Financial System Development in Common Market for Eastern and Southern Africa (COMESA): A Vector Autoregressive Model

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ABSTRACT - This paper investigated the level of financial system development in common market for Eastern and Southern Africa (COMESA), 1997 to 2019. Analysis reveals that level of financial institutions and markets depth, access and efficiency in most COMESA member countries were below the IMF bench mark for low income countries. The VAR estimation shows strong endogeneity and exogeneity across the variables depicting independent influence. The cholesky variance decomposition in tandem with the VAR results confirmed strong endogeneity and exogeneity of all the variables both in the short run and long run. Base on the findings, researchers recommend that COMESA monetary zone should be established to facilitate common regional financial system development plan and cross border effect of financial institutions and markets development in member states, and pursue a robust institutional framework to complement innovations in the components of the financial system and provide incentives for the adoption of digital financial system.

Index Terms - Common market for Easter and Southern Africa (COMESA), financial system development, financial institutions depth, financial institutions access, financial institutions efficiency, financial markets depth, financial markets access and financial markets efficiency.

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1. INTRODUCTION

Financial system development has been a global phenomenon especially in emerging regional blocks. Financial system has witnessed colossal dynamism over time brought by financial innovative practices especially in the emerging markets. [1], financial organizations and financial systems are in the throes of changes caused by escalating globalization and innovations, A terrific deal of transformation has been hugged in the financial system which prompted the growth of financial related items, exercises and ranked structures that have to intensify and expand the productivity of the monetary framework. However, there are divergent views on the symbiotic interactions of the financial system development especially in the emerging regional markets. Existing literature explored the impact of financial system development on economic performance either inform growth or development limiting findings on endogeneity and financial services that could boost the level of innovation in the manufacturing sector thereby paving ways for investors to take advantage of the new

exogeneity of its components especially at the regional markets. Therefore, the growing financial system developments in emerging regional markets need to be examined to establish the segmented influence at the institutional and markets level. Consequently, this paper examines the level of financial institutions and markets depth, access and efficiency as well as the magnitude of shock in COMESA integrated regional markets.

2. LITERATURE REVIEW

[2], the developments in the financial sector have not only led to the increase in the number of financial institutions, but also the development in level of sophistication with new payment systems and alternatives to holding money. [6] in [6] argued that a well structured financial sector development in any economy has the ability to provide opportunities created. Financial system development thus involves the establishment and expansion of financial institutions, instruments and markets which

supports the investment and growth process through improvements in the quantity, quality and efficiency of financial intermediary services [3]. While, [4] assert that there seems to be a lack of strong financial systems and policies to deliver the required economic results in most developing countries. [5] support that development of the financial sector enhances efficient access to financial services and products.

## 2.1: Financial system development in COMESA countries.

charts 2.1.1, 2..12 and 2.1.3 below presents the level of financial institutions depth (FID), access (FIA), efficiency (FIE) compared to the International Monetary Fund (IMF) Bench mark for low income countries (LIC) across the globe. While chart 2.1.4, 2.1.5 and 2.1.6 presents financial markets depth (FMD), access (FMA), efficiency (FME) in Common Market for Eastern and Southern Africa (COMESA) counties compared to the International Monetary Fund (IMF) Bench mark for LIC.

Chart 2.1.1: Financial institutions depth in COMESA and IMF bench mark for Low income countries, 1997-2020
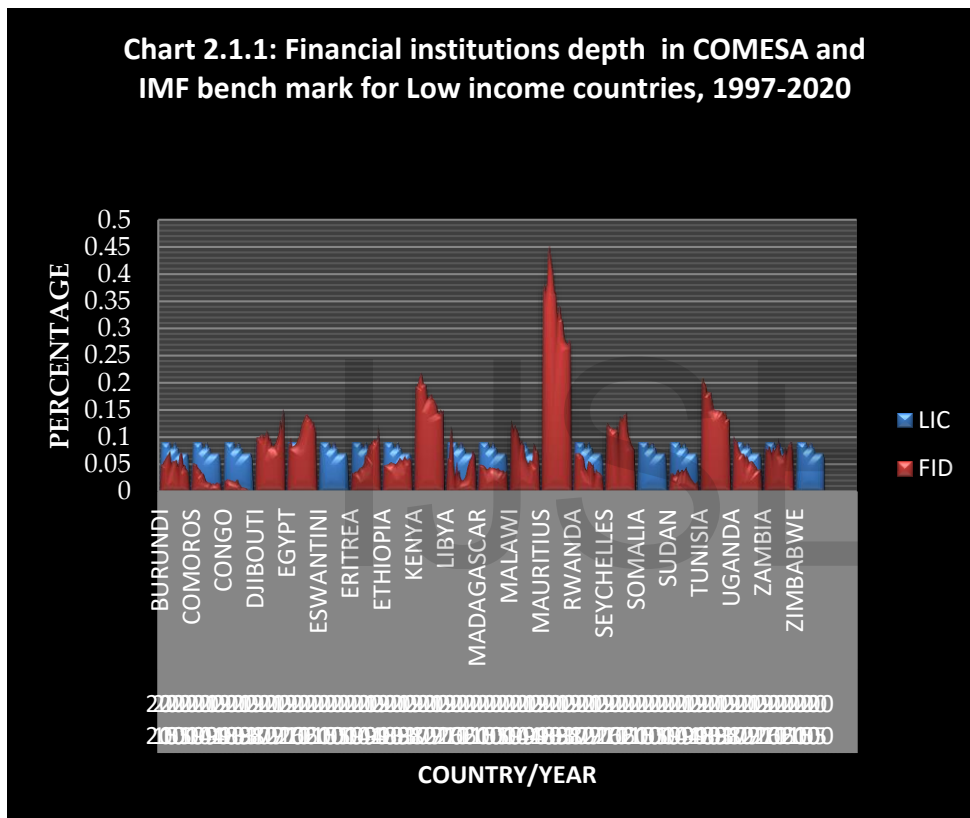
From chart 2.1.1 above, some COMESA member countries performed below standard in the area of financial institutions depth (FID) compared to the low income countries bench mark (LIC) throughout the period. These countries include Burundi, Comoros, DR Congo, Eswantini, Ethiopia, Madagascar, Rwanda, Somalia, Sudan and Zimbabwe representing 47.62 percent. While Eritrea, Libya, Malawi, Uganda and Zambia approximately 24 percent performed below and beyond the standard in some years. But performance of Djibouti, Egypt, Kenya, Mauritius, Seychelles and Tunisia approximately 29 percentage surpassed the bench mark.

Chart 2.1.2: Financial institutions access in COMESA and IMF bench mark for Low income countries, 1997-2020
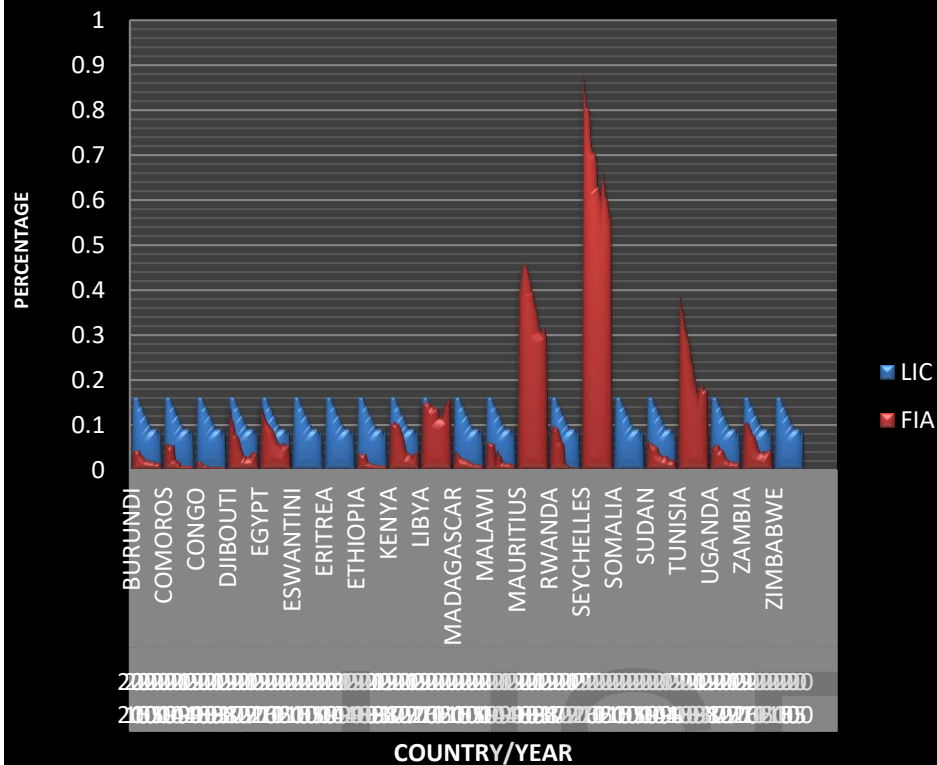
Comparatively, the performance of most COMESA countries in the area of financial institutions access (FIA) in was significantly below the bench mark for low income countries (LIC). Aside Libya, Mauritius, Seychelles and Tunisia representing 19.05 percent, the other seventeen (17) member countries of COMESA totaling 80.85 percent performed below standard throughout the period.

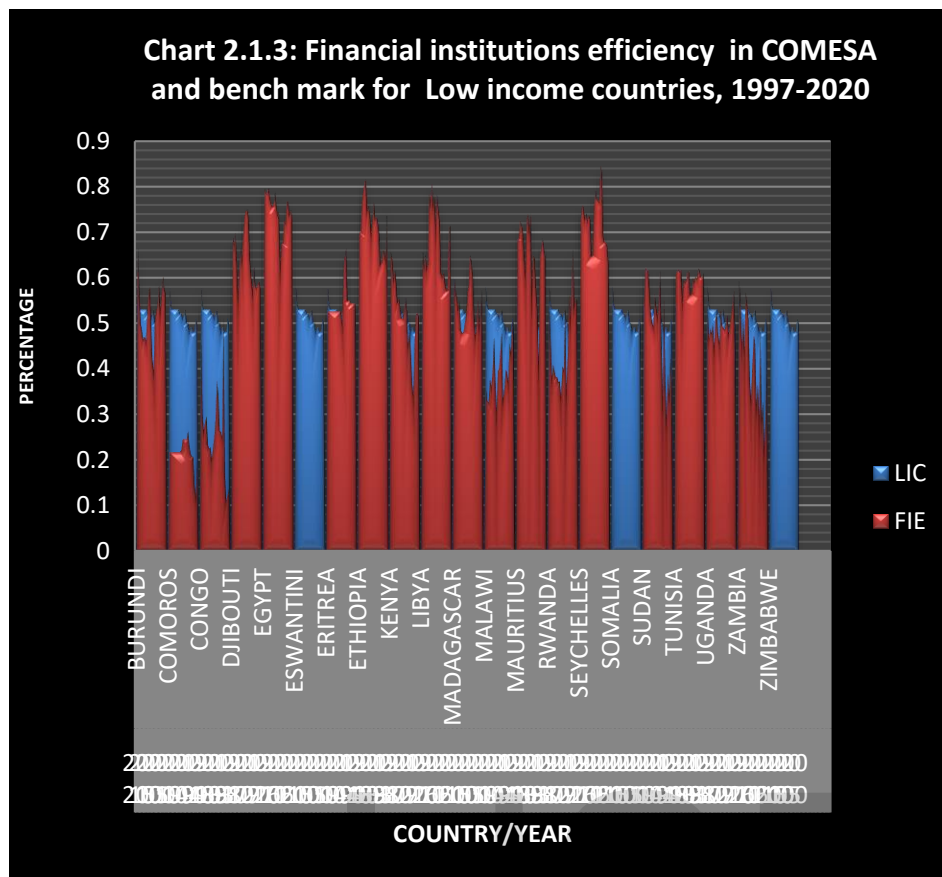Chart 2.1.3: Financial institutions efficiency in COMESA and bench mark for Low income countries, 1997-2020

Chart 2.1.3 depicts that the level of financial institutions efficiency (FIE) in Djibouti, Egypt, Ethiopia, Libya, Mauritius, Seychelles and Tunisia representing 33.33 percent of COMESA member countries significantly outweighs the bench march for low income countries (LIC) throughout the period. However, Burundi, Eritrea, Kenya, Madagascar, Rwanda, Sudan and Uganda (33.33 percent) recorded dual performances, below and beyond the LIC standard. While, the performance of another 33.33 percent including Comoros, Congo, Eswantini, Malawi, Somalia, Zambia and Zimbabwe were below the standard throughout the period under review.

Chart 2.1.4: Financial markets depth in COMESA and bench mark for Low income countries, 1997-2020
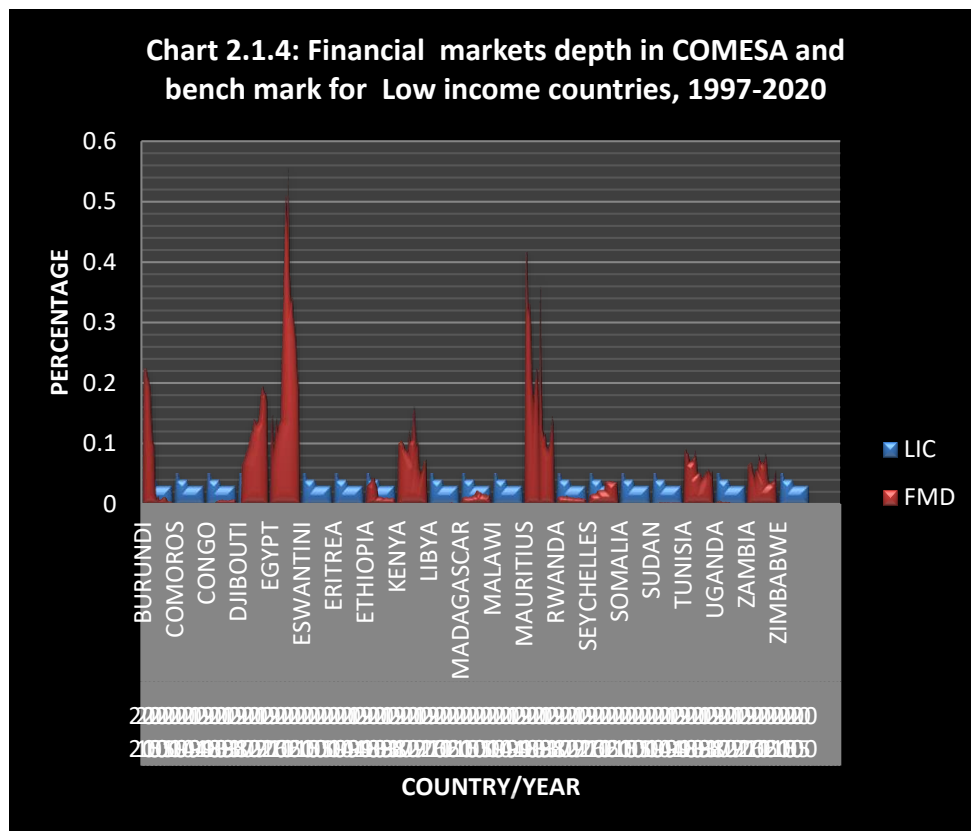
Chart 2.1.4 reveals that apart from Egypt, Kenya, Mauritius, Tunisia and Zambia approximately 29 percent that performed significantly above the bench mark and dual ratios in Djibouti, Ethiopia and Seychelles (14.29 percent), other member countries representing 61.90 percent performed below standard throughout the period in her financial markets dept compared to the IMF bench mark for LIC.

Chart 2.1.5: Financial markets access in COMESA and bench mark for Low income countries, 1997-2020
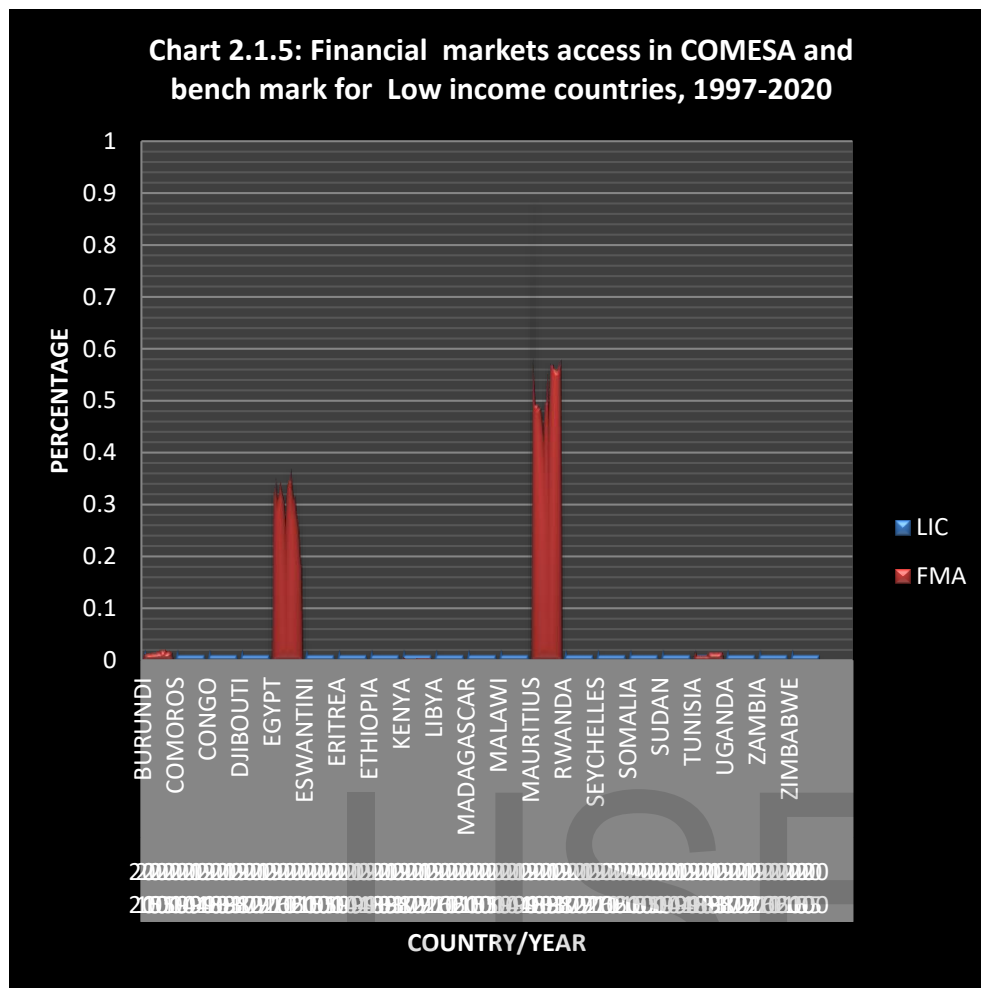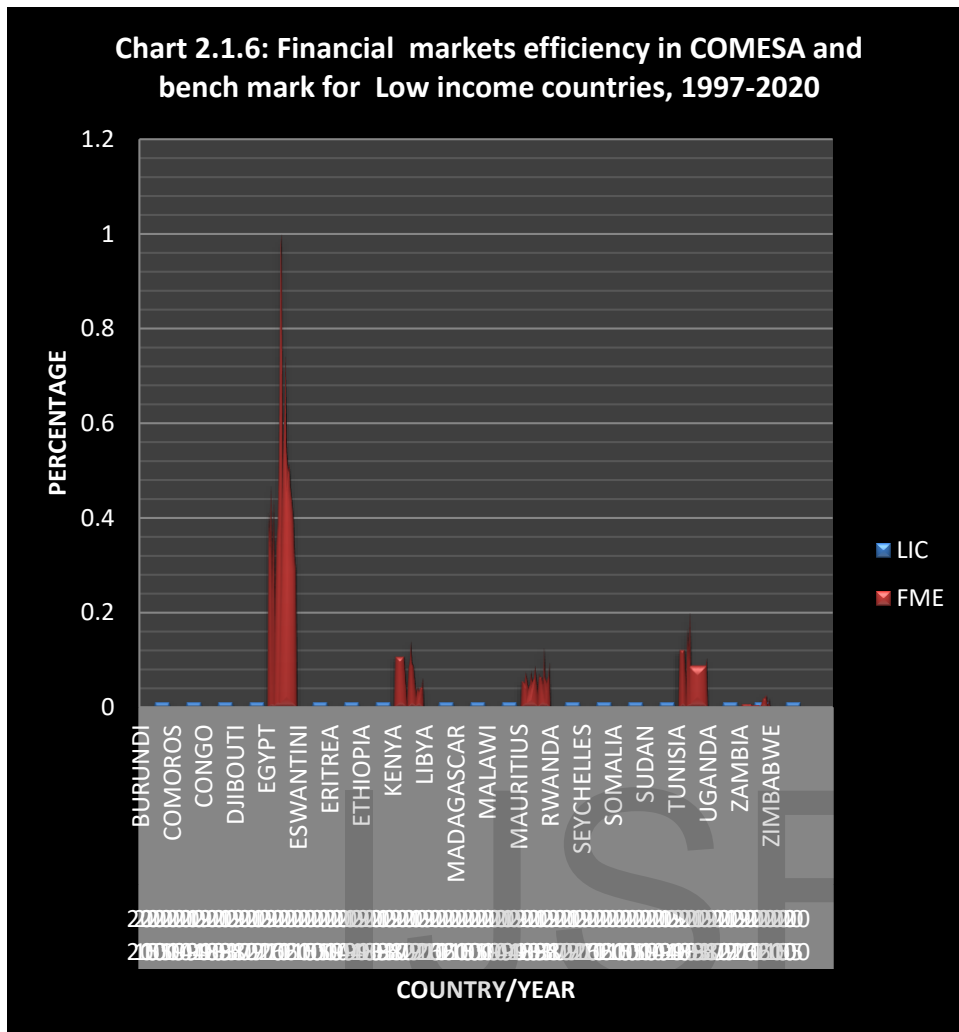
Chart 2.1.5 glares that the ratios financial markets access (FMA) in 21 COMESA member countries were significantly below the IMF bench mark for low income countries throughout the period under review, except Burundi, Egypt, Mauritius and Tunisia (19.05percent).

Chart 2.1.6: Financial markets efficiency in COMESA and bench mark for Low income countries, 1997-2020

From chart 2.1.6 above, the ratios of financial markets efficiency (FME) in the 21COMESA member countries were below the IMF bench mark throughout the period, except in Egypt, Kenya, Mauritius, and Tunisia (19.05 percent) and dual ratios in Zambia.

2.2 Empirical Review

[7] used ARDL to analyze the relationship between remittances and financial development. Results demonstrated a strong positive relationship between remittances and financial development in the long run. [6] reveals that credit to the private sector and money supply positively and insignificantly enhanced capacity utilization and output manufacturing sector in the long run, but negatively impacted value added of the manufacturing sector in the short run. [8] reveals that cash flow positively affects the investment decision of companies in India, that financial development reduces the investment cash flow sensitivity and the effect of financial development was more prominent for small size and standalone firms. [1] depicts that an increase in banking efficiency driven by competition and financial innovation would improve economic growth and development. [9]

Found that financial innovation has positive impact on the financial performance of BRICS countries. [10] panel ARDL confirmed positive relationship between financial innovation and financial inclusion both in the short run and long run. [11] GMM estimations via a panel data regression model revealed a strong persistence in a reliable manner for ROA and ROE, bank cards and ATM affect banks financial performances positively with the exception of POS terminal and internet banking. [12] research indicates a negative and significant relationship between product innovation and return on assets (ROA). The relationship between service innovation and ROA, organizational innovation and ROA was found to be positive and significant. [13] study reveals a positive relationship between financial innovation and financial performance of listed banks in Kenya. While, [14] ARDL estimation revealed a short run positive

relationship between monetary mass (M2), government expenditure and economic growth, a short run negative relationship between bank deposits, private investment and economic growth. However in the long run, all indicators of financial development showed a positive and significant impact on economic growth. [15] found that the use of the risk forecasting strategy contributes to raising the efficiency of banks financial performance and that the use of options contracts contributes to raising the efficiency of banks financial performance.

2.3 Theoretical Review

Legal Theory of Finance (LTF) prostrates that in countries where legal systems enforce private property rights, support private contractual arrangements, and protect the legal right of investors, savers are more willing to finance firms and financial system flourish. [16], the LTF posits that financial markets are constructed legally and ensconced in a hybrid location between market and state, private and public. Law is more fundamental to modern finance than recognized in the extant literature, It allocates power to regulators both private and public; offers authority to private and public financial instruments; and validates financial instruments generated from private contracts if they are consistent with the law [17]. Arguably, law's

significance to finance has increased with the transition from relational finance to entity and ultimately, market based finance. Financial instrument fungibility in anonymous markets depends on credible contractual commitments that can be legally enforced. [18] assert that protecting private contracting rights is fundamental to financial development. [16] argued that finance and law co-constituted and financial markets can be better understood through the lenses of the LTF, and the most important stylized facts of contemporary finance, both national and global are first, that financial assets are legally constructed; secondly law contributes to finance's instability; thirdly, there is a pecking order of the means of pay, which implies that finance is inherently hierarchical; and lastly, the binding nature of legal and contractual commitments tends to be inversely related to the hierarchy of finance: Law tends to be binding on the periphery and relatively more elastic at the apex of the financial system.

3. METHODOLOGY AND DATA ANALYSIS

As a result of endogenous model variables, the VAR approach was adopted as the most plausible technique of analysis in this study. VAR Model automatically specified thus:

$$FID = C(1,1)*FID(-1) + C(1,2)*FIA(-1) + C(1,3)*FIE(-1) + C(1,4)*FMD(-1) + C(1,5)*FMA(-1) + C(1,6)*FME(-1) + C(1,7)$$

$$FIA = C(2,1)*FID(-1) + C(2,2)*FIA(-1) + C(2,3)*FIE(-1) + C(2,4)*FMD(-1) + C(2,5)*FMA(-1) + C(2,6)*FME(-1) + C(2,7)$$

$$FIE = C(3,1)*FID(-1) + C(3,2)*FIA(-1) + C(3,3)*FIE(-1) + C(3,4)*FMD(-1) + C(3,5)*FMA(-1) + C(3,6)*FME(-1) + C(3,7)$$

$$FMD = C(4,1)*FID(-1) + C(4,2)*FIA(-1) + C(4,3)*FIE(-1) + C(4,4)*FMD(-1) + C(4,5)*FMA(-1) + C(4,6)*FME(-1) + C(4,7)$$

$$FMA = C(5,1)*FID(-1) + C(5,2)*FIA(-1) + C(5,3)*FIE(-1) + C(5,4)*FMD(-1) + C(5,5)*FMA(-1) + C(5,6)*FME(-1) + C(5,7)$$

$$FME = C(6,1)*FID(-1) + C(6,2)*FIA(-1) + C(6,3)*FIE(-1) + C(6,4)*FMD(-1) + C(6,5)*FMA(-1) + C(6,6)*FME(-1) + C(6,7)$$

FID = financial institutions depth, FIA = financial institutions access, FIE = financial institutions efficiency, FMD = financial market depth, FMA = financial market access and FME = financial market efficiency.

Table 1: Summarized results of preliminary analysis

VARIABLE	ADF-STAT	Prob.**	ORDER	LAG	R. SQUARE
FID	234.440	0.0000	1(1)	1	0.983606
FIA	110.890	0.0000	1(1)	1	0.997484
FIE	86.9626	0.0000	1(0)	1	0.839016
FMD	142.164	0.0000	1(1)	1	0.893848
FMA	12.4152	0.4129	1(0)	1	0.994146
FME	33.1025	0.0009	1(0)	1	0.800355

Table 2 above summarized the panel unit root test, optimal lag structure and measure of regression. Positive values of the Augmented Dickey Fuller (ADF) statistic indicated stationarity of the variables, and confirmed by the probability values less than one each. FID, FIA and FMD integrated in order one, while FIE,

FMA and FME attained stationarity at level form. Optimal lag structure of one was obtained across the variables and R square individual coefficients of determination shows the high degree of self prediction by each variable tested in the model.

Table 2: VAR Results.

Vector Autoregression Estimates
Date: 11/04/20   Time: 11:29
Sample (adjusted): 1998 2017
Included observations: 340 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	FID	FIA	FIE	FMD	FMA	FME
FID(-1)	0.987144	0.014980	-0.005461	0.108129	0.021079	-0.012882
	(0.01291)	(0.01071)	(0.08892)	(0.03261)	(0.01374)	(0.05762)
	[76.4726]	[1.39893]	[-0.06141]	[3.31611]	[1.53382]	[-0.22358]
FIA(-1)	0.007199	1.019027	0.061553	-0.007944	0.002837	-0.019024
	(0.00427)	(0.00354)	(0.02942)	(0.01079)	(0.00455)	(0.01907)
	[1.68533]	[287.585]	[2.09206]	[-0.73625]	[0.62392]	[-0.99785]
FIE(-1)	-0.002211	0.001311	0.872367	-0.004476	-0.004237	0.035605
	(0.00378)	(0.00314)	(0.02607)	(0.00956)	(0.00403)	(0.01689)
	[-0.58412]	[0.41762]	[33.4653]	[-0.46820]	[-1.05162]	[2.10784]
FMD(-1)	-0.003226	-0.009538	0.104772	0.858141	0.003764	-0.050938
	(0.01074)	(0.00891)	(0.07397)	(0.02713)	(0.01143)	(0.04793)
	[-0.30038]	[-1.07068]	[1.41645]	[31.6359]	[0.32919]	[-1.06273]
FMA(-1)	0.008962	-0.010159	-0.006997	-0.001326	0.983405	0.049949
	(0.00637)	(0.00528)	(0.04387)	(0.01609)	(0.00678)	(0.02843)
	[1.40704]	[-1.92264]	[-0.15948]	[-0.08240]	[145.026]	[1.75697]
FME(-1)	0.005537	-0.001480	0.004171	0.071519	0.011416	0.868807
	(0.00745)	(0.00618)	(0.05135)	(0.01883)	(0.00794)	(0.03327)
	[0.74281]	[-0.23927]	[0.08123]	[3.79800]	[1.43840]	[26.1107]
C	0.002181	-0.000184	0.061019	-0.000842	-6.83E-05	-0.010460
	(0.00195)	(0.00162)	(0.01344)	(0.00493)	(0.00208)	(0.00871)
	[1.11808]	[-0.11397]	[4.54096]	[-0.17079]	[-0.03288]	[-1.20124]

R-squared	0.983900	0.997555	0.843381	0.902522	0.994265	0.805255
Adj. R-squared	0.983610	0.997511	0.840559	0.900766	0.994162	0.801746
Sum sq. resids	0.038121	0.026234	1.808726	0.243241	0.043208	0.759478
S.E. equation	0.010699	0.008876	0.073699	0.027027	0.011391	0.047757
F-statistic	3391.667	22644.04	298.8637	513.8611	9621.766	229.4873
Log likelihood	1063.872	1127.399	407.7358	748.8109	1042.577	555.2527
Akaike AIC	-6.216893	-6.590584	-2.357269	-4.363594	-6.091627	-3.225016
Schwarz SC	-6.138061	-6.511753	-2.278438	-4.284762	-6.012796	-3.146185
Mean dependent	0.097309	0.114905	0.546123	0.058160	0.054868	0.040051
S.D. dependent	0.083573	0.177908	0.184572	0.085796	0.149077	0.107257

Determinant resid covariance (dof adj.)	8.16E-21
Determinant resid covariance	7.20E-21
Log likelihood	4990.027
Akaike information criterion	-29.10604
Schwarz criterion	-28.63305
Number of coefficients	42

The VAR estimates revealed strong endogeneity and exogeneity of all the variables. The coeffecients of t-statistic and percentage increase depicted that FID, FIA, FIE, FMD, FMA and FME strongly influenced itself, as their pass realizations associated with 98.71%, 100%, 87.23%, 85.81%, 98.34% and 86. 88% increase in FID, FIA, FIE, FMD, FMA and FME respectively on average ceteris paribus. And respective co efficient of determination as represented by R square of 0.983900, 0.997555, 0.843381, 0.902522, 0.994265 and 0.805255 with adjusted R of 0.983610, 0.997511, 0.840559, 0.900766, 0.994162 and 0.801746 respectively. FID had weak positive influence on FIA, FMD, and FMA and weak negative influence on FIE and FME. FIA, FMA and FME had weak positive influence on FID while FIE and FMD recorded weak negative influence. FIA had weak positive influence on FID, FIE and FMA, and weak negative influence on FMD and FME. FID, FIE, FMD, FMA and FME had no influence as the pass realization of FIA was associated with 100% increase in FIA on average ceteris paribus. FIE had relative positive influence on FME, weak positive influence on FIA and weak negative influence on FID, FMD and FMA. FIA and FMD had weak positive influence on FIE while FID, FMA and FME had weak negative influence. FMD had weak positive influence on FIE and FMA but weak negative influence on FID, FIA and FME. FID and FME had weak positive influence on FMD while FIA, FIE and FMA recorded weak negative influence. FMA had relative positive influence on FME, weakly positive on FID and negatively exhibited weak influence on FIA, FIE and FMD. FID, FIA, FMD, FMA and FME had weak positive influence on FMA while FIE influence was negatively weak. FME had weak positive influence on FID, FIE, FMD, FMA and FME and weak negative influence on FIA. FIE and FMA had relative positive influence on FME while FID, FIA and FMA revealed weak negative influence.

Table 3: Summary of Diagnostic Tests.

AUTHOCORRELATION		HETEROSKEDASTICITY		NORMALITY	
F- stat	6.993365	Joint	0.0000	1	0.3048
Prob	0.0000	Chi-sq	50.71885	2	0.0000
			85.03983	3	0.2782
			20.08878	4	0.0000
			104.7122	5	0.0000
			88.35852	6	0.5658
	191.3178		Joint	0.0000	

VAR residual serial correlation LM test indicated absence of serial correction at lags 1 to h. The Normality Tests revealed that out of the six components, first, third and sixth variables residuals' were normally distributed. While heteroskedasticity tests at levels and squares depicted presence of heteroskedasticity.

Table 4: Cholesky Variance Decomposition Results.

FID:

Period	S.E.	FID	FIA	FIE	FMD	FMA	FME
1	0.010699	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.015054	99.95531	0.000993	0.011178	0.000158	0.003652	0.028705
3	0.018347	99.86875	0.003366	0.031302	0.000287	0.012309	0.083988
4	0.021084	99.75473	0.007198	0.055910	0.000321	0.026061	0.155781
5	0.023460	99.62337	0.012580	0.082183	0.000288	0.044932	0.236649

FIA:

Period	S.E.	FID	FIA	FIE	FMD	FMA	FME
1	0.008876	1.541016	98.45898	0.000000	0.000000	0.000000	0.000000
2	0.012707	1.812445	98.10646	0.009366	0.061884	0.006965	0.002877
3	0.015763	2.082433	97.66790	0.027807	0.187005	0.022504	0.012348
4	0.018445	2.347197	97.16688	0.051990	0.357233	0.045878	0.030827
5	0.020905	2.604270	96.62205	0.079242	0.558201	0.076442	0.059792

FIE:

Period	S.E.	FID	FIA	FIE	FMD	FMA	FME
1	0.073699	0.000567	0.000914	99.99852	0.000000	0.000000	0.000000
2	0.097722	0.000466	0.005469	99.90963	0.083987	6.08E-05	0.000387
3	0.112628	0.000631	0.013506	99.72436	0.257445	0.000228	0.003834
4	0.122822	0.000592	0.025189	99.46166	0.497465	0.000516	0.014578
5	0.130135	0.000605	0.040647	99.13889	0.781984	0.000922	0.036952

FMD:

Period	S.E.	FID	FIA	FIE	FMD	FMA	FME
1	0.027027	1.030357	0.029112	0.494399	98.44613	0.000000	0.000000

2	0.036291	0.661822	0.041896	0.541721	97.93031	0.000251	0.824001
3	0.042439	0.488863	0.056488	0.547565	96.49043	0.000336	2.416319
4	0.047005	0.494303	0.072386	0.523279	94.44209	0.000274	4.467669
5	0.050593	0.653739	0.089112	0.482806	92.04472	0.000542	6.729077

FMA:

Period	S.E.	FID	FIA	FIE	FMD	FMA	FME
1	0.011391	0.016602	0.601349	0.735672	13.22460	85.42178	0.000000
2	0.016064	0.011608	0.592311	0.992034	13.86559	84.43131	0.107147
3	0.019628	0.035920	0.583191	1.237526	14.38207	83.43475	0.326543
4	0.022616	0.089081	0.574024	1.461814	14.78894	82.45828	0.627863
5	0.025236	0.170002	0.564812	1.659917	15.10135	81.51841	0.985503

FME:

Period	S.E.	FID	FIA	FIE	FMD	FMA	FME
1	0.047757	0.114904	0.117022	0.058082	6.667120	0.016271	93.02660
2	0.063178	0.113806	0.130972	0.371001	6.096619	0.009298	93.27830
3	0.072663	0.108918	0.144543	0.854395	5.647815	0.012050	93.23228
4	0.079088	0.101820	0.157585	1.455492	5.298877	0.024740	92.96149
5	0.083647	0.094157	0.169993	2.126289	5.030338	0.047181	92.53204

Cholesky Ordering: FID FIA FIE FMD FMA FME

All the variables exhibited strong endogeneity and exogeneity both in the short run and long run. There was trace of weak influence from shocks of other variables, as no degree of unexpected variation was produced by innovations from these variables and this was in tandem with the VAR results. In the short run, 100% and 99.95% forecast error variance in FID was explained by FID itself, while 99.87%, 99.75% and 99.62% explained in the long run. Other variables exhibited weak influence on FID both in the short and long run. FIA, FIE, FMD, FMA and FME had weak influence on FID. 98.46% and 98.11% forecast variance in the short run was explained by FIA itself, 97.67%, 97.17% and 96.62% was also predicted in the long run. This implies that FID, FIE, FMD, FMA and FME had weak influence on FID. FIA showed 99.99% and 99.91% self prediction in the short and 99.72%, 99.46% and 99.14% in the long run. FMD revealed self significant impact in the short and long run, 98.45%, 97.93% and 96.49%, 94.44%, 92.04% respectively. However, 85.42% and 84.43% forecast error variance was explained by FMA itself in the short run and 83.43% 82.46% and 81.52% in the long run. While, FMD predicted 13.22% and 13.87% forecast error variation in FMA in the short and accelerated to

14.38%, 14.79% and 15.10% in the long run. This depicts that FMD had relative influence on FMA. Finally, FME strongly predicted itself both in the short and long run as the forecast error variance explained 93.03% and 93.28% in the short run, 93.23%, 92.96% and 92.53% in the long run. While, 6.67%, 6.10%, 5.65%, 5.30% and 5.03% were predicted by FMD, first two in the short and the rest in the long run. This implies that FMD had relative influence on FME both in the short and long run.

4. CONCLUSION/IMPLICATIONS' OF RESULTS AND RECOMMENDATIONS

Generally, the performance of financial system development indicators in most COMESA member countries including Comoros, DR Congo, Eswantini, Eritrea, Libya, Malawi, Rwanda, Somalia, Sudan, Uganda, Zambia and Zimbabwe were below International Monetary Fund (IMF) bench mark for low income countries (LIC). VAR results revealed strong endogeneity and exogeneity across the variables, as they had significant self predictions and minimal or no influence on the other variables both in the short run and long run. This implies that movement in the individual components of financial

system does not have external influence on each other, as all the segmented indicators of financial system development exhibited strong and statistically significant independency both in the short run and long run. Based on the findings, researchers recommends that COMESA monetary zone should be established to facilitate common regional financial system development plan and cross border effect of financial institutions and markets development in member states, and pursue a robust institutional framework to complement innovations in the components of the financial system and provide incentives for the adoption of digital financial system.

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