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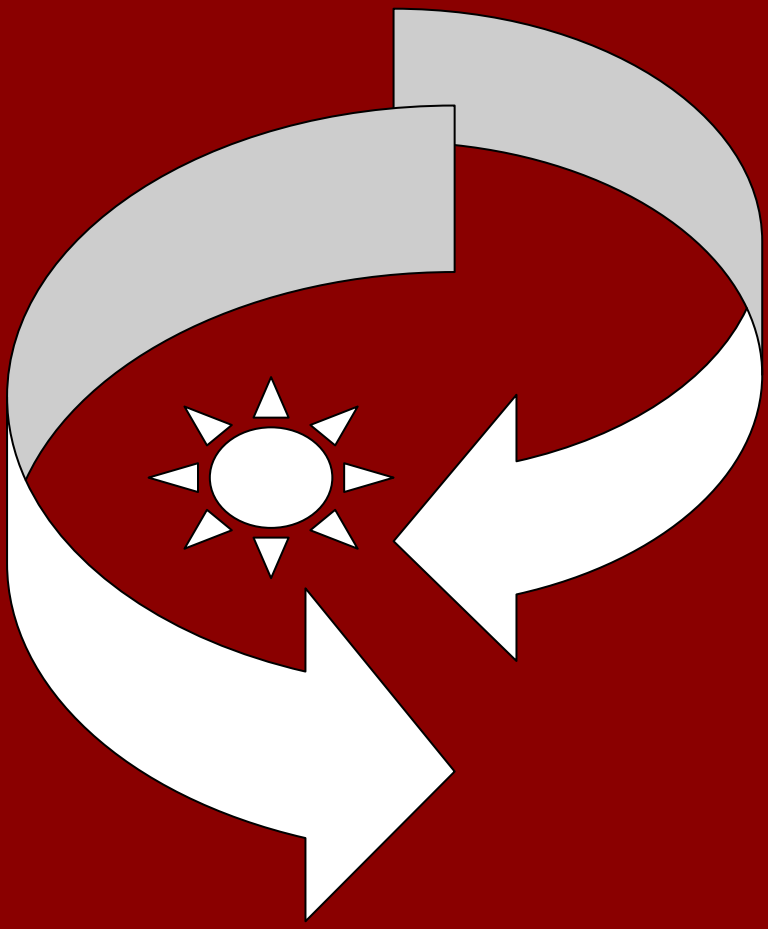

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Perspektif Pembiayaan dan Pembangunan Daerah
(Journal of Perspectives of Financing and Regional Development)

Table of Contents

Table of Contents i

Prognostication of the asymmetry of population incomes in Ukrainian regions 375
Kostenko Anna; Danyluk Liudmyla

Assymmetric effect exchange rate to Indonesian agriculture subsector 387
Sri Utami Lestari; Dedi Budiman Hakim; Tanti Novianti

Poverty in the Indonesia-Malaysia border province (case study in West Kalimantan Province) 401
Pramushinta Arum Pynanjung; Edy Agustinus; Junaidi; Rusli Burhansyah; Shenny Oktoriana

African Continental Free Trade Area (AfCFTA) Agreement and the Mega-Regional Trade Agreements (MRTAs): what are the underlying challenges and prospects for Africa-South-South trade? 413
Anayochukwu Basil Chukwu; Tobechi Faith Agbanike; Lasbrey Iheanyi Anochiwa

An effect of credit to entrepreneurship and micro small and medium enterprises performance in Jambi Province 433
Etik Umiyati; Zulfanetti

Prognostication of the asymmetry of population incomes in Ukrainian regions

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Abstract

The article presents the results of the medium-term forecast of income asymmetry of the population of Ukraine. Of the set of special research methods, statistical analysis was used. The initial information for the forecast was the official statistical data, namely: the income of the population of Ukraine in the dynamics by the type of economic activity and in the regional section over the past ten years. Construction of the forecast of the income and the definition of asymmetry was carried out based on the generalization of homogeneous phenomenons (million UAH and ten years). The average values were used to compare the obtained results, summarizing the characteristics of mass, qualitatively homogeneous socio-economic phenomenons, which scientifically predicted the main prospects. The results show a steady trend in the asymmetry of income asymmetry in Ukraine (both by type of economic activity and region), which will remain until 2024. In addition, it is found that Luhansk and Donetsk regions and the indicator (property income received) require additional research by surveying to establish the key risk factors.

Keywords*: Income asymmetry, Inequality, Poverty, Prognostication*

JEL Classification: C53, J31, R13

INTRODUCTION

In the modern world, such a social phenomenon as the asymmetry of the population's income is presented as a multidimensional interaction process and mutual influence of various factors. In Ukrainian society, the factors of increasing the asymmetry of incomes of the population can be attributed to the protracted socio-economic crisis over the past thirty years. Another factor causing the increase in population income asymmetry is a large sector of the underground economy and the labor market situation (which is characterized by high unemployment, low wages, and labor productivity).

A low level of public health is a consequence of the low incomes of a significant part of the population. The main features of which can be considered the average life expectancy at birth, a high level of child death and death at working age, disability, the attitude of the population to the prevention and treatment of diseases, as well as the possibility of purchasing paid medical services, etc., In these conditions, the adoption of informed management decisions regarding the processes of reproduction of the vital

activity of society in the presence of a deepening socio-economic differentiation of the population. It becomes important to scientific research that presupposes the scientific validity of modern trends based on diagnostics prevailing in each area of the territory's life, scripts of future development, taking into account the assessment of possible results of the taken decisions - both positive and negative.

For many years, the problems of forecasting the main parameters of the population's income have attracted the attention of government, business structures, and scientists. The works of scientists from different countries and periods have highlighted various theoretical, methodological, and practical aspects related to the income asymmetry of the population. In particular, the fundamental aspects of poverty, wealth, and income inequality are reflected by representatives of classical, neoclassical political economy, including Kene, Marx, Malthus, Mill, Ricardo, Smith. Marshall, Pi, Clark, Pareto, Engel, and others. So in the works of Quesnay, who is the author of the theory of net income from land and the founder of the economic term "reproduction", attempts were made to divide society into classes by distinguishing three groups of agents in the public economy (Quesnay, 1960). Marx later criticized Quesnay's theory. He rejected the axiomatics of the table, declaring the theory of "pure product" false and the concept of dividing society into three classes - incorrect.

According to Malthus (1836), "the population is growing exponentially, and the means of subsistence - in arithmetic" gives rise to an imbalance in the welfare of various segments of the population, that is, asymmetry. This statement could be true nowadays, except for one thing. Malthus, in his researches, used incorrect, by today's standards, migration statistics (does not take into account emigrants), did not take into account the mechanisms of self-regulation of the population size, leading to the demographic transition. In addition, it should be noted that during the time of Malthus, a clear asymmetry in income was observed only in large cities, while now this phenomenon has covered entire continents (including all developed countries without exception)

Follower Ricardo, within the framework of his research "on freedom", Mill touched upon the problems of income formation and the possibility of the development of society, focusing on the aspects of private property. He believed that property relations form the directions and proportions of the income distribution. The best state of humanity would be when "no one is poor, no one wants to become richer, and there is no reason to fear being thrown back because of the efforts of others to push forward." (Mill, 1993). The key conclusions of Mill are relevant at present. However, the existing realities indicate the presence of inequality, one of which is an asymmetry in incomes. This problem does not disappear but only transforms, acquiring different colors and manifestations.

Ricardo's ideas had a tremendous influence on the subsequent development of economic theory, including developments in income distribution. In particular, Ricardo's labor theory of value, according to which “there are three main social classes and the corresponding three types of income” (Ricardo, 1852), was applied by socialists, including Marx, to substantiate the redistribution of wealth. However, some severely criticized the methodological aspects of Ricardo. So, Schumpeter, the application of the results obtained based on the methodology proposed by Ricardo to the solution of practical problems called "Ricardian sin", argues that "this is an excellent theory that can never be refuted - it has everything except meaning" (Schumpeter, 2004).

The founder of the modern theory of poverty, in the opinion of the overwhelming majority of economists, is Smith, who is the main source of "wealth" called "economic development - the forces and laws operating in human society, thanks to which the total income grows, it is also fairly distributed" (Smith, 2016).

Income inequality, the theory of distribution, including the theory of surplus-value, is thoroughly presented in the works of Marx (1934). In the works of representatives of the neoclassical direction, Marshall, Pi, Clark, Pareto, Engel raised the issues of incomes and their inequality, making it possible to identify consumer behavior patterns depending on available income and form the fundamental basis of modern science. Based on a research of factors affecting income asymmetry in urban slums in southern Sumatera (Indonesia), Suhel et al. (2021), has been proven that in the aggregate, such variables as education level, age, expected income, and type of work, provide both positive and negative impact on the level of income.

Among European contemporaries who devoted their researches to solving the problems of income inequality, can be singled out the works of scientists from the Institute of Demography and Social Research named after Birds of the National Academy of Sciences of Ukraine, Libanova, Vasiliev, Gerasimenko, Zayats, Klimenko, Boychenko, Vasilchuk, Varnaliy, Vorotin, Geyets, Zhalilo, Luchik, Pyatkina, and others. These works greatly contributed to the research of incomes and living standards of the population in the regional context. The global nature of the issues raised in the article is evidenced by the main provisions of the concept of sustainable development. The concept of sustainable development presupposes a set of measures aimed at meeting current human needs while preserving the environment and resources, without prejudice to the ability of future generations to meet their own needs (Agenda 21, 1992). Seventeen Sustainable Development Goals until 2030 were identified, the first of which is eliminating inequality and poverty in any of its manifestations.

In addition, in 2019, Michael Kremer of Harvard and his followers and colleagues Esther Duflo and Abhijit Banerjee of MIT proposed an experimental approach to poverty alleviation that was highly praised by the global scientific community in the field of economics, as a result of which the authors were awarded the Nobel Prize.

It should be noted that the existing popular and sufficiently tested forecasting methods are largely reduced to financial processes and financial activities. This includes including the two-factor and the five-factor model of Altman, the adapted discriminant model of Lis, the discriminant model of Taffler, the diagnostic model solvency of Conan and Golder, Biver's coefficient, Springate's model, Tereshchenko's discriminant model, Sayfullin's model - Kadykov, Zaitseva, etc.

The existing practice of forecasting the main parameters of the asymmetry of the population's income, as a rule, is limited to determining the priorities for the economic and social development of territories and the development of comprehensive and/or targeted programs aimed at their implementation. At the same time, a wide arsenal of forecasting methods is not used to the full extent, which makes it possible to predict future development not only based on the analysis of data from a retrospective period but also on the identification of external and internal factors of influence, taking into account quantitative and qualitative changes taking place in the territorial community (region, district, city, village, settlement). As a result, there is no inconsistency between the needs of resource provision of plans and programs developed for the future and the respective territories' annual budgetary possibilities.

Thus, the complexity and versatility of the phenomenon of poverty, on the one hand, and the narrow focus, as well as the scientific disunity of the methodological apparatus of forecasting. On the other hand, it has led to research interest in forecasting the asymmetry of the population's income. Based on this, the purpose of the article is to develop theoretical, methodological, and practical approaches to predicting the asymmetry of the population's income in the context of poverty alleviation.

The research object is to forecast the asymmetry of the population's income. The subject is theoretical, methodological, and practical foundations for predicting the asymmetry of the population's income.

METHODS

In the research, a systematic approach was implemented. Generally, scientific methods were used: analysis, synthesis, induction, deduction, logical analysis (to generalize the views of domestic and foreign scientists to forecast categories, income asymmetry). Statistical analysis and forecasting were used from a set of special research methods. Data processing was carried out using an office suite of Microsoft Office applications, particularly a spreadsheet Microsoft Excel and a text editor Microsoft Word. The information base of the research was the publications of Ukrainian and foreign scientists, the official statistical information of the State Statistics Committee of Ukraine. The initial information for the forecast was the official statistical data, namely: indicators of incomes of the population of Ukraine in dynamics by types of economic activity and in the regional context over the past 10 years (Tables 1-3 Appendix).

The construction of the forecast of the population's income and the asymmetry determination was carried out based on the generalization of homogeneous phenomena (million UAH and ten years). The average values were used to compare the results obtained, making it possible to generalize the characteristics of mass, qualitatively similar socio-economic phenomena, making it possible to predict the main prospects scientifically reasonably. Information for 2014-2019 is given without considering the temporarily occupied territory of the Autonomous Republic of Crimea, Sevastopol, and part of the temporarily occupied territories in the Donetsk and Luhansk regions.

The presented accountings were carried out in the following interpretations: optimistic, pessimistic, and most probable scenarios. The accuracy of these predictions depends on the validity, completeness, and reliability of the diagnosis. From the point of view of the forecasting period (short-term, long-term, medium-term), the author presents a short-term forecast that covers 5 to 10 years since it is the most accurate and has a high degree of detail in the context of constantly changing impact factors.

RESULTS AND DISCUSSION

A survey analysis of various points of view regarding the current category of "forecasting" made it possible to establish this concept can be considered in a narrow and broad sense. In a narrow sense, the forecast is from the Greek - πρόγνωση "prevision, prediction".

In our research, the forecast is considered broadly since we are talking about a complex and multifaceted process (incomes and their asymmetry), which is constantly influenced by various factors that change the course of events. In this regard, the article's author calls a forecast a scientifically grounded judgment about the possible

states of the object (income of the population) in the future and (or) about alternative ways and terms of their implementation.

The general goal of forecasting income asymmetry is to provide the necessary information for developing regions' budgets, plans, programs, strategies, economic, social, and sustainable development. Thus, the determination of prospective wages by type of economic activity, by region, profit and mixed-income, income from property, social benefits, trends of natural and mechanical movement in the future, reproduction of labor resources, etc., create the basis on which the determination is made—the priorities and prospects of socio-economic development of territories.

Previous researches made it possible to establish that the following types of risks have the greatest impact on income asymmetry: economic, political, social, and environmental, which included the Covid-19 pandemic. It has been established that the specifics of determining the direction and strength of the action of each of the listed risks is the subjective nature and versatility of their influence. The existence of a direct relationship between the direction of the impact of risks and the reproduction of the main components of the vital activity of the regions leads to the emergence of negative trends in the course of these processes. So, considering the likelihood of certain risks is becoming an important condition in predicting income asymmetry. To predict the population's income asymmetry, we will construct trend models. Description of trend models of income asymmetry by main indicators: presented in (Tables 1, 2, 3)

Table 1. Trend model of income asymmetry in Ukraine

Indicators	Trend model	R^2
Salary	y = 137447x + 137920	0.8455
Profit and mixed income	y = 54570x + 51165	0.9116
Property income received	y = 3341,7x + 64823	0.5132
Social aids and other current transfers received	y = 79756x +268913	0.8907
including social benefits	y = 29290x + 192243	0.8480
social transfers actually	y = 34756x + 77335	0.8751

Source: Compiled by the author according to Table 5(Appendix)

Table 1 shows that the main share in the structure of incomes of the population of Ukraine falls on wages (47%), which tends to grow for the analyzed period, like other indicators. Considering the dynamics of changes in the share of sources of income of the population for the period from 2010 to 2019. It can be argued that there is an increase in the volume of wages in the structure of the population's income by 0.83% on average per year and, conversely, the share of social assistance and other received current transfers decreases by 0.78% on average per year. In addition, during the analyzed period in 2014, in all indicators, there was a drop in income and an increase in social aids, except for income from the property. This situation is associated with the military conflict in the Donbass, which contributed to the resettlement of 1 million 459 thousand 089 people, reducing income and devastating the savings of the population. (Ministry of Social Policy, 2021). Considering the values of the approximation, it is fair to consider the trend model reliable since for almost all indicators, the average value of R^2 was $0.8 \rightarrow 1$. However, in terms of property income, the received R^2 was 0.5132, which indicates that the model does not consider significant factors other than time t. This aspect was considered in the forecast presented in Table 2.

Table 2. Trend model of income asymmetry of the population of Ukraine by type of economic activity

Indicators	Trend model	R^2
Agriculture, forestry and fisheries	y = 803.38x – 390.47	0.8805
Industry	y = 947.95x + 435	0.8646
Constructing	y = 805.21x – 44.667	0.8768
Wholesale and retail trade; repair of motor vehicles	y = 993.81x – 295.73	0.9171
Transport, warehousing, postal and courier activities	y = 956.72x + 359.47	0.8587
Temporary accommodation and catering	y = 576.48x + 197.47	0.8855
Information and telecommunications	y = 1569.6x – 494.27	0.9036
Financial and insurance activities	y = 1537.2x + 1176.4	0.8902
Real estate operations	y = 736.17x + 206.13	0.9086
Professional, scientific activity	y = 1252.1x + 306.73	0.9270
Activities in the field of administrative	y = 714.22x + 89.467	0.8348
and support services	y = 1292.7x – 722	0.8073
Public administration and defense	y = 372.93x +288.2	0.8470
Compulsory social insurance	y = 572.38x + 301	0.8686
Education	y = 734.24x + 555.8	0.9337
Health service	y = 815.33x – 37.133	0.8996
Art, sport, entertainment and rest	y = 877.61x + 221.87	0.8742

Source: Compiled by the author according to Table 6 (Appendix)

The result of trend analysis for the indicator "wages by type of economic activity for the period 2010 - 2019, UAH million." is presented in Table 2. It indicates a significant differentiation in the sectors of the economy in terms of the average wages level.

So, unlike European countries, where the highest remuneration for their work is received by qualified workers in the field of high technologies, in science, medicine, education, in Ukraine, this contingent of workers was in the group of low-paid (< 10497 UAH). The difference between the highest-paid industry, “Financial and insurance activities” (19132 UAH), and the least paid “Temporary accommodation and catering” (6730 UAH) are almost three times in 12402 UAH. (65%). The approximation coefficient for all types of economic activity ranges from 08 to 09, indicating the forecast's reliability.

It can also be argued that the revenue is expected for such activities as agriculture, forestry, and fisheries; construction; wholesale and retail trade; repair of motor vehicles; information and telecommunications; public administration and defense; arts, sports, entertainment, and recreation to decline by 2020. This forecast coincides with the data of the analytical note of Rozumkov Center. The World Bank predicted it; the poverty rate in Ukraine increased from 2.1% in 2019 to 2.3% by the end of 2020. Although the government in the framework of the macroeconomic forecast for 2020-2022. It was planned to increase the average salary by UAH 2000. Per year, however, the introduction of quarantine caused the growth of the real incomes of Ukrainians to stop. At the end of the first half of 2020, the real disposable income of citizens decreased by 7.3% compared to the same period in 2019. This was the first drop in real incomes since 2016 (Razumkov Center, 2021).

Table 3. Trend model of income asymmetry by regions of Ukraine

Regions	Trend model	R^2
Vinnitsa	y = 10467x + 10573	0.8983
Volynsk	y = 5764x +6938.9	0.898
Dnipropetrovsk	y = 28738x+ 25935	0.8918
Donetsk	y = 45431x + 122170	0.2526
Zhytomyr	y = 7687.6x + 9024.1	0.887
Zakarpattia	y = 6207.9x + 7623.3	0.8956
Zaporizhzhya	y = 13414x + 16869	0.9079
Ivano-Frankivsk	y = 7851.1x + 10032	0.8977
Kiev	y = 13970x + 11008	0.879
Kirovograd	y = 5656.4x + 8373	0.9037
Luhansk	y = 331.98x + 58279	0.0101
Lviv	y = 17414x + 16073	0.8842
Nikolayev	y = 7205.3x + 10328	0.8921
Odessa	y = 18410x + 12366	0.8916
Poltava	y = 10360x + 11534	0.8933
Rovensk	y = 6602.2x + 8578.1	0.9082
Sumy	y = 7176.4x + 9352.1	0.9068
Ternopil	y = 5397.7x + 8110.4	0.8978
Kharkiv	y = 19233x + 25278	0.8898
Kherson	y = 6115.9x +7964.5	0.9095
Khmelnitsky	y = 7790.6x +10484	0.9096
Cherkasy	y = 7357.1x +9949.2	0.8981
Chernivtsi	y = 4624.1x + 6448.1	0.9024
Chernihiv	y = 5934.6x +10390	0.9022

Source: Compiled by the author according to Table 7 (Appendix)

The trend analysis of the incomes of the population in the regions of Ukraine made it possible to establish that there is also a significant asymmetry between them over ten years. High incomes are typical for the Dnepropetrovsk industrial region (UAH 89042), Kiev (UAH 76,232), Zaporizhzhya (UAH 76062), Odessa (UAH 75288) and Poltava (UAH 72843) regions. The listed territories' average per capita monetary income per month is almost three times higher than the average Ukrainian one (from UAH 48 to 70 thousand), 151.2%. Forecast data for 2020 indicate that the long-term trend will continue across the regions. The approximation rate for all regions, except for Donetsk and Lugansk, is 0.8-0.9. It indicates the reliability of the forecast.

Regarding the Donetsk and Luhansk regions, it must be said that this dynamics is explained by the military conflict (risk factor) that occurred in 2014, which was not taken into account in the forecast, which indicates an urgent need to study causal relationships. In addition, it should be noted that Covid-19 also made certain adjustments to the structure of trade and economy, and social policy in Ukraine and in all world states. Today, this risk factor is decisive since quarantine exposes the weaknesses of the population's health and socio-economic ones. In this connection, the author proposes to build a medium-term forecast for the main indicators of the asymmetry of incomes of the population of Ukraine until 2024. Table 4 presents the results of forecasting income asymmetry, which was carried out based on the obtained trend models, taking into account the speed of action, the strength of the impact, and the direction of influence of political, social, and economic risks.

Table 4. The results of forecasting the income asymmetry of the population of Ukraine until 2024

Indicators	The year 2024	Deflection 2019/2024	
		Total thousand UAH	Comparative %
Most possible script			
Salary, thousand UAH	2950020.292	1191432	67.71
Profit and mixed-income	1205066.592	526849	77.68
Property income received	133711.6061	16708	14.28
Social aids and other current transfers received	1985178.151	794926	66.77
including: social aids	1026341.373	467804	83.75
social transfers actually	616228.3819	177513	40.46
Pessimistic script			
Salary, thousand UAH	1932936.50	174 348	10
Profit and mixed-income	895091.55	216 874	31.98
Property income received	97820.70	-19183	-16.39
Social aids and other current transfers received	1331101.95	140849	11.83
including: social aids	663608.16	105071	18.81
social transfers actually	475961.02	37246	8.5
Optimistic script			
Salary, thousand UAH	3967104.08	2208516	126
Profit and mixed-income	1515041.64	836824	123.38
Property income received	169602.51	52599	44.95
Social aids and other current transfers received	2639254.35	1449002	121.74
including: social aids	1389074.59	830537	148.7
social transfers actually	756495.74	317780	72.43

So, it follows from the presented forecast that the current trend of the income distribution will continue in the next five years. In addition, it was found that such an indicator requires additional research as "property income received", and the Luhansk and Donetsk regions. Since these regions and this indicator were influenced by risk factors that were not considered in official statistics, which negatively affected the coefficient of reliability R^2.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

A survey analysis of scientific points of view regarding the current category of "forecasting" made it possible to conclude that it is advisable to understand as such a scientifically grounded judgment about the possible states of the object (income of the population) in the future and (or) about alternative ways and timing of their implementation. Previous research made it possible to establish that such risks most influence the asymmetry of incomes of the population of the regions of Ukraine as the economic, political, social, and spontaneous short-term risk of Covid-19, the consequences of which are the author's prospective studies. It was found that during the analyzed period of 2010-2019. in Ukraine, a stable trend of income distribution has formed, namely, an asymmetric distribution, which is expressed in a change in the structural income of the population by individual indicators, by types of economic activity and regions, while being in direct dependence on the economic and social development of society.

Trend analysis for the period from 2010 to 2019 gives grounds to assert that the main share in the structure of incomes of the population of Ukraine falls on wages (47%) and social assistance. The main average per capita income in Ukraine in 2019 was from UAH 48 to 70 thousand. While the regions were identified, the average per

capita monetary income per month exceeds almost three times the average Ukrainian one. These regions include Dnipropetrovsk, Kiev, Zaporizhzhia, Odessa and Poltava. It was determined that the dominant factor in the growth of income differentiation of the population of Ukraine is the intersectoral gap in the wages of full-time employees. So the difference between the highest-paid industry "Financial and insurance activities" (19132 UAH) and the least paid "Temporary accommodation and catering" (6730 UAH) are calculated as three times - 12402 UAH. (65%).

In addition, it was found that revenue is expected for such activities as agriculture, forestry, fisheries; construction; wholesale and retail trade; repair of vehicles; information and telecommunications, public administration and defense, arts, sports, entertainment, and leisure to decline in 2020. The presented forecast until 2024 indicates that the current trend will continue in the next five years. It was also found that such an indicator requires additional research as "property income received", and Lugansk and Donetsk regions since these regions and this indicator were influenced by risk factors that were not considered in official statistics, which negatively affected the approximation rate.

Recommendations

The forecasting results and the author's toolkit for implementing the forecast and assessment of risk factors, developed and published in another article, are offered to local and state authorities. The forecast proposed in the article should become the basis for strategies and programs for the socio-economic development of the regions of Ukraine.

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APPENDIX

Table 5. Dynamics of incomes of the population of Ukraine for the period 2010 - 2019, UAH million

Index	Period									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total income	1101175	1266753	1457864	1548733	1516768	1772016	2051331	2652082	3248730	3744060
Wage	449553	529133	609394	630734	615022	709590	898326	1209097	1529367	1758588
Profit and mixed income	160025	200230	224920	243668	254307	323506	378213	477854	572065	678217
Property income received	67856	68004	80769	87952	85114	80035	75452	78673	91164	117003
Social benefits and other current transfers received	423741	469386	542781	586379	562325	658885	699340	886458	1056134	1190252
including: social help and	237213	263633	301621	323123	311360	342562	337773	391776	465776	558537
social transfers	152131	164775	192827	204840	195881	236647	270560	382345	446193	438715

Source: Compiled by the author based on data (Statistical collection "Income and Expenditures of the Population", 2021)

Table 6. Dynamics of average monthly wages by type of economic activity for the period 2010 - 2019, million. UAH

Economic type Activities	Period									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Agriculture, forestry and fisheries	1472	1853	2086	2340	2556	3309	4195	6057	7557	8856
Industry	2570	3170	3478	3763	3763	4789	5902	7631	9633	11788
Constructing	1758	2270	2516	2702	2860	3551	4731	6251	7845	9356
Wholesale and retail trade; repair of motor vehicles	1877	2342	2704	3010	3439	4692	5808	7631	9404	10795
Transport, warehousing, postal and courier activities	2658	3072	3412	3589	3768	4653	5810	7688	9860	11704
Temporary accommodation and catering	1455	1777	2055	2249	2261	2786	3505	4988	5875	6730
Information and telecommunications	3161	3683	4286	4599	5176	7111	9530	12018	14276	17543
Financial and insurance activities	4638	5377	6012	6275	7020	8603	10227	12865	16161	19132
Real estate operations	1856	2181	2356	2757	3090	3659	4804	5947	7329	8626
Professional, scientific activity	2869	3529	4252	4465	5290	6736	8060	10039	12144	14550
Activities in the field of administrative	1839	2165	2430	2527	2601	3114	3995	5578	7228	8700
and support services	2722	3036	3415	3702	3817	4381	5953	9372	12698	14785
Public administration and defense	1905	2079	2530	2700	2745	3132	3769	5857	7041	8135
Compulsory social insurance	1628	1774	2202	2367	2441	2829	3400	4977	5853	7020
Education	1928	2358	2886	3286	3626	4134	4844	6608	7612	8659
Health service	1717	2056	2618	2707	3361	3634	4615	6536	8132	9096
Art, sport, entertainment and rest	2239	2633	3026	3265	3480	4195	5183	7104	8865	10497

Source: compiled by the author based on data (Statistical collection "Income and Expenditures of the Population", 2021)

Table 7. Dynamics of incomes of the population by regions of Ukraine for the period 2010 - 2019, UAH million

Regions	Income for the period									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Ukraine	1101175	1266753	1457864	1548733	1516768	1772016	2051331	2652082	3248730	3744060
ARC	39393	45562	51759	57324	-	-	-	-	-	-
Vinnitsa	33602	38990	44265	46157	49418	60923	71888	94417	114480	129061
Volynsk	19137	22584	25741	26907	27986	34064	40792	53204	63810	72185
Dnipropetrovsk	88922	101868	118823	124594	136810	166076	188816	245778	307844	360385
Donetsk	118223	135599	158003	166366	142745	117471	117735	141340	174771	199322
Zhytomyr	26124	30069	34110	34947	36814	45053	53684	70126	84830	97301
Zakarpattia	20841	24446	28028	29102	29988	37182	44137	56568	69194	78182
Zaporizhzhya	45779	52272	59191	62671	68327	81737	96695	122759	147627	169384
Ivano-Frankivsk	26504	31224	36186	37310	37848	47152	56418	73474	87479	98587
Kiev	42732	48990	55941	58894	63342	76150	90505	117755	150606	173511
Kirovograd	20213	23443	27129	27695	28901	35350	41875	54514	63999	71713
Luhansk	51338	58619	67025	71485	56233	44157	41267	49342	58880	66287
Lviv	54838	63602	72828	75762	79378	97740	116285	152256	189077	216876
Nikolaev	26034	29800	33907	35125	36373	44275	52390	67558	81581	92529
Odessa	52924	61435	70429	78285	80438	101179	118472	153640	193923	225458
Poltava	34462	39299	44835	46984	49928	60610	71926	92768	114656	129647
Rovensk	22362	26144	29557	31811	33314	40309	47356	61831	73661	82555
Sumy	24918	28347	32415	33469	35375	44311	52551	67287	79848	89702
Ternopil	19587	22712	26102	26345	26892	33851	40277	52196	61731	68282
Kharkiv	67102	77316	88352	91333	95897	116880	135675	175850	216227	245934
Kherson	20978	24096	27221	29489	30077	38233	44268	57144	68064	76449
Khmelnitsky	26987	31336	35458	36770	38853	48653	57367	73520	86821	97560
Cherkasy	26194	29646	33484	35024	36694	44708	53496	69399	82600	92887
Chernivtsi	16114	18682	21012	22408	22941	28316	33657	43542	52108	58028
Chernihiv	23179	26277	29654	30393	31998	38780	45716	58255	69247	76808
Kiev	143903	164057	194436	218747	240198	288856	338083	447559	555666	675427
Sevastopol	8785	10338	11973	13336	-	-	-	-	-	-

Source: compiled by the author based on data (Statistical collection "Income and Expenditures of the Population", 2021)

Assymmetric effect exchange rate to Indonesian agriculture subsector

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Abstract

This study explores the asymmetric effect on the rupiah exchange rate on every subsector agriculture export in Indonesia during 2006-2020. The non-linear ARDL method is used in this study to analyze the asymmetric relationship between exchange rate and export. NARDL method includes short-run and long-run coefficient estimates and embraces the asymmetric effect. The previous studies generally used the linear models on the aggregated data and ignored the differences in each export of the agricultural sub-sector, then they offered ambiguous results. The latest studies have preferred to use the method of NARDL on the agricultural sector in general data. Instead of using agricultural export data for each subsector, this paper considers subsector export data of agriculture. The estimated NARDL results indicate an asymmetric effect of the rupiah exchange rate on exports of the agricultural sub-sector in the long run. In general, there is no asymmetric effect in the short run. Generally, depreciation and appreciation of the Rupiah have a negative effect on exports of the agricultural sub-sector in the long run. However, rupiah appreciation positively impacts lag 2, and depreciation caused a different effect on each sub-sector. The NARDL results suggest that positive movements have lesser impacts than those of negative movements in the exchange rate on the agriculture sector both in the short and long run.

Keywords: *Asymmetry effect, Exchange rate, Export, Agriculture, Nonlinear ARDL*

JEL Classification: C22, F14, F31

INTRODUCTION

Since mid-July 1997, Indonesia has come under great economic stress, which causes the weakening of the rupiah exchange rate against the US dollar. After the collapse of the Bretton Woods system, the subject of the impact of floating exchange rates on international trade becomes an interesting study as the shift from fixed exchange rates that exposed currencies to exchange rate volatility, which might affect trade flows. Exchange rate volatility could potentially lead to market uncertainty, volatility in traders' profits, increase in risk, inflation uncertainty, unfavorable balance of trade, and impacts on production and transaction cost (Juhro & Phan, 2018).

The exchange rate is the main determinant of world trade, and unstable exchange rate movements create global imbalances. Over the last few decades, the global economic system has caused trade and exchange rates (Umaru et al., 2016). Exports are one of the economic sectors that play an important role in expanding the industrial sector market, encouraging other industrial sectors and the economy (Meier, 1996).

According to Simorangkir and Suseno (2014), the exchange rate has a close relationship with exports because the exchange rate determines the price or value of an item to be traded with other countries. If the exchange rate appreciates, commodity exports will also increase, and vice versa; if the exchange rate depreciates, the export rate will decrease.

Data on the role of agriculture in the COVID-19 pandemic era shows that the agricultural sector holds a crucial role in Indonesia's current economic growth. Agriculture has a role in providing food, providing job opportunities, producing raw materials for industry, consuming industrial products in addition to generating foreign exchange (Muhammad-Lawal et al., 2009). The agricultural sector is the only sector with positive export growth in 2020. The Central Statistics Agency (BPS) reported export achievements and increased production in the agricultural sector during the Covid-19 pandemic. From 2019 until now, agricultural exports grew 14.3 percent, with the food crop sub-sector as the highest contributor to the distribution and economic growth of the agricultural sub-sector in 2020. Meanwhile, the agricultural sector is the leading sector that contributes to Indonesia's foreign exchange (Syafa'at et al., 2005). Thus, it is important to analyze the relationship between exchange rate movements and Indonesian agricultural exports.

Changes in the export value of the Indonesian agricultural sector create different responses on the appreciation and depreciation effects. It means that export movements did not follow exchange rate movements when compared from month to month (ITC and IFS, 2020). Based on this, there are indications that the rupiah exchange rate has an asymmetric effect on exports of the Indonesian agricultural sector. Previous researchers have commonly studied the effect of the exchange rate on exports. However, these studies did not consider the asymmetric effect since they used a linear model.

The asymmetrical relationship between the exchange rate and international trade in the Indonesian agricultural sector was difficult to explain. Based on the results of Fadillah's research (2021), changes in Indonesia's agricultural sector exports had a negative effect on changes in exchange rates, depreciation, and appreciation. It could be because, in previous studies, all commodities in the agricultural sector were considered the same. All agricultural sub-sectors have different characteristics and conditions in international trade, which cause different responses to changes in exchange rates. In Indonesia, the agricultural sector in a broad sense is divided into five sub-sectors, namely the food crops sub-sector, the plantation sub-sector, the fisheries sub-sector, the livestock sub-sector, and the forestry sub-sector (Dummary, 1996).

The difference in export conditions of each agricultural sub-sector shows a big difference between the mainstay export sub-sectors such as the plantation, forestry, and fisheries sub-sectors against the sub-sectors, including imported products of Indonesia, namely the food crops and livestock sub-sectors (ITC, 2021). The policies and strategies implemented by the government in the export mainstay sub-sector tend to be different from the sub-sector that still relies on imports. The government tends to increase the added value of sub-sector products from the mainstay of exports. In contrast, the government implements policies to increase production to fulfill domestic needs for products that are not the mainstay of exports.

The interruption in international trade and finance leads to various uncertain effects on foreign trade. The exchange rate uncertainty on trade flows can be categorized as a small impact attached to the very high volatility of exports and imports. There is no doubt that this high volatility in trade flows has a major influence on the export and import decision-making process (Baum, 2009). So far, previous studies have

generally used an asymmetrical approach in evaluating the effect of the agricultural export exchange rate and only concerned the agricultural sector in general. Thus, this research was intended to investigate the effect of the exchange rate on agricultural exports in each sub-sector with an asymmetric approach. This research aims to observe whether there is an asymmetric exchange rate effect in each agricultural sub-sector and investigate the different effects caused by the interruption of the rupiah exchange rate towards exports in each agricultural sub-sector. Therefore, this research has become a consideration for the government to determine the correct policy when the Indonesian rupiah exchange rate depreciates or appreciates.

METHODS

The dependent variable used in this study is the export value of each agricultural sub-sector which is accessed through the ITC (International Trade Community). The independent variable is the real exchange rate obtained from the ITC (International Trade Community). This study used secondary data in monthly time series (quarterly times series) for 180 months from January 2006 to December 2020. The method used in this study is Nonlinear Autoregressive Distributed Lag (NARDL) with an asymmetric approach.

Nonlinear Autoregressive Distributed Lags (NADRL) method was used to assess the asymmetric relationship between the exchange rate and exports in each agricultural sub-sector. The cointegration test is used in the model because it is found that there is no stationarity in the level, but the first difference. Model variations are used to get the best model. The stationarity test was the first stage of testing on time series data, which aims to test the stationary of the data. Determining the optimum lag on the dependent and independent variables aims to determine the best model using the minimum lag.

Suppose exports in each agricultural sub-sector and exchange rates were cointegrated in the cointegration context. It means that although they were temporarily away from each other, they tend to return to equilibrium in the long period. There are three possible cointegration cases: the presence of linear cointegration, the presence of non-linear cointegration, and the lack of cointegration. In a recent study, Shin et al. (2011) developed the asymmetric ARDL cointegration methodology, which used positive and negative partial sum decomposition to detect asymmetric effects in both the long and short run. ARDL's asymmetric specification allows for joint analysis of non-stationarity and non-linear issues in the context of an unrestricted error correction model.

The new variable described the occurrence of appreciation and depreciation. According to this approach, the time series of the rupiah exchange rate was decomposed into two parts, namely ERt^+ and ERt^-, and was described in the following formula;

$$ERt^+ = \sum_{j=1}^{t} \Delta ER_t^+ = \sum_{j=1}^{t} \max(\Delta ER_{t,0}) \quad \ldots\ldots\ldots\

each sub-sector concerning the research of Shin et al. (2014), which is shown in the following equation;

$$\Delta LNX_t = \mu + \rho LNX_{t-1} + \theta^{+} LNER^{+}_{t-1} + \theta^{-} LNER^{-}_{t-1} + \sum_{j=1}^{p-1} \gamma j \ \Delta LNX_{t-j} + \sum_{j=0}^{p-1} \pi j \ ^{+}\Delta LNER^{+}_{t-j} + \sum_{j=0}^{p-1} \pi j \ ^{-}\Delta LNER^{-}_{t-j} + et \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

This study conducted estimation using the following model five times to observe the asymmetric effect of the rupiah exchange rate on exports of each agricultural sub-sector. This model incorporates an asymmetric approach in the short and long run. ΔLNX_t shows changes in the natural logarithm of the export value in each of Indonesia's sub-sectors affected by changes in the rupiah exchange rate. In the long-run relationship, LNX_{t-1} shows the natural logarithm of exports in each sub-sector. LNER+t-1 and LNER-t-1 symbolize the long-run exchange rate variable in the equation. In the short-run relationship, ΔLNX_{t-j} is the changes the natural logarithm of food crop exports. The natural logarithm of exports in each sub-sector is differentiated and takes a positive or negative LNX value. Meanwhile, the exchange rate variable in the short run is symbolized by $\Delta LNER^{+}_{t-j}$ and $\Delta LNER^{-}_{t-j,}$ which are changes in the natural logarithm of the positive exchange rate in the short run, where the natural logarithm of the exchange rate is differentiated, and a positive or negative LNER value is taken.

The ordinary least square (OLS) equation from equation (3) was used to test the truth of the long-run asymmetric relationship. Technically, we test the null hypothesis, which stated that all variable coefficients are zero ($H0{:}\omega1 = \omega2^{+} = \omega2^{-} = \omega3 = \omega4 = 0$), contrary to this hypothesis was these all coefficients are not zero. Rejecting the null hypothesis means that there is an asymmetric effect. The Wald's test was used to see asymmetric tests in the long and short run. In the Wald test, we tested the hypothesis to see whether the long-run coefficients had an asymmetric effect with each other ($H0{:}Lr^{+} = Lr^{-}$). In the short run, it can be tested with the assumption that the sum of the short-run asymmetric coefficients was similar ($H0 = \sum_{j=1}^{q-1} \rho_i{}^{+} = \sum_{j=1}^{q-1} \varepsilon_i{}^{-}$) it was contrary to the alternative hypothesis with different quantities.

RESULTS AND DISCUSSION

Descriptive statistics provide an overview or description of data seen from the average value (mean), standard deviation, maximum, minimum, and coefficient of variation.

Table 1. Descriptive statistics

Variable	Min	Max	Mean	Stdev	Coef. Var
Exchange Rate	8.508	16.367	11.422	2.211.14	0.1936
Food Crop Sub-sector	26.447	215.299	96.309	38.402.10	0.3987
Plantation Sub-sector	511.123	3.047.459	1.778.330	558.483.90	0.3140
Forestry Sub-sector	522.876	1.036.055	772.465	99.268.30	0.1285
Livestock Sub-sector	1.448	10.305	6.836.04	1.581.51	0.2313
Fishery Sub-sector	144.212	553.591	303.971.74	94.450.58	0.3107

N or the amount of data for each valid variable is 180. Rupiah exchange rate (X) as the independent variable, the minimum value is 8,508, the maximum value is 16,367, and the mean value is 11,422. The smallest value of exports of the agricultural sub-sector is the livestock sub-sector, with a value of 1.488. The largest value of exports of the agricultural sub-sector as a whole is the plantation sub-sector, with a value of 3,047,459. The average value for all exports of the agricultural sub-sector has the smallest value in the livestock sub-sector and the highest in the plantation sub-sector.

Comparison of the average value of each variable is greater than the standard deviation or deviation from the datum of these variables shows good results for all variables. The value of the coefficient of variation is only the forestry sub-sector, which has a coefficient of variation below 0.2, which means that only the forestry sub-sector has uniform data. According to Sudjana (1996), if the coefficient of variation value is less than 20 percent or 0.2, it is considered uniform data. In contrast, other sub-sectors have a coefficient of variation above 0.2, which is not uniform. According to Sudjana (1996), if the coefficient of variation value is greater than 20 percent or 0.2, the data is considered non-uniform.

The Phillips Perron Test (PP) test was carried out to assess the availability of stationary in the data. In this test, the automatic lag selection was used based on the Schwarz Information Criterion (SIC) criteria. If the p-value of t-ADF or t-PP is smaller than the critical value of MacKinnon, it can be concluded that the data used is stationary. Data testing was carried out at the level and first difference levels. The data stationarity test is the main thing that must be conducted before further testing on time series data. Table 2 shows that the rupiah exchange rate variable and fishery sub-sector export were not stationary.

In contrast, the export variable from the food crops, plantation, forestry, and livestock sector was stationary. Table 1 data's stationarity test results also indicate that at the first difference level. All variables have a smaller t-statistic than MacKinnon and show significance due to less than 1 percent probability, so all export variables in the agricultural sub-sector are stationary at the first difference.

Table 2. The results of the Phillips and Perron data stationarity test (1988)

Variable	Level		First Difference	
	t-stat	Prob.	t-stat	Prob.
Exchange Rate	-0.8535	0.8008	-12.9491	0.0000***
Food Crop Sub-sector	-3.1708	0.0234**	-24.4506	0.0000***
Plantation Sub-sector	-5.0347	0.0000***	-35.9335	0.0001***
Forestry Sub-sector	-7.3951	0.0000***	-111.0348	0.0001***
Livestock Sub-sector	-7.4295	0.0000***	-36.77534	0.0001***
Fishery Sub-sector	-2.4078	0.1410	-89.14221	0.0001***

*Note : ***, ** significant at the 1 percent, 5 percent*

The lag determination considers the Akaike Info Criterion (AIC) value, including the maximum dependent and independent lag. The program automatically provides lag results to the model with the minimum Schwarz Criteria value. The optimum lag is determined to determine the best model—the optimum lag results from five exchange rate asymmetric relations models for each Indonesia's agricultural sub-sectors. In general, it shows lag differences from all analyzed countries, but the average value of the optimum lag ranges from zero to four.

A cointegration test was also carried out in this study. The cointegration test was used to identify the long-run relationship between the export value of each agricultural sub-sector and the rupiah exchange rate. Cointegration testing used the bound test on the four research models where F-statistics indicated each test. The cointegration test on the model was carried out by comparing the value of F-statistics with the lower bound I(0) and upper bound I(1) values, following the Cointegration Bound Testing according to Pesaran et al. (2001). The cointegration test results on the ARDL and NARDL models can be seen in Table 3. Table 3 shows that the F-Statistic value of all export variables in each agricultural sub-sector was greater than the upper bound I(1). Thus, it can be concluded that there was cointegration for all export variables of the agricultural

sub-sector and the exchange rate. It means that there is an effect of the rupiah exchange rate on exports of all agricultural sub-sectors in the model that has a cointegration relationship or has a long-run relationship.

Table 3. Cointegration test results

Variable	F-Stat	Prob.	Table Bound Test 99%		Cointegration Result
			I(0)	I(1)	
Food Crop Sub-sector	6,3819	0,0026***	5,15	6,36	Cointegrated
Plantation Sub-sector	8,3180	0,0000***	5,15	6,36	Cointegrated
Forestry Sub-sector	6,9107	0,0002***	5,15	6,36	Cointegrated
Livestock Sub-sector	10,1925	0,0000***	5,15	6,36	Cointegrated
Fishery Sub-sector	6,6480	0,0003***	5,15	6,36	Cointegrated

*Note: *** Significant at the 1 percent*

The estimation of the asymmetric NARDL model aims to observe the relationship between the rupiah exchange rate and exports in each of Indonesia's agricultural sub-sectors, which is shown in Table 3. The estimated model that could show a non-linear relationship in the long run with the short run. The diagnostic test implies that the model was statistically acceptable. The value of AdjR2 in the model of each sub-sector was obtained from 0.2654 to 0.4235, implying that in the model, the effect of the exchange rate on exports of each agricultural sub-sector, there were other factors besides the exchange rate that affect changes in agricultural exports. The number in the LM test is a serial correlation test, where all LM test values indicate that the hypothesis is null. Therefore there is no autocorrelation for all models. The HET test shows a statistical test for heteroscedasticity. In all models, it shows no heteroscedasticity problem at all significance levels. The model stability test is used to see the stability of the variables and errors in the model by comparing CUSUM and CUSUMQ. In the CUSUM test, all export models of the agricultural sub-sector have a CUSUM line within the 5 percent significance line. It can be concluded that the variable in the model was stable. However, for the CUSUMQ test, the livestock sub-sector export model has a CUSUMQ line out of the 5 percent significance line. Therefore it can be concluded that the error in the model was unstable. While the other sub-sector export model has a CUSUMQ line that is within the 5 percent significance line, so it can be concluded that the error in the model was stable.

The lag error correction term test was significant and had a negative value. It was appropriate that the exports of all Indonesian agricultural sub-sectors and the rupiah exchange rate had a cointegration test. The value of the error correction term describes the adjustment speed in the long-run balance as a response to the imbalance due to short-run interruption. The value of the lag error correction term coefficient varies in each sub-sector. The lag error correction term value in each agricultural sub-sector with the smallest value was -0.2118, and the largest value was -0.3662. The smallest error correction term lag value comes from the food crops sub-sector of -0.2118, which means that exports of the food crops sub-sector and the rupiah exchange rate adjust in the long run at a rate of 21.18 percent per month and become the agriculture sub-sector with the slowest adjustment. The plantation sub-sector has the largest error correction term lag value of -0.3662, which means that it is the fastest sub-sector in making adjustments at a speed of 36.63 percent per month. In the second position, the forestry sub-sector with a lag error correction term of -0.3603. Meanwhile, the value of the lag error correction term for the livestock and fishery sub-sectors had a lag error correction of -0.2975 and -0.2967, respectively, so that exports of the livestock and fishery sub-

sectors against the rupiah exchange rate could adjust in the long run at a rate of 29.75 percent and 29.67 percent per month.

The application of Wald statistic test in the long and short-run aims to assess whether there is an asymmetric effect in the long and short run. The value in brackets which is in the below of the test result is the probability value of the Wald test. In the long run the null hypothesis was H_0: $L^+_r = L^-_r$, and the alternative hypothesis was H_1: $L^+_r \neq L^-_r$. If H_0 is rejected then there is an asymmetric effect in the long run. Based on the estimation results in Table 3, it shows that almost all export sub-sector models have W_{LR} values smaller than 0.05, which means that almost all agricultural sub-sectors have an asymmetric effect in the long run. Except for the forestry sub-sector export model, which has a W_{LR} value greater than 0.05, this sector does not have an asymmetric impact on the long run. In the short run, the null hypothesis is formulated as follows $H_0 = \sum_{j=1}^{q-1} \boldsymbol{\rho}_i^+ = \sum_{j=1}^{q-1} \boldsymbol{\varepsilon}_i^-$, and the formula for the alternative hypothesis is $H_0 = \sum_{j=1}^{q-1} \boldsymbol{\rho}_i^+ \neq \sum_{j=1}^{q-1} \boldsymbol{\varepsilon}_i^-$. With this formula, based on Table 4, only models in the forestry sub-sector have a Wsr test value less than 0.05, so that only models in the forestry sub-sector have an asymmetric effect in the short run. In contrast, models in other subsectors do not have an asymmetric effect in the short run.

The asymmetric relationship between the rupiah exchange rate and exports of each agricultural sub-sector is a double log function, which can be interpreted as elasticity. In the food crops sub-sector, in the long run, the effect of changes in the rupiah exchange rate, both depreciation and appreciation, was not significant and had a negative impact on changes in exports of the food crops sub-sector. When the Rupiah depreciated by 1 percent, the change in the food crops subsector exports decreased by 0.1951 percent. Meanwhile, when the Rupiah appreciated by 1 percent, the food crop sub-sector exports decreased by 1.1110 percent. Based on the theory, changes in the food crop sub-sector exports when depreciation was intended to increase exports. The rupiah depreciation might reduce the price of export products to trigger an increase in exports. Based on Wuryadi's research (2015) changes in food crop exports that were not in accordance with this theory can be caused by other factors besides the rupiah exchange rate that affects exports of the food crop subsector. In addition, the low competitiveness of food crop export products in the international market can also be an influential factor. This is also supported by the fact that the rupiah exchange rate, both when it depreciates and appreciates, did not significantly affect changes in exports of the food crop sub-sector in the long run.

The fact shows that it was difficult for producers and exporters of agricultural products to relocate resources or production factors to export in response to increased price competitiveness (Firdaus et al., 2018). This is because there was no demand for goods in Indonesia. The low competitiveness and demand for exports of the food crops subsector are due to the fact that Indonesian export products have not been able to fulfill the quality standards of the international market and the high selling prices of export products of the Indonesian food crop subsector, which is due to the high prices of production factors. In the short run, the exchange rate during appreciation did not show a significant and positive impact on exports of the food crops sub-sector with a value of 1.0531 at lag 2. This means that when the Rupiah appreciated by 1 percent, the exports of the food crops sub-sector would experience a change of 1.0531 percent. At the same time, the rupiah depreciation has an optimum lag of zero, which means that changes in the exchange rate in the previous period had no impact on the exchange rate when it depreciates in the current and future periods.

Table 4. NARDL estimation of the effect of the rupiah exchange rate on exports of all Indonesian agricultural sub-sectors

Sector 1: Food Crop Sub-sector

lag	ΔXP_t	ΔER^+_t	ΔER^-_t	XP_{t-1}	ER^+_{t-1}	ER^+_{t-1}
1	-0,3915 (0,0000)***		1,0482 (0,1545)	-0,2118 (0,0003)***	-0,0413 (0,6927)	-0,2354 (0,1296)
2	-0,1714 (0,0190)**		1,0531 (0,1357)			

AdjR2	LM	HET	Lpos	Lneg	WLR	WSR	Cusum	Cusum SQ
0,2654	0.8643	0.6124	-0,1951 (0,6965)	-1,1110 (0,1194)	14,6770 (0,0002)***	No Need	stable	stable

Sector 2: Plantation Sub-sector

lag	ΔXPt	ΔER^+t	ΔER-t	XP_{t-1}	ER^+_{t-1}	ER^-_{t-1}
1	-0,4523 (0,0000)***		0,6430 (0,5317)	-0,3662 (0,0000)***	-0,3811 (0,0160)**	-0,7436 (0,0027)***
2	-0,2284 (0,0015)***					

AdjR2	LM	HET	Cusum	Cusum SQ	Lpos	Lneg	WLR	WSR
0,4065	0.4703	0.0756	Stable	Stable	-1,0405 (0,0102)**	-2,0304 (0,0005)	26,3017 (0,0000)***	No Need

Sector 3: Forestry Sub-sector

lag	ΔXPt	ΔER+t	ΔER-t	XPt-1	ER+t-1	ER+-1
1	-0,3905 (0,0000)***	-1,2585 (0,0004)***	0,8763 (0,0810)*	-0,3603 (0,0000)***	0,0312 (0,6391)	-0,0085 (0,9289)
2	-0,1200 (0,1044)		0,8503 (0,0583)*			

AdjR2	LM	HET	Cusum	Cusum SQ	Lpos	Lneg	WLR	WSR
0,3827	0.1248	0.5358	Stable	Stable	0,0865 (0,6377)	-0,0234 (0,2628)	1,5175 (0,2197)	9,5431 (0,0023)***

Sector 4: Livestock Sub-sector

lag	ΔXPt	ΔER+t	ΔER-t	XPt-1	ER+t-1	ER+-1
1	-0,2975 (0,0012)***		0,8330 (0,1295)	-0,4937 (0,0000)***	-0,4524 (0,0003)***	-0,8323 (0,0001)***
2	-0,0809 (0,3303)		1,0972 (0,0743)*			
3	-0,1781 (0,0064)***					

AdjR2	LM	HET	Cusum	Cusum SQ	Lpos	Lneg	WLR	WSR
0,4235	0.0599	0.0789	Stable	Unstable	-0,9164 (0,0000) ***	-1,6858 (0,0000) ***	54,4954 (0,0000)***	No Need

Sector 5: Fishery Sub-sector

lag	ΔXPt	ΔER+t	ΔER-t	XPt-1	ER+t-1	ER+-1
1	-0,2967 (0.0022)***	-0,5377 (0.2962)	0,7511 (0.3006)	-0,3872 (0,0000)***	-0,0540 (0.5579)	-0,3540 (0.0160)**
2	-0,1372 (0.1334)	0,9409 (0.0974)*	1,0693 (0.0932)*			
3	-0,1473 (0.0516)*					

AdjR2	LM	HET	Cusum	Cusum SQ	Lpos	Lneg	WLR	WSR
0,3300	0.2962	0.3411	Stable	Stable	-0,1392 (0,5624)	-0,9140 (0,0086) ***	44,4775 (0,0000) ***	1,5188 (0,2195)

*Note : ***, **,* significant at the 1 percent, 5 percent, 10 percent*

In the plantation sub-sector, short-run estimation shows the exchange rate when appreciation does not show a significant and positive impact on exports of the plantation sub-sector with a value of 0.6430 at lag 2. It means that when the Rupiah appreciates by

1 percent, the exports of the food crops sub-sector will experience a change of 0,6430 percent, as for the long-run estimation when depreciation was significant and had a negative impact on exports of the agricultural sector with a value of -1.0405. It means that when the rupiah exchange rate depreciated by 1 percent, the change in exports from the agricultural sector decreased by 1.0405 percent. The rupiah exchange rate appreciated significantly and had a negative impact on exports of the plantation sub-sector with a value of -2.0304. It means that when there was an appreciation of the Rupiah by 1 percent, the change in the Indonesian plantation sub-sector exports decreased by 2.0304 percent. It shows that changes in the export of the plantation sub-sector negatively influenced the Rupiah's appreciation and depreciation. This finding contradicts the theory that exports will move according to the exchange rate movement, namely, when the currency is appreciated, exports decrease. In contrast, when the currency depreciates, then exports would be increased. It indicates that Indonesia's plantation sub-sector exports were influenced by factors other than the exchange rate, which means it was not only affected by the exchange rate.

According to Susanti (2017), the rupiah exchange rate did not significantly affect the trade balance in Indonesia. Thus, the policy of seeking a depreciating exchange rate was less effective on Indonesia's trade balance. In addition to the exchange rate, the trade barrier factor that applies to exports of the plantation sub-sector is also a factor that exports of the plantation sub-sector cannot respond to an increase when there is depreciation. The plantation sub-sector, which is the main export sub-sector, faces many barriers, both tariff and non-tariff, from export destination countries. Issues encountered in the palm oil commodity were Renewable Energy Directive (RED). RED is a policy implemented in the European Union to limit the use of palm oil-based biofuels because carbon from CPO-based biofuels exceeds the standards set by the European Union, namely 35 percent (Khairunisa, 2017). Meanwhile, other plantation commodities face high standardization requirements which are also carried out by export destination countries for plantation products such as coffee, cocoa, and nutmeg.

Exports of the forestry sub-sector were the second-largest contribution after the plantation sub-sector to agricultural sector exports. The forestry sub-sector commodity was one of the leading sectors in Indonesia's export commodities (Jose, 2021). In short-run estimates, the presence of an asymmetric effect indicates that changes in depreciation and appreciation should be configured separately because interruptions tend to have different impacts on forestry sub-sector exports. The rupiah appreciation was significant at the 10 percent level and positively impacted forestry sub-sector exports with a value of 0.8503 in lag 1. This means that when the Rupiah appreciates 1 percent, the change in Indonesia's forestry sub-sector exports increases by 0.8303 percent in lag 2, depreciation significant and a negative impact on exports of the forestry sub-sector with a value of 1.2585 at lag 1. This means that when the Rupiah depreciates by 1 percent, the change in the Indonesian forestry sub-sector exports decreases by 1.2585 percent in lag 1. This is in line with research by Baek and Xu (2020) that in the export of the forestry sub-sector, there is an asymmetric effect of changes in exchange rates in the short run. Whereas, it shows that in the long run, the estimated changes in forestry sector exports had a negative effect influenced by the Rupiah's appreciation, and shows a positive effect when the depreciation of the Rupiah influenced it. This is in accordance with the theory that explains the movement of exports following the exchange rate movement, namely, when the currency appreciates, exports would decrease. In contrast, the currency depreciated, exports would increase (Tweeten, 1992).

The livestock sub-sector was a loser sector in Indonesia's export variables (Abdullah & Imran, 2021). The main export commodities from the Indonesian livestock sub-sector are fat, dairy products, animal feed, live pigs, butter, skin, processed meat, and offal. In contrast, the main export destination countries are Hong Kong and China (BPS, 2020). Based on Table 10 in the short run, the estimation results of the exchange rate during depreciation show a significant and positive impact on exports of the livestock sub-sector with a value of 1.0972 at lag 2. It means that when the Rupiah depreciated by 1 percent, the exports of the food crop subsector would experience a change of 1.0972 percent. Depreciation is significant and has a negative impact on exports of the livestock sub-sector with a value of -0.9164. This means that when the rupiah exchange rate is 1 percent, the change in exports of the livestock sub-sector decreases by 0.9164 percent. The rupiah exchange rate appreciated significantly and had a negative impact on exports of the livestock sub-sector with a value of -1.6858. This means that when there is an appreciation of the Rupiah by 1 percent, the change in Indonesia's livestock sub-sector exports decreases by 1.6858 percent. In the long-run estimation, changes in livestock sub-sector exports negatively influenced the Rupiah's appreciation and depreciation. This is presumably because Indonesia is not a major exporting country for livestock commodities. Even though there was a decline in selling prices on the international market due to the depreciation of the exchange rate, it could not encourage an increase in demand for the export volume of the livestock sub-sector. The low competitiveness of export commodities in the livestock sub-sector also caused no increment in exports when there was a rupiah depreciation (Abdullah & Imran, 2021). The low competitiveness of livestock sub-sector commodities was due to the high prices of livestock products so that they could not compete with export commodities from other countries. In this case, farmers still have to struggle with high production costs because the price of animal feed tends to be high.

One of the leading export in Indonesia was the fisheries sub-sector. The main export commodities from the fisheries sub-sector include tuna–skipper–cob (TCT), squid–cuttlefish–octopus (CSG), crab–crab, and seaweed (Seferina, 2019). In the short run, the appreciation was significant and positively impacted exports of the fisheries sub-sector with a value of 2.6969 at lag 1. It means that when the Rupiah appreciates 1 percent, the change in exports of the Indonesian agricultural sector increases by 2.6969 percent at lag 1. Meanwhile, depreciation was significant and positively impacted Indonesia's agricultural export sector of 3.0231 in lag 2. It means that when the Rupiah depreciated by 1 percent, the change in exports of the Indonesian agricultural sector increased by 3.0231 percent in lag 2. It is in accordance with Kesuma's (2018) research on the effect of the exchange rate on Indonesian shrimp exports to the United States. In the short run, the Rupiah exchange rate has no significant effect on the volume of Indonesian shrimp exports to the United States. Meanwhile, the long-run estimation shows that depreciation was not significant and had a negative impact on exports of the fisheries sub-sector with a value of -0.1392. It means that when the rupiah exchange rate depreciates by 1 percent, the change in exports of the fisheries sub-sector decreases by 0.1392 percent. The rupiah exchange rate appreciated significantly and had a negative impact on exports of the agricultural sector with a value of -0.9140. It means that when there is an appreciation of the Rupiah by 1 percent, the Indonesian fishery sub-sector exports decrease by 0.9140 percent. Based on the effect of the rupiah exchange rate on exports of the fishery sub-sector in the long run, changes in the export of the fishery sub-sector were more responsive to the Rupiah's appreciation than depreciation.

In general, the results obtained from the NARDL estimation in this study indicate

an asymmetric export reaction in each agricultural sub-sector in Indonesia. In the long run, exports of the agricultural sub-sector responded negatively to the Rupiah's depreciation. Only exports of the forestry sub-sector responded positively to the Rupiah's depreciation. Only plantation and livestock sub-sectors exports significantly impacted the Rupiah's depreciation. Meanwhile, when the Rupiah appreciates, changes in exports in all agricultural sub-sectors respond negatively. In the long run, the greatest effect of the rupiah exchange rate, both when depreciation and appreciation of the exports of each agricultural sub-sector, occurs in exports of the plantation sub-sector and the smallest on exports of the forestry sub-sector. The Rupiah's appreciation also has a greater influence than when the rupiah depreciation occurs in the long run, except for exports of the forestry sub-sector. Only exports of the livestock and fishery sub-sectors are significant to the Rupiah's appreciation in the long run.

Meanwhile, in the short run, the rupiah depreciation was only significant in the forestry sub-sector export at the level of 1 percent with a negative sign. In contrast, the rupiah depreciation was significant at the 10 percent level in lag 2 and positive in the fisheries sub-sector. Meanwhile, when the rupiah appreciation occurred, all sub-sector exports were positive. Still, at the 10 percent level, significant sub-sectors were forestry sub-sector exports, livestock sub-sector exports, and fisheries sub-sector exports at lag 2.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

In this study, instead of looking for the relationship between the rupiah exchange rate and agricultural exports in general, this study investigates the relationship between the rupiah exchange rate and the exports of each agricultural sub-sector in Indonesia.. In particular, this study evaluates the asymmetric effect of the rupiah exchange rate on each agricultural sub-sector and the magnitude of the effect of changes in the rupiah exchange rate on changes in exports in each agricultural sub-sector in the long and short run. This study also investigated the subsector with the greatest exchange rate influence in the long and short run. In this study, all variables were stationary in the first difference and had cointegration in the long run.

This study used the Nonlinear ARDL (NARDL) method to investigate an asymmetric effect in the long and short-run between the rupiah exchange rate and exports in each agricultural sub-sector. The data used in this study were monthly data on the real exchange rate (Rp/USD) and the export value of the agricultural sub-sector in the period January 2006 to December 2020. The empirical results show various conclusions. It was found that there was an asymmetric exchange rate effect on exports of the food crops sub-sector, plantation sub-sector, livestock sub-sector, and fishery sub-sector in the long run. On the other hand, there was no asymmetric effect between the rupiah exchange rate and exports of the forestry sub-sector in the long run. In the short run, only the export of the forestry sub-sector had an asymmetric effect on the rupiah exchange rate.

The estimation results in this study indicate that in the short run when rupiah depreciation occurs, only forestry sub-sector exports respond significantly and have a negative sign. In contrast, in fisheries sub-sector exports, rupiah depreciation gave a positive but not significant response. Meanwhile, all sub-sector exports positively affected the Rupiah's appreciation. Still, the exports of the sub-sectors that had significance with the Rupiah's appreciation were exports of the forestry sub-sector,

livestock sub-sector, and fishery sub-sector. In the long run, when the Rupiah depreciated, all exports from the agricultural sub-sector responded negatively, except for exports from the forestry sub-sector, which responded positively to the Rupiah's depreciation.

On the other hand, all sub-sectors respond negatively when the Rupiah appreciates. The export sub-sector that provided the greatest response to changes in the rupiah exchange rate both during depreciation and appreciation, in the long run, was the plantation sub-sector. In contrast, the export sub-sector that provided the smallest response was the export of the forestry sub-sector. Meanwhile, when the Rupiah depreciated in the short run, the export of the forestry sub-sector gave the greatest response. When there was an appreciation of the Rupiah, the export of the livestock sub-sector gave the greatest response. Based on this study, it was found that the appreciation of the Rupiah generally gave a greater response than the depreciation.

Recommendations

Based on the estimation results of this study, it shows the existence of a long-run asymmetric effect. On the other hand, the magnitude of the depreciation coefficient is slightly different from the appreciation coefficient, which implies an asymmetric effect. Each sector has a different reaction of exports towards the speed of change in the real exchange rate. Thus, knowing information about these reactions may be useful for increasing exports in each of the agricultural subsectors. The model results imply that the side effects of rupiah appreciation are greater for depreciating than the beneficial effects of depreciation. In other words, currency depreciation is the preferred policy option to increase a country's level of exports. Despite this low significance, the government cannot depend solely on changes in the exchange rate to increase exports in all agricultural sub-sectors. Based on the estimation results on exports of the food crops sub-sector and livestock sub-sector, which are the loser sector in international trade, Indonesian agriculture has low competitiveness in the international market.

Therefore, besides generating policies by relying on rupiah depreciation, it also needs policies that help producers increase production and reduce production costs to ensure the export prices in these sub-sectors can be lower and compete with export products from other countries. In the exports of all agricultural sub-sectors, many obstacles should be encountered by exporting products from the Indonesian agricultural sector in export destination countries regarding product quality standards and environmental issues. Improving the quality of resources and fulfilling environmental quality certification plays an important role in exports of all agricultural sub-sectors. It is recommended that the government conduct more research and development of seed varieties and increase efficiency in applying raw materials and modern technology. Technology transfer in agricultural production plays an important role in increasing agricultural production and economic growth.

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Poverty in the Indonesia-Malaysia border province (case study in West Kalimantan Province)

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Abstract

This study aims to analyze the factors determining poverty in the Indonesia-Malaysia border province of West Kalimantan. Data were obtained from Statistics Indonesia (BPS) of West Kalimantan Province. From 2010 to 2019, panel data of regencies/cities in West Kalimantan were analyzed quantitatively. The results showed that the Random Equation Model (REM) using the GLS method was more appropriate for examining the impact of poverty in West Kalimantan. The study result found that Gross Regional Domestic Product, unemployment rate, and population density significantly affect poverty.

Keywords: *Economic growth, GRDP, Population density, Poverty, Unemployment*

JEL Classification: O11, O47, I31

INTRODUCTION

Poverty is an economic circumstance in which one cannot fulfill their basic needs for food and non-food items. It is referred to as the 'basic need approach' (Khomsan et al., 2015). Statistics Indonesia (BPS) employs this notion as an instrument for measuring the poverty rate in Indonesia. Poor individuals have a monthly per capita expenditure less than the poverty line. The poverty line is determined by the amount of money (in rupiah) spent per month on food needs (2100 kcal/capita/day) and non-food needs (housing, goods, and services, clothing, durable goods such as brooms and scissors, taxes and insurance, as well as party and ceremonial expenditures) (Badan Pusat Statistik Provinsi Kalimantan Barat, 2020).

Due to Indonesia's high poverty rate, poverty is one of the country's main challenges that must be addressed. Moreover, Indonesia shares direct borders with neighboring countries such as Malaysia, Brunei Darussalam, Papua New Guinea, and Timor Leste. Malaysia is one of the countries frequently seen as a point of comparison based on its welfare level. According to World Data Lab (2018), Indonesia ranked second-highest, with a 5.1% extreme poverty rate. In contrast to Malaysia, which came

in second last with a 0% extreme poverty rate. It may undoubtedly be one of the triggers of socioeconomic inequality, notably among those residing in areas bordering Malaysia, such as provinces on the Borneo island.

According to the report, the poor population in West Kalimantan Province fell from 8.48% to 7.28% between September 2011 and September 2019. However, compared to other provinces directly bordering Malaysia, the proportion in 2019 turned out to be the highest. East Kalimantan had a poverty rate of 5.91%, while North Kalimantan had a rate of 6.49% (Badan Pusat Statistik Provinsi Kalimantan Barat, 2020).

Furthermore, as mentioned in Rencana Pembangunan Jangka Menengah Daerah (RPJMD) Provinsi Kalimantan Barat 2018-2023, the poverty rate target was not met in 2019. It is also worth noting that the poverty rate refers to the overall rate in 14 regencies/cities in West Kalimantan, which ranges from 4% to 13% (Pemerintah Provinsi Kalimantan Barat, 2019). The disparity in poverty rates begs the issue of what variables influence it and what exactly is at the root of the problem. These questions are critical considerations while formulating appropriate policies to address poverty.

In China, it was discovered that population density is the root of poverty; thus, the government implemented a residential development policy and livelihood resources to alleviate the problem. People competed for access to livelihood sources in their area as the population grew. They are racing about looking for jobs. Nonetheless, some intriguing findings suggest that population density influences infrastructure development, production output, production gains, and economic growth (Frederiksen, 1981; Ciccone & Hall, 1996; Rahman, 2017; Maguire-Jack et al., 2015; Yang et al., 2020).

If, on the other hand, unemployment and economic growth are found relevant, policies might be oriented toward generating the greatest number of job opportunities by boosting investment in various economic sectors. Unemployment is considered a difficult issue to overcome. Unemployed individuals experience a lower quality of life and are more likely to suffer from psychological distress. Aside from creating job opportunities, other measures such as improving their quality of life via advocate education must be implemented for them to survive (Ding et al., 2020; Prasetyoningrum & Sukmawati, 2018; Sari et al., 2020; Mankiw, 2013).

Another variable, such as Gross Regional Domestic Product (GRDP), also significantly affects poverty (Puspita, 2015). Some regions' declining GRDP is perceived as affecting income and the quality of household consumption. The public will change its consumption pattern by purchasing the cheapest goods. Such circumstances indicate a lack of prosperity in the community. There's also the Human Development Index (HDI) variable which consists of three interconnected indicators: education, health, and income. The relationships between the three indicators are as follows: First, higher education is often linked to higher wages; second, higher wages will increase purchasing power or income; third, when people's purchasing power increases, it indicates that the economy is growing rapidly; and fourth, when education and the economy are both good, it will have an impact on good well-being in the community health. Prasetyoningrum & Sukmawati (2018) similarly found the HDI variable to influence poverty substantially. According to economists and sociologists, those variables have certain implications. For example, if an economic growth variable

has no substantial influence on poverty reduction, it indicates that income disparity exists in the community. This circumstance might arise as a result of inappropriate policies. As a result, society experiences absolute poverty.

In terms of geographical aspects, West Kalimantan has 14 regencies/cities, 5 of which border Malaysia directly, namely Kapuas Hulu, Sintang, Sanggau, Bengkayang and Sambas. From the economic and social standpoint, the location of these areas should benefit West Kalimantan Province, particularly in terms of poverty reduction. Land boundaries of 966 km in length, social and economic networks with heterophilic and homophilic characteristics, and a wide range of livelihood options should reduce unemployment (Agustinus, 2016b; Agustinus, 2016a).

The authors believe that analyzing the factors influencing poverty is critical based on the description above. When such influential factors are identified, it is hoped that effective policies to alleviate poverty may be formulated, particularly in West Kalimantan Province, which borders Malaysia.

METHODS

This study used panel data from 14 regencies/cities in West Kalimantan Province to examine poverty conditions from 2010 to 2019. The total number of data examined was 700, all of which were obtained from Statistics Indonesia. The data include poverty rate, Human Development Index (HDI) value, economic growth, Gross Regional Domestic Product (GRDP), unemployment rate, and population density.

Panel Data Regression was used to look at the relationship pattern of HDI, economic growth, GRDP, unemployment rate, and population density to the poverty rate in West Kalimantan. The equation model can be seen as follows:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + U_{it} \quad \text{.....(1)}$$

Whereas::

Y	:	The poverty rate of regencies/cities in West Kalimantan
X_1	:	HDI value of regencies/cities in West Kalimantan
X_2	:	The economic growth rate of regencies/cities in West Kalimantan
X_3	:	GRDP of regencies/cities in West Kalimantan
X_4	:	The unemployment rate of regencies/cities in West Kalimantan
X_5	:	Population density of regencies/cities in West Kalimantan
α	:	Intercept
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$	:	The regression coefficient of independent variables
U_{it}	:	Error component in time *t* for cross-section unit *i*
i	:	1,2,3,…14 (cross-section data of regencies/cities in West Kalimantan
t	:	1,2,3…..10 (time series data, period 2010-2019)

Common Effect Model (CEM), Fixed Effect Model (FEM), Random Effect Model (REM) with General Least Square (GLS) method are used to select the regression model. Based on the three approaches, there are steps taken to decide the best model to use, namely: 1) Chow Test, to decide whether FEM is better than CEM; 2) Hausman Test, to decide whether FEM is better than REM; and 3) Lagrange Multiplier

Test, to decide whether CEM is better than REM. A good regression model should become the best linear unbiased estimator. Next, the classical assumption tests were performed, including normality, heteroscedasticity, multicollinearity, and autocorrelation. Furthermore, statistical tests were carried out to see the influence of poverty factors, including coefficient of determination test, F-test, and t-test.

RESULTS AND DISCUSSION

Results

In 2019, the poverty rate of West Kalimantan Province was lower (7.28%) compared to Indonesia's poverty rate (9.41%). However, the problem of poverty must still be controlled to reduce the social inequality of the people in the Indonesia-Malaysia border areas. Several variables can serve as benchmarks in controlling West Kalimantan's poverty rate, HDI, economic growth rate, GRDP, unemployment rate, and population density.

According to BPS (2021), the poverty rate of West Kalimantan has been fluctuating in the period 2015-2021. It hit the 8% mark in 2016, but it fell in 2021 (7.15%). It is also in line with its economic growth rate, which fluctuated rises and falls with the highest rate in 2017 (5.17%) and the lowest in 2015 (4.88%). Meanwhile, the highest unemployment rate was recorded in 2021 (5.82%), and the lowest rate was in 2018 (4.18%). In contrast to the previous three variables, West Kalimantan's HDI value tends to increase every year. As of 2021, its HDI value stands at 67.90. Each of these variables certainly has a different influence on the poverty rate.

To determine the best model, a selection of appropriate panel data regression models for poverty, HDI, economic growth rate, unemployment rate, and population density variables was carried out. The Chow test and Hausman test performed the selection. The results of the model selection test are shown in Table 1.

Table 1. Regression model selection test results

Testing	Criteria	p-value	Accepted Model
Chow Test	H_0 : CEM H_1 : FEM	0.9979	H_0 : accepted H_1 : rejected *CEM*
Hausman Test	H_0 : REM H_1 : FEM	0.9923	H_0 : accepted H_1 : rejected *REM*
Langrange Multiplier Test	H_0 : CEM H_1 : REM	0.0000	H_0 : rejected H_1 : accepted *REM*

Based on the Chow Test, Hausman Test, and Lagrange Multiplier Test results, the best panel data regression model is the Random Effect Model (REM) using the General Least Square (GLS) method. The panel data regression model is as follows:

$$Y_{it} = 1{,}862891 + 0{,}520048X_{1it} + 0{,}187321X_{2it} - 0{,}107779X_{3it} + -0{,}100092X_{4it} - 0{,}149837X_{5it} + 0{,}5967 \quad \ldots\ldots(2)$$

After selecting the best regression model, classical assumption testing is performed, i.e., by heteroscedasticity test, multicollinearity test, and autocorrelation test.

The results show a Jarque-Bera value of 0.05284 at the 0.05 (α) significance level. The J-B value is 0.05284 > = α = 5% (0.05) and it indicates that the data is normally distributed. Furthermore, the heteroscedasticity test aims to see the residuals of regression have changing variance. The test results using the Glejser test method are shown in Table 2.

Table 2. Heteroscedasticity test using Glejser Test method results

Variable	p-value	Decision
Log(X1)	0.3549	Not significant
Log(X2)	0.3569	Not significant
Log(X3)	0.6761	Not significant
Log(X4)	0.4971	Not significant
Log(X5)	0.1840	Not significant

The results of the heteroscedasticity test show that the p-value of X1, X2, X3, X4, and X5 are greater than α (0.05). So there is no heteroscedasticity. A multicollinearity test is performed to see whether the regression model has intercorrelation or collinearity between independent variables. The results of the test are shown in Table 3.

Table 3. Multicollinearity test results

	LOG(X1)	LOG(X2)	LOG(X3)	LOG(X4)	LOG(X5)
LOG(X1)	1.000000	0.152718	0.028893	0.338072	0.637915
LOG(X2)	0.152718	1.000000	0.006594	0.039722	0.127262
LOG(X3)	0.028893	0.006594	1.000000	0.304362	0.337141
LOG(X4)	0.338072	0.039722	0.304362	1.000000	0.623062
LOG(X5)	0.637915	0.127262	0.337141	0.623062	1.000000

The results show no coefficient with magnitudes of .80 or higher (r > 0.8), so multicollinearity in the model is not detected.

Autocorrelation in panel data usually occurs in OLS equations due to estimation errors (underestimate). It can be fixed using the General Least Square (GLS). The estimation of the selected panel data used REM with the GLS method, and the autocorrelation was solved.

The classical assumption test results mean that the regression model is free from econometric problems. Then, statistical tests were carried out to determine the factors that influence the poverty rate in West Kalimantan Province. The test includes the coefficient of determination test, statistical F test, and statistical t-test.

Next, the regression model has no econometric issues in the classical assumption tests. Then, statistical tests were carried out to determine the factors affecting the poverty rate in West Kalimantan, including the coefficient of determination test, F-test, and t-test.

1. *Coefficient of Determination Test (Adjusted R^2)*

   The test can measure the capability of a model in describing the variation of its dependent variables. The results show an R^2 value of 0.4033. It means that poverty in West Kalimantan can be explained by HDI, Economic Growth Rate, GRDP, Unemployment Rate, and Population Density of 40.33%. Meanwhile, the remaining 59.67% can be explained by other variables outside this study.

2. *F-Test*

   The results show the value of F count (17.1724) > F table (2.29); therefore, H0 is rejected, and H1 is accepted. It means that the independent variables (HDI, Economic Growth Rate, GRDP, Unemployment Rate, and Population Density) simultaneously affect the dependent variable (Poverty Rate in West Kalimantan).

3. *t-Test*

   Table 4 shows some significant variables in the regression model. The results show two independent variables with a t-statistic > a significant level of α=0.5%, namely HDI and Economic Growth Rate. While GRDP, Unemployment Rate, and Population Density have a significant effect on the Poverty Rate in West Kalimantan.

Table 4. T-statistic test results

Variable	t-statistic	Probabilitas	t-table	Decision (α = 5%)
LogX1	0,869443	0,3862	1,65694	Not significant
LogX2	1,449740	0,1496	1,65694	Not significant
LogX3	-2,158777	0,0327	1,65694	Significant
LogX4	1,830658	0,0695	1,65694	Significant
LogX5	-6,282202	0,0000	1,65694	Significant

Discussion

HDI on poverty

The Human Development Index (HDI) is the benchmark of the UNDP (United Nations Development Programme). However, the Human Development benchmarks have undergone several changes in recent years. They were tailored to each country's needs, including Indonesia's. For example, Mangaraj & Aparajita (2020) modified the concept of HDI to GHDI and GHDIR. Both models have flaws since the degree of equality is not considered. Therefore, this dimension is included so that the benchmarks of human development can be integrated. Meanwhile, Ghana has its indicator known as the Multidimensional Poverty Index (Global MPI). The study of Masset & García-Hombrados (2021) reported that the index made it easier for the Ghanaian government to alleviate poverty.

Based on the results of panel data regression, the coefficient value of West Kalimantan's HDI is 0.520048. It indicates that for every one-unit increase in the HDI, people living in poverty rise by 0.52%. It contradicts the findings of Prasetyoningrum & Sukmawati (2018), who found that HDI had a favorable influence on poverty. It suggests that the policies to raise the HDI in West Kalimantan have failed to alleviate poverty.

Based on the findings, the Government of West Kalimantan Province must collaborate with the Central Government to adopt Ghana's policy by launching Millennium Village *(Desa Millenium)*. This initiative aims to improve sectors classified as "urgent" and influence poverty alleviation. The sectors include agriculture, education, health, infrastructure, and business development. Its implementation in West Kalimantan must be tailored to the HDI indicator (Long et al., 2020).

Economic growth rate on poverty

Economic growth and poverty rates are important indicators of a region's development success. Based on the estimation results, Economic Growth Rate has a

value of 0.187321. It indicates that if economic growth rises by 1%, the poverty rates will rise by 0.18%. This finding is in line with Perera & Lee (2013), which revealed that an increase in the poverty rate is followed by economic growth across Asia. Erlando et al. (2020), on the other hand, concluded that economic growth has a negative impact on poverty.

In West Kalimantan, economic growth has no significant effect on poverty. It is due to the huge income inequality across regencies/cities in this province and the low quality of institutions and financial development management (Ahmed et al., 2021). Kulkarni & Gaiha (2020) also emphasized that the larger the income disparity, the higher the poverty rate. Therefore, efforts to address inequality should be prioritized before improving economic growth. Improving the efficient movement of commodities across regions would be a more practical approach. It is, then, mandatory to build major infrastructures such as seaports, roadways, terminals, and airports.

Another assumption is that because economic growth is concentrated in cities, it does not considerably relieve poverty. People in rural areas continue to live in absolute poverty. There are a finite number of human resources capable of managing the village's potential. Therefore, fostering good human resources may be considered as a means of reducing poverty (Ahmed et al., 2021; Chen et al.,2016; Adeleye et al.,2020; Moore & Donaldson, 2016).

GRDP on poverty

The sources of economic activity in West Kalimantan are highly diversified. Agricultural, mining, fishing, forestry, plantation, and service industries have historically sustained the province's economic, social, and even cultural activities. GRDP, as an indicator of West Kalimantan's ability to generate added value substantially, lowers its poverty rate. It is shown by its coefficient value of -0.107779 and a significance of 0.0327. It indicates that if the GRDP rises by 1 billion rupiahs, the poverty rate will fall by 0.10%. These findings are consistent with Puspita (2015), which found that GRDP had a significant negative effect on poverty. It is a cue for the government to continue increasing regional GRDP to alleviate poverty.

Measures taken in Singapore and Finland can be seen as models for boosting the added value of economic activity sources. They are concentrating their efforts on advancing and utilizing information technology and encouraging their country to lead the service industry. As a result, the residents of both countries have a better standard of living than those of other countries (Watanabe et al., 2018; Ferreira et al., 2020). In the digitalization era, the government of West Kalimantan Province may adopt such actions as well. The establishment of internet infrastructure in rural areas should be accelerated. The purpose is for information on economic activity sources in agriculture, fishery, and forestry to be widely disseminated so that people in rural areas may access larger market opportunities.

Unemployment on poverty

Individuals continue to improve their capacity to get a job. However, the current job opportunities cannot accommodate a large number of workers. Like the rest of the world, West Kalimantan is experiencing rapid population growth. The estimation results of the unemployment variable show a value of 0.100092. It indicates that a 0.10% increase in the poverty rate will result in a 1% increase in unemployment. The findings

of this study are also supported by Puspita (2015) and reinforced by Prasetyoningrum & Sukmawati (2018), who stated that the unemployment variable strongly drives a significant increase in the poverty rate.

Kiaušienė (2015) attempted to examine it from a gender perspective. She researched the female unemployment rate, and it was shown that unemployed women in the European Union had a greater risk of poverty than unemployed men. In West Kalimantan, the women's unemployment rate climbed in 2018. It is consistent with the study's findings, which indicated that as unemployment rises, so will poverty. One explanation is that measures such as introducing new entrepreneurs have failed (Danson et al., 2021).

To address the problem of unemployment in West Kalimantan, an alternative is to make agriculture the prima donna sector, which will absorb new employees. The agriculture sector's contribution to West Kalimantan's GRDP has reached 22% of the total GRDP. However, this does not negate the importance of other sectors. According to LI et al. (2021), working outside the agriculture sector can help to alleviate poverty in rural areas.

Furthermore, the practice of granting unemployment benefits during the Covid-19 pandemic has to be reviewed. According to Martins (2021), after providing benefits was implemented during the pandemic, the unemployment rate increased by 10%. Therefore, initiatives to provide job opportunities in both urban and rural areas must be prioritized. Income tax regulations must also be reconsidered because the poor are typically in debt and unable to pay the tax; thus, it is worsening poverty circumstances (Pac et al., 2020).

Population density on poverty

Based on the estimation results, the population density variable has a value of -0.149837. It indicates that if the percentage of the people living in poverty falls by 0.149 percent, the population density climbs by 1 person/km^2. It is necessary to develop policies to increase population density in an area. It is doable since West Kalimantan covers 7.53% of Indonesia's total land area and has a comparatively small population of about 5 million people (Badan Pusat Statistik Provinsi Kalimantan Barat, 2020). Such a vast area has unexplored social, economic, and cultural potential. It will be valuable if it is managed to its full capacity. Local transmigration programs, for example, might be considered to adopt by the government. People in areas with high population density, such as Pontianak City and Singkawang City, might be urged to move to less populated areas like Kapuas Hulu Regency, Ketapang Regency, and Melawi Regency.

However, it should be recognized that the local transmigration program does more than simply relocate people from one place to another. It should be complemented by effective spatial planning policies for clear information on the new location and its economic potential. It is backed by the opinion of Želinský et al. (2021), which suggests that population density in an area might impact well-being if spatial planning is well-prepared. Another policy that can alleviate poverty, especially in urban areas, is to manage the flow of urbanization—especially urban residents who do not have skills and expertise because of their low education. Therefore, residents who move to cities must be aware of their presence and detect the quality of their resources. The aim is that stakeholders can stimulate appropriate policies to not become parasites in urban areas (Cobbinah et al., 2015).

Another alternative for alleviating poverty, particularly in urban areas, is to regulate the flow of urbanization. It should be focused more on the urban residents with lack skills and knowledge due to a lack of education. Therefore, the government should be aware of the presence of this type of resident and should assess their resources. The goal is to stimulate suitable policies so that these individuals do not become parasites in urban areas (Cobbinah et al., 2015).

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study found that variables, namely HDI, Economic Growth Rate, GRDP, Unemployment Rate, and Population Density, simultaneously affect the poverty rate in West Kalimantan Province. The partial test findings suggest that only GRDP, Unemployment Rate, and Population Density significantly influence. In contrast, HDI and Economic Growth Rate have no significant effect on the poverty rate. It is presumably because the policies have not been implemented following the findings presented in the study. Adopting appropriate policies is expected to help reduce poverty in the province directly bordering Malaysia, particularly in West Kalimantan.

Recommendations

Poverty reduction is a critical issue that must be addressed. Therefore, to reduce it in the province close to neighboring Malaysia, and in light of the findings of the study, the stakeholders should consider 1) the development of major infrastructures such as seaports, roadways, terminals, and airports must remain a priority so that movements across regions run smoothly, 2) good human resources capable of capitalizing on the potential of the village must be prepared, particularly through advocacy education, 3) GRDP of the regions must be continuously increased, 4) internet infrastructure in rural areas must be built so that the wider community can know the potential of the village, and 5) in addition to managing the flow of urbanization and regulation spatial planning in cities and villages, the agricultural sector, which contributes significantly to GRDP, should be encouraged as a prima donna sector, particularly for the millennial generation in West Kalimantan.

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African Continental Free Trade Area (AfCFTA) Agreement and the Mega-Regional Trade Agreements (MRTAs): what are the underlying challenges and prospects for Africa-South-South trade?

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Abstract

This study examines the possible challenges and prospects of the recent signing of the African Continental Free Trade Area (AfCFTA) Agreement on South-South trade. The recent ratification of the agreement by the African Union (AU) Heads of Government and the establishment of the mega-regional trade agreements (MRTAs) by the major global trading economies are the biggest since the establishment of the WTO. One of these regional and continental agreements' principal objectives is to further strengthen trade terms and balance of trade statistics between member nations. Whereas almost all the regional and continental blocs have to a large extent, achieved the purpose of their trade agreements, Africa stands out as the only region whose intra-trade value still constitutes less than 15% of global trade share. Many reasons have been adduced to be responsible for the weak trade performance, one of which is weak regional integration. This study, therefore, concludes that for Africa to achieve significant improvement in global trade, the region needs to encourage regional trade, which will act as a catalyst for transforming the domestic economies and lay a robust foundation for healthy regional competition and integration.

Keywords: *AfCFTA, MRTAs, Regional integration, Trade policy, South-South trade*

JEL Classification: F11, F13, F14, F19

INTRODUCTION

The signing into law of a new trade agreement – the African continental free trade area (AfCTA), by the African Union (AU) Heads of governments on March 21, 2018, signifies a new trade beginning and enhanced efforts at actualizing the much desired regional integration for the African continent. In the past couple of years, concerted efforts have been made (including the Lagos Plan of Action (LPA) and Abuja treaties of 1980 and 1991, respectively) towards actualizing the developmental goal of regional integration. However, these efforts have not paid off, perhaps due to internal structural rigidities, which many experts say have been a source of great concern to the continent. Most African countries have been victims of poor governance structures and weak productive capacities. These have led to poor policy frameworks boosting aggregate growth and development both in trade and welfare. According to development experts,

trade (domestic and foreign) and regional integration play important roles in global economic growth and development.

The principles of international trade theory suggest that countries seeking to maximize their wealth and welfare should engage in trade devoid of barriers with other trading partners. In addition, countries derive the most benefits from liberalizing their own trade regimes. Taking together the principles of trade liberalization among trading partners and the individual trade regime liberalization is an appropriate mechanism for countries wishing to reap from the gains of free trade. However, despite the associated gains from trade liberalization and regional integration, many African countries are still under the burden of low trade yields compared with those of other regions such as Asia, Latin America, and the Caribbean (Mishra, 2018). A look at the world trade network between 2016 and 2017 shows that global trade and its associated benefits are concentrated among the East Asian, Europe and North American regions, with a greater share of the trade being intra-regional (see fig 1)

Some of the factors identified by trade and development experts that lead to the abysmal trade performance in the African region include weak economic and industrial/trade policies, weak political and institutional structures, and fragile security architectures (see Chukwu, 2007; Mishra, 2018). Whereas some of these factors are debatable, which is incontrovertible is the issue of the quality of trade policies in place at both regional and continental levels. Over the years, the issue of trade policy among African trade experts has encouraged continental rather than regional trade, despite the challenges of unemployment, weak economic growth, poor infrastructure, and ill-equipped markets facing the continent.

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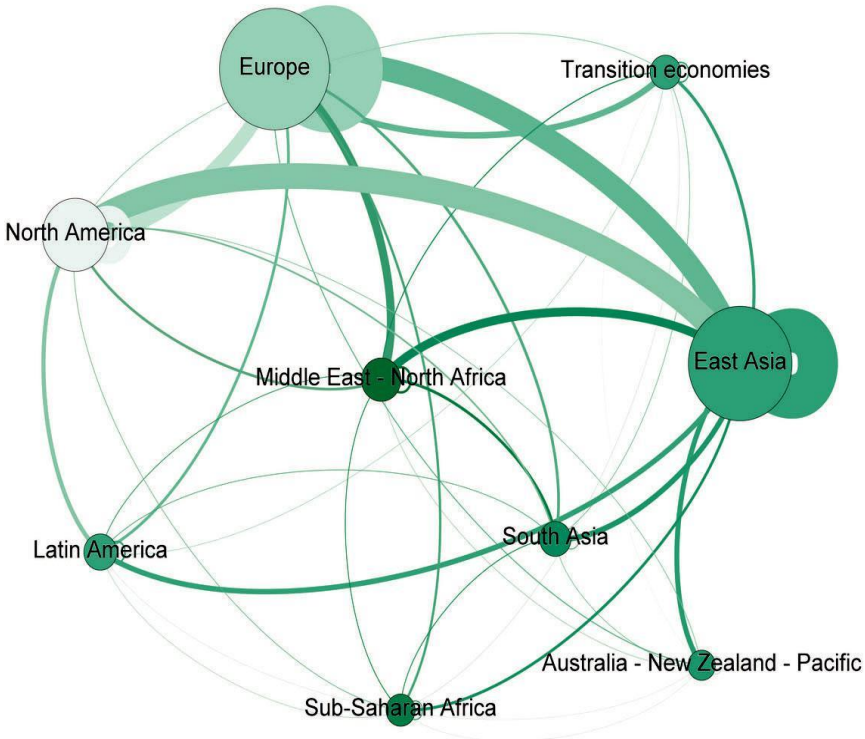


Source: UNCTAD, 2018

Figure 1. World trade network between 2016 and 2017

Notes: The width and colors of lines, size of the nodes reflect the magnitude of trade in 2017, percentage increase of trade value (2016-17), and total value

Although factor endowments in the African region are quite appreciable when compared with other regions of similar classification, trade and economic growth are constrained by deliberate domestic policies that encourage: (i) trade division rather than trade creation; (ii) rent-seeking and transfer of scarce resources to the development of sectors with low productivity; and (iii) the promotion of weak market structures rather than encourage competitive market environment. Whether the African region will reverse the trend of weak growth structure and weak competitive market environment depends on the successful implementation of the continental free trade area (CFTA) agreements and how the region is able to manage the recent buy-in of its major trading partners into one of the structural components of the MRTAs – the regional comprehensive economic partnership (RCEP). The objectives of this study are: (i) examine the possible effects of CFTA agreement in the context of Africa's regional integration efforts; and (ii) identify the underlying implications of the new trade arrangement on Africa-South-South trade in the context of the recent mega-regional trade agreements (MRTAs).

The rest of the paper is organized as follows: Section 2 examines Africa's trade performance and the macroeconomic environment. Section 3 reviews Africa's previous and present initiatives at promoting regional and continental integration. Section 4 looks at current trends in South-South merchandise trade and the potential impact on the AfCFTA. Section 5 examines the implications of the membership of Africa's major trading partners in the RCEP - a component of the mega-regional trade agreements (MRTAs) while section 6 concludes the study.

AFRICA'S TRADE PERFORMANCE AND MACROECONOMIC ENVIRONMENT

Africa's trade performance

A cursory observation of Africa's trade performance in the past decade shows that the region's share of global trade is weak compared with other regions such as Asia, Latin America, and Oceania. However, in recent times, available statistics show that Africa has been experiencing significant improvement in trade value to the rest of the world. According to recent trade statistics, Africa's share of trade to the rest of the world increased in value from US$226 from 1983 to 2014 by 42% to US$760 billion in current prices in the period 2015–2017 (see UNCTAD, 2019). The significant improvement in the value of trade is as a result of the transition from the export of agricultural commodities to export of mining and manufacturing products by the five main commodity exporters (The five main commodity exporters in the region include: South Africa, Nigeria, Morocco, Algeria, and Angola). A look at Africa's recent merchandise exports shows that the region's annual export growth rate stands at 14.7%, with a lower import of 11.6%. Although these growth rates are very encouraging compared with other developing regions, the share of trade as a percentage of world output is extremely low with 3% (see Table 1). A look at the intra-trade structure for Africa, shows that intra merchandise exports are also low compared with other regions. A study by Parshotam (2018) revealed that Africa's total intra-trade basket averaged 12-14% due to the region's continuous reliance on the production of raw materials and the levels of development of the industrial sector.

Table 1. Leading exporters and importers by a group of developing economies, 2018

	Exports (Ranked by value)			Imports (Ranked by value)		
	Value (Billions of US$)	Share in world total (%)	Annual growth rate (%)	Value (Billions of US$)	Share in world total (%)	Annual growth rate (%)
South Africa	94	0.48	5.6	(e) 114	(e) 0.57	(e) 12.1
Nigeria	61	0.31	36.2	72	0.36	16.8
Algeria	41	0.21	17.0	51	0.26	14.7
Angola	41	0.21	17.8	46	0.23	0.3
Morocco	29	0.15	13.2	43	0.22	37.5
Developing Africa	484	2.49	14.7	576	2.91	11.6
Mexico	451	2.32	10.1	477	2.41	10.3
Brazil	240	1.23	10.2	189	0.95	19.7
Chile	75	0.39	9.6	75	0.38	14.9
Argentina	62	0.32	5.1	65	0.33	-2.2
Peru	49	0.25	8.0	51	0.26	11.2
Developing America	1086	5.58	9.2	1123	5.67	10.6
China	2487	12.78	9.9	2136	10.79	15.8
Korea Republic	605	3.11	5.4	627	3.17	6.4
China, Hong Kong SAR	568	2.92	3.4	535	2.70	11.9
Singapore	413	2.12	10.6	514	2.60	14.3
China, Taiwan province	336	1.73	5.9	371	1.87	13.1
Developing Asia and Oceania	7087	36.43	9.8	6623	33.46	11.0

Source: UNCTAD Handbook, 2019. *(e) estimate

Notes: A 10-year spread of global merchandise trade exports (by regions and some regional trading blocs) are shown in appendices 3 and 4, respectively

According to the study, "approximately 26% of African countries rely on one or two resource commodities for at least 75% of their exports, while 60% rely on a maximum of five commodities" (p.5). However, a United Nations Conference on Trade and Development (UNCTAD, 2019) report shows that between 2015 and 2017, intra-African exports, as a percentage of world exports, stood at 17%. It is compared to 68% recorded for Europe, 59% for Asia, 55% for America and 7% for Oceania in the same period. Similarly, a look at intra-regional economic community (intra-REC) trade in Africa shows that while there's a deeper level of regional integration, the intra-regional trade area (intra-RTA) average trade share of the region's main economic blocs is lower when compared with the other major RTAs (see WTO, 2018 and UNCTAD, 2019).

For instance, while average Africa's intra RTA trade in 2016 was 11.2%, the Association of South-East Asian Nations (ASEAN), North American Free Trade Agreement (NAFTA), and European Union (EU) were 24, 50, and 64%, respectively. An analysis of the intra-regional trade performance of the economic blocs, 2018, shows that among the eight regional blocs, preferential access is topmost for East African Community (EAC), Economic Community of Central African States (ECCAS), Southern African Development Community (SADC), and Common Market for Eastern and Southern Africa (COMESA) as they enjoy lower tariff structure on the export of agriculture and industrial commodities. However, among the eight regional blocs, the Economic Community of West African States (ECOWAS) and Arab Maghreb Union (AMU) are the least as they do not have preferential access to many African Regional Economic Communities (RECs). Recent trade statistics (UNCTAD, 2019) show that while exporters from the EAC bloc enjoy greater preferential access to African markets, a lower tariffs structure is about 8.9 percentage points lower than the tariffs faced by exporters from other countries regional blocs (in all products). It is followed by SADC

(7.8), COMESA (6.8), and IGAD (6.7). Exporters from EAC pay average tariffs as high as 2.5 percent in AMU and ECOWAS markets (see Table 2).

Table 2. Trade preference matrix, 2016 (percent)

Importer	Exporter									
	EU	Africa	AMU	CEN-SAD	COMESA	EAC	ECCAS	ECOWAS	IGAD	SADC
Africa	2.9	6.2	-0.5	3.8	6.8	8.9	3.7	4.9	6.7	7.8
AMU	4.2	5.0	7.7	7.2	5.0	-2.0	-0.5	-0.1	1.1	-2.6
CEN-SAD	4.7	3.7	0.6	5.6	1.7	4.5	0.9	8.2	-1.8	0.3
COMESA	-1.8	7.4	4.2	5.7	8.6	10.0	5.6	-4.1	8.9	7.7
EAC	-0.5	7.7	-2.3	8.7	11.1	12.8	7.4	-5.2	12.0	5.9
ECCAS	1.3	4.9	-3.2	4.8	10.9	13.8	5.2	-1.4	13.4	2.2
ECOWAS	-0.3	2.9	-2.3	4.9	-2.7	-3.0	-1.9	7.6	-3.3	-1.2
IGAD	5.8	5.4	-2.8	9.8	11.9	12.7	9.4	-5.0	11.7	2.6
SADC	3.5	6.0	-5.0	-1.7	4.9	4.7	3.6	-2.9	1.8	7.7

Source: UNCTAD (2019)

Notes: Positive figures in the table indicate high preferential access in the African market due to a lower tariff structure.

Intra-regional trade preferential access is higher between EAC and ECCAS and between EAC and IGAD. However, AMU and ECOWAS are regional blocs that do not prefer many other African RECs. The high performance of these regional blocs, especially those of EAC and SADC, might be attributed to the improvement in the mining and manufacturing sectors. The high performance of these regional blocs, especially those of EAC and SADC, might be attributed to the improvement in the mining and manufacturing sectors.

An assessment of Africa's trade similarity and complementary index also presents the key products market indicators (see Table 3). Whereas there is a significant increase in developing countries' similarity index from 0.72 in 1995 to 0.81 in 2013, Africa's performance index fell below Latin America, European Union (EU), and South Asian averages.

Table 3. Trade complementarity and similarity indexes, 1995-2013

	Complementarity					Similarity				
Indicator/year	**1995**	**2000**	**2010**	**2012**	**2013**	**1995**	**2000**	**2010**	**2012**	**2013**
Developing economies	0.72	0.74	0.79	0.80	0.80	0.72	0.74	0.79	0.80	0.81
Developed economies	0.87	0.86	0.81	0.81	0.81	0.88	0.87	0.82	0.81	0.81
Africa	0.42	0.39	0.44	0.46	0.46	0.41	0.38	0.44	0.46	0.47
Eastern Africa	0.28	0.28	0.31	0.34	0.34	0.28	0.28	0.31	0.34	0.34
Middle Africa	0.15	0.15	0.18	0.19	0.19	0.16	0.16	0.19	0.19	0.19
Northern Africa	0.29	0.28	0.35	0.37	0.38	0.29	0.28	0.35	0.38	0.39
Southern Africa	0.49	0.45	0.43	0.41	0.42	0.48	0.45	0.44	0.41	0.42
Western Africa	0.21	0.21	0.26	0.29	0.30	0.20	0.22	0.27	0.29	0.31
SSA	0.42	0.39	0.41	0.42	0.42	0.41	0.39	0.41	0.43	0.43
South America	0.50	0.49	0.49	0.51	0.50	0.49	0.49	0.49	0.51	0.50
Eastern Asia	0.60	0.62	0.61	0.60	0.60	0.62	0.62	0.60	0.60	0.60
EU28	0.83	0.82	0.77	0.77	0.78	0.84	0.83	0.78	0.77	0.78

*Source: Verter (2017).

Notes: Trade similarity and complementary index range from 0-1 percent. Any of the values above 0.5 percent signifies a high index

Similarly, Africa's trade complementarity index (TCI) also presents a similar weakness compared to other regions. The poor performance of Africa, judging from these two indexes, demonstrates a lack of depth in the region's markets and a glaring weakness in intraregional cooperation. However, within the region's assessment, Southern Africa performed far better in the two indexes than the other regions,

indicating that the region is making more frantic efforts in matching their export compositions with the import structures of other member communities.

Africa's macroeconomic constraints and global shocks

According to UNCTAD (2018), one of the major growing concerns for most developing countries is the issue of the ongoing trade tension between the United States of America and China. Going by the current tension in global trade, the further confrontation between these two superpowers will further create more negative shocks to the commodities and financial markets, thus leading to another round of global economic crisis. As stated by the UNCTAD report, "trade frictions weigh on global growth as they impose adjustment costs on international firms which would reflect upon investment decisions, profitability, and productivity. In addition, the increase in uncertainty about commitments to trade rules adds to the risk of investing abroad" (p.2). These will certainly create more negative economic consequences on fragile economies, especially low-income countries that are more susceptible to unfavorable global shocks.

Apart from the apparent negative shocks to low-income countries and Africa in particular, another growing macroeconomic concern is the issue of nominal exchange rates depreciation/appreciation and stagflation. According to development economics literature, the nominal exchange rate is the benchmark for determining global competitiveness. While some other factors might also affect the level of market competitiveness, the current trade 'war' has been the major factor that contributes to the depreciation of the Chinese's Renminbi, and at the same time, contributing to the appreciation of the United States' Dollar (UNCTAD, 2018). Growth studies posit a strong correlation between different currency markets (see Fedorova and Saleem, 2009; Lee, 2009; Ke, Wang, and Murray, 2010). An adjustment in one dominant currency automatically affects the others, thus leading to high currency volatility in the currency markets of many economies.

According to UNCTAD (2018), "the trade confrontations between the United States and China have already weighed on currency markets by increasing the volatility and downward pressure for many currencies, especially in the riskier emerging markets." A cursory analysis of the African financial, commodity, and currency markets shows that the trade tension's impact is huge on the region. Over 80% of African economies are major trading partners with the Asian 'Tigers' and the United States of America. However, the trade war between China and the United States of America has caused most economies in Africa to face acute foreign exchange shortages in their currency markets. Although Africa's share of global trade is very insignificant (about 3%), the escalation of the trade tension will have a second and third-tier effect on the region's trade and aggregate growth structure.

Currently, Africa's global trade is structured asymmetrically, with exports of primary commodities on one hand and imports of capital goods on the other. According to Prempeh (2006) and Barratt Brown (2007), Africa is characterized by unfair trade relations with trading partners with fewer exports and more imports. Presently, over 75% of Africa's exports are on primary commodities, even when studies have shown that primary commodities are characterized by low productivity, low wages, and high price volatility (see Gupta, 1993). With high commodity volatility and huge import dependence, Africa's revenue profile and growth architecture are tailored towards the constant negative trend. Another great constraint to the African macroeconomic

environment is the issue of stagflation which many economic and trade experts say affects trade output negatively.

One factor that has been identified as leading to stagflation in theoretical and empirical constructs is the structure of tariff a country imposes on its trade components. Empirical studies show that a high tariff regime discourages domestic and foreign trade, increases inflationary pressure, and reduces trade earnings and labor productivity (Madsen, 2001; Kim and Beladi, 2005; and Opp, 2010). According to UNCTAD key statistics report (2018:2), "tariffs can contribute to stagnation as they can reduce efficiency due to the frictions they create while increasing inflationary pressure because some of their costs will be inevitably passed down to consumers…while moderately higher inflation is generally not a problem if it is as a result of economic growth, the periods of stagflation often results in job losses and rising unemployment". A look at Africa's current inflationary and unemployment trends present some worrisome dimension as the entire region has continued to experience rising unemployment and inflation rates.

Apart from the CFA franc countries that enjoy lower inflation rates of about 2%, perhaps as a result of their currency is tied to the European Monetary Union (EMU), some regions, such as the East Africa Countries and some oil-exporting countries, experienced higher inflation rates averaging above 10%. A look at Africa's average inflation rates shows that it spiked from 6.7% in 2013 to 7.4% in 2015 and to 12.5% in 2017 before dropping to 9.2% in 2019 (IMF, 2020). Similarly, unemployment rate seems to follow the same trend with inflation. Although the trend of unemployment was slower as compared to inflation, average unemployment rate in the last 5 years was consistently on a rising trend. A look at the average unemployment rate in the Sub-Saharan region in the period 2014 -2019 shows that the rate increased by over 7% (World Bank, 2020).

The rising trend in unemployment (especially youth unemployment) is worrisome given the region's high population and low economic growth. Recent African Economic Outlook report (AEO, 2020) stated that given an estimated 226 million youth unemployment in 2015, the figure is projected to increase by over 42%, to 321 million by 2030. Many studies have expressed concern about the inherent danger of rising inflation and unemployment in the mix of weak output growth. According to Ademola and Badiru (2016) and Mohseni and Jouzaryan (2016), rising inflation and unemployment rates decrease economic growth in the long run. Accessing the effect of inflation and unemployment on the economy, Brunner, Cukierman, and Meltzer (1980); Ghosh and Ghosh (2013); and Rogers (2013) showed that there's a great difficulty in tackling economic stagnation in the period of rising inflation and unemployment regimes. An analysis of the African economic and trade indicators shows that the region is burdened by low output growth, high commodity prices, and high tariff regimes (see Tables 4 and 5). Many studies have found a positive correlation between low output and high tariffs.

Table 4. Growth of world output 2016–2020

	Annual percentage change						
	2016	2017	2018	2019	2020[a]	2018	2019
World	2.5	3.1	3.1	3.0	3.0	0.1	0.0
Developed economies	1.7	2.2	2.2	2.1	1.9	0.2	0.2
Economies in transition	0.4	2.0	2.1	2.0	2.6	-0.2	-0.4
Africa	1.6	3.4	3.2	3.2	3.7	-0.3	-0.3
North Africa	2.9	5.3	3.7	3.4	3.5	-0.4	-0.7
East Africa	5.5	6.1	6.2	6.4	6.5	0.4	0.2
Central Africa	-0.5	-0.2	2.2	2.5	3.8	0.1	0.0
West Africa	0.2	2.4	3.2	3.4	3.8	-0.1	0.0
Southern Africa	0.3	1.5	1.2	2.1	2.6	-1.1	-0.4
East and South Asia	6.1	6.1	5.8	5.5	5.6	0.0	-0.4
East Asia	5.7	6.1	5.8	5.6	5.5	0.1	0.0
China	6.7	6.9	6.6	6.3	6.2	0.1	0.0
South Asia	8.0	6.1	5.6	5.4	5.9	-0.9	-1.6
India[b]	7.1	6.7	7.4	7.6	7.4	0.2	0.2
Western Asia	3.1	2.5	3.0	2.4	3.4	0.7	-0.3
Latin America and the Caribbean	-1.3	1.0	1.0	1.7	2.3	-1.0	-0.8
South America	-2.9	0.5	0.4	1.4	2.3	-1.4	-1.0
Brazil	-3.5	1.0	1.4	2.1	2.5	-0.6	-0.4
Mexico and Central America	3.1	2.4	2.4	2.5	2.3	-0.2	-0.1
Caribbean	-0.7	-0.4	1.9	2.0	2.0	0.1	0.0
Least developed countries	3.6	4.6	5.0	5.0	5.7	-0.4	-0.5
Memorandum items							
World trade	2.5	5.3	3.8	3.7	3.9	0.3	0.1
World output growth with PPP weights[d]	3.2	3.7	3.7	3.6	3.7	0.0	-0.1

Source: World Economic Situation Prospect (WESP, 2019). (a) Forecast, based in part on Project LINK; (b) Fiscal year basis; (c) Includes goods and services; and (d) Based on 2012 benchmark.

The study by Madsen (2001) finds that global output contracted by 14% due to the increase in world tariff. A look at the regional tariff structure in 2017 shows that among all the regions classified as developing economies, Africa's intraregional tariffs on exports are relatively the highest, except in South Asia (see Table 5). However, while intraregional tariff is high in Africa, the extra-regional tariff is lower, indicating that the degree of trade restrictiveness is higher in the region. While other regions such as the Transition and Latin American countries operate lower tariff regimes, Africa is burdened with a high tariff structure that has negatively affected trade values. Although the increase in tariff by most African countries is driven by the quest for an increase in revenue and protection of infant industries, the overall objective is not achieved due to trade restrictions (tax escalation) imposed by Africa's main trading partners (Verter, 2017).

Table 5. Tariff restrictiveness matrix for developing regions, 2017 (percentage)

Importing regions	Developed Countries	East Asia	Latin America	South Asia	Sub-Saharan Africa	Transition Economies	West Asia & North Africa
Developed Countries	1.6 -0.5	2.6 0.2	1.2 0.3	2.1 -0.8	0.4 -0.1	1.7 0.8	0.6 0.0
East Asia	4.9 -1.0	2.7 -0.7	5.4 -0.2	3.2 -0.9	1.7 -0.2	3.8 1.2	1.8 -0.3
Latin America	3.8 -0.3	8.0 -1.0	1.1 -0.6	10.9 -1.5	1.9 -0.7	2.0 0.4	2.9 -0.5
South Asia	10.7 0.6	10.4 -0.3	17.8 -2.0	6.8 -1.1	5.7 -1.1	8.1 0.8	9.2 -1.7
Sub-Saharan Africa	7.4 -0.7	11.6 -0.2	9.0 0.4	8.3 0.7	3.1 -0.8	8.6 2.1	5.4 0.0
Transition Economies	3.4 -2.9	1.9 -5.7	2.0 -8.4	4.0 -6.1	0.6 -2.2	0.4 0.3	4.7 -2.6
West Asia & North Africa	3.2 -0.9	5.5 -0.4	6.4 -0.8	4.0 0.3	2.6 0.0	8.7 4.7	1.9 -0.1

Source: UNCTAD (2018). Changes between 2008 and 2017 are shown in a smaller font

Granted, there has been a gradual reduction in tariffs and other market access instruments since after the 2001 Doha Round Submit, by almost all African countries, high trade tariffs persist along the value chains of most processed commodities of the regional blocs. Another possible constraint that has been identified that impedes the growth of trade and Africa's macroeconomic environment is the issue of sanitary and phytosanitary (SPS). The underlining principles of SPS suggest that exporting nations should adhere strictly to safety standards as stipulated by importing nations. Over the years, many LDCs (including Africa) have had their products rejected by importing countries at different ports of entry due to failure to meet set standards. For instance, in 2015, the European Union (EU) banned all processed goods from Nigeria for one year for failing to meet set standards (Verter, 2017).

Many African countries lack the requisite knowledge, expertise, and tools for setting standards and enforcing compliance. Although many African countries are seriously trying to improve these gaps through development in socio-economic structures, the overall outcome is yet to stimulate trade and aggregate demand for commodities. Lastly, the issue of domestic support and export subsidies on products by Africa's major trading partners is another great concern to Africa's macroeconomic environment and trade growth. Received literature shows that most of Africa's trading partners still provide domestic support and export subsidies to most of their farmers, infant, and as well as developed industries (see Lee, Hoffman and Cramer, 2003 and Dimaranan, Hertel and Keeney, 2004). Domestic supports to farmers and small and medium scale enterprises (SMEs), provides advanced technologies and large economies of scale to would-be producers.

Verter (2017) observed that under the Common Agricultural Policy (CAP), around 58 billion euros or 40% of the European Union's total budget were earmarked for CAP in 2014. This huge amount of resources earmarked for the protection and support of infant industries puts these industries far ahead of their African counterparts, whose economies cannot boost of such funds. The lack of intervention funds makes African products more expensive and less competitive. In China, the country operates a trade policy framework where governments provide export incentives to producers wishing to export their products to any part of the world. Unlike in Africa, where there are few export incentives to producers, the shipping cost of freights in China is directly borne by the government, thus reducing production costs. The lack of domestic supports for African producers and farmers creates huge trade gaps for the region.

SOME OF AFRICA'S PREVIOUS INITIATIVES AT ENHANCING REGIONAL AND CONTINENTAL TRADE

Received studies showed that over the years, the AU had established many initiatives to foster regional integration and enhance competitiveness in global trade. Some of these initiatives as highlighted in Mishra (2018) include: the establishment of the New Partnership for African Development (NEPAD); (ii) the African Free Trade zone (AFTZ); (iii) the Minimum Integration Programme; (iv) Boosting Intra-African Trade; and (v) the Tripartite Free Trade Area (TFTA) agreement. These initiatives are briefly discussed below.

1. The New Partnership for African Development (NEPAD): This initiative was established by the AU in 2002, with the sole aim of integrating a holistic socio-economic development strategy among member nations. It also aimed to halt the overreliance of most African economies on foreign aid and replace it with an effective framework that would strengthen domestic trade.

2. The African Free Trade Zone (AFTZ): The establishment of the African Free Trade zone (AFTZ) was heralded by the AU as a new trade arrangement in fostering 'regionalism' among the African countries. The foremost AFTZ, was announced at the EAC-SADC-COMESA Summit in October 2000. However, in 2012, other regional blocs such as the ECOWAS, ECCAS, and AMU, were integrated into the already established structure to operationalize the AFTZ agenda of the AU fully. The full commencement of operation of the AFTZ in 2018 marked the beginning of Africa's journey towards regional and continental integration.
3. Minimum Integration Programme (MIP): In 2009, a mechanism for convergence known as MIP was signed into law by a special committee of the AU and the RECs. The purpose was to see to the identification of projects both at regional and continental levels and see to their quick implementation. While the job of the RECs was expected to work at a wavering pace on all the activities of MIP, the RECs are also required by their briefs to identify priority projects/programs and see to their full implementation.
4. Boosting Intra-African Trade (BITA): In 2012, the African Union (AU) Heads of state and government organized a summit on the theme: "Boosting Intra-African Trade". The essence of the summit was to provide a framework for the deepening of Africa's domestic markets to significantly increase intra-African trade volume from an average of 12 to 25 percent. In order to achieve this objective, seven priority clusters were set up, and they include: trade policy, trade facilitation, productive capacity, trade-related infrastructure, trade finance, trade information, and factor market integration.
5. Tripartite Free Trade Area (TFTA): Africa's journey towards attaining regional and continental integration was achieved at Egypt's COMESA-EAC-SADC meeting of 2015. At the meeting, a resolution was reached by the Heads of Governments of these economic blocs to launch a Tripartite Free Trade Area (TFTA) to take care of the interest of the over 600 million customers of the region. According to Mishra (2018), the launch of TFTA "demonstrated the possibility of a collective action among several heterogeneous nations and showcased the feasibility of harmonizing three different preferential trade regimes into one unified scheme" (p.12).

The AfCFTA agreement and the underlying benefits to Africa

The signing into law of the AfCFTA agreement by the AU Heads of government heralds a new beginning. It provides a vaster of opportunities for growth and development for the continent. The CFTA agreement is aimed at achieving the following main objectives: (i) create a single continental market for goods and services, with free movement of business persons and investments, and thus pave the way for accelerating the establishment of the Continental Customs Union and the African customs union; (ii) expand intra-African trade through better harmonization and coordination of trade liberalization and facilitation regimes and instruments across Regional Economic Communities (RECs) and across Africa in general; (iii) resolve the challenges of multiple and overlapping memberships and expedite the regional and continental integration processes; and (iv) enhance competitiveness at the industry and enterprise levels through exploiting opportunities for scale production, continental market access and better reallocation of resources (AU, 2019).

Given that the CFTA agreement is yet to be fully operational, many studies have projected that the agreement's impact on Africa's trade growth is huge. Going by the projections of the AU, the CFTA is expected to, among other things, increase online retail trade by over US$75 billion annually by 2025, increase intra-trade by 52% and

decrease Africa's trade with the rest of the world by 51% if all forms of tariffs are eliminated. The study by McKinsey Global Institute (2016), estimates that with the establishment of the CFTA, Africa's share of manufactured output is projected to increase by over 86% from $500 billion in 2016 to $930 billion in 2025. Although Africa's exports are projected to decline significantly with other regions, 'intraregional trade is expected to lead to the much-desired industrialization of the continent' (p.19).

The study by Shingal and Mendez-Parra (2020) projected that when the AfCFTA is fully implemented, the stock of intra-African Greenfield investment will increase by 14%. United Nations Economic Commission for Africa (UNECA, 2018) report highlights possible areas of benefit to the African region once the CFTA agreement is fully implemented. The report posits that the CFTA will improve trade-related infrastructure, reduce import duties and transit costs, and lead to a more than 50% increase in intra-African exports by 2022, from the 2010 levels. The UNECA study further stated that, apart from structural transformation and increased labor productivity in industrial and services sectors, trade statistics are expected to double up on the removal of non-tariff barriers by as much as US$ 40.6 billion (or 39.9%).

Similarly, UNCTAD's (2019) report on Africa shows that the region stands to benefit immensely from the CFTA agreement when it is fully implemented. Some areas of possible benefits as highlighted in the UNCTAD report include: (i)increased competitiveness of firms and boosting of intra-African trade and investment; (ii) improved business and investment climate that attracts foreign direct investment and fosters linkages between foreign and local firms; (iii) economic growth and structural transformation; (iv) participation of small and medium-sized enterprises in regional and global value chains; (v) development of agriculture and agribusiness and implications for rural development; (vi) unleashed the potential of the services sector; and informal cross-border trade, gender implications, and reduced illicit trade.

The study by Parshotam (2018) posits that the establishment of the AfCFTA will stimulate total African exports by 4 percent ($25.3 billion) and result in an overall 52% ($34.6 billion) increase in intra-African trade when compared to the baseline figure (no trade reforms in 2022). Furthermore, the study stated that with sectoral expansions in agriculture and agro-processing, industry, and services, overall trade is expected to increase by 53% between 2010 and 2022. The report further stressed that the full implementation of the CFTA agreement would improve the region's cross-border movements in investments, goods, and services and increase interconnectivity. Apart from these projected increases in volumes and values of trade due to the implementation of the CFTA agreement, there will also be static and dynamic gains to member nations.

While static gains lead to increases in economic welfare in the short-run, dynamic gains which arise from competitive pressures from member nations lead to productivity benefits in the long run. Other associated benefits of the full implementation of the AfCFTA agreement include: (i) improved business and investment environment that attracts foreign direct investment (FDI) and fosters linkages between foreign and domestic firms; (ii) participation of small and medium-scale enterprises (SMEs) in regional and global value chains; and (iii) improvement in aggregate growth and structural transformation (see UNCTAD, 2019). However, some quarters have caveats on the signing into law of the AfCFTA agreement (see Kohnert, 2018 and Signe and Van der Ven, 2019). These studies argue that the ~~ACFTA~~ agreement might not solve the intra-trade challenges in the region until all aspects of the Phase (1 and 2) agreements are fully negotiated. Going by this observation, it is very clear that the success of the new trade agreement will be accessed by the number of participating

countries and the commitment and willingness of all participating countries to fully implement the stages of the agreement. In summary, it is very evident that the rectification of the CFTA agreement will boost intraregional integration and boost industrial growth, inter-sectoral linkages and facilitate infrastructural development that would eventually lead to improvement in intra-trade relations among member nations.

The AU Continental Integration Agenda

The signing into law of the CFTA agreement follows the establishment of the Tripartite Free Trade Area (TFTA), a free trade area between COMESA, SADC, and the EAC. Establishing these RECs aims "to bridge regional divisions by building on the TFTA's regional industrial development policies, strengthening trade among the various RECs and incorporating all African economic blocs under standardized rules and regulations" (Parshotam, 2018:7). Of the 18 preferential trade agreements establishing the various African RECs, eight are recognized by the AU as 'building blocks' for the African Economic Community (AEC). The eight AECs include: Community of Sahel-Saharan States (CEN-SAD), Common Market for Eastern and Southern Africa (COMESA), East African Community (EAC), Economic Community of Central African States (ECCAS), Economic Community of West African States (ECOWAS), Intergovernmental Authority on Development (IGAD), Southern African Development Community (SADC) and Arab Maghreb Union (UMA). See Fig.2 for a web of intra-African trade agreements, including the eight RECs, and four sub-regional groupings.

In order to achieve the objective of integrating all the economic blocs, the AU established a six-phased timeline covering a 34-year period (see Table 6) and set up five key regional integration indicators to measure the performance of these economic blocs.

Table 6. The AU continental integration agenda

Phase	Timeline	Action Plan
PHASE 1	5 years	Strengthen existing RECs and create new RECs in regions where they do not exist.
PHASE 2	8 years	Ensure consolidation within each REC, focusing on liberalizing tariffs, removing non-tariff barriers, etc.
PHASE 3	10 years	Establish in each REC and FTA and customs union (with a common external tariff and single territory)
PHASE 4	2 years	Coordinate and harmonize tariff and non-tariff systems of RECs to establish a continental customs union
PHASE 5	4 years	Establish an African common market
PHASE 6	5 years	Establish the AEC, including an African Monetary Union and a Pan-African Parliament

Source: SAIIA (2018)

The 2016 African regional integration index is shown in Table 7. In the trade integration index, the statistics show a high movement of trade in almost all the RECs, except CEN-SAD and ECOWAS. According to trade theories, when trade moves freely and at faster rates, the cost of doing business becomes cheaper, thus benefiting both producers and consumers. In the case of regional infrastructure, statistics show that other blocs are still lagging behind apart from EAC and IGAD that performed creditably well in terms of infrastructural development.

Table 7. African Regional Integration Index, 2016

Regional Economic Community	Trade Integration	Regional Infrastructure	Productive Integration	Free Movement of People	Financial Macroeconomic Integration
CEN-SAD	0.35	0.25	0.24	0.48	0.52
COMESA	0.57	0.44	0.45	0.27	0.34
EAC	0.78	0.50	0.55	0.72	0.16
ECCAS	0.53	0.45	029	0.40	0.60
ECOWAS	0.44	0.43	0.26	0.80	0.61
IGAD	0.51	0.63	0.43	0.45	0.22
SADEC	0.51	0.50	0.35	0.53	0.40
UMA	0.63	0.49	0.48	0.49	0.20
Average of Eight RECs	0.54	0.46	0.38	0.52	0.38

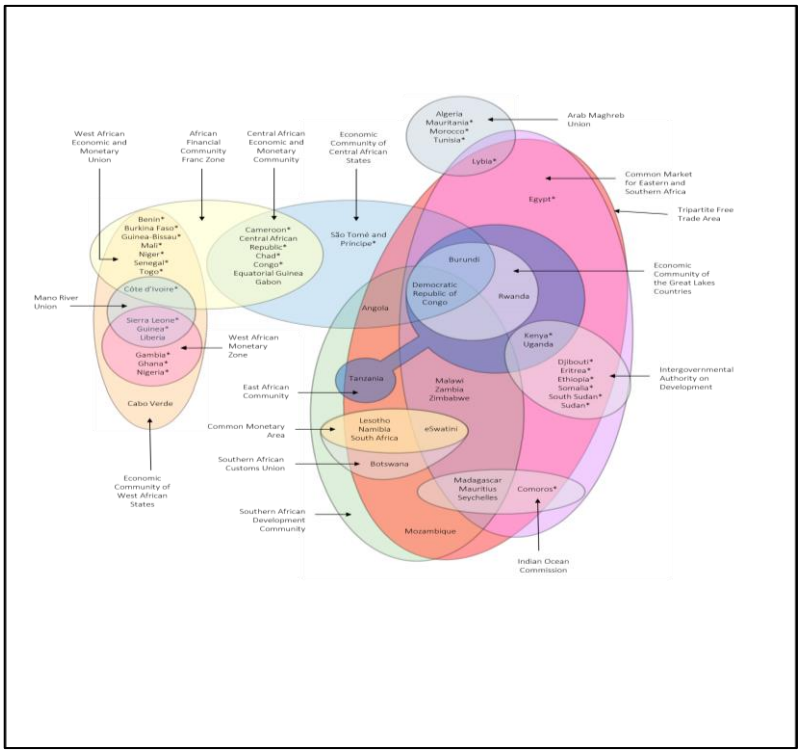
Source: Africa Regional Integration Index Report, (2016)

Evidence has shown that countries with quality road networks, communication, and airports tend to have low business costs. ECOWAS, ECCAS, and CEN-SAD scored highest in the financial and macroeconomic dimensions. This result indicates the free flow of capital, the lower transaction cost of doing business, and the higher efficiency of the financial institutions within these three RECs. In the case of the free movement of people dimension, statistics show that ECOWAS and EAC are the only blocs with freer cross-border movement, while COMESA is the least. Although the overall performance of ECA and SADEC blocs are relatively better than other blocs in all dimensions, the index for ease of doing business (financial and macroeconomic integration) for these two blocs is weak.

SOUTH-SOUTH MERCHANDISE EXPORT TRADE AND POTENTIAL IMPACT ON AFCFTA

Since 1990, a number of preferential trade agreements (PTAs) have been signed by South-South countries to boost trade, economic growth, and interregional integration. Between the initial times of signing the agreements to date, more than 267 PTAs have been signed by participating regions, of which Africa is one. A look at the impact of these agreements on South-South trade statistics shows that these PTAs have greatly improved trade between member regions due to strict adherence and implementation of the various trade agreements (Notes: See appendices 5(i), 5(ii), and 5(iii) for annual intra-trade and extra-trade of economies, regional trading blocs, and country groups by-product). Although some of the participating regions have benefited more than the others from the signing of the PTAs, perhaps as a result of further improvement in market access, technology, and infrastructure, the overall economic synergy between these regions can be gauged from the recent robust trade outcomes.

For instance, in the last decade, Africa's merchandise export to Asia and Oceania increased from US$ 113billion to US$161billion in 2018. Similarly, export from these regions to Africa also improved significantly by over 54%, from US$162billion to US$249billion within the same period. However, the case of Africa and Latin America is a little different as trade between these two regions is on the decline.



Source: Adopted from Economic Integration in Africa (www.afdb.org)
Figure 2. Regional Trade Arrangements (RTAs) in Africa, 2019

Although the percentage reduction in trade between the two regions stands at 0.5 and 15%, respectively, the trade value from Latin America to Africa is higher within the same period (see Table 8). The improvement in trade between Africa and Asia, most especially, is principally due to the robust trade relationship between Africa, China, and India. A look at the Africa-China-India relationship shows that trade inflows and outflows have almost doubled in the space of 5years. Available statistics from UNCTAD report (2019) shows that the value of Africa's export to China and India in 2018 stands at US$54 billion and US$37 billion, respectively. An analysis of regional trade specialization pattern shows that while about three-quarters of Africa's exports are mainly on primary commodities (ores, metals, precious stones, and non-monetary gold, food items, and fuels), Asia and Latin America/Oceania export commodities are mainly on manufactures.

Available statistics show that in 2018, over 42% of Africa's exports to its main trading partners were in the commercial services (fuels). Conversely, a close look at Africa's import structure shows that manufacturing imports from its trading partners are three times higher than manufacturing exports. Although a significant trade imbalance exists between Africa and its trading partners, this is counterbalanced by Africa's primary exports in precious metals, non-monetary gold, and fuels (Notes: see appendix 2(i), 2(ii) and 2(iii) for export by product group, origin and destination (2018).). Available statistics in 2018 show that while total manufacture export from Asia and Oceania to Africa stood at US$183,012 million, that of Africa was US$16,809 million.

However, a look at Africa's primary exports to Asia and Oceania shows a trend reversal. Whereas the value of Africa's export of these commodities to the two regions stood at US$43,690million, export from the region to Africa was US$5,526million (see appendix 2(iii)). Conversely, as trade relations between Africa, Asia and Oceania continue to improve, trade value between Africa and Latin America declines, though in favor of Latin America. Despite these realities, there exists an enormous potential for

Africa and its South-South trading partners once the AfCFTA agreements are fully implemented.

Table 8. Exports by origin and destination selected years (US$ billion)

	Destination							
		Developing economies						
Origin	Year	World	Total	Africa	America	Asia and Oceania	Transition economies	Developed economies
World	2008	16135	5517	481	866	4 169	564	9959
	2013	18997	8025	640	1126	6260	595	10121
	2018	19414	8064	591	1076	6397	474	10729
Developing economies	2008	6274	3184	236	373	2575	123	2941
	2013	8454	4952	359	485	4109	159	3285
	2018	8649	4981	342	434	4205	143	3480
Developing economies: Africa	2008	550	186	55	18	113	3	357
	2013	587	274	86	21	166	3	300
	2018	487	250	77	12	161	3	227
Developing economies: America	2008	910	322	19	199	104	10	569
	2013	1117	463	20	219	224	10	634
	2018	1084	415	16	173	226	8	631
Developing economies: Asia and Oceania	2008	4814	2675	162	156	2358	111	2015
	2013	6750	4216	253	244	3719	146	2351
	2018	7077	4316	249	249	3818	133	2622
Transition economies	2008	721	138	12	11	115	144	438
	2013	810	187	14	10	163	137	419
	2018	682	207	23	10	174	112	360
Developed economies	2008	9140	2194	233	482	1479	296	6579
	2013	9732	2886	267	630	1988	300	6417
	2018	10083	2876	226	632	2018	219	6888

Source: UNCTAD handbook of statistics (2019).

AFCFTA AND THE MRTAS – THE UNDERLYING IMPLICATIONS TO AFRICA'S TRADE

The two main selling points of the AfCFTA agreements are the drive to boost Africa's intra-regional trade by over 52% and decrease trade deficits by 51% when all forms of tariffs are eliminated and the expedition of the continental integration processes. However, the latest developments within the global trade circle, especially the signing into effect of one of the structural components of the MRTAs - the regional comprehensive economic partnership (RCEP), by most of Africa's trading partners, suggest that achieving these laudable objectives might be grossly affected. The three structural components of the MRTAs include: Trans-Atlantic Trade and Investment Partnership (TTIP), Trans-Pacific Partnership (TPP) and Regional Comprehensive Economic Partnership (RCEP).

A study by Mevel and Mathieu (2016) argues that unless the AfCFTA agreement is properly deepened, Africa's total trade may be adversely affected through trade diversion by some of its trading partners once the RCEP fully comes on stream. This is because since Africa is not part of the mega-trade agreements, its major trading partners from Asia and Latin America might wish to seek a deeper form of continental trade understanding with other markets with the sole purpose of maintaining or increasing their global trade share. For instance, if the Regional Comprehensive Economic Partnership (RCEP) is fully implemented, trade from Africa to the ten member nations

of the Association of Southeast Asian Nations (ASEAN) is projected to decrease by over US$11 billion (Mevel and Mathieu, 2016).

However, the study also shows that the decrease in the value of export trade to RCEP countries might lead to an appreciable increase of exports to countries outside RCEP by over US$8 billion. A similar report from a joint study conducted by UNECA and Confederation of Indian Industries (2018), also estimates that Africa's exports to other countries outside RCEP will increase by US$27.5 billion by 2022 if the AfCFTA is established parallel to other MRTAs. Although African countries stand to gain significantly from trade shift from continental to regional, the quality of commodity trade might be low and less competitive, going by the current level of industrialization, markets, and other structural challenges that include: weak output growth structure that is highly susceptible to global shocks, low productive capacities, poor security architecture, and low-quality infrastructure.

CONCLUSION AND RECOMMENDATION

Conclusion

This study examines the Africa's continental free trade area agreement and South-South trade in the context of the mega-regional trade agreements (MRTAs). One of the principal reasons why the AfCFTA agreement was established is to attain a single common integrated market for Africa in order to assist in improving intra-trade among member countries. Hitherto, Africa's share of intraregional trade, as a percentage of world trade, remains the lowest when compared with other South-South economies despite the region's huge resource endowments. Therefore, the establishment and signing into law of the new Africa's trade agreement is seen in many quarters as a credible measure to correct the trade imbalance in the region, reinvigorate the domestic market, and lay a sound foundation for the much-desired regional integration. However, many trade experts have strongly argued that the success of this new trade agreement by the African continent may be short-lived given the current structural and economic challenges facing the continent, the ongoing United States - China trade 'war' and the recent entry of Africa's major trading partners of the ASEAN countries into the mega-regional trade agreements (MRTAs). Experts say the membership of Africa's major trade partners into one of the structural components of the MRTAs- the regional comprehensive economic partnership (RCEP), will lead to substantial trade losses to the region.

Recommendation

This study, therefore, recommends that for the African continent to mitigate these losses and improve its share of global trade, the region needs to make concerted efforts to implement the entire six-phase timelines of the AU continental integration agenda (CIA) simultaneously prior to the full implementation of the RCEP agreement. To access and monitor the progress in implementing the six-phase timelines, the region should endeavor to set up regional integration indicators to measure the progress of each economic bloc.

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APPENDIX

Appendix 1: Intra-trade and extra-trade of country groups by product, annual (US$ million)

YEAR		2015				2016				2017				2018		
PARTNER*	ROR	ROW	TTG	IG	ROR	ROW	TTG	IG	ROR	ROW	TTG	IG	ROR	ROW	TTG	IG
ECONOMY**																
World	0.0	0.0	18981.2	16546.3	0.0	0.0	16546.3	15993.3	0.0	0.0	15993.3	17687.8	0.0	0.0	17687.8	19414.0
AMU	2.9	118.8	123.9	3.4	3.1	80.6	84.1	3.1	3.0	74.2	77.3	2.9	3.6	92.2	95.1	3.5
APEC	0.0	2861.3	9113.1	5758.0	0.0	2565.4	8323.4	5566.1	0.0	2420.0	7986.1	6127.7	0.0	2685.9	8813.5	6690.4
APTA	1352.2	2908.5	3282.7	364.0	1252.5	2751.1	3115.1	341.1	1156.2	2566.2	2907.3	390.4	1239.5	2798.9	3189.3	435.8
ASEAN	557.8	970.0	1296.6	281.7	502.6	888.3	1170.0	269.3	490.2	880.1	1149.3	305.0	581.0	1010.5	1315.5	341.0
ASEAN***	1124.2	3187.5	4902.2	1567.4	1049.5	3027.7	4595.1	1508.1	973.8	2879.2	4387.3	1725.5	1030.8	3125.1	4850.6	1892.5
CEMAC	1.3	39.2	40.3	0.8	1.0	22.3	23.1	0.7	0.8	18.2	18.8	0.9	1.0	21.0	21.9	0.8
CEN-SAD	15.6	226.9	243.7	13.4	8.4	148.0	161.4	12.5	7.2	133.2	145.7	13.3	7.4	164.8	178.1	15.2
COMESA	8.4	102.0	113.0	9.6	7.7	77.9	87.5	8.7	7.6	78.7	87.4	10.8	7.7	93.7	104.5	12.4
EAC	2.5	10.7	13.6	3.1	2.3	10.6	13.7	2.7	2.3	11.0	13.7	2.6	2.7	11.4	14.0	2.9
ECCAS	4.9	106.1	107.7	1.3	3.3	61.5	62.8	1.0	2.0	51.6	52.6	1.3	4.0	64.2	65.5	1.4
ECOWAS	12.7	134.2	145.9	8.7	5.7	77.1	85.8	7.3	4.4	62.4	69.6	8.3	4.7	82.1	90.4	9.1
EFTA	268.4	458.2	460.8	2.0	217.4	399.5	401.5	2.0	224.5	396.8	398.8	1.9	225.2	404.3	406.2	2.2
IGAD	2.1	14.8	17.2	2.5	2.0	12.9	15.4	2.4	2.4	12.8	15.2	2.7	2.0	14.3	17.0	2.5
MERCOSUR	100.2	335.3	386.4	40.1	74.5	260.7	300.9	37.3	69.0	247.8	285.0	41.2	79.8	283.7	324.9	42.9
SADC	5.1	165.1	204.6	34.4	4.8	122.5	156.9	30.3	3.9	114.6	144.9	33.7	4.9	137.9	171.6	37.0
WAEMU	5.6	22.6	26.5	3.2	3.4	20.2	23.4	3.0	3.0	19.6	22.6	3.4	3.1	22.5	25.9	3.4

Compiled by authors. Source: UNCTADstat (2020). *Rest of the region (ROR); Rest of the world (ROW); Total trade of group (TTG); Intra-group (IG)

**AMU (Arab Maghreb Union); APEC (Asia-Pacific Economic Cooperation); APTA (Asia-Pacific Trade Agreement); ***ASEAN (Association of Southeast Asian Nations); ASEAN (Association of Southeast Asian Nations) plus China, Japan and Republic of Korea; CEMAC (Economic and Monetary Community of Central Africa); CEN-SAD (Community of Sahel-Saharan States); COMESA (Common Market for Eastern and Southern Africa); EAC (East African Community); ECCAS (Economic Community of Central African States); ECOWAS (Economic Community of West African States); EFTA (European Free Trade Association); IGAD (Intergovernmental Authority on Development); MERCOSUR (Southern Common Market); SADC (Southern African Development Community); WAEMU (West African Economic and Monetary Union)

Appendix 2. Exports by product group, origin and destination, 2018 (US$ million)

Origin	Destination						
		Developing economies					
	World	Total	Africa	America	Asia and Oceania	Transition economies	Developed economies
World	**1 206 418**	**652 441**	**23 809**	**24 990**	**603 642**	**14 655**	**532 837**
	(100)	(54)	(2)	(2)	(50)	(1)	(44)
Developing economies	557 799	367 943	15 797	11 277	340 870	2 702	181 245
	(100)	(66)	(3)	(2)	(61)	(0)	(32)
Developing economies: Africa	93 252	53 592	9 188	713	43 690	459	33 795
	(100)	(57)	(10)	(1)	(47)	(0)	(36)
Developing economies: America	136 284	77 387	1 083	7 133	69 172	650	58 036
	(100)	(57)	(1)	(5)	(51)	(0)	(43)
Developing economies: Asia and Oceania	328 263	236 965	5 526	3 431	228 008	1 593	89 414
	(100)	(72)	(2)	(1)	(69)	(0)	(27)
Transition economies	54 967	16 047	652	260	15 135	7 190	31 730
	(100)	(29)	(1)	(0)	(28)	(13)	(58)
Developed economies	593 652	268 451	7 360	13 453	247 637	4 763	319 862
	(100)	(45)	(1)	(2)	(42)	(1)	(54)

Source: UNCTAD (2019). Note: Percentage of exports to the whole world in parentheses

Appendix 3. Merchandise: Total trade and share by some regional trading blocs (annual, US$ billion)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AMU	142.0	134.8	174.0	152.7	123.5	83.9	77.1	94.8	112.7	106.7
APEC	7245.3	8511.5	8756.0	8937.8	9121.2	8326.0	7982.9	8811.7	9587.6	9407.7
APTA	2302.9	2798.2	2934.6	3129.3	3288.2	3119.4	2912.0	3194.6	3479.8	3428.8
ASEAN	3864.0	4516.2	4648.8	4753.2	4902.4	4592.2	4383.2	4851.4	5277.5	5168.0
CACM	31.9	38.2	39.8	39.6	40.6	38.7	39.0	41.3	41.5	44.4
CEMAC	35.7	44.6	44.5	41.9	39.4	26.5	22.8	23.8	28.2	26.7
CEN-SAD	240.2	261.4	295.0	257.4	244.6	161.7	147.0	177.4	209.9	212.6
CIS	529.6	702.3	712.4	694.7	658.9	445.9	370.3	464.2	577.5	553.5
COMESA	135.4	117.2	152.1	139.3	113.3	86.6	87.3	104.4	118.8	112.4
SADC	181.0	223.0	218.8	215.7	205.9	157.4	146.8	172.2	189.8	172.0
TPP	2438.1	2808.3	2807.6	2747.1	2769.6	2454.0	2434.7	2724.1	2971.6	2941.8
UNASUR	81.8	112.7	121.4	113.3	99.4	56.5	43.7	51.2	54.4	36.8
WAEMU	20.7	24.0	23.8	24.6	26.4	23.3	23.0	25.4	27.1	28.7
ECCAS	92.0	119.1	122.7	117.2	107.3	66.3	56.6	67.3	81.1	69.4
ECO	344.6	441.0	435.8	416.7	426.6	328.2	311.3	364.2	411.4	366.7
ECOWAS	114.8	155.1	155.7	133.5	147.0	86.5	70.9	89.4	107.8	110.5
EFTA	330.9	400.6	478.5	518.9	460.9	398.4	395.7	405.5	438.1	421.8

***Compiled by authors. Source**: UNCTADstat (2020). * ECO (Economic Cooperation Organization); CIS (Commonwealth of Independent States); CACM (Central American Common Market); TPP (Trans-Pacific Partnership); UNASUR (Union of South American Nations); Others are as earlier defined.

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An effect of credit to entrepreneurship and micro small and medium enterprises performance in Jambi Province

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Abstract

This research aimed at analyzing 1) an effect of micro small and medium enterprises on entrepreneurship activity, 2) an effect of micro small and medium enterprises on its performance, 3) an effect of entrepreneurship on micro small and medium enterprises performance, 4) an indirect effect of micro small and medium enterprises credit to micro small and medium enterprises through Jambi Province. This research is conducted in Jambi Province by sampling approximately 276 business owners selected according to regional representatives with purposive random sampling. PLS-SEM analysis is used in this research in which the results are 1) micro small and medium enterprises credit has a positive and significant influence on entrepreneurship, 2) micro small and medium enterprises credit has a positive and significant to micro small and medium enterprises performance, 3) micro small and medium enterprises credit has significantly positive influence to micro small and medium enterprises performance, 4) the effect of entrepreneurship to micro small and medium enterprises performance are significantly positive.

Keywords: *Credit, Entrepreneurship, Micro small and medium enterprises*

JEL Classification: L25, L26, M21

INTRODUCTION

Micro Small and Medium Enterprises (MSME) is considered one of the country's economic growth stimuli. This condition can be found in micro, small, and medium enterprises' performance and contribution to Indonesia's Gross Domestic Product (GDP). According to Indonesia Statistics Bureau, Indonesian MSMEs in 2018 reached 58.97 million business units. Meanwhile, in 2019 there was an enhancement to 59.2 million. MSMEs contributed to the labor absorption in 2018, approximately around 58.9, which is about 96% of 170 million active labor. In 2019 labor absorption had increased 60% from the Indonesian GDP total, around Rp. 8.400 trillion.

MSMEs often face principle problems, like capital. There are still numerous MSME that has not been reached out to by the financial sector. Neither all micro MSME find credit facilities nor countless business units access the formal credit institution. Other weaknesses are the limited quality of human resources, difficulty of raw materials, or limitation of innovation and technology. Entrepreneurship and market-

oriented affected in innovation and profitability of small businesses (Baker & Sinkula, 2009). Indonesian Bank (2018) showed total credit allocation to micro small and medium enterprises in Indonesia during 2017 Rp 990.377,60 billion and increased to Rp 1.086.082,3 billion in 2018.

Bank credit is one of the capital source alternatives to MSMEs. The lack of entrepreneurship passion is the factor that causes the low accessibility of micro, small and medium enterprises to financial institutions. The creative business will encourage the emergence of new Business-Owners to create innovative products that can penetrate International Markets. Baker and Sinkula (2009) stated that entrepreneurship-oriented and the market were affected by small business innovation and profitability. Gomet et al. (2010) and Jaworski & Kohli (1993) market-oriented affected business performance. David Mc Clelland from the USA stated an advanced country would emerge if the minimum amount of entrepreneurs were 2% of the population (Mudjiarto, 2006). The number of entrepreneurs will be discovered by measuring the entrepreneurship activity level (Naude, 2008).

Armstrong (2014) stated MSMEs are necessary for analyzing performance to give out feedback in completing obstacles. Arif et al. (2013) stated a positive relationship between entrepreneurship oriented in increasing small business manufacturing performance. According to the Central Bank of Indonesia (2014), the number of entrepreneurs in Indonesia was 1.65%. This score was lower than Malaysia, Thailand, and Singapore that successfully reaching out 7.2%. Furthermore, The Global Entrepreneurship and Development Index (2014) stated the soundness of the Indonesian entrepreneurship ecosystem was in 68 from 121 countries. Then, 'The EYG Entrepreneurship Barometer 2013', Indonesia in between G20 countries was in Quarter 4, which possesses the lowest position in entrepreneurship. For the most part, Indonesian entrepreneurship dominated by MSMEs was 99.9%, in the meantime 0,1% was leftover. The entrepreneur categories were Conglomerates and large-scale businesses (Mulyati, 2016).

Mulyono (2006), MSMEs credit has a positive effect on business volume in which accepted credit is used for purchasing raw materials and production tools, which will increase business volume. MSMEs were likely to be contributed to growth, job opportunity, and social progress (Harash et al., 2014). The development of MSMEs credit in Jambi can be measured from the magnitude of nominal value increasing. Some factors to MSMEs performance from some business units and job opportunity.

In 2017, the number of MSMEs credit given off Rp 12.331.149 million with the number of business units was 100.898 units. Labor absorption in MSMEs sector 175.765 people with a turnover was approaching Rp 3.975.600.754.566 (Central Bank of Indonesia and Micro small and medium enterprises agency in Jambi, 2017). Jambi city possesses the largest amount of MSMEs credit. However, the growing amount of business unit development and labor is slowing down and has a large turnover. On the contrary, MSMEs distribution in Tanjung Jabung Timur Regency is relatively smaller than other regions; however, business units and labor growth are relatively higher than turnover.

Although small businesses had a role in labor absorption, there has been some limitation of bank accessibility and competitive market. In so doing, they could survive only but hard to develop (Haryadi, 2016). As the researchers mentioned above, this research aimed to analyze the effect of credit on entrepreneurship and MSMEs performance in Jambi Province.

METHODS

This research utilizes a primary source of data obtained directly from respondents and secondary data like articles and related publications/reports/journals. The data collecting method used in this research is field research by conducting surveys, interviews, and questionnaires. The research populations are MSME Owners. According to Micro small and medium enterprises agency, there had been 184.124 business units of MSMEs in 2018, located in 2 (two) cities and 9 (nine) regencies.

From a sample of 276 MSME actors in Jambi Province, 163 respondents use MSME loans. Furthermore, from the number of respondents, as many as 163 MSME actors were used as samples to analyze the influence of MSME credit on entrepreneurship and the performance of micro, small and medium enterprises in Jambi Province.

Partial Least Square (PLS) with Warp-PLS Version 5 is used in analyzing this credit effect on entrepreneurship and MSMEs performance. There are 2 exogenous and endogenous variables. The exogenous variable is MSMEs(X). meanwhile, latent endogenous variables(Y) are entrepreneurship and MSMEs performance.

Subsequent, in Figure.1 is illustrated conceptual research framework associated with observed variables. It shows and describes relationships among observed variables and positive and negative variables, having the form symmetrical, causality, or interactive.

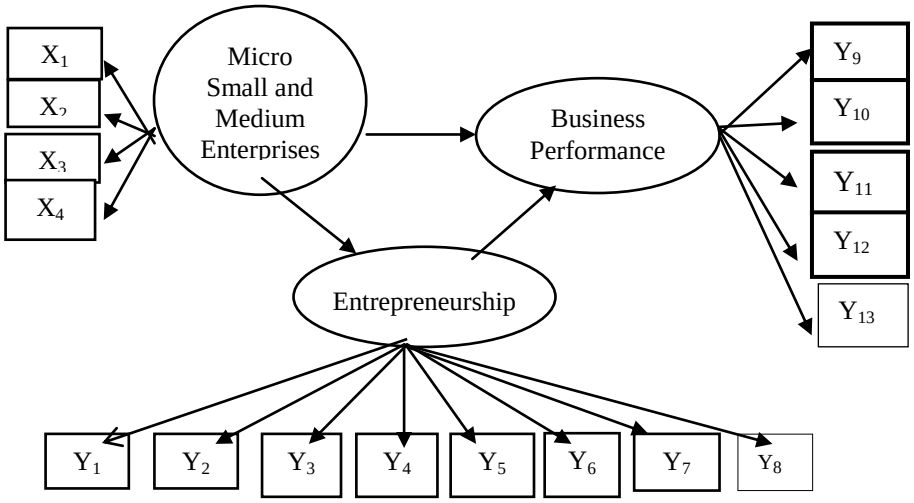

Figure 1. Research model

Notification:

X_1 = education and training
X_2 = accessibility market information
X_3 = partnership pattern
X_4 = capital loan
Y_1 = strategically plan
Y_2 = resources combination
Y_3 = self-discipline
Y_4 = creativity
Y_5 = innovative
Y_6 = motivation
Y_7 = brave and risk

Y_8 = self-confidence
Y_9 = average selling
Y_{10} = average production
Y_{11} = amount of asset
Y_{12} = profit
Y_{13} = amount of labor

Hair et al. (2013) stated there were 2 (two) criteria to assess whether outer model qualify convergence validity to reflective construction, viz. (1) loading factor score must higher 0.70 (2) significance level (<0.05)

RESULTS AND DISCUSSION

Convergent validity

Convergent validity is a measurement model with indicator reflective assessed by correlation between component score with construct score by PLS. The validity test can be analyzed in cross-loading, an indicator considered valid; if convergent validity is higher than 0,70 or approximately 0.50-0.60, it will be accepted (Ghozali, 2016).

Table 1. Outer loading

Variable	Credit	Entrepreneurship	Performance	p-Value
X1	0.697	0.032	0.071	<0,01
X2	0.783	0.077	0.012	<0,01
X3	0.695	0.028	0.043	<0,01
X4	0.753	0.072	-0.042	<0,01
Y1	0.359	0.631	0.185	<0,01
Y2	0.180	0.803	0.046	<0,01
Y3	0.069	0.822	0.057	<0,01
Y4	0.069	0.784	-0.000	<0,01
Y5	0.074	0.774	0.049	<0,01
Y6	0.006	0.716	0.088	<0,01
Y7	0.119	0.844	0.085	<0,01
Y8	0.149	0.853	0.180	<0,01
Y9	0.421	0.106	0.656	<0,01
Y10	0.146	0.042	0.868	<0,01
Y11	0.158	0.000	0.682	<0,01
Y12	0.046	0.109	0.907	<0,01
Y13	0.105	0.073	0.597	0,05

SEM-PLS test, micro small and medium enterprises credit has loading factor value between 0.695 – 0.783 higher than critical limit 0.6, in so doing qualify convergent validity. All indicators from 4th dimensions variables micro small and medium enterprises reflected robust correlation.

Education and training indicators (X_2) possess the highest value in MSMEs credit, viz. 0,783. If there is an enhancement of MSMEs credit, education, and training will increase. Education and training MSMEs are very useful for business continuity, particularly production marketing, business administration training, and financial management.

Indicator accessibility of market information (X_3) has the smallest value than others, viz. 0.69. It is acknowledged that the access point for market information for MSMEs is still limited, particularly information path related to product planning and description of market needs.

Entrepreneurship has a loading factor value of 0.622 - 0.853 which means that all indicators in the entrepreneurship variable qualify convergent validity because it has a value higher than 0.60. The combination resources indicator (Y_2) has a value of 0.803. Business-Owners in combining resources are related to using capital, raw materials, and labor in a more appropriate, cheap, and timely manner. The self-discipline indicator (Y_3) has an outer loading value of 0.822. It means that with entrepreneurship, self-discipline in MSMEs actors will also increase. The value of self-discipline is related to the ability of a business owner to complete every job completely, on time, and with full attention in providing services to customers. Business people who have self-discipline will use the capital loan they get according to their business needs to avoid credit arrears. The loading factor value for the motivation or motivation indicator (Y_6) is 0.716, with the smallest value compared to other indicators. Motivation is related to the ability of business actors to find solutions to problems faced for business development and to accept new ideas in business activities more precisely and better.

Brave and risk indicator (Y_7) possess loading factor value 0.844, which means if there is an enhancement of entrepreneurship, business owners will also increase the courage over risk. The highest loading factor score is one of the strengths for MSMEs Owners in Jambi Province. The business owners must make-decision, receive brainchild, leverage business opportunities in facing competition. Furthermore, the self-confidence indicator (Y8) loading factor is 0,853, the most dominant and robust factor in entrepreneurship. Business owners must be an optimist in solving problems and has a market scale.

Business performance possess loading factor 0,597 – 0,907. The turnover indicator gives out the highest loading value between business performance indicators, viz. 0.907 means the enhancement of business performance will influence selling turnover. Labor indicator possesses loading value 0.597 less than critical limit 0,60. Even though these indicators are still being maintained, Ghozali stated loading 0.5 is still tolerated. Aside from that, after respecification, if the labor indicator is eliminated, the researchers could not eliminate the labor variable.

Discriminant validity

To evaluation of discriminant validity will be analyzed from square roots average variance extracted (AVE) viz. diagonal column and given off brackets (Sholihin & Ratmono, 2013). They should be higher than the correlation between latent variables in the same column.

Table 2. Output correlation in between latent variable and AVE

Latent Variable	Credit	Entrepreneurship	Performance
Credit	(0,706)	0,331	0,194
	(1.000)	(<0.01)	0.018
Entrepreneurship	0,331	(0,758)	0,243
	(<0.01)	(1.000)	(0.003)
Performance	0,194	0,243	(0,617)
	(0.018)	(0.003)	(1.000)

Discriminant validity score construct variable credit has been qualified, due to AVE roots 0.706, it is highest than 0.331 and 0.194. Entrepreneurship construct variable is obtained roots AVE = 0.758, higher than 0.331 and 0.243. Performance construct possesses roots AVE 0.617. Diagonal latent line in latent variable correlations shows discriminant validity for all variables is excellent, with a score > 0.60. It means

respondents have no difficulty in answering the questionnaire. It can be concluded all latent variables qualify criteria and have no discriminant validity.

Reliability test

There are two measures of instrument reliability in a study, namely composite reliability and Cronbach's alpha, where both must have a value above 0.60. The greater the reliability value (closer to number 1), the higher the confidence level of the instrument. The following is the value of composite reliability and Cronbach's alpha.

Table 3. Reliability test

Construct	Composite Reliability	Cronbach's Alpha	Explanation
Credit	0.682	0.707	*Reliable*
Entrepreneurship	0.914	0.892	*Reliable*
Performance	0.703	0.606	*Reliable*

The results showed that the value of composite reliability and Cronbach's alpha on the variables of MSME credit, entrepreneurship, and performance had met the requirements, so it can be concluded that the measurements in this study were reliable.

Collinearity test

Vertical collinearity is the collinearity between predictor variables in the same block. Meanwhile, lateral collinearity is the collinearity between the latent variables of the predictors and the criteria (Ratmono & Sholihin, 2013). The Criterion for a full collinearity test is that the value must be low than 3.3 (Kock, 2013). The results of the multicollinearity test in this study can be seen in Table 4

Table 4. Full collinearity test VIFs

Construct Variables	***Full Collinearity VIFs***	**Explanation**
Credit	1.140	No Multicollinearity
Entrepreneurship	1.166	No Multicollinearity
MSME Performance	1.079	No Multicollinearity

Based on the research results in Table 4, it shows that the full collinearity VIF value is less than 3.3, so that the model is free from collinearity problems.

Research model test

One of the research model test objectives is to compare the best model between different models. In Ratmono and Sholihin (2013), the WarpPLS Version 5 program can produce several fit indicators, including average R-squared (ARS), average path coefficient (APC), and average variance inflation factor (AVIF). Evaluation of model fit can be seen from the p-value for APC and ARS, which must be less than 0.05 or it means significant. The AVIF value as an indicator of multicollinearity must be less than 5. Based on the results of the research, the results of the fit model are as follows:

Table 5. The output of the research model test

Information	Value	Criteria
Average path coefficient (APC)	0.249	P<0.01
Average R-squared (ARS)	0.316	P=0.037
Average adjusted R-squared (AARS)	0.307	P=0.046
Average block VIF (AVIF)	1.127	Acceptable if < = 5, ideally < = 3.3
Average full collinearity VIF (AFVIF)	1.129	Acceptable if < = 5, ideally < = 3.3
Tenenhaus GoF (GoF)	0.326	Small >= 0.1, medium >= 0.25, large >= 0.36
Symson's paradox ratio (SPR)	1	Acceptable if > = 0.7, ideally = 1
R – squared contribution ratio (RSCR)	1	Acceptable if > = 0.9, ideally = 1
Statistical suppression ratio (SSR)	1	Acceptable if > = 0.7
Nonlinear bivariate causality direction ratio (NLBCDR)	0.833	Acceptable if > = 0.7

Based on the output results, the criteria for the goodness of fit model have been met, namely the Average path coefficient (APC) value of 0.249 with a significance of p <0.001 and the Average R-squared (ARS) of 0.316, significant at p <0.05. The AVIF value of 1.127 also meets the criteria. Furthermore, the goodness of fit (GoF) value of 0.326 is in the medium, greater than 0.25, which means that the results of this test show that the overall model is good and able to reflect research phenomena.

Structural model evaluation analysis (inner model)

The structural model in WarpPLS version 5 is evaluated using the R-square for the dependent construct, path coefficient estimation, and prediction relevance (Q2) (Ghozali, 2011).

Coefficient of determination (R^2)

According to Chin in Ghozali (2011), R^2 results of 0.67 for endogenous latent variables in the structural model indicate a good model, R^2 value of 0.33 is called moderate, and R^2 is 0.19 for a weak model. Based on the research results, the coefficient of determination is obtained as follows:

Table 6. Coefficient of determination value (R^2)

Variable	*R-square*	Explanation
Entrepreneurship	0.569	Moderat
MSME Performance	0.478	Moderat

In Table 6, from the data processing results on 163 MSME players who received MSME credit in Jambi Province, the R^2 value for the variable credit to entrepreneurship was 0.569, which means that MSME credit could explain entrepreneurial variance by 56.9%. Furthermore, the MSME credit and entrepreneurship variables could explain the performance variance of micro, small and medium enterprises by 47.8% (R^2 = 0.478).

Q- squared value

Q-Squared assesses the predictive validity or relevance of a set of predictor latent variables on the criterion variable. A model is good if the predictive validity (Q-squared) has a value greater than zero (Ratmono and Sholihin, 2013). Based on the estimation results of the model in this study, a good Q-Squared value is obtained, namely 0.214 for entrepreneurial variables and MSME performance variables of 0.122.

Table 7. *Q-squared Value* (Q^2)

Variable	*R-square*	Explanation
Entrepreneurship	0.214	Q2> 0
MSME Performance	0.122	Q2> 0

Based on the results of the estimation model in this study, it was obtained a good Q-Squared value of 0.214 for entrepreneurial variables and MSME performance variables of 0.122.

Estimated path coefficients (path analysis)

The results of the path coefficient estimation are used to analyze the effect of MSME credit on entrepreneurship and the performance of micro, small and medium enterprises in Jambi Province.

Table 8. Path analysis result

Hypothesis	Relation	Coefficient	p-Value	Ideal	Result
H1	Credit-Entrepreneur	0.522	< 0.01	< 0.05	Accepted
H2	Credit-Performance	0.244	0.04	< 0.05	Accepted
H3	Entrepreneur-Performance	0.451	< 0.01	< 0.05	Accepted
H4	Credit-Entrepreneur-Performance	0.235	0.042	< 0.05	Accepted

Table 8 shows that the path coefficient between MSME credit and entrepreneurship is positive, namely 0.522. It means that if there is an increase in MSME credit, entrepreneurship will also increase. The direct effect is significant with the probability value ($p < 0.01$).

The MSME credit variable on the performance of micro, small and medium enterprises has a positive direct effect, namely 0.244 with a significance level of $p = 0.04$ ($p < 0.05$). It means that an increase in MSME credit will improve the performance of micro, small and medium enterprises.

Furthermore, there is a positive and significant influence between entrepreneurship on the performance of micro, small and medium enterprises of 0.451 with a significance level ($p<0.01$). It means that if entrepreneurship increases, it will increase the performance of micro, small and medium enterprises.

The influence of MSME credit on the performance of micro, small and medium enterprises indirectly through entrepreneurship has a positive value of 0.235 with a significance level of $p <0.05$.

The effect of MSME credit on entrepreneurship

MSME credit has a positive and significant direct effect on entrepreneurial variables in MSME actors in Jambi Province. It can be seen from the positive path coefficient of 0.522, meaning that if there is an increase in MSME credit, it will increase entrepreneurship among MSME actors in Jambi Province. The increase in UMKM credit given to business actors means a tendency for entrepreneurship to increase. It is known that the direct effect is significant with the probability value of the path coefficient ($p <0.01$). Based on the results of data analysis, the value of $R^2 = 0.574$ was obtained, which means that micro, small and medium enterprise (MSME) credit can explain the entrepreneurial variation of 57.4%.

Entrepreneurship variables are measured using 8 (eight) indicators: 1). Strategic planning; 2). Combine resources; 3). Self-discipline; 4). Creativity; 5). Innovation; 6). Motivation; 7). Courage for the risk consequences of action; and 8). Confidence.

According to Purwanti (2012), business capital has a positive and significant effect on business development, so that it requires ease in obtaining business capital at an affordable interest rate.

According to Minniti (2008), government policies in capital or financial assistance can increase entrepreneurship. Furthermore, the same research was also conducted by Olu (2009), who analyzed the impact of microfinance on the entrepreneurial development of small businesses in Nigeria. The results showed a significant relationship between microfinance institutions' productivity and entrepreneurship development.

Research by Quaye (2011) also shows that microfinance positively affects the growth of small businesses in Kumasi, Ghana. Microfinance institutions increase SMEs'

access to credit, savings, financial and managerial training. Furthermore, the results of this study are also strengthened by research by Obaji and Olugu (2014), which states that the success of entrepreneurship in several countries is influenced by government policies, one of which is financing in the financial sector.

The influence of MSME credit on the performance of micro, small and medium enterprises

The quantitative performance measurement can be seen from the average amount of wealth owned by MSMEs (assets), the average profit gained (Profit), the average production (Production), the average turnover, and the number of workers used in the production process.

The research results show that the direct effect of MSME credit and business performance has a positive and significant direction of 0.244. A positive coefficient value means that if there is an increase in MSME credit, it will cause the performance of micro, small and medium enterprises also to increase. The direct effect is significant, with a p-value of 0.04 ($p < 0.05$). It indicates that MSME loans provided by financial institutions have a very important role in increasing income. The results of this study support the theory of Kasmir (2011), which states that credit can positively increase income, because the provision of credit can increase business capital.

This research aligns with what Akoten, Sawada, & Otsuka (2006) conducted on garment SMEs in Kenya. The research results show that SMEs borrow from various formal and informal credit sources (ROSCA). Credit has a significant effect on profitability and job opportunities.

Credit as a source of capital is closely related to small business activities to increase production, which will increase entrepreneurs' profits and income. The credit obtained allows business actors to have more cash and additional liquidity that can be used to finance the purchase of production inputs until optimal conditions are achieved.

Purchases of production inputs can be in the form of additional purchases of raw materials, purchases of supporting materials, an increase in the number of workers. Furthermore, using these raw materials in the production process will increase production capacity or output so that MSMEs' turnover or sales volume will increase. The increase in production output will also increase business revenue. Coleman (1999) states that research on the impact of credit can be seen from several aspects, including: (1) aspects of physical assets, (2) savings, debt, and loans, (3) aspects of production, sales, purchases, and working time, and (4) aspects of education and health.

The influence of entrepreneurship on the performance of micro, small and medium enterprises

MSME resource development is an individual or group preparation for a set of information, knowledge, and knowledge to achieve certain competencies to have new standards, knowledge, attitudes, skills, and responsibilities in developing their business. Business actors are generally provided with entrepreneurial training/provisioning, not automatically integrated.

The relationship of motivation, innovation, and risk with performance is explained by Noersasongko (2005) which states that entrepreneurship is considered to have a dominant influence on business success. It is also supported by Kao (2001), which states that small companies that want to develop must have an entrepreneurial spirit; besides, Gray (2002) emphasizes that small business owners can outperform

their competitors with the entrepreneurial spirit. Georgellis et al. (2000) stated that their capacity to innovate and the courage to take risks develop successfully.

This condition is also confirmed by Munizu (2010) which states that internal factors consisting of human resources, financial aspects, technical aspects of production or operations, and market and marketing aspects have a positive and significant impact on the performance of micro and small businesses.

The effect of MSME credit on the performance of micro, small and medium enterprises through entrepreneurship

This research indirectly shows a positive influence between MSME credit and business performance through entrepreneurship variables of 0.235. MSME credit indirectly positively affects business performance through entrepreneurship with a probability value of 0.042 ($p < 0.05$). This study shows that entrepreneurship variables mediate the effect of MSME credit on the performance of micro, small and medium enterprises. It indicates that the entrepreneurial ability of MSME actors in Jambi Province has good capacity. The biggest indicators that shape entrepreneurship are 1) Strategic planning, 2) Combining resources, 3) Self-discipline, 4) Creativity, 5) Innovation, 6) Motivation, 7) Courage due to the risk of action, 8) Self-confidence.

Credit is one of the sources of funding obtained through financial/banking institutions for MSMEs, which is needed to improve and develop their business. Hidayat and Herlambang (2009) stated that the assistance of State-Owned Enterprises (BUMN) and bank credit does not necessarily improve performance but instead reduces it. This statement is also supported by Imam Santoso (2015) based on his research on MSME Agroindustry in Mojokerto Regency, East Java. His research results show that credit does not directly affect the performance of MSMEs.

Business development, either in the form of training or assisting in business capital loans, is expected to increase the entrepreneurial behavior of MSME players in Jambi Province. Managing businesses that are at least based on entrepreneurial orientation is expected to encourage business actors to improve their business performance. In other words, the better the implementation of entrepreneurial orientation and market orientation in business governance will increase the resulting business performance.

Testing the entrepreneurial behavior variable as a mediating variable using the variance accounted for (VAF) method.

Variance Accounted For (VAF) measures how much the mediating variable can absorb the previously significant direct effect of the model without mediation (Hair et al., 2013). Several steps must be considered in calculating the mediating variable: 1) The direct effect must be significant when the mediating variable has not been included. 2) The indirect effect must be significant if the model includes the mediating variable. 3) Calculating VAF using the formula for the indirect effect divided by the total effect. If the VAF value is between 20% - 80%, it is categorized as a partial mediator. But if the VAF value is less than 20%, it can be concluded that there is no mediating effect (Hair et al., 2013)

The effect of MSME credit on the performance of micro, small and medium enterprises in the absence of entrepreneurial behavior variables obtained a coefficient value of 0.183 with a significance level ($p < 0.01$). Based on the results in the image below, it is obtained that the R-squared value is 0.25, which means that the MSME

credit variable can explain the performance of micro, small and medium enterprises by 25%.

The indirect effect is obtained by multiplying the value of the MSME credit coefficient on entrepreneurship (0.522) and the entrepreneurial coefficient value on business performance (0.451). The results of the indirect effect are as follows: (0.522) * (0.451) = 0.2354. Furthermore, the total effect is calculated by adding the direct and indirect effects, namely 0.183 + 0.235 = 0.418. VAF = indirect effect divided by the total effect. For more details, the results of the VAF calculation can be seen in Table 9.

Table 9. Calculation of *variance accounted for* (VAF)

Description	Result
Indirect Effect = (0.522) * (0.451)	0.235
Direct Effect of MSME Credit on Business Performance	0.183
Total Effect = 0.235 + 0.183	0.418
VAF = Indirect Effect / Total Effect	0.563

Based on the calculation results, the VAF value is 0.563 or 56.3% for the entrepreneurial variable as a mediator between MSME credit and performance. This VAF value is above 20%, so it can be concluded that the entrepreneurial variable is a partial mediator. The form of partial mediation shows that entrepreneurship is not the only mediator of the MSME credit relationship to business performance. It also means that either directly or indirectly (through entrepreneurship), MSME credit still affects the performance of micro, small and medium enterprises. When viewed from the coefficient value between the direct and indirect effects, the coefficient value for the indirect effect is greater than the direct effect.

The results of the interviews revealed that MSME actors who have received entrepreneurship training generally have higher motivation and confidence in carrying out their business activities.

Policy implications of research results

MSME assistance is carried out in regular discussions, where usually the topics discussed are about the problems faced by MSMEs. The mentoring program carried out by PLUT-KUKM Jambi Province only covers two areas, namely Jambi City and Muaro Jambi Regency. For MSME, Jambi City already has a group of UMKM associations known as the Food and Beverage Association (ASMAMI) and the Muaro Jambi UMKM Association (ASUMKMUJA) for the Muaro Jambi Regency area.

The data-target program for 1000 MSME in Jambi is one of the PLUT-KUKM efforts to record 1,000 KUKMs. One of the objectives of this program is to help improve the performance of MSMEs, including production, marketing, access to finance, human resource development through entrepreneurial, technical, and managerial capacities, and institutional performance so that MSMEs have competitiveness. There are still many MSMEs in Jambi Province that do not have permits and halal certification. The MSME development program is through the Sharia Cooperative. The shift in people's mindset from conventional to Islamic banks has made many cooperatives implement the Islamic concept.

Given the magnitude of the influence of MSME credit on entrepreneurship and business performance, it is necessary to implement financial inclusion to open the widest possible access to financing sources for MSMEs. There are still many micro, small and medium business loans that do not achieve the target objectives that have

been set. High-interest rates, guarantee systems, complicated procedures, limited sources of non-banking financing are important issues that require attention and handling from the government. The government must have a capital financing policy that supports the micro, small and medium enterprises sector to develop and become one of the supporting sectors for Indonesia's economic development.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The models built in this study are the development and modification of various previous empirical studies. Several previous empirical studies generally use Becker's (1965) household economic theory model to analyze the behavior of farmer households. However, in this study, it turns out that household economics can be applied to small, MSME households in Jambi Province by emphasizing household characteristics, individual characteristics, and MSME business characteristics.

This study indicates that business actors' factors in taking MSME loans are sided jobs, working hours, working partners, gender, education level, length of business, household expenses, and account ownership.

This study also analyzes the effect of MSME credit on entrepreneurship and business performance. The estimation results show that: 1) MSME credit has a positive and significant effect on entrepreneurship. 2) MSME credit has a positive and significant effect on business performance. 3) Entrepreneurship has a positive and significant effect on business performance. 4) By using the Variance Account For (VAF) method, it can be concluded that the entrepreneurial variable is a partial mediator between MSME credit and business performance. The model estimation approach uses SEM-PLS.

Recommendations

The government's support and participation in fulfilling funds as business capital through bank credit for MSME entrepreneurs are needed. It is necessary to carry out entrepreneurial insight and skills training, forming an attitude always to think ahead, fostering and developing MSMEs. It aims to develop entrepreneurs without limits on time, region, age, class, and educational background.

Access to MSME financing, the credit guarantee scheme through the Credit Guarantee Institution that has been implemented by the government now needs to be expanded again so that it can reach all regions/regions that need MSME credit services.

It is necessary to have commitment, capability, and quality of guidance in government agencies, to foster entrepreneurial behavior among micro, small and medium enterprises. It also aims to promote and cultivate entrepreneurship through competency-based training and cooperation.

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