Chapter 4

THE CAUSALITY ANALYSIS OF FINANCIAL INCLUSION, ECONOMIC GROWTH, AND DEVELOPMENT: THE CASE OF MAURITIUS

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1. INTRODUCTION

Financial services refer to the services provided by the financial industry. The financial industry consists of banks dealing with money management, stockbrokers, mutual funds, government-backed businesses, credit card and insurance companies. Financial services can be defined as products and services offered by financial institutions to facilitate various financial transactions and other related activities. Financial services can also be called financial intermediation. Financial intermediation is a process in which funds are mobilized from many savings providers and offered to everyone, especially corporate customers. There are various financial service institutions such as banks, investment companies, accounting firms, financial institutions, commercial banks, leasing companies, venture capital companies, factoring companies, mutual funds, etc. These organizations offer various services to corporate businesses. Such services are called financial services. Therefore, services provided by financial service institutions to industrial enterprises and end-consumer markets are called financial services. These are the services and facilities necessary for the smooth functioning of the financial markets. In short, services provided by financial intermediaries are called financial services (Goyal, 2015).

Financial inclusion is the access of individuals and businesses to official financial products and services that are responsibly and sustainably presented. Access to finance makes people's daily life easier. It helps families and businesses plan everything from long-term goals to unexpected emergencies (Worldbank, 2018). There is evidence to document the potential benefits for individuals and society, while the spread of financial base has become an increasing concern for worldwide development and policy agendas, especially after the global financial crisis. With the increase of financial inclusion, non-banking adults are included in the

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official financial system, which allows them to save their savings, invest in assets that can generate income in the future, and protect against financial risks (Özşuca, 2019). Financial inclusion provides access to financial services. Thus, financial services activate people's savings and offer various services to corporate organizations and direct them to productive investments. Financial services provided broadly and efficiently increase the efficiency of resource allocation, improve wealth distribution, and contribute positively to economic growth and development. (Von-Pischke, 1997)

A comprehensive measure of financial inclusion is important to assess and support the current situation of financial expansion in an economy and to monitor the progress of policy initiatives taken. In this study, the relationship between "Financial Inclusion and Economic Development" and "Financial Inclusion and Economic Growth" was investigated with Granger Causality analysis. In the study, as financial inclusion indicators "Domestic credit provided by the financial sector (% of GDP)", "Net Foreign Assets", "Number of ATMs per 100.000 adults", "Outstanding deposits with commercial banks (%GDP)" and "Outstanding loans from commercial banks (% of GDP)" are used. To express economic growth and development, "GDP per capita" and "Human Development Index (HDI)" are included in the model.

The remainder of the paper is organized as follows: Section 2 represents the literature review, Section 3 lays out the basics of the Var based Granger causality test while Section 4and 5 describes the data and empirical results. Finally, section 6 concludes the paper.

2. LITERATURE REVIEW

It is important to emphasize what the literature says about the contribution of financial inclusion to economic growth and development. Most researchers have focused on financial development and economic growth rather than on financial inclusion and economic growth. For example, Claessens and Laeven (2003) show that financial development contributes to economic growth. This view, which accepts that financial development causes economic growth, has also been proven in the works of Shahbaz, Rehman, and Muzaffar (2015), Sehrawat, and Giri (2012), Shahbaz and Mafizur Rahman (2014), Anwar and Sun (2011). Masoud and Hardaker (2012) emphasized that stock market development has an important effect on economic growth as part of financial development. Valickova, Havranek, and Horvath (2015) showed that exchanges support faster economic growth than other financial intermediaries. Durusu-Çiftçi, İspir, and Yetkiner (2016) showed that the debt from the credit markets and the equity obtained from

exchanges are two long-term determinants of GDP per capita. King and Levine (1993) showed that various financial development measures, including the presence of financial intermediaries at the cross-country level, the liquidity liabilities of financial institutions, private sector domestic loans, stock, and bond market activation, are robust and positively related to economic growth. Sehrawat and Giri (2016) stated that financial development and economic growth caused income inequality in rural and urban areas. Onaolapo (2015) stated that financial inclusion is complementary to economic growth, as it contributes to reducing poverty. Beck, Demirgüç-Kunt, and Maksimovic (2005) showed that access to finance is associated with faster growth. However, Shan, Morris, and Sun (2001) stated that there is little evidence to support the hypothesis that finance is prioritized to grow and caution should be taken when making general conclusions about this relationship. Due to these differences in findings and the need to focus on financial inclusion, this research was carried out on the financial base, economic growth, and development.

3. METHODOLOGY

3.1. Granger Causality Test

With the introduction of Granger (1969), Granger causality has become a popular concept used in many other fields, especially in econometrics. The 'causality' term is the cause-effect relationship between two sets of variables, Y and X (Pearl, 2012). Runes (1962) emphasized nine basic causality definitions in his work:

(1) Several conditional relationships between events, processes, or entities in the same time series,
(2) The relationship between events, processes, or entities in a time series, one followed by the other when it occurs,
(3) The relationship between variables where one can produce or replace the other,
(4) The relationship between variables that one cannot achieve without the other,
(5) The relationship between experienced events, processes or assets and extreme experimental events, processes or assets,
(6) The relationship between anything and itself (self-causality),
(7) The relationship between an event or process and its cause or description,
(8) The relationship between idea and experience, and
(9) A principle or category that experiences one of the previous (Awe, 2012).

To examine whether the X variable is the cause of another Y variable using the Granger causality test, the restricted regression model (1) described by Y's past

values is created. Then the historical values of X as the explanatory variable are included in the equation (1). Thus, the unrestricted regression model (2) is obtained. If the historical values of X increase the prediction level of Y significantly, X is said to be Y's Granger cause. Similarly, these steps are repeated to determine if Y is causing X.

$$Y_t = \alpha_0 + \sum_{i=1}^{m} \alpha_i Y_{t-i} + \mu_t \quad (1)$$

$$Y_t = \alpha_0 + \sum_{i=1}^{m} \alpha_i Y_{t-i} ++ \sum_{j=1}^{m} \beta_j X_{t-j} + \mu_t \quad (2)$$

In the equations (1) and (2), α_0, μt, α_i and β_j, m, X and Y represent constants, white noise sequence, coefficients, the number of lagged terms, independent variables, and dependent variable respectively. For both equations (1) and (2), the longer the delay length, the better the dynamic properties of the models are shown. However, if the delay length is too long, the freedom of the model will decrease. Therefore, there must be a balance between the dependent and independent variables (Wang, 2019).

4. DATA

In this study, the effect of financial inclusion on economic growth and development for the country of Mauritius was investigated by using the Granger Causality Analysis. Two dependent variables were selected in the study; the Human Development Index (HDI), which shows basic living standards such as health and education, and GDP Per Capita to express economic growth. Variables used for a good expression of the concept of financial inclusion;

- It should provide information on as many aspects of financial inclusion as possible.
- It should be easy and simple to calculate.
- It should be comparable across countries.

Taking into consideration these criteria, financial inclusion is explained with variables that show the usage of finance and access to finance, which are indicated in Table 1. In the study, annual data covering the period of 2004-2018 were converted to quarterly to increase the length of the examined period and obtain more accurate information. Natural logarithms of the variables were taken to smooth the data.

Table 1. Descriptions of variables			
	Variables	**Definitions of Variables**	**Sources**
Financial Inclusion Indicators	Access to Finance		
	LNATM	Number of ATMs per 100,000 adults	International Monetary Fund
	Usage of Finance		
	LNETASS	Net Foreign Assets (Current)	International Monetary Fund
	LNDOMCRE	Domestic credit provided by the finance sector (% of GDP)	International Monetary Fund
	LNLOANS	Outstanding loans with commercial banks (% of GDP)	International Monetary Fund
	LNDEPOSIT	Outstanding deposits from commercial banks (% of GDP)	International Monetary Fund
Economic Indicators	LNGDP	GDP per capita, PPP (constant 2011 international $)	https://data.worldbank.org/indicator/ny.gdp.pcap.cd
	LNHDI	Human Development Index	http://hdr.undp.org/en/data

5. EMPIRICAL FINDINGS

As the first step of the empirical analysis, the ADF and Phillips Perron (PP) tests were employed to investigate the stationarity behavior of variables. The null hypothesis of both the ADF and PP tests is that a time series contains a unit root. The results of the ADF and PP tests are reported in Tables 2 and 3.

Table 2. ADF Unit Root Test Results									
Variables	ADF			ADF First Diff.			ADF Second Diff.		
	Trend+ Constant	Constant	None	Trend+ Constant	Constant	None	Trend+ Constant	Constant	None
LNATM	-0.8296	-2.239	0.904	-2.48823	-1.1588	-1.54396	-8.981771	-9.117853	-8.86774
	[0.9558]	[0.1955]	[0.900]	[0.3325]	[0.6852]	[0.1140]	[0.000]	[0.000]	[0.000]
LNETASS	-3.333224	-2.86079	1.18465	-	-	-3.07584	-	-	-
	[0.0716]	[0.0566]	[0.9376]			[0.0028]			
LNDOMCRE	-2.5752	-1.086089	1.4252	-2.311378	-2.4265	-2.2679	-4.54552	-4.471995	-
	[0.2929]	[0.7145]	[0.9599]	[0.4204]	[0.1397]	[0.0239]	[0.0036]	[0.0008]	
LNLOANS	0.340787	-2.233189	-4.41234	1.974835	-0.4824	-0.62143	-7.351004	-6.95448	-6.8109
	[0.9984]	[0.1975]	[0.5302]	[0.6007]	[0.886)]	[0.4432]	[0.000]	[0.000]	[0.000]
LNDEPOSIT	-0.88368	-1.902855	-0.78941	-2.09653	-1.3063	-1.4384	-5.020616	-5.056707	-4.8698
	[0.9503]	[0.3286]	[0.3695]	[0.5359]	[0.6204]	[0.1387]	[0.0008]	[0.0001]	[0.000]
LNGDP	-3.064713	-1.279601	3.44647	-3.064713	-1.279601	-0.13166	-3.226524	-3.2261	-7.2111
	[0.1249]	[0.6329]	[0.9998]	[0.1249]	[0.6329]	[0.6337]	[0.09]	[0.0237]	[0.000]
LNHDI	-1.18852	-1.635905	-2.2885	-1.630451	-0.8888	-	-7.36827	-7.39218	-
	[0.902]	[0.4571]	[0.0226]	[0.7666]	[0.7838]		[0.000]	[0.000]	

Values in the squared parenthesis show the 'prob. of t statistics' at the significance level of 1%, 5%, and 10%

Table 3. Phillips Perron Unit Root Test Results									
Variables	PP			PP First Diff.			PP Second Diff.		
	Trend+ Constant	Constant	None	Trend+ Constant	Constant	None	Trend+ Constant	Constant	None
LNATM	-1.0504	-4.4578	2.2449	-3.54098	-	-2.74531	-	-	-
	[0.928]	[0.0007]	[0.9935]	[0.0448]		[0.0069]			
LNETASS	-2.7728	-4.346246	3.1703	-3.0678	-	-2.0316	-	-	-
	[0.2132]	[0.001]	[0.9995]	[0.1242]		[0.0414]			
LNDOMCRE	-1.975117	-1.334101	0.50879	-3.199779	-3.2132	-3.24667	-	-	
	[0.6018]	[0.6076]	[0.8224]	[0.0951]	[0.0245]	[0.0016]			
LNLOANS	1.783983	-1.4266	0.34495	-2.6067	-1.82103	-1.90415	-7.250631	-7.261488	-
	[0.999]	[0.5629]	[0.7813]	[0.2791]	[0.3667]	[0.0549]	[0.000]	[0.000]	
LNDEPOSIT	-0.66477	-2.600777	0.293989	-2.31317	-	-1.621339	-7.266208	-	-
	[0.9706]	[0.0989]	[0.7673]	[0.4198]		[0.0984]	[0.000]		
LNGDP	-1.87934	-0.0713	18.19114	-3.17927	-3.2388	-0.13166	-	-	-7.211103
	[0.6519]	[0.9472]	[0.999]	[0.0993]	[0.0229]	[0.6337]			[0.000]
LNHDI	0.482102	-2.459846	-9.64112	-2.96901	-2.38324	-	-7.09745	-7.1629	-
	[0.999]	[0.1308]	[0.000]	[0.1503]	[0.1511]		[0.000]	[0.000]	

Values in the square parenthesis show the 'prob. of t statistics' at the significance level of 1%, 5%, and 10%

As can be seen from Tables 2 and 3, the stationary levels of the variables are different from each other. Therefore, causality between variables was examined by VAR based Granger Causality test. As the first step to investigate causality between variables, appropriate lag-lengths were selected for both dependent variables.

Table 4. Lag-Lengths Selection

Dependent Variable: GDP Per Capita, PPP						
Lag	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	516.7319	NA	1.19e-16	-19.64353	-19.41839	-19.55722
1	1144.526	1086.566	1.56e-26	-42.40483	-40.82883	-41.80063
2	1247.390	154.2971*	1.26e-27*	-44.97655*	-42.04968*	-43.85446*
3	1267.378	25.36858	2.70e-27	-44.36068	-40.08295	-42.7207
4	1306.454	40.57916	3.26e-27	-44.479	-38.85041	-42.32113
Dependent Variable: Human Development Index						
Lag	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	572.2338	NA	1.40e-17	-21.77822	-21.55308	-21.69191
1	1156.227	1010.757	9.95e-27	-42.85487	-41.27887	-42.25067
2	1266.305	165.1172	6.09e-28	-45.70403	-42.77716*	-44.58194*
3	1286.525	25.66430	1.29e-27	-45.09712	-40.81939	-43.45714
4	1358.620	74.86817	4.39e-28	-46.48540	-40.85681	-44.32753

Table 4 shows the values for the information criteria used to determine the lag-length. As a result, the "2" was selected as a proper lag-length for both the GDP and the Human Development Index. Series in level is tested by the Granger causality test. In the Granger causality test, two variables are usually analyzed together, while the interactions of the variables are tested.

All possible results of the analysis:

- One-way Granger causality from Y_t to X_t
- One-way Granger causality from X_t to Y_t
- Bidirectional causality
- No causality

In Table 5, Granger Causality Analysis results are shown where GDP is a dependent variable.

Table 5. VAR Granger Causality Analysis Results (GDP is the dependent variable)

Null Hypothesis	Chi-Squarere Value	P-Value	Result
GDP is not Granger Cause of LNLOANS GDP→LNLOANS	0.640266	0.7261	Don't reject H_0
LNLOANS is not Granger Cause of GDP LNLOANS→GDP	13.943	0.0009	Reject H_0
GDP is not Granger Cause of LNETASSET GDP→LNETASS	2.604142	0.272	Don't reject H_0
LNETASSET is not Granger Cause of GDP LNETASS→ GDP	0.553432	0.7583	Don't reject H_0
GDP is not Granger Cause of LNDOMCRE GDP→LNDOMCRE	2.878732	0.2371	Don't reject H_0
LNDOMCRE is not Granger Cause of GDP LNDOMCRE→ GDP	2.988629	0.2244	Don't reject H_0
GDP is not Granger Cause of LNDEPOSIT GDP→LNDEPOSIT	2.195193	0.3337	Don't reject H_0
LNDEPOSIT is not Granger Cause of GDP LNDEPOSIT→ GDP	1.977797	0.372	Don't reject H_0
GDP is not Granger Cause of LNATM GDP→LNATM	5.296364	0.0708	Reject H_0
LNATM is not Granger Cause of GDP LNATM→ GDP	8.449524	0.0146	Reject H_0
LNLOANS is not Granger Cause of LNETASSET' LNLOANS→LNETASS	0.546281	0.761	Don't reject H_0
LNETASSET is not Granger Cause of LNLOANS LNETASS→LNLOANS	0.268395	0.8744	Don't reject H_0
LNLOANS is not Granger Cause of LNDOMCRE LNLOANS→LNDOMCRE	4.42684	0.1093	Don't reject H_0
LNDOMCRE is not Granger Cause of LNLOANS LNDOMCRE→LNLOANS	7.707992	0.0212	Reject H_0
LNLOANS is not Granger Cause of LNDEPOSIT LNLOANS→LNDEPOSIT	1.425428	0.4903	Don't reject H_0
LNDEPOSIT is not Granger Cause of LNLOANS LNDEPOSIT→LNLOANS	1.115949	0.5724	Don't reject H_0

Table 5. (Devamı)

Null Hypothesis	Chi-Squarere Value	P-Value	Result
LNLOANS is not Granger Cause of LNATM LNLOANS→LNATM	8.394777	0.015	Reject H_0
LNATM is not Granger Cause of LNLOANS LNATM→LNLOANS	10.63536	0.0049	Reject H_0
LNETASSET is not Granger Cause of LNDOMCRE LNETASS→LNDOMCRE	2.359862	0.3073	Don't reject H_0
LNDOMCRE is not Granger Cause of LNETASSET LNDOMCRE→ LNETASS	2.637240	0.2675	Don't reject H_0
LNETASSET is not Granger Cause of LNDEPOSIT LNETASS→LNDEPOSIT	4.28198	0.1175	Don't reject H_0
LNDEPOSIT is not Granger Cause of LNETASSET LNDEPOSIT→ LNETASS	1.899092	0.3869	Don't reject H_0
LNETASSET is not Granger Cause of LNATM LNETASS→LNATM	6.602925	0.0368	Reject H_0
LNATM is not Granger Cause of LNETASSET LNATM→LNETASSET	0.305638	0.8583	Don't reject H_0
LNDOMCRE is not Granger Cause of LNDEPOSIT LNDOMCRE→LNDEPOSIT	5.995593	0.0499	Reject H_0
LNDEPOSIT is not Granger Cause of LNDOMCRE LNDEPOSIT→LNDOMCRE	1.242503	0.5373	Don't reject H_0
LNATM is not Granger Cause of LNDOMCRE LNATM→LNDOMCRE	7.931988	0.0189	Reject H_0
LNDOMCRE is not Granger Cause of LNATM LNDOMCRE→ LNATM	2.354015	0.3082	Don't reject H_0
LNDEPOSIT is not Granger Cause of LNATM LNDEPOSIT→LNATM	4.196146	0.1227	Don't reject H_0
LNATM is not Granger Cause of LNDEPOSIT LNATM→LNDEPOSIT	0.566921	0.7532	Don't reject H_0

According to the results from Table 5:

There is a one-way causality between "GDP per capita and Outstanding loans with commercial banks(% of GDP)", "Outstanding loans with commercial banks (% of GDP) and Domestic credit provided by the finance sector (% of GDP)", "Number of ATMs per 100,000 adults and Net Foreign Assets".

There is bidirectional causality between "GDP per capita and Number of ATMs per 100,000 adults",

"Outstanding loans with commercial banks (% of GDP) and Number of ATMs per 100,000 adults", "Outstanding deposits with commercial banks (% of GDP) and Domestic credit provided by the finance sector (% of GDP)".

Table 6 shows the results of Granger Causality analysis in case HDI is the dependent variable.

Table 6. VAR Granger Causality Analysis Results (HDI is the dependent variable)

Null Hypothesis	Chi-Square Value	P-Value	Results
HDI is not Granger Cause of LNLOANS HDI →LNLOANS	1.316907	0.5177	Don't reject H_0
LNLOANS is not Granger Cause of HDI LNLOANS→ HDI	5.803441	0.0549	Reject H_0
HDI is not Granger Cause of LNETASSET' HDI →LNETASS	1.559293	0.4586	Don't reject H_0
LN_NETASSET is not Granger Cause of HDI LNETASS→ HDI	6.451671	0.0397	Reject H_0
HDI is not Granger Cause of LNDOMCRE HDI →LNDOMCRE	6.385466	0.0411	Reject H_0
LNDOMCRE is not Granger Cause of HDI LNDOMCRE→ HDI	9.485686	0.0087	Reject H_0
HDI is not Granger Cause of LNDEPOSIT HDI →LNDEPOSIT	3.279804	0.194	Don't reject H_0
LNDEPOSIT is not Granger Cause of HDI LNDEPOSIT→ HDI	4.800761	0.0907	Reject H_0
HDI is not Granger Cause of LNATM HDI →LNATM	3.596859	0.1656	Don't reject H_0
LNATM is not Granger Cause of HDI LNATM→ HDI	2.495851	0.2871	Don't reject H_0
LNLOANS is not Granger Cause of LNETASSET LNLOANS→LNETASS	0.015889	0.9921	Don't reject H_0

Table 6. (Devamı)

Null Hypothesis	Chi-Square Value	P-Value	Results
LNETASSET is not Granger Cause of LNLOANS	1.932265	0.3806	Don't reject H_0
LNETASS→LNLOANS			
LNLOANS is not Granger Cause of LNDOMCRE	4.081101	0.13	Don't reject H_0
LNLOANS→LNDOMCRE			
LNDOMCRE is not Granger Cause of LNLOANS	12.21614	0.0022	Reject H_0
LNDOMCRE→LNLOANS			
LNLOANS is not Granger Cause of LNDEPOSIT	0.475051	0.7886	Don't reject H_0
LNLOANS→LNDEPOSIT			
LNDEPOSIT is not Granger Cause of LNLOANS	1.074317	0.5844	Don't reject H_0
LNDEPOSIT→LNLOANS			
LNLOANS is not Granger Cause of LNATM	7.988491	0.0184	Reject H_0
LNLOANS→LNATM			
LNATM is not Granger Cause of LNLOANS	6.2682	0.0435	Reject H_0
LNATM→LNLOANS			
LNETASSET is not Granger Cause of LNDOMCRE	4.786461	0.0913	Reject H_0
LNETASS→LNDOMCRE			
LNDOMCRE is not Granger Cause of LNETASSET	1.331893	0.5138	Don't reject H_0
LNDOMCRE→ LNETASS			
LNETASSET is not Granger Cause of LNDEPOSIT	5.16553	0.0756	Reject H_0
LNETASS→LNDEPOSIT			
LNDEPOSIT is not Granger Cause of LNETASSET	0.654246	0.721	Don't reject H_0
LNDEPOSIT→ LNETASS			
LNETASSET is not Granger Cause of LNATM	2.861834	0.2391	Don't reject H_0
LNETASS→LNATM			
LNATM is not Granger Cause of LNETASSET	0.824476	0.6622	Don't reject H_0
LNATM→LNETASSET			
LNDOMCRE is not Granger Cause of LNDEPOSIT	7.341937	0.0255	Reject H_0
LNDOMCRE→LNDEPOSIT			

LNDEPOSIT is not Granger Cause of LNDOMCRE	0.524471	0.7693	Don't reject H0
LNDEPOSIT→LNDOMCRE			
LNDOMCRE is not Granger Cause of LNATM	0.239392	0.8872	Don't reject H0
LNDOMCRE→LNATM			
LNATM is not Granger Cause of LNDOMCRE	3.005232	0.2225	Don't reject H0
LNATM→LNDOMCRE			
LNDEPOSIT is not Granger Cause of LNATM	2.070062	0.3552	Don't reject H0
LNDEPOSIT→LNATM			
LNATM is not Granger Cause of LNDEPOSIT	3.670626	0.1596	Don't reject H0
LNATM→LNDEPOSIT			

According to the results from Table 6:

There is a one-way causality between "HDI and Outstanding loans with commercial banks (% of GDP)", "HDI and Net Foreign Assets", "HDI and Outstanding deposits from commercial banks (% of GDP)", "Domestic credit provided by the finance sector (% of GDP)" and "Outstanding loans with commercial banks (% of GDP)", "Domestic credit provided by the finance sector (% of GDP) and Net Foreign Assets","Outstanding deposits from commercial banks (% of GDP) and Net Foreign Assets", "Outstanding deposits from commercial banks (% of GDP) and "Domestic credit provided by the finance sector (% of GDP)".

There is bidirectional causality between "HDI and Domestic credit provided by the finance sector (% of GDP)", "Outstanding loans with commercial banks (% of GDP) and Number of ATMs per 100,000 adults".

6. CONCLUSION AND SUMMARY

The objective of this research is to investigate the relationship between financial inclusion, economic growth, and economic development of Mauritius. To examine the relationship, we included different financial inclusion indicators taking into account only commercial banks. Our research covers the period from 2004 to 2018. In this paper, the stationary behaviors of variables are investigated by using ADF and Phillips Perron tests. Based on the evidence of the nonstationary behaviors of the variables, the Granger Causality test is applied to explain the causality relationship between variables. According to the Granger test results, the GDP per capita is associated with "the number of ATMs per 100.000 adults", which explains the access to finance, and "outstanding loans with commercial banks (% GDP)", which refers to the use of finance. On the other hand, As a measure of economic development, HDI is associated with all variables that express the use of finance.

Besides economic growth, this result showed that economic development, which shows basic living standards such as health and education, is also important for the spread of financial base in Mauritius.

REFERENCES

Anwar, S, Sun, S. Financial development, foreign investment, and economic growth in Malaysia. *Journal of Asian Economics*, *22*(4), 335–342.

Awe, O. On pairwise Granger causality modeling and econometric analysis of selected economic indicators. Corpus, 1-17. http://interstat.statjournals.net/YEAR/2012/articles/1208002.pdf

Claessens, S, Laeven, L. Financial development, property rights, and growth. *Journal of Finance*, *58*(6), 2401–2436.

Goyal, P, K. An overview of financial services in Indian context. *International Research Journal of Commerce Arts and Science*, *6*(7), 180-188.

Demirguc-Kunt, A, Klapper, L, Singer, D, et al. The Global Findex Database 2014: Measuring financial inclusion around the world. *World Bank Policy Research Working Paper*, *7255* (April).

Durusu-Ciftci, D, Ispir, M, S, Yetkiner, H. Financial development and economic growth: some theory and more evidence. *Journal of Policy Modeling, 39* (2), 290-306. Doi: 10.1016/j.jpolmod.2016.08.001

Granger, C,W,J. Investigating causal relations by econometric models and cross-spectral methods. *Econometrica, 37*, 424-35.

King, R, Levine, R. Finance and growth Schumpeter might be right. *The Quarterly Journal of Economics, 108*(3), 717–737.

Masoud, N, Hardaker, G. The impact of financial development on economic growth: Empirical analysis of emerging market countries. *Studies in Economics and Finance, 29*(3), 148–173.

Onaolapo, A,R. Effects of financial inclusion on the economic growth of Nigeria (1982-2012). International *Journal of Business and Management Review, 3*(8), 11–28.

Özşuca, E,A. (2019). Financial inclusion in Turkey: Evidence from individual level data, *Ankara University Journal of SBF, 74*(4), 1377-1400. DOI: 10.33630/ausbf.614032

Pearl, J. Correlation and causation-the logic of co-habitation. *The European Journal of Personlity*, Special Issue.

Sehrawat, M, Giri, A,K. The impact of financial development on economic growth. *Studies in Economics and Finance*, *29*(3), 148–173.

Sehrawat, M, Giri, A,K. Panel data analysis of financial development, economic growth, and rural-urban income inequality. *International Journal of Social Economics*, *43*(10), 998–1015.

Shahbaz, M, Mafizur Rahman, M. Exports, financial development and economic growth in Pakistan. *International Journal of Development Issues*, *13*(2), 155–170.

Shahbaz, M, Rehman, I,U, Muzaffar, A,T. Re-visiting financial development and economic growth nexus: The role of capitalization in Bangladesh. *South African Journal of Economics*, *83*(3), 452–471.

Shan, J, Z, Morris, A,G, Sun, F. Financial development and economic growth: An Egg-and-Chicken Problem? *Review of International Economics, 9*(3), 443–454.

Valickova, P, Havranek, T, Horvath, R. Financial development and economic growth: A meta-analysis. *Journal of Economic Surveys*, *29*(3), 506–526.

Von Pischke, J,D. Poverty, human development and financial services, *Human Development Occasional Papers*, *25*, 1-47. http://hdr.undp.org/sites/default/files/jd_von_pischke.pdf

Wang, X. A Granger causality test of the causal relationship between the number of editorial board members and the scientific output of universities in the field of chemistry. *Current Science*, *116*(1), 35-39. https://www.currentscience.ac.in/Volumes/116/01/0035.pdf

WORLD BANK (2018). *Financial Inclusion 2018*. (16/04/2020, retrieved from https://www.worldbank.org/en/topic/financialinclusion/overview)