

SYNERGY OF DIGITALIZATION OF PAYMENTS AND DEVELOPMENT OF MSMEs: A STRATEGY TO PROMOTE REGIONAL EQUALITY OF THE SUMATRA PROVINCE ECONOMY

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ABSTRACT

The aim of the research is investigating the impact of the financial inclusion index and digitalization of payments in Micro, Small and Medium Enterprises (MSMEs) on economic growth and equality. This research also carries out simulations (policies) for developing MSMEs to encourage economic growth in Sumatra Province. This research consists of four blocks of variables: 1) the impact of the real sector economy as the dependent variable block. Meanwhile, the independent blocks are 2) MSME performance block; 3) MSME capital block; and 4) digitalization and financial inclusion simulation block. The digitalization and financial inclusion simulations include e-commerce digitalization simulations, payment digitalization simulations, financial inclusion index simulations, and technology development index simulations. This research uses a quantitative approach with panel data covering 2015 to 2022 in 10 provinces on the island of Sumatra. Generalized Method of Moments (GMM) is used as an analysis method. The research results show that both the MSME performance block and the MSME capital block contribute to the acceleration of MSMEs and economic growth in Sumatra Province. This also has an impact on reducing inequality and poverty. Furthermore, the simulation results show that digitalization of e-commerce and digitalization of payments will increase economic growth, reduce poverty and inequality, but will have no impact on reducing unemployment. The financial inclusion index and Technology Development Index have an impact on accelerating MSME growth which has an impact on the real sector. With the results of the financial inclusion index and technological development index, it is increasingly massive, encouraging more inclusive growth and reducing poverty and regional economic inequality. These results can be used as material for consideration by the government in formulating policies and strategies for developing financial digitalization and MSMEs in Sumatra Province.

Keywords: e-commerce digitization; financial digitalization, MSMEs; economic equality; Sumatra.

I. INTRODUCTION

1.1 Background to the Problem

Island and surrounding areas become Power leverage The economy in Indonesia focuses on production centers for the processing of agricultural products, to the point

where it becomes a national energy source. If referring to about *Master plan Acceleration and Expansion of Indonesia's Economic Development 2011-2025*, geostrategically (Figure 1) , the Sumatra region is expected to become the "National Economic Gateway to the Markets of Europe, Africa, South Asia, East Asia and Australia." Until moment This , regional areas of the province in Sumatra are expected become The Sumatra Economic Corridor is well developed in the economic and social fields with main economic activities such as oil palm, rubber and coal plantations.

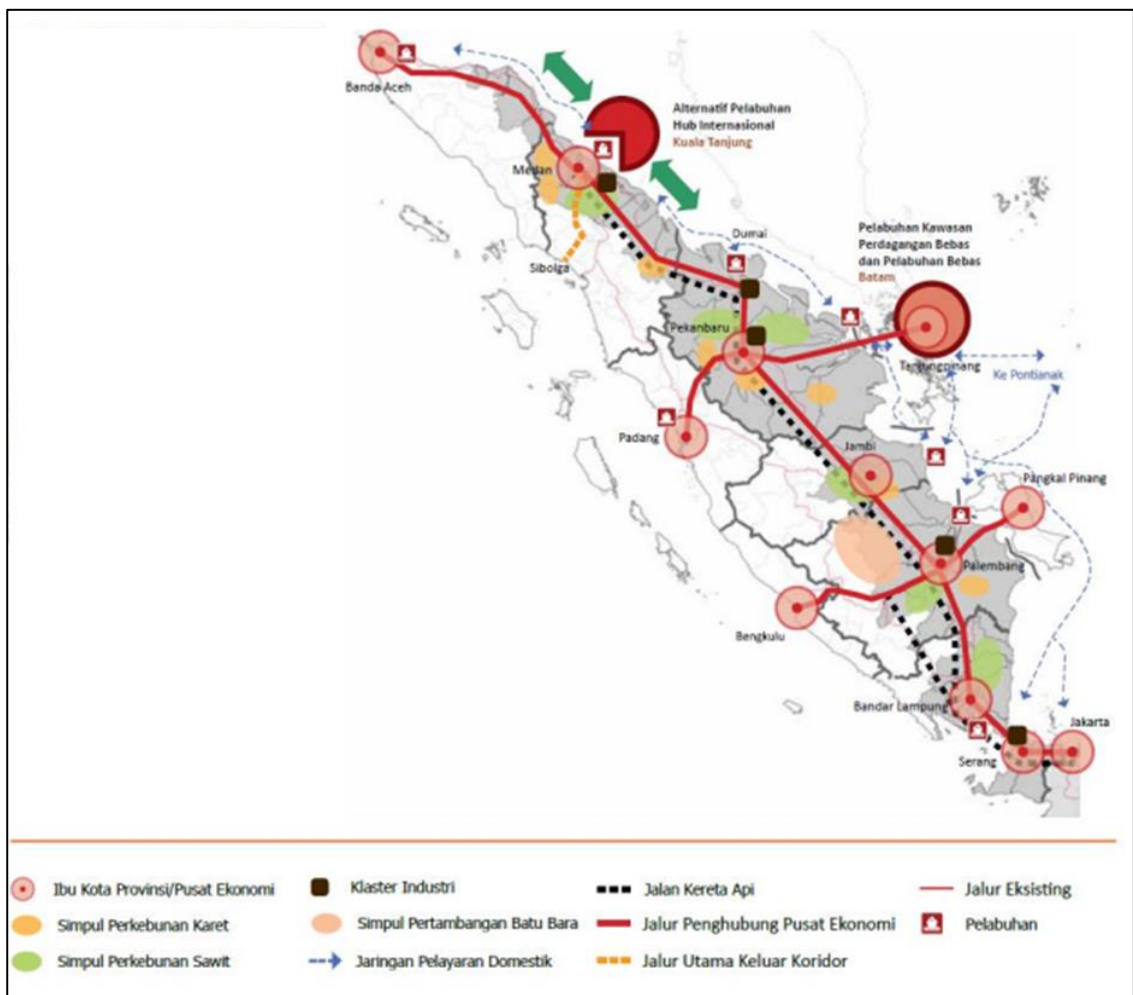


Figure 1. Regulation President (PERPRES) Number 48 of 2014

Change on Regulation President Number 32 of 2011 concerning Master Plan for the Acceleration and Expansion of Indonesian Economic Development 2011-2025

Source : <https://peraturan.bpk.go.id/Details/41537/perpres-no-48-tahun-2014>

However, regional provinces in Sumatra post-pandemic face challenge economic conditions that must be addressed include: (1) there are significant differences in income, both between urban and rural areas or between provinces; (2) growth in the main economic activities of oil and gas (20 percent share from the aggregate GRDP/ Gross Regional Income of 10 provinces in Sumatra) which tends to be the more low

with dwindling reserves; (3) prospects underinvestment _ _ grow fast ; (4) basic infrastructure to support industrial development, among others improving , and (5) inequality steady income _ tend high , though tend decrease pattern (Figure 2).

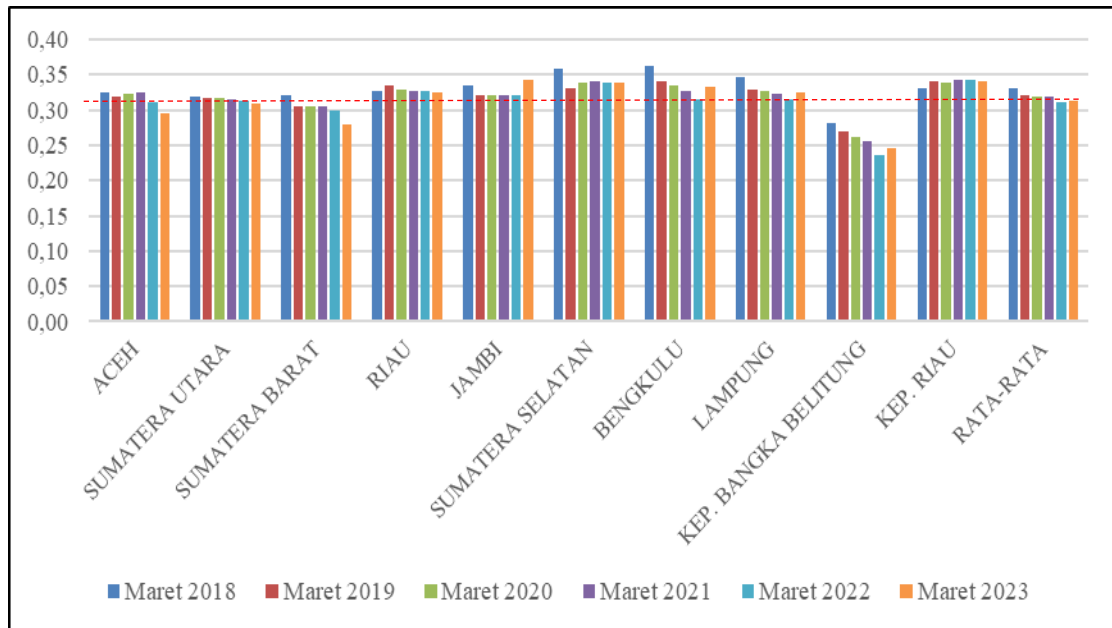


Figure 3. Development Inequality (Gini Index) in Regional Provinces in Sumatra (March 2018-March 2023) in Unit Gini Index

Source : BPS, Processed Data (2023)

Considering regional provinces in Sumatra general development oriented _ industry capital intensive (Mubarok *et al.*, 2022), then Other challenges also arise . That thing is How such conditions _ should can balanced with development business congested works , so that you can push inequality (realization equality income). One _ *chanel* the alternative is push role Business Micro , Small and Medium Enterprises (MSMEs) in Sumatra, so that later progressing in absorb field Work congested works . Although of course unfortunate , because its development tend decrease Good business small , and business micro (except South Sumatra continues to rise), especially Because impact pandemic covid19

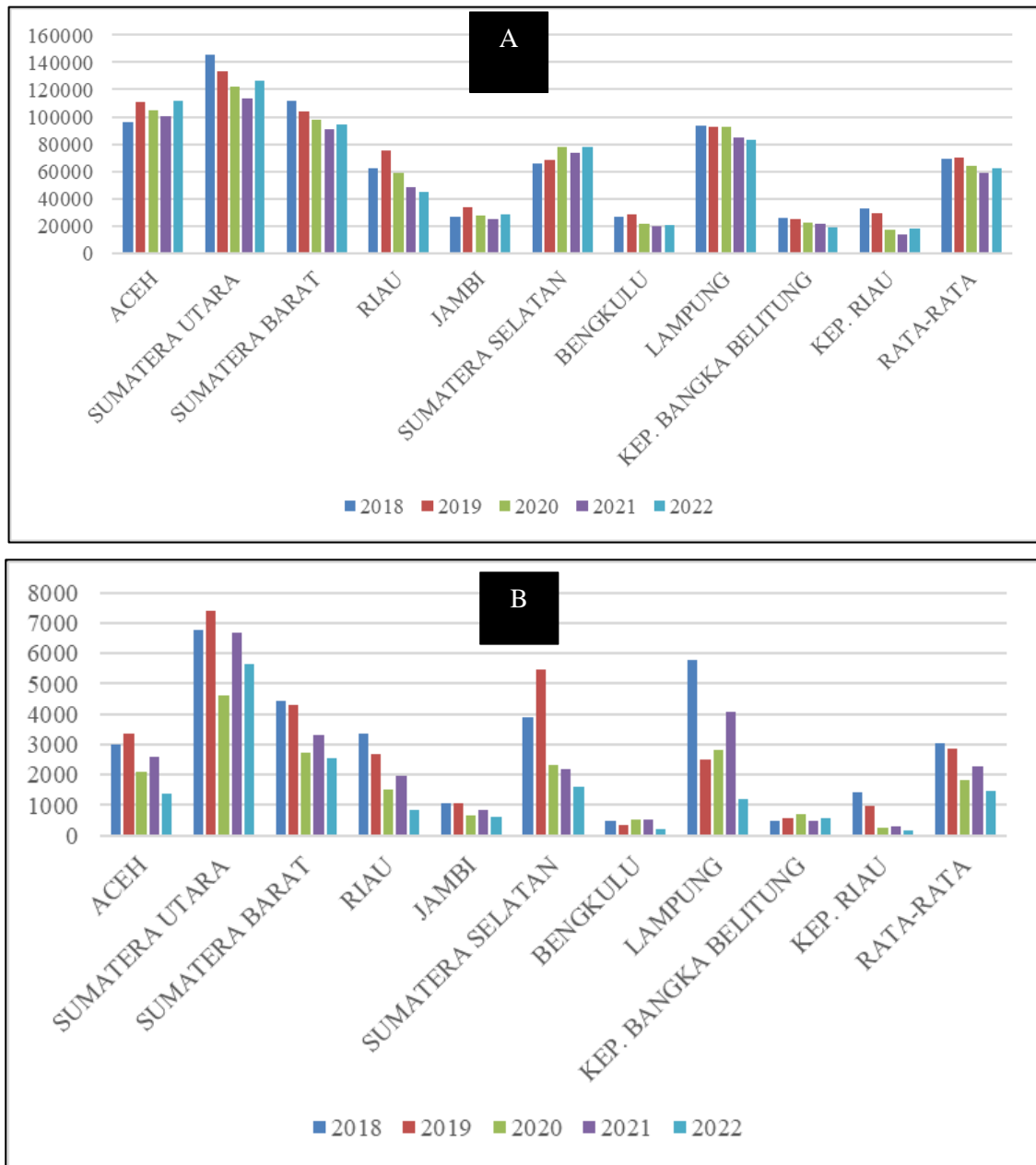


Figure 4. (A) Development Number of Micro Enterprises ; (B) Development Number of Provincial Regional Small Businesses in Sumatra (2018-2022) in Units Units

Source : BPS, Processed Data (2023)

If condition source absorption power the easiest job done through scheme major in the sector micro and small the amount tend decline , other challenges will appear that is inconsistency acceleration decline unemployed (many province still above average (Figure 5.)), especially in the Riau Islands , Riau , West Sumatra, North Sumatra and Aceh regions.

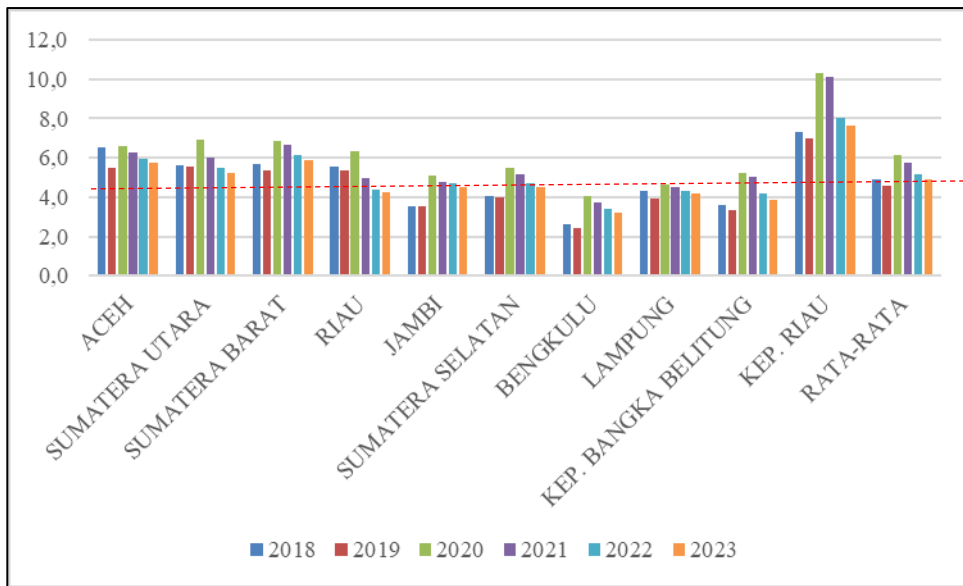


Figure 5. Development of Open Unemployment Rates in Regional Provinces in Sumatra (2018-2022) in Unit Percent

Source : BPS, Processed Data (2023)

It's fast development today 's digital economy This become opportunity in increase the role of MSMEs especially in development effort (Jadhav *et al.*, 2023). There should be digital transformation encourage MSMEs to increase efficiency . This means that MSMEs have it's time move sell in a way *on line*, along appearance development transactions and recording finance through use digital payment *platforms* , various convenience market access and training development business , the existence of a logistics system For *delivery* nor distribution product to increasing number of *customers* cheap and diverse , and the market share is moving very dynamically along increasing internet use , especially in the Sumatra region.

Just deep period 1 decade _ Lastly , the percentage of households accessing provincial regional internet in Sumatra (2012-2022) increase sharp . Initially that was aggregate users at home level ladder still below 50 percent , now _ capable exceed up to above 85 percent . Condition the is a market that can reachable If digitalization of MSMEs can developed with fast (Figure 6).

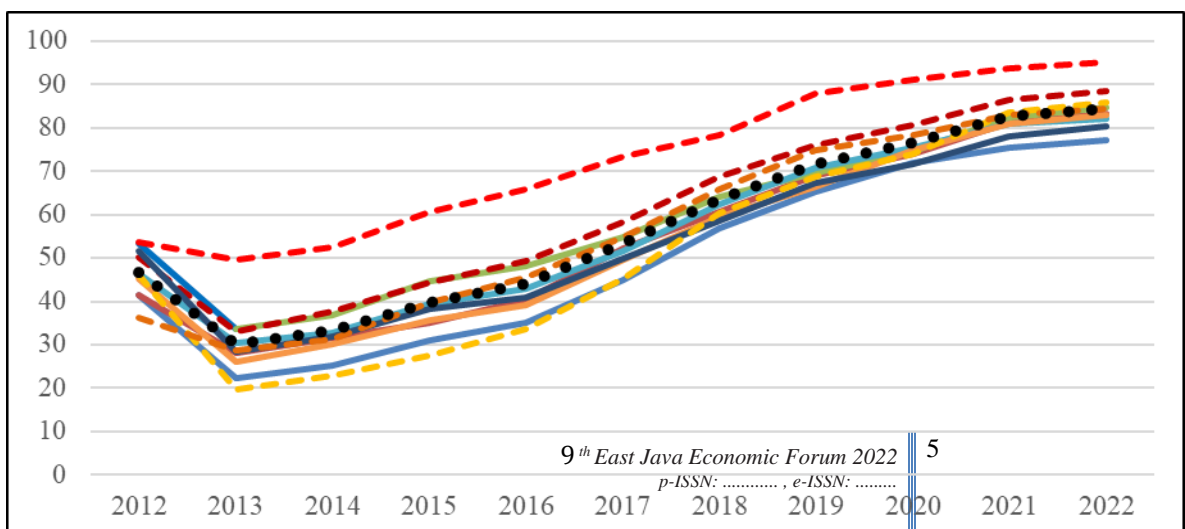


Figure 6. Percentage of Households Accessing the Provincial Regional Internet in Sumatra
(2012-2022) in Unit Percent

Source : BPS, Processed Data (2023)

Apart from development internet usage , time This development Infrastructure for Payment Instruments Using Cards (APMK) and Electronic Money (EU) also continues to increase. Apart from because factor Pandemic Covid19 , p that's also because the convenience offered in it . Condition This will Good For develop MSMEs because speed of money received (liquidity payment results effort) more easy accessible and very flexible . Although challenge equalization of the APMK and the EU Alone Still develop No evenly distributed in Sumatra. It is the base regions such as North Sumatra and West Sumatra that have the APMK and UE the more growing . Temporary For other provinces tend to Not yet Lots progressiveness and intensity its use . Apart from because factor amount population , possibly acceleration acceleration business in areas other than 2 provinces the not optimal yet facet utilization of APK and UEnya .

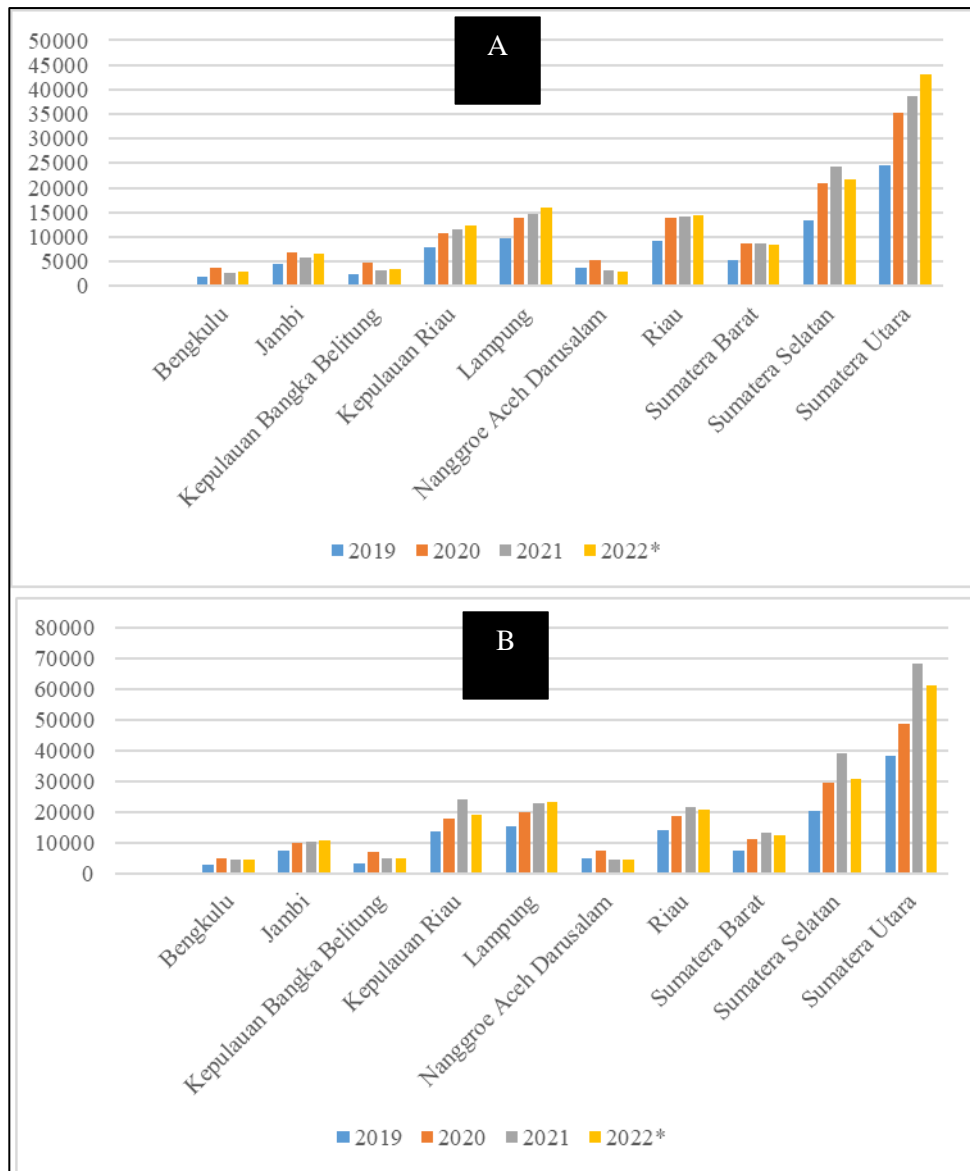


Figure 7. (A) Total Payment Instrument Infrastructure Use Card (APMK) and (B) Regional Electronic Money (EU) in Units Units

Source : Indonesian Tires, Processed Data (2023)

Furthermore , in the midst of various challenges classic aspects of MSME development, such as limited access to financing (Prelipcean & Boscoianu 2014; Benthami , 2019) , lack of acceleration inadequate infrastructure (Zhang *et al.* , 2023; Cao *at al.*, 2011) , and internally there are limited workforce skills (Fuentes *et al.*, 2013; Saini & Budhwar , 2008) . Enthusiasm and optimism must always appear Because Sumatra has great opportunities in developing superior natural resource sectors and local creative products .

This study in general _ aim For analyze influence digitalization and context inclusion finance to factor fundamental economics in Sumatra such as equality income , poverty , inequality , and growth inclusive economy . _ Its development and

novelty is analyze simulation or policy in development of useful MSMEs push development economy through track intervention development digitalization finance in Sumatra.

Study This own four block variable namely (1) block impact economy real sector as block dependent variable ; (2) block MSME performance ; (3) block MSME capital ; and (4) block simulation development through digitalization and inclusion finance . Simulation development consists from start development digitalization *e-commerce* , digitalization payment , encourage inclusion finance , and development technology .

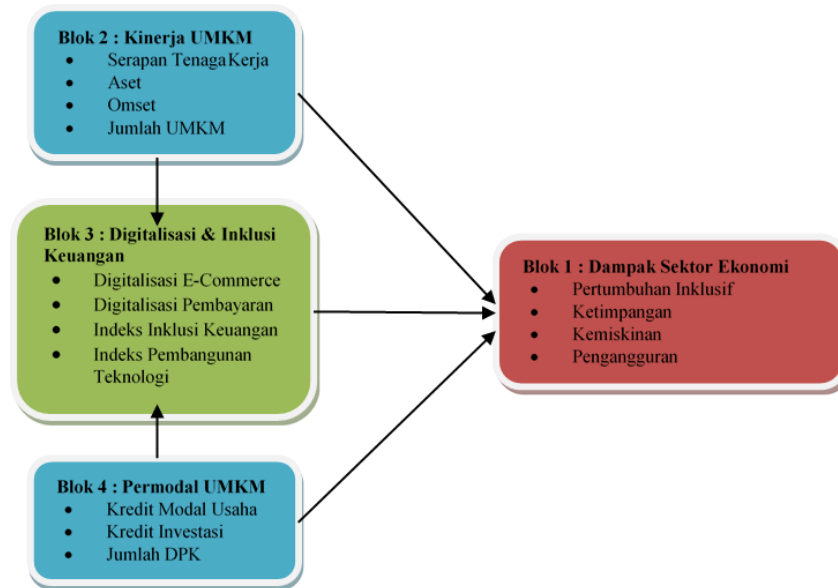


Figure 8. Research Objective Framework

Source : Processed Data (2023)

Previous study show policy related development of many MSMEs proxy with a number of matter such as (1) Digitalization of MSMEs (Gavrila & de Lucas Ancillo , 2021 ; Dutta, *et al.*, 2021); (2) strengthening MSME infrastructure (Fernández & Camacho, 2016; Isichei *et al.*, 2020); Strengthening Human Resources (HR) of MSMEs (Fuerte *et al.*, 2013; Saini & Budhwar , 2008) Inclusion Finance (Rasheed, *et al.*, 2019); Technology Development up to date (Raymond & St-Pierre, 2005). Though Thus , other studies show that aspect strength or performance of MSMEs and investment in it without intervention policy can influential in a way direct to the real sector , for example like growth . The more Lots available access to capital provided by the government and the sector banking through possible policies _ MSME capital , will push growth positive economy (Arianto , 2020 ; Astutik *et al.*, 2020). Gherghina *et al.* (2020), also found that MSME performance will increase activity sell buy , which in turn

will push growth economy in a way overall . Whereas Nursini (2020); Wulan *et al.*, (2021) found another path that finance banking give capital capabilities at the beginning , then spur society and actors business develop quality services and products (*supply leading hypothesis*), in the end will push upgrade sales and *aggregate output* (growth basis economy). During the pandemic, MSMEs became passenger growth economy . Brodny and Tutak (2022) convey that digitalization of MSMEs or business micro impact multiplied to sales in season pandemic , of course matter This push growth regional economy .

1.2. Research question

1. How influence digitalization in MSMEs towards economy in Sumatra?
2. How synergy digitalization payment and development Umkm as a push strategy equality regional economy of Sumatra province ?

1.3 Research purposes

1. This study in general _ aim For analyze influence digitalization in MSMEs towards economy in Sumatra
2. This study aim For analyze synergy digitalization payment and development Umkm as a push strategy equality regional economy of Sumatra province .

1.4 Benefits of research

- Theoretical Benefits
The hope capable give contribution thoughts and references for study related furthermore
- Theoretical Benefits
The hope capable give contribution recommendation useful policies _ for taker policy and related stakeholders .

II. LITERATURE REVIEW

2.1. MSME theory

Micro , Small and Medium Enterprises (MSMEs) have Different definitions for each _ literature according to a number of agency or institution even law . In accordance with Constitution number 20 of 2008 concerning Micro , Small and Medium Enterprises , MSMEs are defined as following :

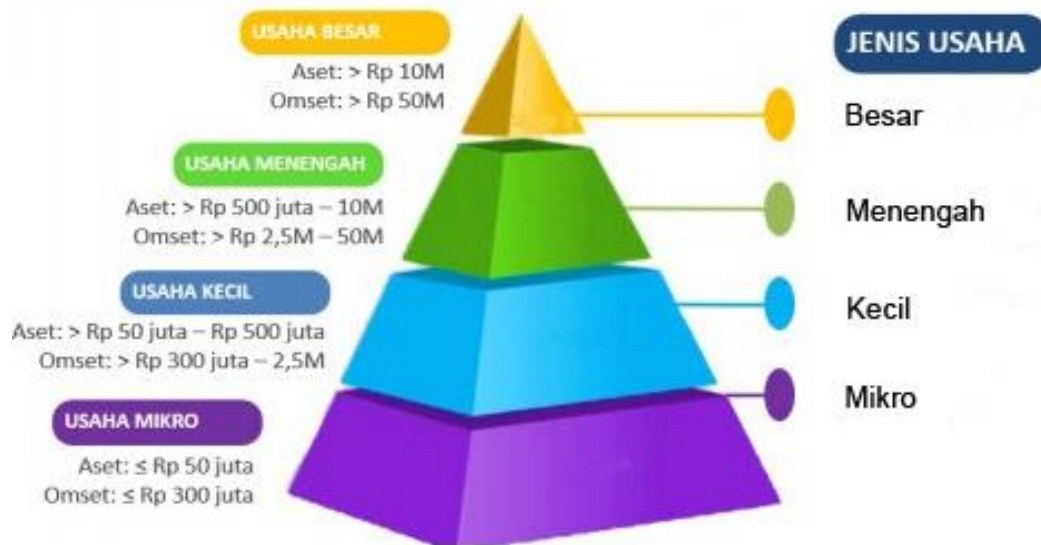


Figure 9. Classification of MSMEs based on type of business, assets and turnover

Source : Processed Data (2023)

1. Micro businesses is business productive owned by individuals and / or business entities individuals who fulfill it Micro Business criteria as arranged in Constitution this .
2. Small Business is business economy productive standing _ themselves , carried out by individuals or a business entity that is not is child company or No branch companies owned , controlled , or _ become part Good direct nor No direct from Medium Enterprises or Large Business that meets Small Business criteria as follows intended in Constitution this .
3. Medium Enterprises is business economy productive standing _ themselves , carried out by individuals or a business entity that is not is child company or branch companies owned , controlled , or _ become part Good direct nor No direct with Small Business or Large Business with amount riches clean or results sale annual as arranged in Constitution this .

Based on wealth and results sales , according to Constitution Number 20 of 2008 article 6, criteria business micro namely :

1. Own riches net maximum IDR 50,000,000.00 (fifty million rupiah) no including land and buildings place business ; or
2. Own results sale annual maximum IDR 300,000,000.00 (three hundred million rupiah). Criteria business small is as following :

1. Own riches clean more from IDR 50,000,000.00 (fifty million rupiah) up to with a maximum of IDR 500,000,000.00 (five hundred million rupiah) not including land and buildings place business ; or
2. Own results sale annual more from IDR 300,000,000.00 (three hundred million rupiah) up to with a maximum of IDR 2,500,000,000.00 (two billion five hundred million rupiah).

Whereas criteria business intermediate is as following :

1. Own riches clean more from IDR 500,000,000.00 (five hundred million rupiah) up to with a maximum of IDR 10,000,000,000.00 (ten billion rupiah) no including land and buildings place business ; or
2. Own results sale annual more from IDR 2,500,000,000.00 (two billion five hundred million rupiah) to with a maximum of IDR 50,000,000,000.00 (fifty billion rupiah) .

2.2. The Impact of MSMEs on Sustainable Development

In the study by Shelly *et al.* (2020), author mention that draft development sustainable covers broad aspects _ Because covers problem economic , social and environmental with notice aspect environment . This is purposeful For create society in which nature and the individual life in harmony One each other and not sacrifice damage environment (Verma & Nema , 2019). According to Grossman, GM, and Helpman (1991), development sustainable means reach balance between development and protection environment (energy work , housing , services basic , infrastructure social , transportation , and others) .

One _ organization famous people involved For meeting the Sustainable Development Goals (SDGs) by 2030 is the United Development Programme Nations (UNDP) and through these , related SDGs in our research is goal : #1 Without Poverty , # 8 Decent work and growth economy , and #10 Reducing inequality ; SDG Goal #1 eradication poverty become focus main government and stakeholders interests (Nursini , 2020).

Alleviation poverty must deal with an effective program anything related _ with development sustainable (Quingco & Leonoras, 2020). Shelly *et al.* (2020) view the MSME sector as an important pillar in achieving the SDGs because can contribute in a way direct nor No straight away . Sustainable development must become precondition For competitive MSME sector especially in developing countries or developing countries Because produce opportunity enormous work ; _ help diversification activity economics ; and contribute to development local (Sari & Kusumwanti , 2007).

2.3. Impact of MSMEs on Poverty and Inequality

Dollar and Kraay (2002), authors defines poor people as those who are in order fifth bottom from distribution income a country. MSMEs can in a way significant influence inequality income a country, help lower inequality distribution income with create more Lots chance work and industrialization in Indian economy (Saini, & Budhwar , 2008). Researcher such as Odhiambo (2010), Ogun (2010), Pradhan (2016), Gavrilu and de Lucas (2021), Adonsou and Sylwester (2016), and Uddin (2012) emphasize that high inequality _ hinder effect positive economy in matter subtraction poverty . Furthermore , Yuspov (2012) emphasized that inequality distribution income is endogenous to the development process ; happen enhancement inequality when There is development but surpass certain threshold , inequality _ balanced , then decrease until reach level lowest possible _ achieved in economy industry . In addition , Zhang, (2023) found that level activity more entrepreneurship _ tall through company will produce inequality more income _ big Because those at the end _ on distribution income have additional capital For invested in business other .

Cheema and Sial (2012) stated that poverty depends on inequality and growth , however connection between poverty , inequality revenue , and growth no simple . By theoretical , investigating connection between MSMEs and alleviation poverty through trend growth economics and absorption power work (Nursini , 2020). Similar things were also stated in research and Ali *et al.* (2014) that important SME sector Because is most effective instrument For alleviation poverty Because they is sector emerging private sector which is company share great , creation field work , and contributors eye livelihood for poor society . Through SMEs, it happens enhancement growth productivity economics , that is role important in well-being society and alleviation poverty (Ali *et al.*, 2014), through : (1) increasing income and opportunities diverse livelihoods , (2) opportunities more work _ guaranteed , and (3) provision benefit social other for the poor, like enhancement skills , improvement trust self , improvement participation women , empowerment , and security to disappearance income , growth of MSMEs in general direct contribute to alleviation poverty (Eneh, 2017). Verma *et al.*, (2020) stated that MSMEs do not only relieve poverty but also can increase condition economic and social economy less population _ capable so that push development rural ; The more many MSMEs are developing , this become base alleviation poverty and development rural areas of a country. Therefore _ that , the state must give attention important and considerate to development of MSMEs because they give effort For reduce level poverty in a country (Salim, 2020)

2.4. Draft Inclusive Finance

As the name suggests, inclusive finance began to emerge after the concept of financial exclusion emerged. Financial exclusion is the process of making it difficult for social groups or individuals to gain access to the formal financial system (Leyshon and Thrift 1995; Allen *et al.*, 2012). Meanwhile, according to Sarma (2012) *financial inclusion* is a process that ensures easy access, availability and benefits of the formal financial system for all economic actors. According to Kunt *et al.* (2011) financial inclusion can be said to be a process of ensuring access to financial products and services that are implemented according to the needs of the entire community in general, and economically vulnerable groups such as economically weak communities and low-income groups in particular, at affordable, fair and transparent costs. by institutional actors. Another view, Leyshon and Thrift (1995) explains that financial inclusion is the antithesis of financial exclusion. The process of financial exclusion makes poor people unable to access *benefits* from the financial sector and causes losses to society due to lack of access, collateral, credit history and networks. Therefore, it is important to develop financial sector policies that are pro -*poor* by eliminating barriers to accessing the financial system (Demirgüç-Kunt *et al.*, 2008; Chandran, 2010).

The term *financial inclusion* became a trend after the 2008 crisis, especially based on the impact of the crisis on groups *at the bottom of the pyramid* (low and irregular income, living in remote areas, "disabled" people, workers who do not have legal identity documents, and the community). periphery) and generally fall into the *unbanked category* , which is recorded in quite large numbers in developing countries. At the 2009 G20 *Pittsburgh Summit* , G20 members agreed on the need to increase financial access for *unbanked groups* , which was confirmed by the 2010 Toronto Summit, which gave rise to 9 *Principles for Innovative Financial Inclusion* as guidelines for the development of inclusive finance. These principles are *leadership, diversity, innovation, protection, empowerment, cooperation, knowledge, proportionality, and framework* .

Various reasons cause the community to become *unbanked* , both from the supply side (service providers) and demand (community), because of *the price barrier* (expensive), *information barrier* (not knowing), *product design barrier* (suitable products) and *channel barrier* (facilities that appropriate) (Sahoo *et al.*, 2017). Inclusive finance is able to answer these reasons by providing many benefits that can be enjoyed by society, regulators, government and the private sector, including the

following: (1) increasing economic efficiency; (2) supporting financial system stability; (3) reducing *shadow banking or irresponsible finance* ; (4) supporting financial market deepening; (4) providing new market potential for banking; (5) supporting the increase in Indonesia's *Human Development Index* (HDI); (6) contribute positively to sustainable and sustainable local and national economic growth, and; (7) reducing inequality *and the rigidity of the low income trap* , so that it can improve community welfare which ultimately leads to a reduction in poverty levels. Since then, many international forums have focused their activities on financial inclusion, such as *the Consultative Group to Assist the Poor* (CGAP), World Bank, APEC, *Asian Development Bank* (ADB), AFI , *Financial Action Task Force* (FATF), including developing countries, and Indonesia.

Several studies have convinced economists and policy makers in developing countries about the positive impact of the inclusive financial sector on economic growth and poverty reduction. However, there is still no global and standard definition of inclusive finance that explains what inclusive finance actually is. Various studies and institutions try to define it, as follows:

Leyshon and Thrift (1995) explain that financial inclusion is the antithesis of financial exclusion. The process of financial exclusion makes poor people unable to access benefits from the financial sector and makes it disadvantageous for people to gain access to the financial system due to lack of access, collateral, credit history and networks.

" The Global Partnership for Financial Inclusion (GPFI-CGAP) Forum in 2012 defined financial inclusion as: " a state in which all working age adults have effective access to credit, savings, payments, and insurance from formal service providers. Effective access involves convenient and responsible service delivery, at a cost affordable to the customer and sustainable for the provider, with the result that financially excluded customers from using formal financial services rather than existing informal options " .

According to *The Financial Action Task Force* (FATF), *" financial inclusion involves providing access to an adequate range of safe, convenient and affordable financial services to disadvantaged and other vulnerable groups, including low income, rural and undocumented persons who have been underserved or excluded from the formal financial sector " .*

The Reserve Bank of India (RBI) defines financial inclusion as: *" the process of ensuring access to appropriate financial products and services needed by all sections of the society in general and vulnerable groups such as weaker sections and low income groups in particular, at an affordable cost in a fair and transparent manner*

by regulated, mainstream institutional players ”

Meanwhile, in the National Strategy for Inclusive Finance, this is described as a condition where "every person's right to have full access and services from financial institutions in a timely, comfortable, informative and affordable manner, with full respect for his or her dignity . " Financial services are available to all segments of society, with special attention to the underprivileged, the productive poor, migrant workers, and residents in remote, outermost, innermost and even border areas.

Several existing studies have linked at least three points of financial inclusion, namely access, community groups, and financial systems (Demirgüç-Kunt *et al.*, 2008; Sarma and Pais, 2011; Sarma, 2012; Demirgüç-Kunt and Klapper, 2012). Based on these three elements, this research defines financial inclusion as a process to ensure poor/underprivileged people's access to various financial services. Furthermore, Sarma and Pais (2011) in their research stated that financial inclusion connects people, especially poor and vulnerable groups, to the formal banking system with safe, easy and affordable access to credit and other financial services. Meanwhile, according to Laksmi and Visalaksmi (2013), financial inclusion is the process of receiving/providing financial services and products at affordable costs.

With regard to financial inclusion, several literatures try to measure the extent of financial inclusion between countries, for example Demirguc-Kent and Klapper (2012), Sarma (2012). Initially , the first fairly comprehensive analysis was the Global Financial Inclusion (*Global Index*) data base. This base has been used in 148 economies by Demirguc-Kunt and Keppler (2012). The results of this survey show that 50% of adults worldwide use formal financial services, and more than 2.5 billion adults worldwide do not have an account. formal financial services. However, partial and incomplete information from micro level analysis can lead to misinterpretations about the extent of financial inclusion from a macro perspective. Furthermore, Sarma (2012) developed a method for calculating the Financial Inclusion Index (IFI) which can be used to *compare* levels financial inclusion between countries or provinces within a country over a certain period of time. This method meets the assumptions of comparability, mathematical properties, and three dimensions (accessibility, availability, and usefulness of banking services). Low IFI is indicated by the low income of middle class people, whereas most high-income countries have high IFI. The success of financial inclusion can also be seen from how equitable the availability of access to financial services is for every community (fair) .

2.5. Index Formula Inclusion Finance

Calculation *The Financial Inclusion Index* (IFI) developed by Sarma (2012) uses calculation based on three dimensions, ie penetration banking, availability service banking, and usability. The World Bank designated IFI as one method alternative for measurement finance inclusive who uses multidimensional index based on macroeconomic data, especially on range service sector banking. Financial Inclusion Index (IFI) measurement, basically is efforts made to combine various indicator sector banking, so that in the end the Financial Inclusion Index (IFI), can combine a number of information about various dimensions from a system inclusive finance, ie access, usage and availability from service banking.

Access Dimension is dimensions used to measure ability use service formal finance, so can be seen happen potency obstacle for open and use bank account. Generally like cost or affordability physique service financial (bank offices, ATMs, etc.). Indicators used in measure dimensions access includes: (1) amount bank offices per 100,000 residents adult; (2) number of ATMs per 10,000 residents adult; (3) amount bank offices per 1,000 km²; and (4) number of ATMs per 1,000 km².

Dimensions Use is dimensions used to measure ability use actual products and services finance, among other things related regularity, frequency and duration of use. Indicators used in measure dimensions access includes: (1) amount Party Fund account The third (DPK) which consists of from deposits, current accounts and savings per 1,000 population adult; and (2) amount account credits per 1,000 residents adult. Whereas Dimensions Availability is dimensions used to know is availability attribute products and services finance has fulfil need customer.

Measurement to dimensions This Still hard for done and when This a number of institution international concern within development finance inclusive currently compile indicator from dimensions quality along with the tools used. By general *The Alliance for Financial Inclusion* (AFI) has agreed the principles used in compile indicator from dimensions quality, includes concise (*conciseness*), specific (*specificity*), simple (*simplicity*), existence repair (*improvement*), and *client perspective*. Temporary in literature others, as in Sarma (2012), Gupta *et. al.* (2014), Sanjaya and Nursechafia (2016), uses indicator or dimensions measurement on method calculation of the Financial Inclusion Index (IFI) in the form of accessibility (*penetration*), availability (*availability*) and use service banking (

usage of banking services). Dimensions penetration represented by a number deposit account per 1,000 number of adults , dimensions availability represented by the number of bank outlets per 1000 amounts residents and/ or number of ATMs per 1000 amounts population , and dimensions use represented by the volume ratio of two basic services of the banking system namely credit and deposits from amount resident mature to mark *Gross Domestic Product* (GDP). low IFI showed with low income public class intermediate , whereas most low-income countries tall has a high IFI .

Measurement index inclusion finance done with moreover formerly determine index For dimensions in inclusion finance with equality as following :

$$d_t = w_i \frac{A_i - m_i}{M_i - m_i} ; i = 1,2,3 \dots \tag{1}$$

di = dimensions ith (d1= accessibility , d2 = availability , d3 = usage)

wi = given weight _ to dimensions i

Ai = value actual dimensions i

Mi = value maximum dimensions i

mi = minimum value of dimension i

Furthermore for each variable the in a way definition can explained in the table following :

Table 1. Definition Dimensions Index Inclusion Finance

Dimensions	Variable
d1 Accessibility	Ratio amount of party funds third with amount public poor adults
d2 Availability	Amount bank offices per 100,000 people mature
d3 Usage	Ratio amount deposits and credit banking to GRDP.

Source : Modified from Sarma and Pais, 2008

Value in for i = 1, 2 or 3 will is on the hose between 0 and wi . The more tall the value in indicates the more success a region or country within achievement dimensions i . Achievement inclusion finance a country is indicated by point X = (d1, d2, d3). In context dimension , point O = (0,0,0) represents mark worst , temporary point W = (w 1, w 2, w3) where w1, w2, and w3 are given weight _ for each dimension will represent situation ideal and high achievement For all dimensions . Explanation about three composing dimensions _ index finance inclusive can depicted in the model below this .

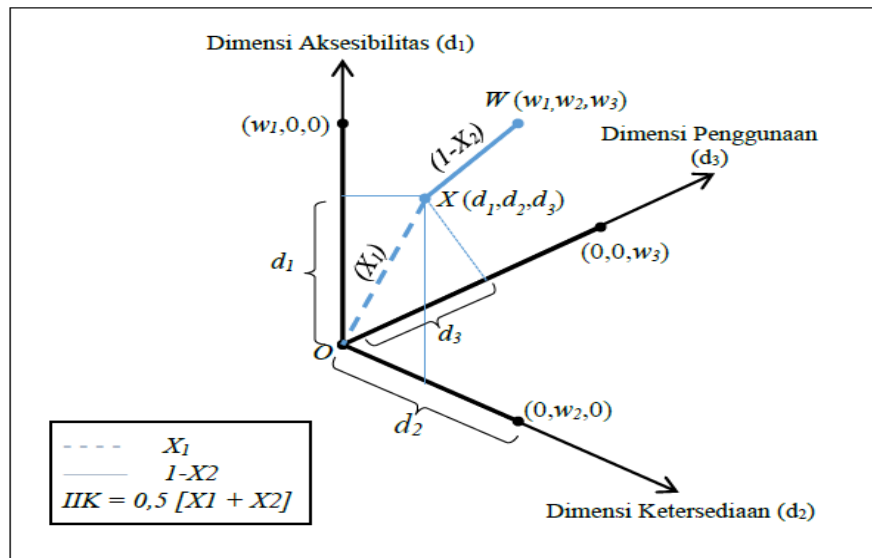


Figure 10 . Illustration Calculation Index Inclusion Finance
Source : Sarma and Pais, 2008 (with adjustment)
Note : IIK = Index Inclusion Finance

Calculation index inclusion finance calculated based on distance between point worst and achievements dimensions (OX or X1) as well as distance between point ideal achievement and achievement dimensions (WX or X2). This thing done with formula :

$$x_1 = \frac{\sqrt{d_1^2 + d_2^2 + d_3^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2}} \text{ And } x_2 = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + (w_3 - d_3)^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2}} \quad (2)$$

Equation (X1) is sign distance Euclidcan (*Euclidcan distance*) X from point worst O, normalized with distance point worst O and ideal point W. Normalization This done For get existing X1 value between 0 and 1. Increasingly tall X1 value shows the more tall inclusion finance . Equation (X2) is distance Euclidcan inverted X of ideal point W. In case This distance Euclidcan showed from the formula next to it right sign negative (-) , then normalized with give number 1 in front sign negative . Normalization to distance point worst and point ideal achievement is also carried out For make the value of X2 is located between 0 and 1 and reversal done in order to get interpretation Where the more tall value of X2 then the more tall level achievements inclusion finance . Adopt from research conducted by many _ researcher previously , in research This assumed that all dimensions used _ in formation index inclusion finance The same importance , then from That $w_i = 1$ for all mark i . In case This then $W = (1,1,1)$ so equality index inclusion finance (IIK) becomes :

$$IIK = -\frac{1}{2} \left[\frac{\sqrt{d_1^2 + d_2^2 + d_3^2}}{\sqrt{3}} + 1 - \left(\frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + (1-d_3)^2}}{\sqrt{3}} \right) \right] \quad (3)$$

IIK equation is obtained with method average the values X1 and X2 show position

between point worst and most ideal points . The following image This illustrates 10 provinces index finance inclusive provinces in Sumatra from 2015 to 2022 .

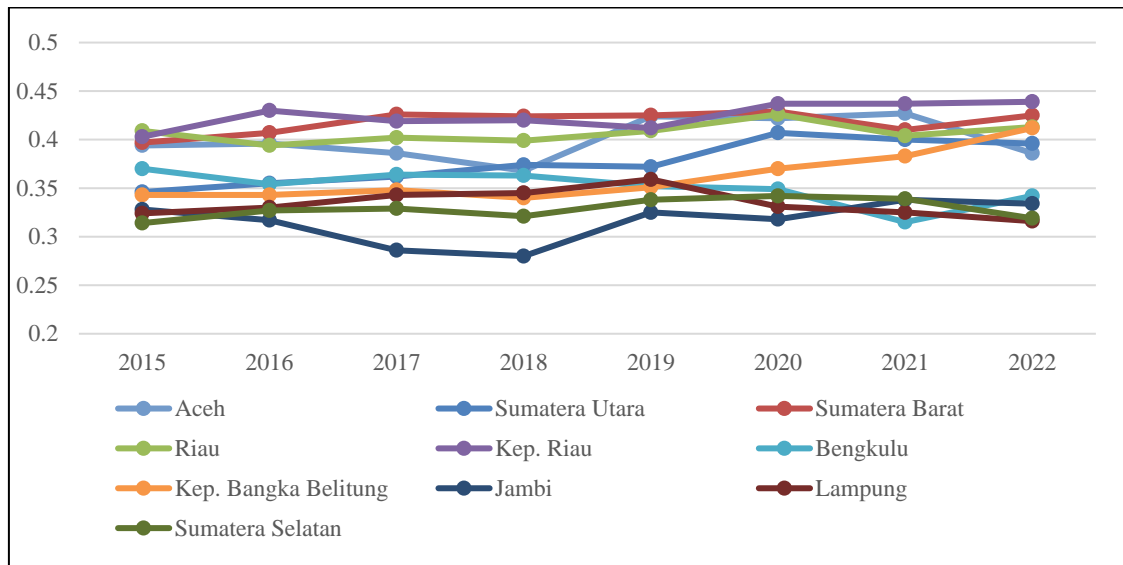


Figure 11. Counter results Index Inclusion Finance

Source ; Data Processed (2023)

Based on results index inclusion finance (IIK) . on obtained 4 provinces top with largest IIK value namely 1) Riau Islands ; 2) West Sumatra; 3) Riau and 4) Bangka Belitung Islands . Whereas province with index inclusive finance smallest ie Province 1) Lampung; 2) South Sumatra; and 3) Jambi. Index inclusive finance show ability province in provide capital and finance To use support sector real in matter This is MSME economy .

III. RESEARCH METHODS

3.1 Data Types and Data Sources (Definition Operational Variable)

This paper uses a quantitative analysis approach, panel data with secondary data sources. Panel data consisting of 10 provinces in Sumatra (Aceh Province , North Sumatra Province, West Sumatra Province, Riau Province , Riau Islands , Jambi Province , Bengkulu Province , South Sumatra Province , Bangka Belitung Province , and Lampung). Secondary data collected start 2015 - 2022 which has been collected from several credible sources (BPS, BI Regional Secretary, and the relevant Provincial Cooperatives and Small Business Services) . So that the total panel data sample is obtained in study This namely $n = i \times t = 10 \times 8 = 80$ samples .

Table 2. Variables and Data Sources

Block	Variable	Indicator /Proxy	Symbol	Source
Block 1: Impact of Economic Sectors	Economic Growth	GRDP	GRDP	Regional BPS, BI Regional Secretary , DisKup
	Inequality	Gini Index	Gini	Regional BPS, BI Regional Secretary , DisKup

Block	Variable	Indicator /Proxy	Symbol	Source
	Unemployment	Unemployment Rate (TPT)	Unep	Regional BPS, BI Regional Secretary , DisKup
	Poverty	Percentage Poor Population (P0) (Percent)	POV	Regional BPS, BI Regional Secretary , DisKup
Block 2: MSME performance	Labor Absorption	Amount power Work in the MSME sector	LnTK	Regional BPS, BI Regional Secretary , DisKup
	Asset	Total MSME Assets (million)	LnAsset	Regional BPS, BI Regional Secretary , DisKup
	Turnover	Amount MSME turnover (million)	LnTurnover	Regional BPS, BI Regional Secretary , DisKup
	Number of MSMEs	Number of registered MSMEs (thousand)	LnFri	Regional BPS, BI Regional Secretary , DisKup
Block 4: MSME capital	Total TPF	Number of Third Party Funds per Province (million)	LnDPK	Regional BPS, BI Regional Secretary , DisKup
	Business Capital Credit	Total amount of sector capital credit UMKM (million)	LnCapital	Regional BPS, BI Regional Secretary , DisKup
	Business Investment Credit	Total amount of credits investment sector UMKM (million)	LnInvestment	Regional BPS, BI Regional Secretary , DisKup
Block 3: Digitalization and Inclusion Finance	E- Commerce Digitalization	Digitization of MSMEs goes online with dummy variables 1= technology / internet 0= non-technology / internet	Sim1DigEcom	Regional BPS, BI Regional Secretary , DisKup
	Digital Payments	Amount QRIS Digital Payment transactions , Linkaja	Sim2DigPay	Regional BPS, BI Regional Secretary , DisKup
	Inclusive_Index	Index Inclusion Finance	Sim3In_Fin	BI Regional Secretary
	Technology_Index	Technology Development Index	Sim4In_Tech	Regional BPS, DisKup

3.2 Data Analysis Techniques

Analytical tools used in paper This is a dynamic panel model *Generalized Method of Moment* (GMM), which can represented in at least four equation . Equality First from four models, taken by researchers , are growth economy .

$$\begin{aligned}
 PDRB_{it} = & \alpha_0 + \alpha_1 LnTK_{it} + \alpha_2 LnAset_{it} + \alpha_3 LnOmset_{it} + \alpha_4 LnJumlah_{it} + \\
 & \alpha_5 LnDPK_{it} + \alpha_6 LnModal_{it} + \alpha_7 LnInvestasi_{it} + \alpha_8 DigComsim1_{it} + \\
 & \alpha_9 DigPaysim2_{it} + \alpha_{10} Ind_Finsim3_{it} + \alpha_{11} Ind_Tehsim4_{it} + \\
 & \varepsilon_i \quad (3)
 \end{aligned}$$

Where: i is amount There are 10 provinces in Sumatra . While t is period research in 2015-2022 . v_t is panel level effect and ε_{it} is white noise disturbance term ; where $E(\varepsilon_{it}) = 0, (i = 1,2), E(\varepsilon_{1t}, \varepsilon_{2t}) = 0$.

Next , GMM or known with dynamic panels can serve estimation dynamic about How

factor key MSME performance , MSME capital , and digitalization inclusion finance impact on growth and equality economy . Inspection causality dynamic , direction influence , and period give information addition about connection variable . The GMM method originates from the ideas of Holtz-Eakin *et al.* (1988), which is later researcher modification . For each Arellano-Bond estimation model , we use variable with significance statistics , as pointed out by the author in the GMM panel model equation (6). Equality following can be used to explain the research model this :

$$Y_{it} = C + \sum_{s=1}^m A_s Y_{i,t-s} + \eta_i + d_{ct} + e_t \tag{4}$$

Y_{it} consists from four vector models , namely :

- Model 1 :** (GRDP against LnTenaga_Kerja , LnAsset , LnOmset , LnAmount , LnDPK , LnCapital , LnInvestasi , Sim1DigEcom; Sim2DigPay; Sim3Ind_Fin; Sim4Ind_Teh)
- Model 2:** (Gini against LnTenaga_Kerja , LnAsset , LnOmset , LnAmount , LnDPK , LnCapital , LnInvestasi , Sim1DigEcom; Sim2DigPay; Sim3Ind_Fin; Sim4Ind_Teh);
- Model 3 :** (Unep to LnTenaga_Kerja , LnAsset , LnOmset , LnAmount , LnDPK , LnCapital , LnInvestasi , Sim1DigEcom; Sim2DigPay; Sim3Ind_Fin; Sim4Ind_Teh); And
- Model 4:** (Pov against LnTenaga_Kerja , LnAsset , LnOmset , LnAmount , LnDPK , LnCapital , LnInvestasi , Sim1DigEcom; Sim2DigPay; Sim3Ind_Fin; Sim4Ind_Teh)

IV. RESULTS, ANALYSIS, AND DISCUSSION

4.1 GMM Results

In subchapter This will be discussed about results connection influence between block variable , block MSME performance , block MSME capital as well block digitalization and inclusion finance to block impact sector economy . Test results statistics can be seen in the table following this .

Table 3. GMM Method Analysis Results

Variable	Model 1	Model 2	Model 3	Model 4
	Economic Growth	Inequality	Unemployment	Poverty
<i>Coefficient (Probability)</i>				
MSME Workers	0.234539 (0.5317)	0.018345 (0.0066)* **	-0.083873 (0.000 0)* **	-0.450249 (0.0000)* **
MSME Assets	1.657625 (0.0 147)* **	0.051230 (0.0029)* **	0.203602 (0.1901)	-0.678347 (0.0023)* **
MSME turnover	0.445664 (0.0015)* **	0.248906 (0.0055)* **	-0.209802 (0.5676)	-0.090732 (0.0912)*

Number of MSMEs	0.756434 (0.0000)* **	-0.238938 (0.0017)* **	-0.109744 (0.0088)* **	0.209223 (0.9827)
Total TPF	-1.234503 (0.0093) * **	-0.010203 (0.0008)* **	-3.205008 (0.0000)* **	0.309407 (0.0904) *
MSME Capital Credit	1.584352 (0.0547)*	-0.123499 (0.0001)* **	2.090438 (0.4235)	-0.123894 (0.0003)* **
MSME Investment Credit	-0.098003 (0.0535)*	-0.079842 (0.0003) * **	1.407641 (0.3662)	-0.320093 (0.0005)* **
Sim 1:	0.239654 (0.0207)* **	-0.211009 (0.0000)* **	0.234080 (0.4099)	- 0.110900 (0.02072) * **
Sim 2:	1.908542 (0.0747)*	-0.340854 (0.0000)* **	1.09806 (0.5117)	-0.913238 (0.0907) * _
Sim 3: Index Inclusion Finance	1.706552 (0.0769)*	-0.089094 (0.0633)*	0.09067 _ (0.5117)	-0.790908 (0.0997) * _
Sims 4: Technology Development Index	1.876032 (0.0709)*	-0.278054 (0.0033)* **	0.0570 5 _ (0.5117)	-0.739038 (0.0587) * _
Intercept	2.065296 (0.0618) *	1.097237 (0.0487) * *	1.069217 (0.0348) * *	1.008388 (0.0890) *
R²	0.568128	0.509824	0.500804	0.460076
Prob(F-statistic)	(0.0030)* **	(0.0040)* **	(0.0020)* **	(0.0015)* **

Notes : ***) significant 1% (0.01); * *) significant 5% (0.05); *) significant 10% ((0.1)

4.2 Discussion

First model results , variables growth economy as variable dependent show that block MSME performance has impact positive . In other words, improvement assets , turnover and number of MSMEs will push growth economy . as well as block profitable MSME capital enhancement economy . The more Lots available access to capital provided by the government and the sector banking through possible policies _ MSME capital , will push growth positive economy (Arianto , 2020; Astuti *et al.*, 2020). According to research by Gherghina *et al.* (2020), the performance of MSMEs will increase activity sell buy , which in turn will push growth economy in a way overall . In part digitalization and inclusiveness financial , results show that **First** , related with development digitalization of MSMEs, will push growth economy of 2.3%, and **secondly** , which is related with strengthening *digital payment* , is also projected will push growth economy by 19% . Calculation results This confirm study by Hasan *et al.* (2012), Zandi *et al.* (2013), as well Grzelczak and Pastusiak (2020). Apart from *digital payments* give comfort shop for consumers (Zandi *et al.*, 2013), conditions in developed countries like *United States* is also multifunctional Because can push use *remote card payments* are dominated transaction payment *e-commerce*. There is an increase shopping in *e-commerce* massively , will increase use *remote card payment* as well as *e-money* . In term long change financial structures accompanied by technological developments can have a positive impact (Ye *et al.* , 2021) . This finding is in line with the neoclassical growth theory by Solow (1956) and the endogenous theory by Romer. Both theories

emphasize that *output growth* can be driven by technological progress, in this case the technology used is a form of financial technology, namely non-cash payments (Mustapha, 2018) .

In simulation *third* results index inclusion finance push growth economy by 17%, that is that inclusion seen finances _ from (d1= Accessibility , d2 = availability , d3 = usage) provides Damang positive in the future to growth economy in Sumatra province . This thing in line with study Nursini (2020); Wulan *et al.* (2021) that finance banking give capital capabilities of the community and actors business in develop quality services and products , of course will push enhancement sales and aggregate output. Whereas simulation *fourth* The provincial Technology Development Index (IPT) also has an impact positive to growth economy value of Sumatra province 18% prediction , that is if IPT increases growth economy will increase by 18%. IPT is size standard level ICT development in an area that can compared intertime and interregional . In addition , IPT measures growth ICT development , measuring the digital gap or digital divide between regions , and measuring potency ICT development . The opinion of Brodny & Tutak (2022) conveys that digitalization of MSMEs or business micro impact multiplied to sales during the pandemic season , of course matter This push growth regional economy .

second model , where variables inequality used as variable dependent , visible that MSME performance has an impact negative on the block inequality , that is number of MSMEs. The more Lots business small and medium-sized (MSME) economy public the more evenly . In other words, MSMEs help create field Work for society . No doubt again , kind of chance Work This can contribute to growth economy . Additionally , findings _ This Enough interesting Because its height MSME asset and turnover variables , which show that inequality the more increases . This thing in line with research by Stiglitz (2016), which states that growth assets and capital flows indeed can cause inequality . The argument enter sense Because capital turnover is still limited to power a handful group society . This means that people who have large capital Possible Still become MSME owners . Apart from that , it's very interesting that block capital show results negative , which shows that enhancement MSME financing _ No direct will reduce inequality . However , in simulation *First* E-Commerce digitization and simulation *second* digitalization of MSME payments will lower inequality social . The result show that strengthening quality perpetrator business and the era of digitalization are very necessary in period long . By empirical , yes proof that idea This can reduce

inequality economy .

Simulation *third* index inclusion finance negative impact on inequality , that If something area the more inclusive his finances (d1= Accessibility , d2 = availability , d3 = usage) will lower inequality area by 0.8%, though small number the show confirmation similar research _ with research conducted by Shinozaki (2022) and Nursini (2020). Nursini (2020) with connect inclusion finance and MSMEs, we can increase access finance for MSMEs, so can help they grow and develop . When MSMEs are empowered with access more finances _ OK , this can work too contribute in reduce inequality economy with increase well-being and participation economy from various layer society . Simulation *fourth* own negative impact of 2.7% means If service index development technology succeed so inequality will can be lowered by 2.7%. Use technology can facilitate access to markets and information . In the digital era, access to the internet and technology other can give opportunity for MSMEs to reach more markets wide . If MSMEs from group poor economy _ capable or marginalized own access limited to technology this , them Possible difficulty in compete and improve business they , cause inequality in economy so here it is important IT transformation for MSMEs (*MSMEs go digital*) (Georgescu *et al .*, 2021). More far , Georgescu *et al .* (2021) for maximizing impact positive from digital effectiveness in reduce inequality economics , maker policies and stakeholders interest must overcome digital divide with invest in digital infrastructure , promote digital literacy and training skills , as well designing ensuring policies _ that benefit digital economy can accessible to everyone . Apart from that , effort must done For ensure condition decent work and protection _ for worker in the gig economy, and policy must made For mitigate transfer work through initiative improvements and skills repeat .

third model , as the dependent variable variable unemployment show negative relationship _ with block MSME performance . In other words, power work and the number of MSMEs fill in role . The more many MSMEs are absorbing it power work and amount they Keep going increase every the year , then with automatic will capable reduce unemployment in Sumatra province . This result in line with research conducted by Arestis and Biefang -Frisancho (2000), who stated that breadth willingness field work together with factor others , like need power work , determine level unemployment (Lee & Sahu, 2017). On the block MSME capital , total TPF variable aggregate influence unemployment with sign negative , which means MSME capital will reduce unemployment 3.2%. This means that MSMEs are supported by capital will own ability

For develop with fast , hiring more many people, and in the end reduce unemployment . Simulation **First** And **secondly** , no own significant influence on unemployment . _ In other words, digitalization *E-Commerce* , digitalization payment , and index inclusion finance the human No influence unemployment . By macroeconomics , unemployment is results simultaneous from various activity economics (Al-Afeef, 2020; Birchenall , 2004; Arestis & Biefang-Frisancho , 2000). There's a possibility that ineffectiveness from third simulation the caused by delays (*gaps*) or lateness reaction policy . In term length , variable This Possible No own impact (Mroz & Savage, 2006). Simulation **third and fourth** Good inclusion finance and index Technology development No impact to unemployment , of course matter This need dug more in . A number of study mention that impact from inclusion finance to unemployment No own influence in a way direct need exists *gaps* or other channels like quality of human resources and opportunities Work moreover formerly new reduce unemployment . Inclusion finance can contribute in a way positive For reduce unemployment and vulnerability field Work with provide access to credit , support development HR skills , encouraging entrepreneurship , and facilitating search and mobility job . However , reach subtraction significant unemployment _ need approach comprehensive solution _ challenge more economic _ expansive and creating conducive environment _ For creation field work and growth economics (Mehry *et al.*, 2021; Alshyab *et al.*, 2021).

Fourth model results , variables poverty as variable dependent show negative relationship _ with block MSME performance . This shows that better performance of MSMEs good (increase in assets, turnover and amount) will help reduce poverty in Sumatra Provinces because level uptake power more work _ high , availability more assets _ large , and quantity transactions carried out by MSMEs. As For example , a 1% increase in MSME assets will reduce poverty by 6.7%. The result in line with research conducted by experts (Kangar , 2017; Eneh, 2017; Lateh *et al.*, 2017; Tambunan, 2019) which shows that performance economy in matter this , which includes performance business small and medium enterprises (MSMEs), have ability For impact on reduction poverty . On the contrary , it is low activity economy , as indicated by a decline transaction sell buy from MSMEs, yes cause enhancement poverty , esp during times of crisis like COVID-19 pandemic in 2020-2021. However , in sector MSME capital , capital credit and credit investment impact negative to poverty . This means that enhancement access to capital can push MSME performance and decrease poverty . Of course just This is great find ; _ This show that role sector banking in reduce poverty

can achieved through MSME capital . Findings from the fourth model This aligned with findings from the first model . Based on , simulation **First** digitalization *e-commerce* reduce poverty of 1.1%, and simulation **second** digitalization of payments reduces poverty by 9%. Although the numbers small , second simulation the proven capable reduce poverty in Sumatra Province . In simulation **third** index inclusion finance impact negative by 7% against poverty , that is inclusion finance capable give impact decline poverty . As in line with research (Erlando *et al.*, 2020; Lee *et al.*, 2023) for inclusion finance own significant impact on alleviation _ poverty , inclusion finance must be equipped with alleviation strategies comprehensive poverty , targeted social programs , and initiatives development sustainable economy . _ Apart from that , effort must done For ensure that products and services finance designed and delivered with fulfilling way _ need special public income low and vulnerable . Simulation **fourth the** technological development index is also indicated capable lower poverty by 7%. Study This aligned with those produced by Zhang *et al.* (2023) that case in China digitalization and technology in a area capable lower number poverty up to 30%. Because technology can become catalyst For entrepreneurship and growth business small and medium . Use technology in business can increase efficiency and power competitive , open opportunity for poor people to create field Work for self they yourself and others. Condition of development progress technology that occurs in Sumatra is in harmony with development inclusion existing finances . _ This thing explain that inclusion finance development technology related tightly .

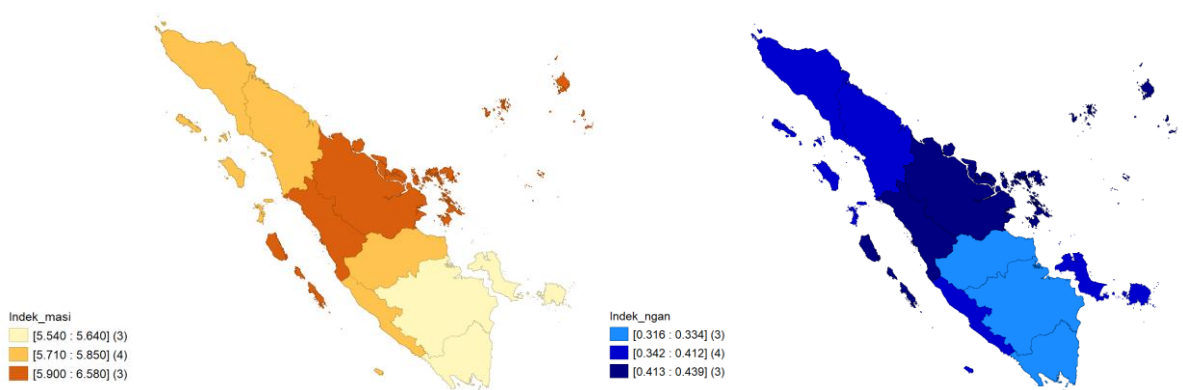


Figure 12. Inclusion Pattern Finance (Blue) and Technology Development (Brown)

Source : Illustration Researcher with processed with Geoda Software (2023)

Next , for summarize results findings , below This can seen results summary findings study as following .

Table 4. Core Research Findings

Model	Independent Variable	Dependent Variable	Relationship Between Variables	Findings
Model 1	MSME performance	Economic Growth	Positive Influence	In accordance with Theory/ Policy
	MSME capital		Positive/Negative Influence	Opposite
	Simulation1 (E-Commerce Digitalization)		Positive Influence	In accordance with Theory/ Policy
	Simulation2 (Digitalization of Payment)		Positive Influence	In accordance with Theory/ Policy
	Simulation3 (Financial Inclusion Index)		Positive Influence	In accordance with Theory/ Policy
Simulation4 (IT Development Index)	Positive Influence	In accordance with Theory/ Policy		
Model 2	MSME performance	Inequality	Positive Influence	Opposite
	MSME capital		Negative Influence	In accordance with Theory/ Policy
	Simulation1 (E-Commerce Digitalization)		Negative Influence	In accordance with Theory/ Policy
	Simulation2 (Digitalization of Payment)		Negative Influence	In accordance with Theory/ Policy
	Simulation3 (Financial Inclusion Index)		Negative Influence	In accordance with Theory/ Policy
Simulation4 (IT Development Index)	Negative Influence	In accordance with Theory/ Policy		
Model 3	MSME performance	Unemployment	Negative Influence	In accordance with Theory/ Policy
	MSME capital		Positive Influence	Opposite
	Simulation1 (E-Commerce Digitalization)		No effect	-
	Simulation2 (Digitalization of Payment)		No effect	-
	Simulation3 (Financial Inclusion Index)		No effect	-
Simulation4 (IT Development Index)	No effect	-		
Model 4	MSME performance	Poverty	Negative Influence	In accordance with Theory/ Policy

Model	Independent Variable	Dependent Variable	Relationship Between Variables	Findings
	MSME capital		Negative Influence	In accordance with Theory/ Policy
	Simulation1 (E-Commerce Digitalization)		Negative Influence	In accordance with Theory/ Policy
	Simulation2 (Digitalization of Payment)		Negative Influence	In accordance with Theory/ Policy
	Simulation3 (Financial Inclusion Index)		Negative Influence	In accordance with Theory/ Policy
	Simulation4 (IT Development Index)		Negative Influence	In accordance with Theory/ Policy

Based on results findings (summary results research inside _ table mentioned), proposed mapping strategy equality Inner Sumatran economy push equality provincial regional economy Sumatra depicted as following .

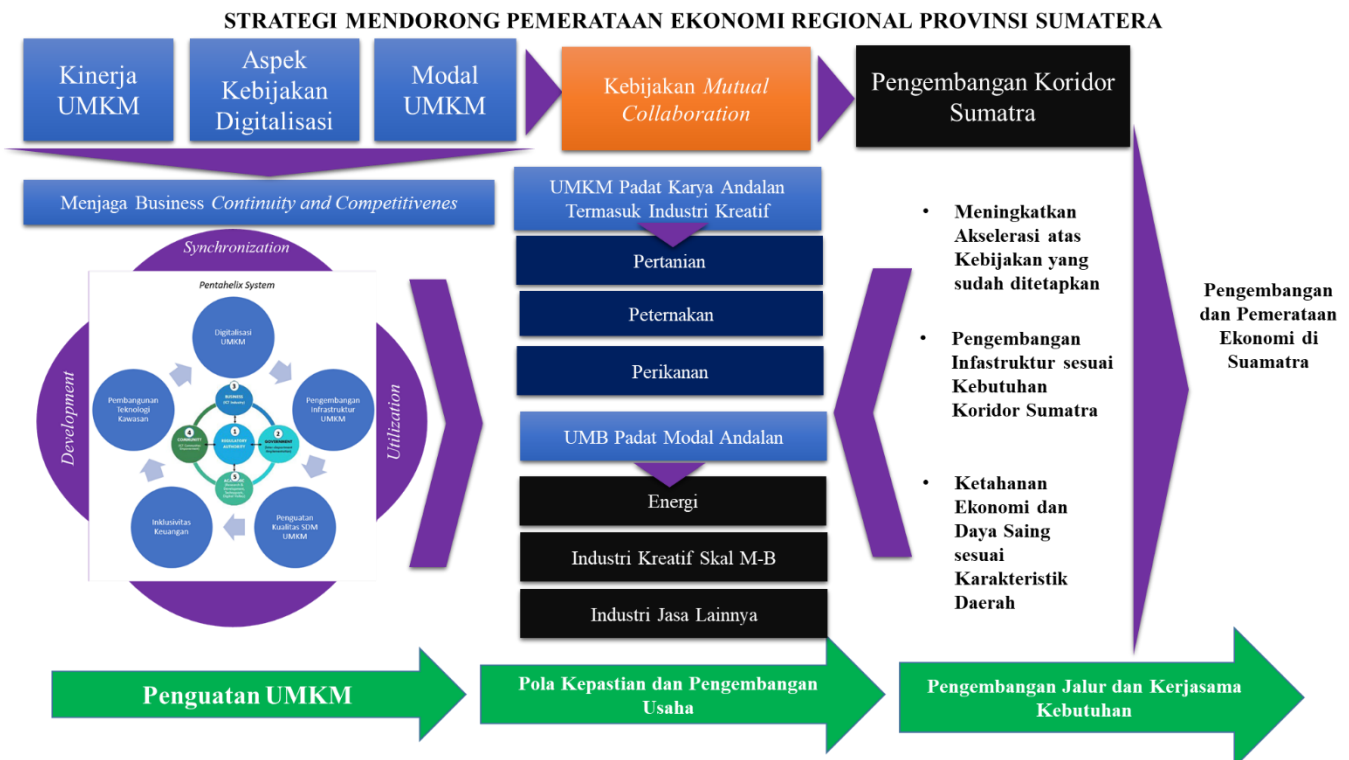


Figure 13. Strategy Direction Economic Equalization of Sumatra as Gate supporting IKN Economic

Development

Source : Illustration Researcher (2023)

The picture show that strengthening MSMEs in Sumatra is a must moreover formerly formed for sustainability growing business _ with consistent , as well Power competitive formed as initial capital development economy Sumatra regional area / corridor . The main way to do it is with synergy *penta helix* and strengthening the 4 core values (explanation more carry on is in the section behind page / recommendations). After strengthening done , then *mutual collaboration* must formed in a way definite (inter- connection) especially Java, and Kalimantan (candidate Mother city archipelago), for example component results natural or processing agrocomplexes and the like or commodity energy , industry service related , as well needs that support other IKN . Furthermore need mapped development track cooperation and the need for intervention from Central Government (command) to Provinces /Regions in Sumatra and surrounding areas . This must also be supported _ with acceleration development of the western region of Indonesia for its role as gate supporter development of MSMEs to logistics trading international development in Indonesia . Strategy implemented _ in matter This including : Acceleration on existing policies _ set , development Infrastructure in accordance need dynamic in Sumatra, and resilience economy and power competitive in accordance characteristics area

V. TO CONCLUSION, SUGGESTIONS AND RECOMMENDATIONS

5.1 Conclusion

possible conclusion taken from study This is as following :

1. MSME performance block , MSME capital block has an impact positive to growth economic and impactful negative to inequality and poverty . It means the more Good MSME performance and increasingly easy capital will push growth economy . Apart from that , the performance of MSMEs and MSME capital is good will reduce inequality and poverty .
2. Simulation *First* ie the digitalization of MSMEs has an impact positive to growth economy as well as impact negative to inequality and poverty . It means development of MSMEs with approach digitalization will increase growth economy as well as also has an impact on decline inequality and poverty .
3. Simulation *second* ie development MSME infrastructure has an impact negative to growth economy , and impact positive to poverty .

4. Simulation *third* ie strengthening human resources for MSME actors has an impact positive to growth economy as well as impact negative to inequality and poverty . It means the more Good quality and education MSME actors will push growth economy through good performance _ from MSMEs. As well as at the end will reduce poverty and inequality .
5. Simulation *fourth* that inclusion finance area impact on improvement growth economy , reduction number inequality and poverty
6. Simulation *fifth* that index development technology area impact on improvement growth economy , reduction number inequality and poverty
7. Fifth simulation No impact to level unemployment .

5.2 Suggestions

Possible advice given For study furthermore among them as following :

1. Further study can develop model development with consider policy shopping government as representation from aspect autonomy specific area _ related with strengthening position province which is in Sumatra
2. Further study can developed with approach more spatial _ comprehensive However focus on simulation Sumatra's connection with future issues _ like for example, IKN Nusantara in the Kalimantan Region.
3. In the future study with consider aspect resilience economy area can done as One proxy interesting variable .

5.3 Recommendations

Based on results study this , then possible recommendations _ recommended is optimizing synergy penta *helix* in Sumatra and surrounding areas moreover first :

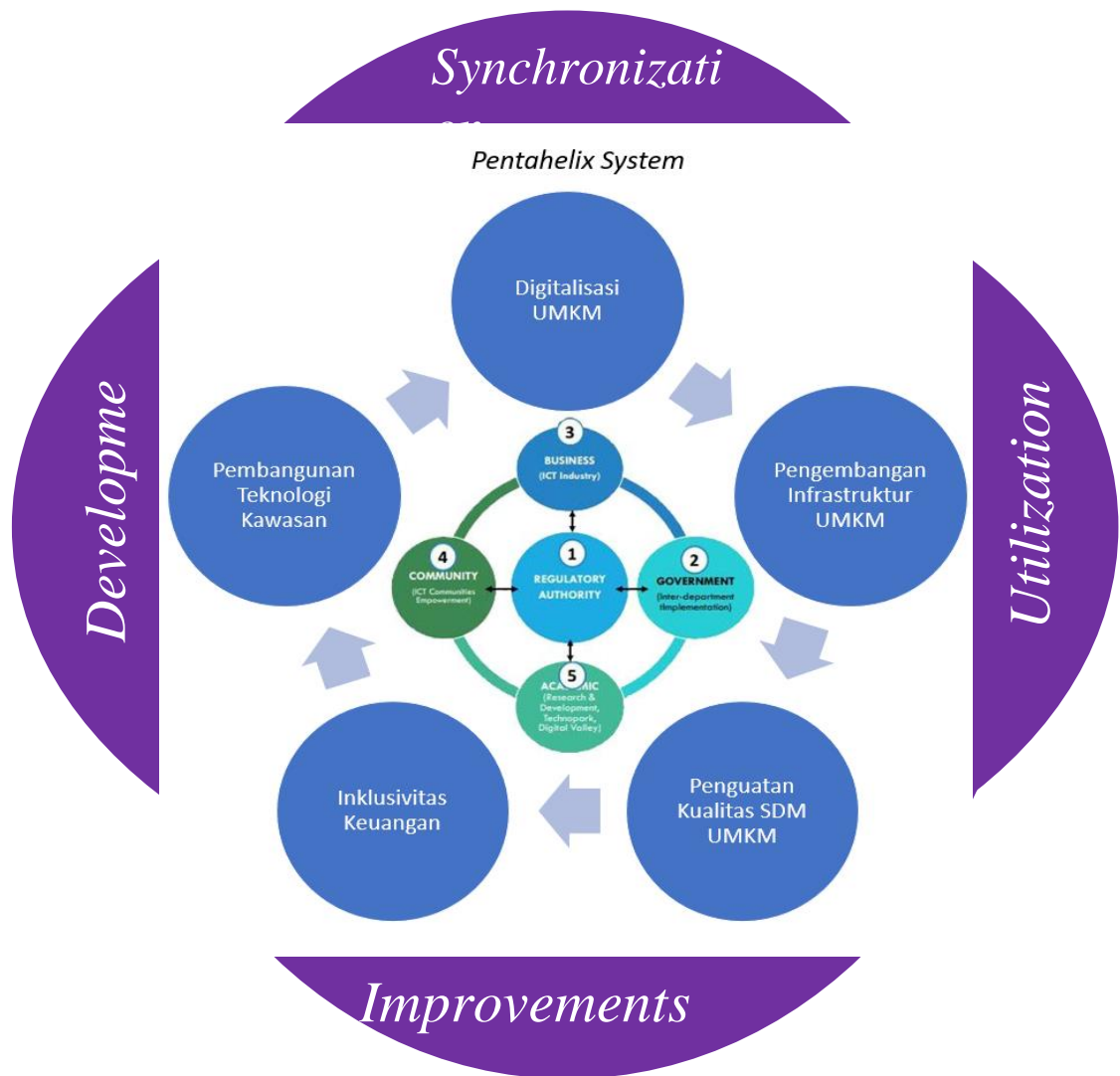


Figure 14 . Synergy Policy Based *Pentahelix System*

Source : Illustration Researcher (2023)

The picture show recommendation policy synergy *pentahelix* inside _ prioritizes 4 values implementation including : *Synchronization* between parties , *Improvements* above potential and achievements moment this , *Utilization* in aspect availability capabilities and budget , and *Development* development to direction tactical .

Table 5. Recommendations Policy

Simulation	Description	Goals / Programs
Development Digitalization	Represents step strategic policy strengthening MSMEs with utilise internet services , information and technology in the Sumatra region	<ul style="list-style-type: none"> - Strengthening marketing process strategies (advertising , promotion , publicity and sales) through digitalization systems sustainable - Increase cooperation on the sales platform <i>online (market place)</i> among MSMEs that have not <i>go online, market place platform</i>, which is facilitated by the government - Utilization payment and delivery <i>on line</i> - One MSME data system <i>goes online</i>
Development MSME Infrastructure	Represents policies directed at compliance _ means upstream downstream <i>factors</i> production , mobilization goods and services , making things easier access sell buy between area , p This impact multiplier towards MSMEs in Sumatra	<ul style="list-style-type: none"> - Emergence system legal and integrated <i>drop ship</i> between MSME and service players logistics For cut cost transportation (catalog integrated within _ office logistics) - Spawn system monitoring price integrated that can be accessible to all public in a way <i>on line</i> - Enhancement network access more information _ strong (connectivity) - Spawn oriented integrated MSME center _ special For product sale <i>on line</i>
Strengthening Quality of HR	It is an improvement strategy supporting quality of human resources acceleration quality and impact of MSMEs in Sumatra	<ul style="list-style-type: none"> - Push enhancement literacy finance and technology through level education cross level - Push consistency training MSME management for can <i>go online</i> and work professional - <i>Facilitation</i> of MSMEs in increase Power competitive product (training Power competitive product) - Bring up a <i>business to business meeting</i> program (<i>link and match</i> between upstream , midstream and downstream producers _
Inclusivity Finance	Represents policy strengthening accessibility , availability and usefulness service finance and banking	<ul style="list-style-type: none"> - Make it easy permission in submission Business financing - Enhancement literacy finance with Campaigns , outreach and mentoring - Education finance since early collaboration with educational institutions - <i>One Gate</i> MSME financing system - Development of services and <i>mobile payments</i> - Strengthening the transaction system finance business micro upstream-downstream
Regional Technology Development	Represents improving policies _ public services with take advantage technology information , serca connect connect between area	<ul style="list-style-type: none"> - Infrastructure Technology : Building infrastructure adequate technology _ is step important . This includes expand access to fast and affordable broadband internet , strengthening network telecommunications , and building facility technology in the region remote countryside . _ - Education and Training Technology : Training and education programs technology must supported For increase digital literacy and skills technology society . Training can covers use device hardware and devices software , security cyber , and skills entrepreneurship based technology . - Startup and Innovation Promotion : Support startup and innovation ecosystem local can push development technology based on needs _ area . Government can give incentives and support for technology startups , such as room Work shared and access to research and development funds . - Digitalization Public Service : Encourage digitalization service public will increase efficiency and accessibility for citizens .

Simulation	Description	Goals / Programs
		<p>This includes service online government , app For administration public , and system online payment .</p> <ul style="list-style-type: none"> - Empowering MSMEs: Improving inclusion finance for MSMEs through technology can help they in develop business them . Programs like application of fintech for loan micro , <i>e-commerce platform</i> local , and digital marketing can support MSME growth . - Use Technology in the Agricultural Sector : Integrating technology in the sector agriculture , like agriculture drone-based or the use of smart sensors , can increase productivity and efficiency , that will impact positive on prosperity farmers and growth economy area . - Technology for Education and Health: Uses technology For education distance away and service digital health can give more access _ Good for community in the area isolated or isolated . - Partnership and Collaboration : Collaboration between government , sector private , institutional education , and society civil is key in creating sustainable and impactful programs significant . - Enhancement Security <i>cyber</i>

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PIAGAM PENGHARGAAN

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Sebagai

JUARA II RESEARCH MODELLING PAPER

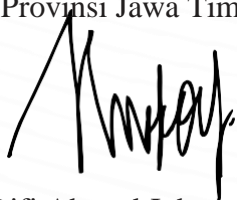
Pada

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