ICT and trade openness which is assumed to be able to control inflation has been reviewed empirically. The results of empirical studies conducted by Puspaningtyas & Mukhlis (2022) and Mawusi (2021) which contain the relationship between inflation and openness and also ICT on inflation can indeed have a positive impact on controlling the inflation rate. Qin et al. (2021) examine the relationship between inflation technology and ZINB. As well as Lv et al. (2019) also measured and determined the contribution of technology and globalization variables to inflation in the United States using the Extended hybrid New Keynesian Phillips Curve (NKPC) model. Although several technological studies on inflation have different methods and samples, all of these studies agree that technology can influence inflation significantly. Technological advances can make inflation more controlled. by Mansilla et al. (2020), Sahu & Sharma (2018), Mukhtar et al. (2019), and Tee et al. (2018), shows that trade openness affects inflation.

An empirical study on trade openness on inflation carried out by Sakanko & Joseph (2019), shows that there is a long-term relationship between the level of inflation and trade openness with oil prices, money supply, exchange rates, and per capita income. Sahu & Sharma (2018) show that there is a unique and stable long-term relationship between inflation and other variables, such as trade openness, import opening, interest rate depreciation, real GDP, and money supply. Also, Tee et al. (2018) find a positive and significant relationship

between trade openness and inflation when adopting a newly developed composite trade stock measure in the GMM estimation system. However, the relationship between trade openness and inflation becomes negative and significant when this study uses alternative trade stock measurements in the GMM estimation system.

Research conducted by Puspaningtyas & Mukhlis (2022) investigated internet users, technology, taxes, and economic growth using the VECM method. As well as Lv et al. (2019) also measured and determined the contribution of technology and globalization variables to inflation in the United States using the Extended Hybrid New Keynesian Phillips Curve (NKPC) model. Although several technological studies on inflation have different methods and samples, all of these studies agree that technology can influence inflation significantly. Technological advances can make inflation more controlled.

Based on previous research, it can be seen that there are differences in results regarding trade openness and ICT on inflation. This study tries to examine the relationship between trade openness and inflation in Asia. The use of strong methods must also be used to obtain results that can truly be used as a reference. This research uses the GMM estimation method. This research is important to observe because it uses the year when the global economic crisis (GFC) occurred in the world where many countries were affected, including countries in Asia.

There are several research updates offered in this study. First, the objects used are 21 developing Asian countries. Second, using the Generalized Method Moment (GMM) method. Third, the control variables financial openness, per capita income, exchange rate, and unemployment in one model. Fourth, in this study, the ICT indicators are more dis-aggregated using indicators of fixed broadband subscriptions, fixed telephone subscriptions, mobile cellular subscriptions, and individuals using the internet as ICT proxies.

The previous explanation gets to the core of the problem, namely that inflation is an important indicator in the economy. There was a gap in inflation in Asia during the era of the global economic crisis until 2020 and during the era of the global economic crisis, inflation in Asia was below the world inflation average. Trade openness in Asia is also good, but there are disparities between countries which cause various economic problems. It is not only openness that influences inflation in Asia but also many factors, one of which is technology (ICT). The level of technological progress in Asia is not

evenly distributed, some are high, low, and very far apart. This is a fairly large inequality for countries in Asia. The use of the internet and telephone is what makes inequality so large in Asia, even though technology, especially ICT, can be an important factor in controlling the inflation rate in Asia.

This research is based on several previous studies in journal form. For example, research conducted by Puspaningtyas & Mukhlis (2022) investigated internet users, technology, taxes, and economic growth using the VECM method. Qin et al. (2021) examine the relationship between inflation technology and ZINB. As well as Lv et al. (2019) also measured and determined the contribution of technology and globalization variables to inflation in the United States using the Extended hybrid New Keynesian Phillips Curve (NKPC) model. Although several technological studies on inflation have different methods and samples, all of these studies agree that technology can influence inflation significantly. Technological advances can make inflation more controlled.

Sakanko & Joseph (2019) and Mawusi (2021) research using the ARDL method. Shows Granger's cointegration and one direction between the inflation rate and trade openness. Moreover, short-term and long-term results show a significant and negative relationship between inflation rate and trade openness in Nigeria. Likewise, Mansilla et al. (2020), Sahu & Sharma (2018), Mukhtar et al. (2019), and Tee et al. (2018), show that trade openness affects inflation. Research by Guender & Mchugh-Smith (2023) and Mendonça & Nascimento (2020) measures and tests the effect of financial openness on inflation and other macroeconomic problems. Using different methods, namely OLS and SGMM. Shows the same results, namely that financial openness is an important variable in controlling inflation and maintaining macroeconomic stability. Research by Bhatti et al. (2021) who examined financial globalization on inflation using heterogeneous panel GMM also had the same results.

Research by Siami-Namini & Hudson (2019) and Muhibbullah & Das (2019) investigated the hypothesis of non-linear effects of inflation on income inequality and explored the short-term and long-term relationship between inflation and income inequality using the VECM model. This study found a nonlinear relationship between inflation and income inequality. As well as Takyi & Fosu (2019), show that there is weak evidence that inflation targeting affects reducing inflation.

Research by Hoang et al. (2020) shows that there are certain effects of the exchange rate on exports, imports, money supply, output, and prices in the economy. Sharma et al., (2019) examine the long-term and short-term impacts of crude oil price and exchange rate shocks on domestic inflation in India. Shows that exchange rate shocks and oil prices have a significant effect on inflation during the research period. Research by Gidigbi et al. (2018), investigated the pass-through impact of exchange rate volatility on price inflation in Nigeria using the VECM method. The results except for money supply show that exchange rate volatility along with other Granger model variables does not cause inflation in the short term over a twelve-month calendar period. However, in the long run, all variables contribute to changes in inflation. Popescu & Diaconu (2022) analyze the impact of economic policy measures on the evolution of inflation and unemployment in the G7 countries using causality and cointegration methods, such as the Granger, Granger-Wald, and Johansen tests. Ho & Iyke (2018) analyzed the effect of unemployment on inflation. Shows that there is an inverse relationship between the inflation rate and the unemployment rate. Galstyan (2021) finds that the unemployment rate explains 11% of the variation in headline inflation, indicating the significant power that slack has in influencing medium-term core inflation.

According to Blix (2015), it shows that rapid digitalization can increase competitiveness and influence inflation. Digitalization is related to technological developments. Increasingly developing technology has increased productivity in a country, and increased competitiveness, thereby delaying the rise in inflation. Lv et al. (2019) technology influences inflation by creating increased productivity through labor substitution, for example, automation which can cause a deflationary effect. Charbonneau et al. (2017) describe three main channels: (i) the direct channel, where the prices of ICT-related goods and services decrease as a result of technological change (ii) by changing market structures and competition for differentiated goods and services, including through the possibility of higher entry barriers low levels, the emergence of superstar companies and the emergence of e-commerce and thus easier price comparisons and (iii) through increased productivity, thereby lowering operational costs. To some extent, this channel can be captured in standard macroeconomic inflation models.

In the Rogoff (1985) model, it explains the reasons why open economies tend to have

low inflation rates. This states that an economy when open to trade will have an optimal monetary policy to overcome the problem of dynamic inconsistencies created by unexpected monetary expansion. On the other hand, an economy that does not have a stable monetary policy can result in very high inflation. Developing economies or small open trading economies may experience trade deficits rather than trade surpluses and therefore may cause currency appreciation leading to high inflationary pressures. Therefore, a positive relationship is observed in developing countries or among countries where imports are greater than exports (Romer, 1991).

The relationship between trade openness and inflation has been inconsistent over different periods. According to Romer's (1991) hypothesis, if trade openness proves to be an important contributor capable of reducing inflation rates in the case of developing Asian countries, then greater openness in the trade sector is the trade policy that should be adopted so that the goal of having a low and stable inflation rate can be achieved. achieved through trade openness (Tee et al., 2018).

II. RESEARCH METHOD

The type of data used in this research is panel data. Panel data is a combination of time series and cross-section data. Eleven years of time series data starting from 2010 to 2021 and cross-section data for 21 developing countries on the Asian continent. Researchers use the Asian continent as an object because there are many countries with quite high inflation. Meanwhile, the period is determined based on the phenomenon of the world economic crisis in 2010 and the economic crisis caused by the disease outbreak from 2019 to 2021. The following is a list of countries used.

Table 1. Sample Country

No	Country	No	Country
1	Armenia	12	Bangladesh
2	Azerbaijan	13	Bhutan
3	Georgia	14	India
4	Iran	15	Nepal
5	Mongolia	16	Pakistan
6	Oman	17	Brunei Darussalam
7	Qatar	18	Kamboja
8	Thailand	19	Indonesia
9	Kirgiztan	20	Malaysia
10	China	21	Philipina
11	Vietnam		

Inflation in this research uses the Consumer Price Index (CPI). The consumer price index reflects changes in average consumer costs to obtain various types of goods and services that can be fixed at certain intervals such as annually. Inflation data uses annual data from 2010 to 2021 sourced from the World Bank with index units. The data is then transformed into natural logarithm units. a. Fixed broadband subscriptions, are fixed broadband subscriptions that refer to fixed subscription broadband access to the public internet. Fixed broadband customer data is divided by a population of 100 people. Fixed broadband subscription data uses annual data from 2010 to 2021 sourced from the International Telecommunication Union in units per 100 people. The data is then transformed into natural logarithm units. Fixed telephone subscriptions are fixed telephone subscriptions that refer to the number of active numbers on analog fixed telephone lines. Fixed telephone subscriber data is divided by population and multiplied by 100. Fixed telephone subscription data uses annual data from 2010 to 2021 sourced from the International Telecommunication Union in units per 100 people. The data is then transformed into natural logarithm units.

Mobile cellular subscriptions is a cellular telephone subscription that refers to public cellular telephone services that use cellular technology. Cellular telephone subscription data is divided by population and multiplied by 100. Mobile cellular subscription data uses annual data from 2010 to 2021 sourced from the International Telecommunication Union in units per 100 people. The data is then transformed into natural logarithm units. Individuals using the internet (X4), are individuals who have used the internet. Data on individuals who use the internet is divided by the total population. Individuals using the internet data use annual data from 2010 to 2021 sourced from the International Telecommunication Union in percent units.

Trade openness used in this research is trade. Trade is the amount of exports and imports of goods and services measured as a share of gross product. The data used is annual data from 2010 to 2021 sourced from the World Bank in percent units. Financial Openness in this study uses the FDI Net Inflow indicator which is the net inflow of investment. FDI Net Inflow data uses annual data from 2010 to 2021 sourced from the World Bank in percent units. Per capita income in this study uses GDP Per Capita data. GDP per capita is gross domestic product divided by population. The data used is annual data from 2010 to 2021 sourced from the World Bank in USD units. The data

is then transformed into natural logarithm units. The exchange rate in this study uses official exchange rate data. Official exchange rate refers to the exchange rate determined by national authorities or the exchange rate determined in legally approved exchange markets. The data used is annual data from 2010 to 2021 sourced from the World Bank in percent units. Unemployment in this research uses unemployment data. Unemployment refers to the portion of the workforce that is not working but is available to look for work. The data used is annual data from 2010 to 2021 sourced from the World Bank in percent units.

This research uses the Generalized Method Moment analysis technique, where GMM is a method that is more dynamic than other methods, can determine whether an instrument is strong or not, and can also avoid hetero and auto or classic assumption tests. In processing the data, the author used Stata 17 software. The data used in this research is panel data with objects from 21 countries on the Asian continent and over 12 years. It can be seen that N, namely 21 countries, is greater than T, namely 12 years, so in this study N>T.

Arellano & Bond (1991), Arellano & Bover (1995), and Blundell & Bond (1998) are general estimators that design for 1) panels "small T, large N, meaning few periods and many individuals; 2) linear functional relationship; 3) one variable on the left side that is dynamic depending on 4) independent variables that are not completely exogenous, meaning they correlate with past and possibly current realizations of errors; 5) individual fixed effects and;6) heteroscedasticity and autocorrelation within individuals but not between them. Arellano-Bond estimation begins by transforming all the regressors, usually by differencing, and using the generalized method of moments (GMM), and is called difference GMM. The Blundell-Bond estimator augments the Arellano Bond by making the additional assumption that the first differences of the instrument variables are uncorrelated with the fixed effects. This allows the introduction of more instruments and can dramatically increase efficiency. This builds a system of two original and modified equations and is known as the GMM system.

The difference and system GMM estimators were developed by (Holtz-Eakin et al., 1988). One of the weaknesses of the difference and GMM estimator systems is that they are complicated so they can easily produce invalid estimates. The difference and system GMM estimators are designed for situations with small T and more N (T<N) which means multiple periods with many

individuals. First difference (FD)-GMM is used to overcome the correlation problem between the dependent variable legs with error compensation. This aims to eliminate individual μ effects in the model, but Blundell & Bond (1998) stated that in small sample sizes, the FD-GMM estimator can contain bias and inaccuracy. Apart from that, the instrument in the form of a lagged level in the First difference equation is weak in the FD-GMM. Therefore, it is important to utilize initial conditions in producing efficient estimators from dynamic panel data models when they have short time series. Blundell & Bond (1998) suggest using a GMM system which is claimed to be more efficient than previous estimators. The FD-GMM and SYS-GMM estimation models consist of one-step and two-step models. The three-step model is a more efficient and robust standard error against heteroscedasticity and auto correlation (Roodman, 2009).

The estimation model for this research is written as follows:

$$LnIHK_{it} = \alpha + \beta_1 LnIHK_{it-1} + \beta_2 TO_{it} + \beta_3 FO_{it} + \beta_4 LnIN_{it} + \beta_5 EX_{it} + \beta_6 UNP_{it} + \varepsilon_{1it}$$

$$LnIHK_{it} = \alpha + \beta_1 LnIHK_{it-1} + \beta_2 LnICT1_{it} + \beta_3 LnICT2_{it} + \beta_4 LnICT3_{it} + \beta_5 ICT4_{it} + \beta_6 FO_{it} + \beta_7 LnIN_{it} + \beta_8 EX_{it} + \beta_9 UNP_{it} + \varepsilon_{2it}$$

Note:

α	: Konstanta
$\beta_1 \dots \beta_7$	: Koefisien Variabel Independen
$\varepsilon_1 \dots \varepsilon_4$	: Error Term
IHK	: Inflasi
TO	: *Trade Openness*
ICT1	: *Fixed Broadband Subscription*
ICT2	: *Fixed Telephone Subscription*
ICT3	: *Mobile Cellular Subscription*
ICT4	: *Individuals Using the Internet*
FO	: *Financial Openness*
IN	: *Income*
EX	: *Exchange Rate*
UNP	: *Unemployment*
Ln	: logaritma natural

III. RESULT AND DISCUSSION

This research uses one of the commonly used GMM estimates, namely system GMM. Blundell & Bond (1998) suggest using a GMM system which is claimed to be more efficient than the previous estimator, namely FD-GMM. The FD-GMM and SYS-GMM estimation models consist of one-step and two-step models. The two-step model is a more efficient and robust standard error against heteroscedasticity and autocorrelation (Roodman, 2009). Econometrically, the preferred estimate is SYS-GMM rather than FD-GMMphysical education teachers in promoting sustainable development.

Table 2 shows the SYS-GMM estimation results for the first model and the second model. In the first model, the independent variable Trade Openness has a probability number above 0.05, which means it does not influence the dependent variable. The Sargan test in this one-step model does not reject H0 because it has a probability above 0.05, thus confirming the validity of the instrument. Then there are the control variables FDI, income, exchange rate, and investment, all of these control variables have a probability below 0.05, which means that all control variables affect the dependent variable. However, the standard error AR (1) has a probability value of less than 0.05, which indicates that there is an autocorrelation problem in the modelSome teachers showed no difference in perception between men and women in the treatment at school. Although some teachers have not received socialization about the importance of gender equality in education, they have good behavioral attitudes regarding gender equality (López-Morales et al., 2023).

Table 2. System GMM Estimation Results

Variabel	*System* GMM	
	Model 1	**Model 2**
LnIHK	1.049998* (0.000)	1.158184* (0.000)
LnICT1	-	-0.0008649 (0.852)
LnICT2	-	0.033297* (0.000)
LnICT3	-	-0.1354295* (0.000)
ICT4	-	-0.0001708 (0.440)
TO	-0.0008666*** (0.086)	-
FO	0.0112948** (0,015)	0.0022234* (0,000)
Lag.FO	0.0085722** (0.033)	-
LnIN	-0.0213604*** (0.086)	-0.0153533* (0.001)
EX	-0.0013791 (0.200)	-0.0014536** (0.047)
UNP	-0.0010617 (0.595)	-0.0021836* (0.003)
AR (1)	0.313	0.047
AR (2)	0.186	0.883
Sargan Test	0.961	0.425
Hansen test	0.108	0.251

Note: *, **, and *** respectively indicate a significant level of 1%, 5%, 10%

Based on Table 2, model 2 explains that there is an influence of the independent variable ICT on the dependent variable Inflation. Almost all independent and control variables have a probability number below 0.05, meaning that there is an influence on the dependent. Only ICT indicator 1 has a probability number above 0.05, which means it does not influence the dependent variable. An economy when open to trade will have an optimal monetary policy to overcome the problem of dynamic inconsistencies created by unexpected monetary expansion. On the other hand, an economy that does not have a stable monetary policy can result in very high inflation. Developing economies or small open trading economies may experience trade deficits rather than trade surpluses and therefore may cause currency appreciation leading to high inflationary pressures. Therefore, a positive relationship is observed in developing countries or among countries where imports are greater than exports (Romer, 1991).

Romer (1991) states that trade openness can be a factor that has a significant influence on the level of inflation. Romer (1993) believes that trade openness functions to control inflation fluctuations so that policymakers feel it has a beneficial impact because it can limit the incentives given to economic actors. Rogoff (1995) also shows that as a country's trade openness becomes more open, the country tends to experience less inflation.

SYS-GMM model 1 estimation results from Trade Openness. Know that the results show that the dependent variable has a negative and insignificant effect on inflation. The estimation results shown by Trade openness can decrease but are not significant. There are control variables such as financial openness which have a positive and significant influence on inflation, then income has an insignificant negative influence on inflation. Exchange rate and unemployment

have a significant negative influence on inflation.

Trade openness has a negative and insignificant effect on inflation. The coefficient value is -0.0008666, meaning that a one percent increase in trade openness can reduce inflation by 0.086 percent. Financial Openness has a positive and significant effect, having 2 coefficient values without lag, 0.0112948 and lag 0.0085722, meaning that a one percent increase in FO can increase inflation by 1 or 0.8 percent. Income has a coefficient value of -0.0213604, meaning that a 1 percent increase in income can reduce inflation by 2.1 percent. There are Exchange Rate and Uneployment which both have a negative and significant influence, having coefficient values of -0.0013791 and -0.0010617. This means that a one percent increase in EX and UNY can reduce inflation by 0.1 percent.

The estimation results above are evidence that trade openness does not have a significant influence on inflation after the global financial crisis. These results are supported by Karina et al. (2021) who say that trade openness does not have a significant influence on inflation in Nigeria. These results also differ from the hypothesis of Romer (1991) and several previous studies such as Sahu & Sharma (2018), Mukhtar et al. (2019), and Tee et al. (2018) which state that trade openness can be a factor that has a significant influence on high and low inflation.

Understanding trade openness is considered important for openness and the country's introduction to the global economy. The results presented show that trade openness does not affect inflation. Adopting effective and well-integrated fiscal, monetary, and trade policies in each country can stabilize prices and maintain them without sacrificing economic and trade liberalization.

Digitalization can influence price levels gradually and destabilize prices and thus influence inflation through different channels (Csonto et al., 2019). Charbonneau et al. (2017) describe three main channels: (i) the direct channel, where the prices of ICT-related goods and services decrease as a result of technological change (ii) by changing market structures and competition for differentiated goods and services, including through the possibility of higher entry barriers low levels, the emergence of superstar companies and the emergence of e-commerce and thus easier price comparisons and (iii) through increased productivity, thereby lowering operational costs.

Technology can reduce prices or inflation through two channels, namely ICT with goods or services and new digital platforms and services. The relationship between ICT

and goods or services influences an increase in productivity and a shift in consumption from goods that were not yet technologically advanced to those with advanced technology. This will reduce demand for old goods so that prices can be reduced and inflation controlled. New digital platforms and services can influence increased productivity, changes in consumption behavior, market structure, and competition. All three have an impact that can reduce prices or control inflation. estimation results from ICT.

It is known that the SYS-GMM results from the four ICT indicators of fixed broadband subscriptions, fixed telephone subscriptions, mobile cellular subscriptions, and individuals using the internet have different influences on inflation. ICT 1 (fixed broadband subscriptions) has an insignificant negative effect on inflation. ICT2 (fixed telephone subscriptions) has a significant positive influence on inflation. ICT 3 and 4 (mobile cellular subscriptions and individuals using the internet) have an insignificant negative and significant negative effect on inflation. There are control variables, all of which have a negative and significant effect on inflation, except for Financial Openness which is significantly positive.

The results of this estimation provide empirical evidence for the four different ICT indicators. The results of the analysis of fixed broadband subscriptions do not have a significant effect on the level of inflation, this is supported by research by Maharani et al. (2014) which shows that there is an inverse relationship between fixed broadband subscriptions and inflation which do not influence each other. The results of the analysis of fixed telephone subscriptions can increase inflation significantly. This research is inversely proportional to Lv et al. (2019) which states that fixed telephone subscriptions can reduce inflation.

The results of the analysis of mobile cellular subscriptions do not have a significant effect on inflation. The results of this study differ from Qin et al. (2021) which states that mobile cellular subscriptions can have a significant influence on inflation. The results of the analysis of individuals using the Internet show that it can reduce inflation. This research is supported by Çoban (2022) and Puspaningtyas & Mukhlis (2022) who show the results between individuals using the internet and inflation show that individuals using the internet in ASEAN countries can cause a decrease in the inflation rate.

Digital technology users are increasing rapidly in the world and the rapidly developing digital economy is spreading and its influence is increasing. This makes it more important for policymakers and economic agents to understand the effects of using the digital economy, especially the four indicators of the digital economy (ICT). Bearing in mind that the use of information technology can reduce inflation significantly or insignificantly by increasing productivity. The state must prioritize information and communication technology and the sectors that accommodate this technology.

This research shows that the government makes productivity, competition, and e-commerce widespread by ensuring there are no obstacles to the use of digital technology. Consumers who avoid significant time and search costs by shopping online will thus be able to purchase products or services at lower prices and increase competition. Central banks must also follow developments related to economic digitalization because it is more effective in price stability.

IV. CONCLUSION

Based on the System GMM (SYS-GMM) estimation test, the results show that the dependent variable has a negative and insignificant effect on inflation. The estimation results show that Trade openness can reduce but not significantly, this also means that inflation is not too vulnerable to external shocks from the transmission of the trade sector. Where the trade sector has no significant influence in reducing inflation in developing Asian countries after the global financial crisis. It is known that the SYS-GMM results from the four ICT indicators of fixed broadband, fixed telephone, mobile cellular, and individuals using the internet have different influences on inflation. ICT 1 (fixed broadband subscriptions) has an insignificant negative effect on inflation. ICT2 (fixed telephone subscriptions) has a significant positive influence on inflation. ICT 3 and 4 (mobile cellular subscriptions and individuals using the internet) have an insignificant negative and significant negative effect on inflation. Of the four ICT indicators, only ICT 4 individuals using the internet can reduce inflation significantly in Asia after the global financial crisis.

It is hoped that adopting fiscal, monetary, and trade policies that are effective and well-

integrated in each country will stabilize prices and maintain them without sacrificing economic and trade liberalization. It is hoped that we can continue to make efforts to ensure that greater trade openness does not increase inflation even more. Consumers who avoid significant time and search costs by shopping online will thus be able to purchase products or services at lower prices and increase competition. Central banks must also follow developments related to economic digitalization because it is more effective in price stability. And also continue to monitor and adhere to the inflation target

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