VOLUME 6 ISSUE 3, 2021

Journal of Social Sciences

Published by
Faculty of the Social Sciences
Enugu State Unviersity of Science & Technology
www.esutjss.com

Journal of Social Sciences

Effects of Monetary Sector Financial Liberalization on Domestic Savings in Selected ECOWAS Countries

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Abstract

There has been rapid decline in the rate of saving in the ECOWAS countries. More so, monetary sector financial liberalization in the region has not yielded a fruitful outcome as the countries have suffered widened disparity of lending and deposit rates, high inflation and continuous decline in economic growth. The study examined the effects of monetary sector financial liberalization in the ECOWAS countries of Benin, Cote d' Ivoire, Ghana, Liberia and Nigeria from the period 1981-2019. The study anchored on the frameworks of the life cycle and the financial liberalization hypotheses employed the panel Vector auto regression (VAR) estimation technique. The variables of the study are household saving (dependent) and domestic credit provided by the financial sector, growth of GDP, interest rate spread, broad money supply and financial liberalization dummy, and gross fixed investment as independent and control variables. The data were sourced from World Bank Development Indicator (WDI, 2020) and the African Development Bank Database (2020). The study showed that domestic credit has a significant positive effect on domestic saving while gross fixed capital formation has a negative effect on domestic saving. The study further revealed that labour force and money supply are negatively related to household saving in the ECOWAS countries within the reviewing period. From the empirical evidence, the study recommended among others, the need for the Government to implement restrictive monetary policy measures that will curtail excessive money supply in order to reduce inflation spiral and improve household saving in the ECOWAS countries.

Keywords: ***Domestic saving, ECOWAS countries, financial liberalization, monetary sector, panel VAR,***
JEL Classification: D14, B26, E50, E58, C23

Introduction

Saving is defined as that part of disposable income which is not spent on consumption (Bime & Mbanasor, 2011). Saving involves sacrificing the current consumption in order to increase the living standard and fulfilling the daily requirements in the future. Domestic saving therefore becomes that part of the household income not consumed. The vitality of savings to the economy has well-being espoused in the economic development literature. It could be used for investment to earn profit (interest) or be used to purchase assets such as building, machinery and infrastructure. Investment from saving contributes to growth in aggregate wealth. But the investment cannot increase without increasing the amount of saving. Thus, saving performs a major role in providing the national capacity for investment and production, which will affect the potentials of economic growth. In general terms, increasing aggregate saving contributes to higher investment and this leads to higher economic growth

(GDP) both in the long and short-runs. It means that the higher saving rate leads to less consumption, which could also result in larger amount of capital investment and finally a higher rate of economic growth. Furthermore, saving creates capital formation and leads to technical innovation and progress this helps with economies of large scale production and increase specialization. This also helps to accelerate the productivity of labour. Thus, saving leads to fuller utilization of available scarce resources in an efficient way, as it increases the size of national output, income and employment, thereby solving the problems of inflation, unemployment and balance of payments deficits, poverty, inequality and making the economy free from the burden of foreign debt and better welfare of the citizenry.

The monetary sector includes the Central Banks and banking financial institutions and units (monetary agency) and certain operations that are usually attributed to the central bank but in some cases, are carried out by other government institutions (example, commercial/deposit money banks). The monetary aggregates include the totality of currency outside the banks. This includes narrow money (M_1) and broad money (M_2) supplies. The currency outside the central banks includes cash issued by the central bank for circulation, but with the exclusion of cash in the vaults of Deposit Money Banks (DBMs).Narrow money (M_1) includes currency in circulation plus transferable deposits held by all deposit money banks. Broad money ($M_{2)}$is the combination of M_1 and deposits (in national currency) plus money market instruments. This may include time deposits of all maturities, or only those deposits with maturities that do not exceed a specified maximum term.

The main objective of monetary reform as pointed out by the monetary authority of the ECOWAS countries include: Removal of controls on interest rate to increase the level of savings and improve efficient allocation of domestic credit in the economy; elimination of non-price rationing of credit to reduce misdirected credit and increase competition; adoption of indirect monetary management in place of the imposition of credit ceiling on individual banks; enhancement of institutional structure and supervision, strengthening the money market through policy changes and distress resolution measures and improving the linkage between formal and informal sectors(CBN, 2007).Thus, the idea behind monetary sector liberalization is summarized in two folds: First, to quantity effects through generating higher saving and investment in the economy, and second, to quality effects by efficiently allocating capital to profitable investment (Ahmad &Premaratna, 2020). Monetary sector liberalization serves as a panacea to money market constraints in a financially repressed economy and under the financial repression region. Monetary sector financial liberalization promotes the attraction of foreign investment, availability of credit facilities to the investors and allocation of capital towards the most productive projects, and it also facilitates financial development which in turn could positively affect productivity in the economy (Ikeora, Igbadika& Jessie, 2016).Since the focus of the study is on monetary sector financial liberalization, unlike the entire financial system liberalization with multifaceted characteristics, and to avoid the problems of data measurement, our measures of monetary sector financial liberalization includes: Domestic credit provided by the financial sector in percentage of GDP, interest rate spread, which is the different between the lending rate and deposit rate and a constructed financial liberalization dummy, to account for the various monetary sector financial liberalization regimes in the ECOWAS countries.

ECOWAS countries researchers such as Akpan (2008) and Emenuga (2005) in their separate studies concluded that financial liberalization is critical to savings mobilization. Udegbunam (1995) found out that financial liberalization has provided great incentives for the expansion of banking institutions. Similarly, Bakare(2011) found out that financial liberalization has impacted negatively on domestic saving in Nigeria. Other related studies are Bosede (2013);

Owusu and Odhiambo (2016); Adewuyi, Bankole & Damilola (2010), Abu, Modh and Mukhriz (2013) and Adebanyo, Awonusi, Ahmed, Ewunaga and Yemisi (2017). However, there is no unanimous agreement on the nature of financial liberalization effects on domestic saving from these studies and papers. The relationship between financial liberalization and domestic saving is complex not only because there are short and long-run effects involved but because financial liberalization is a process with many dimensions. These studies were deficient on the measurement of financial liberalization. Again, existing empirical studies focusing on the effect of financial liberalization on saving in sub-Saharan Africa (SSA) have employed the real rate of interest (Oshikoya, 1992; Seck& El Nil, 1993; Azam, 1996; Matsheka, 1998), and measures of financial deepening such as the broad money ratio (Mwega, 1997; Elbadawi & Mwega, 2002) and the ratio of bank credit (Elbadawi & Mwega, 2000; Kelly &Mavrotas, 2002) as proxies for financial liberalization. However, such variables are inadequate measures of financial liberalization because they fail to explicitly account for different liberalization measures. As a result, the study attempts to contribute to the literature on the effects of monetary sector financial liberalization on domestic saving in the ECOWAS countries of Benin, Ghana, Cote d'Ivoire, Liberia and Nigeria, relying on monetary sector variables only other than measuring financial liberalization with either a variable of the money market or capital market. Such measurements lead to estimation bias. The study employed the panel vector autoregressive approach (PVAR) to investigate the effects of monetary sector financial liberalization on domestic saving in ECOWAS countries from the period 1981 to 2019. The research questions that formed the focus of discussion in the paper is as follow:

- What is the effect of monetary sector financial liberalization on domestic saving ECOWAS countries?
- What is the effect of economic growth on domestic saving in ECOWAS countries?
- What is the effect of monetary sector liberalization policy regimes/reforms on domestic saving in the ECOWAS countries?

The overall objective of the study is to examine the effect of monetary sector financial liberalization on domestic savings in Benin, Cote d'Ivoire, Ghana, Liberia and Nigeria. Specifically, the study objectives are: To determine the effects of domestic credit provided by the financial sector (% of GDP), interest rate spread and broad money supply on household savings in Benin, Cote d'Ivoire, Ghana, Liberia and Nigeria; To investigate the effect of annual growth rate on household savings in Benin, Cote d'Ivoire, Ghana, Liberia and Nigeria and; To empirically evaluate the effect of monetary sector financial liberalization policy regimes on household saving in the ECOWAS countries of Benin, Ghana, Cote d'Ivoire, Liberia and Nigeria.

Theoretical Framework, Model Specification and Data Sources

Theoretical Framework

The Life Cycle Hypothesis (LCH) and the financial liberalization thesis form the theoretical frameworks of the study. The LCH was first theorized by Modigliani and Brumberg (1954) to establish a positive relationship between the saving ratio and output growth. Within the theory of LCH, the individual objective is to enhance consumption over the life time. Savings are therefore determined by total life time earnings and not by the level of current income.

The theoretical arguments for monetary sector financial liberalization are centered mainly on the need for a more laissez faire banking policy, especially the domestic financial market that

is determined by the market forces. It will ensure that interest rate captures the actual scarcity of capital in less developed countries. McKinnon (1973) and Shaw (1973), the proponents of the financial liberalization thesis produced a theoretical basis for financial development that has been formalized and extended to show how some financial controls that produce financial repression effects could make the financial sector stifle rather than promote a country's development. The McKinnon-Shaw analysis is anchored on the fact that interest rate ceilings stagnate savings and reduce the quality of investments. Moreover, it implies that an end to interest rate ceilings and other government regulations responsible for slow competitive operations in the market for funds will be beneficial to developing countries. Higher interest rates will result in increased savings and investment, which in turn contribute to economic growth and investment. Efficient financial system will lead to appropriate channeling of financial resources provided that the financial system is efficient and well-functioning. This means that firms could grow their enterprises through the opportunity of borrowing at lower interest rates. More so, financial intermediaries will enable investors direct their funds to more rewarding projects. This main critique of the financial liberalization theory emanates from the imperfect information hypothesis. That school of thought assesses the problem of financial development within the context of information asymmetry and costly information resulting from credit rationing. The frameworks are adopted following the relevance to the study

Empirical Model Specification

On the basis of the theoretical frameworks presented in the foregoing, household domestic saving proxy by domestic saving function is specified in a Panel VAR model form to enable estimation to be carried out for the selected ECOWAS Countries. The model estimation follows: Adewuyi, Bankole and Arawomo (2010)**,** whose model is specified as thus:

$GDS_{tk} = b_0 + b_1GRGDP_{tk} + b_2TOT_{kt} + b_3GDP_{tk} + b_4BRMO_{tk} + b_5GDPPC_{tk} + b_6INF_{tk} + b_7INT_{tk} + b8DCPRrtk + b_9LFE_{tk} + b_{10}LAP_{tk} + U_{tk.}$(3.1)

Where GDS is gross domestic saving (measured as gross domestic saving as a percentage of GDP.GRGDP is growth rate of gross domestic product, TOT is Terms of Trade, GBP is Government Budget position (Fiscal deflect or surplus as a percentage of GDP), BRMO is the degree of financial depth (measure as broad money supply as a percentage of GDP), GDPPC is gross domestic product per capital (GDP as a ratio), DEPR is Dependency Ratio, LFE is life expectancy ratio, LAP in labour participation rate.

Since the objective of the current study is to investigate the effect of monetary sector financial liberalization domestic of savings in the selected ECOWAS countries, equation (3.1) is re-specified with adjustment as follows:

$GDS_{tk} = b_0 + b_1DESCRE_{tk} + b_2M2/GDP_{tk} + b_3INTSP_{tk} + b_4GDPPC_{tk} + b5GFCF_{tk} + b_6POGROW\ b_7FINLDUM_{tk} + u_{tk}$(3.2)

Where GDS is Gross Domestic Saving; DESCRE, is domestic credit allocated to the private sector by the banking sector; M2/GDP, is broad money supply as a percentage of GDP; INTSP, interest rate spread previously defined; GDPPC, growth per capita; GFCF, aggregate investment as gross fixed capital formation and FINLDUM, liberalization dummy representing the different policy regimes of reforms/liberalization in the economies of the ECOWAS countries over the reviewing period and U, the error term. K represents countries heterogeneity and t is the time frame. The study is focusing on the monetary sector financial liberalization because the complexity of financial liberalization itself. This becomes expedient so as to avoid the problem of multicollinearity and data biasness resulting from the

construction of an index variable to measure financial liberalization. Measurement error may occur during the factor analysis.

Domestic credit provided by financial sector (in percentage of GDP): One of the explanatory variables used in measuring monetary sector financial liberalization. Domestic credit provided by the financial sector includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The financial sector includes monetary authorities and deposit money banks, as well as other financial institutions. Elom-Obed, Odo, Udude and Okonkwo(2016) revealed a unidirectional causality from domestic credit (DCPS%GDP) to domestic private saving, indicating a positive significant relationship between the two variables. Our study hypothesizes a positive effect of domestic credit on household saving, as such, $\alpha_1>0$.

Economic Growth: Economic growth, proxy by GDPPC measured in annual percentage rate entered into the model as a control variable, in the sense that growth affects domestic saving outside the explanatory variables.From a theoretical point of view, a positive relationship between domestic savings and economic growth is expected, due mainly to the fact that an increase in savings would positively stimulate economic growth, and economic growth could in turn stimulate the growth of domestic saving via investment and employment. Misztal (2011) found the existence of one-way causal relationship between gross domestic savings and gross domestic product in the case of developed countries as well as in developing countries. In this study, our study expects a positive significant relationship between both variables. Our study therefore hypothesizes a positive effect of economic growth on household saving, as such, $\alpha_2>0$.

Interestrate Spread: This is another explanatory variable of the study. Interest-rate spread is defined as the difference between the lending rate and the deposit rate. The life cycle theory introduced that the net effect of the real interest rate increases the current price of consumption relative to the future price, thus affecting savings positively. The income effect indicates that if the household is a net lender, an increase in the interest rate will have a positive effect on savings ratio only when the substitution effect dominates the income effect. In developing countries, like the ECOWAS countries, where financial markets are still not developed, substitution effect is expected to be much greater than income effect, and thus the real interest rate is likely to have a net positive effect on domestic savings. Hence, $\alpha_3>0$.

Broad Money Supply (M^2/GDP)

The broad money supply is among the measures of financial deepening of the money market reforms. The broad money supply involves currency in circulation and all reserve balances/deposits held by money bank financial institutions in ECOWAS countries. It is the overall money held by the ECOWAS countries country in the form of liquid instruments for a specified time. The broad money supply also includes balances held in cheques and savings accounts, cash and coins. Brookin (2001); Narayan & Siyabi (2005), concludes on the inverse connection with aggregate savings. Conversely, money supply growth has positive effect on gross domestic savings (Khan, Teng, Khan, Jadron&Rehan, 2017). The study hypothesizes a positive relationship between broad money supply and gross domestic savings. A positive relationship is expected such that $\alpha4>0$.Population growth entered into the model as a control variable and is measured by labour force rate. This refers to the increase in the number of individuals in a population. The effect of population growth, say, family size on household saving can be negative, negligible or positive. For example, a positive effect of children on saving can result if their presence increases family income more than their effect on

consumption. Population growth could lead to increase in saving through the growth effect or a decrease in saving through the dependency effect. Financial Liberalization Dummy (FINLDUM: A control variable in the model. A dummy for monetary sector financial reforms, it captures the liberalization policy regimes in the ECOWAS countries. These reforms periods should, in particular, include policies that should induce higher growth thereby generating savings and investment. In relevant studies, Akinsola, Odhiambo & McMillan (2017) found a negative result for low-income countries. On the other hand, (Kunt & Demigrunt, 1998) found out that the different policies are strongly and positively correlated with the indicators of measurement. It is expected that these policy regimes have positive effect on household saving.

Results, Analysis and Discussion of Findings

Summary of Descriptive Statistics

Table 1: Summary of Descriptive Statistics

HHS	BMS	DCR	IRS	GGDP	GCF	CFLIB		
Mean		4.242608	27.47	115.4958	8.66	3.36266	4.34	0.764103
Median		11.59121	26.38	24.56837	8.7	4.000000	5.79	1.000000
Maximum		39.31757	101.8	3170.321	16.2	106.2798	123	1.000000
Minimum		-152.5373	8.89	-26.65229	0.31	-51.03086	0.45	0.000000
Std. Dev.		31.89767	10.2	350.5593	3.13	11.36628	12.4	0.425651
Skewness		-3.093106	2.3	5.488374	-0.14	2.813243	11.0	-1.244128
Kurtosis		12.68144	16.1	38.23734	2.6	40.22144	57.2	2.547855
Tarque-Bera		1072.495	1645	11067.54	0.34	11513.88	65.1	51.96633
Probability		0.000000	0.0	0.000000	1689	0.000000	75.2	0.000000
Sum		827.3085	5357	22521.67	1903	655.7394	438.4	149.0000
Sum Sq.Dev.		19737.5	20305	23841.007	0.234	2.5063.30	1867	35.14872
Observation		195	195	195	195	195	195	195

Note: HHS: Household savings, domestic credit, interest rate spread, broad money supply), GGDP, economic growth, FLIB, Financial liberalization dummy).Significance level; 5%

Source: Authors Computation using Econometric View 11.0

Table 1. present the descriptive statistic of the model variables for household savings (% of GDP), financial index of domestic credit (% of GDP, interest rate spread (lending-deposit rate), and broad money supply (% of GDP), growth of GDP in annual percentage (GGDP) and financial liberalization dummy (FLIB). The summary statistics indicate the existence of wide variations in the variables. For instance, the average household savings rate for the 1981 to 2019 periods was 4.21 percent compared to 115.4, 3.36 and 0.76 percentage points for financial index variables, growth rate and the financial liberalization dummy. The maximum for household savings was 39.32, 3170 for the index 106.3 for the growth rate and 1.0 for the liberalization dummy. Similarly, the minimum ranges from -152.5 to 0.00 for household savings, the financial liberalization index, growth rate and liberalization dummy. The skewness statistics showed that with the exception of household savings and liberalization dummy with negative values, the others, financial index and growth were positive. The Kurtosis statistics showed that the values of the data ranges from 12.6 to 2.54 suggesting that the variables are leptokurtic, i.e, the distribution is peaked relative to normal distribution. Finally, the Jarque-Bera statistics values of 1072 to 51 rejected the null hypothesis of normal distribution for the variables at the 5% critical value.

Correlation Matrix

In furtherance to the descriptive statistics, the correlation matrix test was carried out to show the movement and pattern of the data used in the model estimation, -1 indicates a perfectly negative linear correlation between two variables, 0 indicates no linear correlation between the two variables and 1 indicates a perfectly positive linear correlation between two variables. Table 4.2 shows the correlation matrix of the data between the periods 1981 to 2019.

Table 2: Correlation Matrix

Correlation Probability	**HHS DCR**	**BMS IRS**	**GGDP**	**GCFC**	**FLIB**
Observations					
HHS	1.000000				
	195				
DCR,BMS,IRS	-0.073111	1.000000			
	0.3098	-			
	195	195			
GGDP	-0.068799	-0.097927	1.000000		
	0.3392	0.1732	-		
	195	195	195		
FLIB	-0.080515	0.101383			1.000000
	0.2632	0.1585			
	195	195			

Source: Authors' Computation using E-View 11.0

The correlation matrix presented in Table 2 shows that the coefficients of DCR, BMS IRS, GGDP and FLIB were all negative. The coefficient of HHS was positively signed showing perfect correlation. Meanwhile, DCR, BMS and is negatively related with HHS, the same with GGDP with HHS. Liberalization dummy was also negatively related to household savings. The results show that the coefficient is free from multicollinearity.

Panel Unit Root and Co integration Results

The first step of the analysis is to look at the data properties. Two classes of tests allow the investigation of the presence of the unit root: the first generation panel unit-root tests (including Hadri (2000) and Im et al., (2003), were developed on the assumption of cross-sectional independence among panel units (except for common time effects), and may be at odds with economic theory and empirical results. On the other hand, second generation tests (Smith et al., (2004); Pesaran, 2007) relax the assumption of cross-sectional independence, allowing for a variety of dependence across the different units. We employ four different types of panel unit roof tests; Im, Pesaran and Shin, Levin, Lin Chu, ADF (augmented Dickey-Fuller and Philip-PerronFisher Chi-Square). The tests are constructed with a unit roof under the null hypothesis and heterogeneous autoregressive roots under the alternative, which means that a rejection should be taken as evidence in favour of staionarity for a least one country

Table 3: Panel Unit Root Test

Variables	Levin, Lin & Chu t*	First Difference	Im, Pesaran & Shin W-stat	Test Difference	ADF-Fisher Chi-Square	First Difference	PP Fisher Chi-Square	First Difference
GGDP	-0.95	-7.136	1.37	-7.619	2.49	71.7759	0.02	-71.69
DCR, BMS, IRS	-2.63	-11.4087	0.02	-10.8997	0.99	108.80	1.18	148.378
HHS	1.37	-3.05	-3.90582	-17.31	1.18	35.299	-2.07	35.5102
FLIB	-4.99	-17.97	-3.98	-11.46	2.09	-5.59	-0.70	-23.22

Note: The statistic test is the cross-sectionally Augmented Dickey Fuller of Pesaran (2007). The test has the null hypothesis of presence of unit roof.
Source: Researchers' Computation using E-view 11.0

Table 3 reports the results of the first second generation unit roof test of Persan (2007), Levin, Lin & Chu, Im, Pesaran and Shin W-Stat, ADF-Fisher chi-square and PP-fisher chi-square. At conventional levels of significance, the results show that most of the variables are not stationary in levels but stationary in first difference. Form the report, the variable GGDP was not significant at its levels except in its first difference the same with the financial liberalization index (DCR, IMs, IRs). The household savings variable was the same. The financial liberalization dummy representing financial regime shifts in the selected ECOWAS countries were significant in its levels and first difference. Due to the existence of mixed levels of integration among the series, we proceed to apply the panel co-integration of Johansen fisher panel co-integration test presented in Table 4.

Table 4: Johansen Fisher Panel Cointegration Test

Sample (adjusted): 1981-2019
Series: HHS DCRBMS IRS FLIB GGDP
Lags interval (in first difference): 1-3
Unrestricted Co-integration Rank Test

Hypothesized No. of CE (s)	Fisher Stat (Trace test)	Prob.	Fisher staft (Max-Eyen Staf)	Prob.
None	305.3	0.0000	148.9	0.0000
At Most 1	209.1	0.0000	118.9	0.0000
At Most 2	122.4	0.0000	80.83	0.0000
At Most 3	55.90	0.0000	41.86	0.0000
At Most 4 `	25.18	0.0050	19.41	0.0353
At Most 5	23.62	0…87	23.62	0.0087

Note: Probabilities are computed using asymptotic, Chi-square distribution.
5% critical values are: 82.49; 59.46; 39.89; 24.31; 3.84
1% critical values are: 90.45; 66.52; 45.52; 45.58; 79.75; 6.51
Source: Researchers' Computation using E-view 11.0.

The Johansen Fisher Panel co integration test for the selected countries in ECOWAS show that the variables are all the variables are co integrated at both 1 percent and 5 percent significance levels. In all the co integration results implies that there exists a long-run relationship between financial liberalization and domestic savings in the selected ECOWAS countries of Benin, Cote d' Ivoire, Ghana, Liberia and Nigeria. Table 4b. which is also cross section of the Johansen Fisher Panel co integration test further supported the existence of co integration or long-run relationship between financial liberalization and domestic savings in the selected ECOWAS countries.

Table 4b: Johansen Fisher Panel Cointegration Test Result.

Cross Section	Trace Test Statistics	Probability	Max-Eyen Test Statistics	Probability
Hypothesis of no cointegration				
Benin	240.6289	0.0000	83.6522	0.0000
Cote d'Ivoire	282.4478	0.0000	115.6547	0.0000
Ghana	253.9848	0.0000	119.3316	0.0000
Liberia	239.3161	0.0000	124.3513	0.0000
Nigeria	225.6890	0.0000	81.5542	0.0000
Hypothesis of at most 1 cointegration relationship				
Benin	156.9767	0.0000	61.2830	0.0000
Cote d'Ivoire	166.7931	0.0000	98.0344	0.0000
Ghana	134.6532	0.0000	50.6129	0.0002
Liberia	114.9649	0.0000	48.8971	0.0004
Nigeria	144.1348	0.0000	55.9884	0.0000
Hypothesis of at most 2 cointegration relationship				
Benin	95.6937	0.0000	50.0168	0.0000
Cote d'Ivoire	68.7588	0.0002	30.3448	0.0215
Ghana	84.0402	0.0000	47.9136	0.0000
Liberia	66.0617	0.0004	27.6856	0.0485
Nigeria	88.1463	0.0000	54.1357	0.0000
Hypothesis of at most 3 cintegration relationship				
Benin	45.6769	0.0004	28.8479	0.0034
Cote d'Ivoire	38.4140	0.0040	26.0449	0.0094
Ghana	36.1266	0.0082	25.3588	0.0120
Liberia	38.3821	0.0040	24.6588	0.0153
Nigeria	34.0107	0.0154	17.7138	0.1409
Hypothesis of at most 4 cointegration relationship				
Benin	16.8289	0.0313	15.1998	0.0355
Cote d'Ivoire	12.3691	0.1401	11.4872	0.1314
Ghana	10.7678	0.2262	7.9923	0.3795
Liberia	13.7233	0.0908	11.5914	0.1270
Nigeria	7.1109	0.0077	7.1109	0.0077

** Mackinnin-Haug-Michelis (1999) P-values

Source: Researchers' Computation using E-view 11.0

The cointegration test of the cross section of the countries involved showed that there are existence of long-run relationship between financial liberalization and domestic saving in the selected ECOWAS countries. There is a hypothesis of at most five cointegration relationships at both the 1 percent and 5 percent significant values.

Panel VAR Lag Order Selection Criteria Test

Panel VAR analysis is predicated upon choosing the optimal lag order in both panel VAR specification and moment condition. Andrews and Lu (2001) proposed MMSC for GMM models based on Hansen's (1982) J statistic of over identifying restrictions. Their proposed MMSC are analogous to various commonly used maximum likelihood-based model selection criteria, namely, the Akaike Information Criteria (AIC) (Akaike 1969), the Bayesian Information Criteria (BIC) (Schwarz, 1978; Rissanen, 1978, Akaike 1977), and the Hannan-Quinn Information Criteria (HQ^{IC}) (Hannan& Quinn, 1979).
Correct lag-length selection is critical for PVAR since excessively short lags may fail to capture the system's dynamics, lead to omitted variables, bias the remaining coefficients, and likely produce serially correlated errors. Meanwhile too many long a lag leads to a rapid loss of degrees of freedom and to over parameterization. Given that the number of variables included in PVAR and the time dimension of the time series, the system cannot be tested for a lag length more than three (IMF, 2000).

Table 5: PVAR Lag Selection Criteria

Lag	Logl	LR	FPE	AIC	Sc	HQ
0	-3934.303	NA	1.45e+12	45.03204	45.14054	45.07605
1	-3190.267	1428.549	4.45e+08	36.94020	37.69975	37.24821
2	-3101.846	69.51928	4.38e+08	36.92249	38.33308	37.49467
3	-3152.718	90.6972	3.71e+084	36.75253	38.81416	37.58879
4	-3078.530	39.97040	4.31e+08	36.89749	39.61016	37.99783

Note: *indicates lag order selected by the criterion

LR: Sequential modified LR test statistic (test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schewarz information criterion
HQ: Hannan-Quinn information criterion
Source: Researchers' Computation using E-View 11.0
Using the sample period by taking into account the number of lost observation with each additional lag, the lowest value of the criteria for the same four countries attested that a uniform lag-length of three as shown in Table 5 should be selected. A lag-length of one was not sufficient to yield a white noise residual in a number of cases.

Impulse Response Function (IRFs) Test

The generalized IRFs, traces out the responsiveness of the dependent variable domestic saving in selected ECOWAS countries to shocks of each of the variables: domestic credit, broad money supply and interest rate spread) financial liberalization dummy and growth rate(not presented here). For each equation, a unit shock is applied to the error, and the effects upon the system over 10 horizons are noted. Since the study has six variables, a total of 36 impulses could be generated. However, since our objective is to examine the effect of the explanatory variables on the dependent variable (HHS-Housing Saving), we only trace out

the responsiveness of the independent variables on the dependent variable. Sims (1980) proposed the Choleskydecomposition of Σ to impose a recursive structure on a Panel VAR. The decomposition, however, is not unique but depends on the ordering of variables in Σ. Figure 5.1 present the response to Cholesky One S.D (d.f adjusted) innovations -2.5.E. The impulse responses for the recursive VAR, in response to the Cholesky One S.D. innovations are plotted. The first row show the effect of an unexpected one percentage point increase in household savings on the financial liberalization variables (DCR, BMS, and IRS), financial liberalization dummy and growth rate, as it works through the recursive VAR systems with the coefficients estimated from actual data. The second, third and fourth rows shows the effect of an unexpected increase of one percentage point in the financial liberalization index to household savings. The fifth row shows the effect of an unexpected increase of one percentage point in the financial liberalization dummy to household savings, while the sixth row shows the effect of an unexpected increase of one percentage point in the growth rate to household savings in the selected ECOWAS countries. Also plotted are ±1 standard error bands, which yield an approximate 66% confidence interval for each of the impulse responses. These estimated impulse responses show patterns of persistent common variation. For example, an unexpected rise in financial liberalization index (DCR, BMS, IRS) financial liberalization dummy and economic growth slowly fades over the 10 quarters, and is associated with a persistent increase/decrease in household savings in the countries of Benin, Coe d' Ivoire, Ghana.

Variance Decomposition (Forecast Error Decomposition) Test

The forecast error decomposition is the percentage of the variance of the error made in forecasting a variable (e.g. household saving), due to a specific shock (e.g. the error term in the financial liberalization and domestic savings equation) at a given horizon. Thus, the forecast error decomposition is like a partial R^2 for the forecast error, by forecast horizon. These are shown in Table 4. for the recursive VAR.

Table 6: Variance Decomposition for the Recursive VAR Ordered as HHS, DCR, BMS, IRS, FLIB, and GGDP

(a) Variance Decomposition of HHS

Forecast Horizon	Forecast Standard Error	Variance Decomposition (Percentage Point)					
		HHS	DCR	BMS	IRS	FLIB	GGDP
1	14.83	100.0	0.00	0.00	0.00	0.00	0.00
4	24.10	93.19	0.23	1.15	1.40	0.08	3.85
7	28.35	90.35	0.44	3.55	1.12	0.14	4.41
10	30.66	88.02	0.38	5.98	1.44	0.16	4.01

(b) Variable Decomposition of FINLINDEX DCR

Forecast Horizon	Forecast Standard Error	Variance Decomposition (Percentage Point)					
		HHS	DCR	BMS	IRS	FLIB	GGDP
1	182.64	2.13	97.87	0.00	0.00	0.00	0.00
4	283.41	5.29	48.23	0.897	0.75	0.97	43.86
7	338.33	6.19	36.57	2.20	1.10	1.49	52.50
10	357.38	6.98	33.88	4.10	1.25	1.73	52.05

(c) Variance Decomposition of BMS

Forecast Horizon	Forecast Standard Error	Variance Decomposition (Percentage Point)					
		HHS	DCR	BMS	IRS	FLIB	GGDP
1	6.24	0.00	72.05	27.94	0.00	0.00`	0.00
4	9.20	0.10	35.74	29.50	0.37	1.10	33.17
7	10.31	1.24	29.54	26.04	0.50	2.31	41.35
10	10.57	3.76	27.26	25.01	0.52	3.03	40.41

(d) Variance Decomposition of FINLINDEX IRS

Forecast Horizon	Forecast Standard Error	Variance Decomposition (Percentage Point)					
		HHS	DCR	BMS	IRS	FLIB	GGDP
1	1.04	1.82	0.14	5.174	92.87	0.00	0.00
4	1.61	1.10	2.69	2.62	89.50	0.19	3.90
7	2.01	0.88	5.88	3.01	85.799	0.19	4.22
10	2.32	1.11	8.61	4.77	81.72	0.27	3.52

(e) Variance Decomposition of FLIB

Forecast Horizon	Forecast Standard Error	Variance Decomposition (Percentage Point)					
		HHS	DCR	BMS	IRS	FLIB	GGDP
1	0.16	8.69E.05	0.24	0.05	0.69	99.01	0.00
4	0.27	0.03	0.52	0.21	3.15	95.73	0.36
7	0.30	0.06	0.43	0.24	3.04	95.92	0.31
10	0.31	0.17	0.40	0.25	2.94	90.95	0.29

(f) Variance Decomposition of GGDP

Forecast Horizon	Forecast Standard Error	Variance Decomposition (Percentage Point)					
		HHS	DCR	BMS	IRS	FLIB	GGDP
1	10.25	1.12	8.29	0.00	3.83	1.24	85.51
4	12.10	3.12	6.32	0.21	3.22	1.37	85.74
7	12.15	3.18	6.34	0.41	3.26	1.42	85.37
10	12.21	3.20	6.30	0.44	3.26	1.46	85.33

Source: (a-f) was computed using E-view 11.0

Table 6. (a-f) suggest considerable interaction among the variables. The variance decomposition indicates that household saving changes in the selected ECOWAS countries explained about 100 percent of the shocks to itself in the first quarter. It inclined to about 88 percent in the 10^{th} quarter. Domestic credit, one of the indicators of the financial liberalization index accounted for about 2 percent shock to household savings in the first quarter. This increased to 7 percent in the 10^{th} quarter. This explains that domestic credit account for about 7 percent changes in household saving in the ECOWAS selected countries

over the reviewing period. Broad money, the second indicator of the financial liberalization index accounted for about 0 percent shock in household savings, this increased to 4 percent in the 10th quarter. Interest rate spread accounted for 1.8 percent of the shocks to household saving in the first quarter, however, declined to 1.1 percent in the 10th quarter, while liberalization dummy accounted for 0.2 percent in the 10th quarter. Growth rate of output accounted for 1.12 percent of the changes in household saving in the selected ECOWAS countries. From the results presented, growth rate caused the greatest shock to household savings. The reason could be that increase in growth promotes employment which in turn stimulates household savings. In order words, inclusive growth is a necessary condition for household welfare and the attendant improvement in household income, investment and savings.

Vector Autoregression Estimates (Summary Statistics)

Table 7 Presents the Summary Statistics of the VAR

HHS	DCR	BMS	IRS	FLIB	GGDP
R-squared	0.818	0.77	0.67	0.90	0.83	0.30
Adj-R-squared	0.80	0.71	0.63	0.89	0.82	0.22
Sum square resid	35424.3	5370464	6281.45	174.64	4.15	16906.52
S. E. equation	14.833	182.63	81.848	46.35	3.85	18.39
F-statistics	40.21	30.56	18.39	81.845	46.35	3.85
Log likelihood	-730.81	-1182.7	-575.12	-252.69	83.86	-664.23
Akaike AIC	8.33	13.35	6.94	3.018	-0.72	7.59
Schwarz Sc	8.67	13.69	6.94	3.36	-0.38	7.92
Mean dependent	3.796	119.18	27.92	8.79	0.83	3.82
S. D dependent	32.97	364.03	10.35	3.15	0.37	11.6

Source: Researchers' Computation using E-View 11.0

Discussion of Findings

Because VARs involve current and lagged values of multiple time series, they capture co movements that cannot be detected in invariance or bivariate models standard VARs summary statistics (impulse response functions and variance decompositions) are well accepted and widely used methods for portraying these movements. These summary statistics are useful because they provide targets for the model and were the focus of the discussions.

From the impulse response function, an unexpected rise in domestic credit, broad money supply and interest rate spread is associated with a persistent decrease in household savings in the countries of Benin, Cote d'Ivoire, Ghana, Liberia and Nigeria. The finding is in tandem with previous related study. For example, Elom *et al.,* (2016) found a positive significant relationship between interest rate and domestic savings in Nigeria in the long-run and insignificant influence of interest rate on domestic saving in the short-run. For broad money supply, the findings of Ogbokor and Samalivya (2017) for Benin supports the result of the current study and concluded that deposit rate and financial deepening (M_2/GDP) have no significant effects on domestic savings. Aggregate investment has also significant level of shock on the selected ECOWAS economies, while the labour force rate has less shock on the household saving over the horizons.

From the variance decomposition result, domestic credit accounted for about 7 percent changes, positive or negative changes in domestic saving in the selected ECOWAS countries, while broad money supply accounted for 4 percent shock to domestic savings in the 10th quarter. Interest rate spread accounted for 2 percentage shocks to household savings in the first quarter, however, declined to 1 percent in the 10th quarter, this implies that economic growth may not be a major shock to household savings in the selected and this reinforces the

need for inclusive growth in the ECOWAS countries. Inclusive growth promotes employment generation, which in turn promotes household savings for poverty reduction.

Policy Implication of Findings

The policy implication of the empirical results is germane for policy input and implementation. The following are some of the deduced implications:

1. Even though domestic credit was found to have a positive significant effect on domestic savings in the selected ECOWAS countries, more policy effect in needed to strengthen the liberalization of countries the credit market and ECOWAS in general for easy access by households.
2. Broad money supply is related to the monetary base of the selected ECOWAS countries Central Banks through the money multiplier. Given the increased importance of the behaviour of banks in a deregulated environment for the determination of the shock of money supply, the Central Banks of the selected ECOWAS have a major role to play in strengthening the monetary variables of the interest rate, broad money supply and availability of domestic credit. This is to avoid repression of the selected ECOWAS and the rest of the countries in the region.
3. Infrastructure no doubt promotes financial development. From the evidence, aggregate investment measured by the gross fixed capital formation has negative relations with domestic saving. Therefore, the Government and policy makers of the ECOWAS countries must ensure that infrastructure is adequately provide.
4. Labour force ratio is also negatively related to household saving. This implies the absence of employment opportunities in these countries. Without infrastructure, the aims of reform/liberalization will not be fully optimized.

Conclusion, Policy Recommendation and Agenda for Future Research

Conclusion

This paper examined the effect of monetary sector financial liberalization on domestic saving in five selected ECOWAS countries of Benin, Cote d'Ivoire, Ghana, Liberia and Nigeria between the the period 1981 to 2019 and using the panel VAR approach The key findings of the study are re-represented and these indicates to the fact that are negative and positive significant effects of monetary sector financial liberalization on household saving in the ECOWAS countries. . The implication of the findings had been espoused and it points to the fact that there is likelihood of potential negative effects of domestic credit, interest rate spread and broad money supply to GDP after a shock has occurred, especially a negative shock like financial crisis and the covi-19 pandemic. The decrease in domestic credit to the household affects productivity which is turn affects employment of productivity and saving. The widening gap between interest rate and deposit rates affects households which influences negatively on household saving. Again, increase in broad money supply has a reactionary effect on inflation which in the long-run affects savings. Decrease in economic growth resulting from lack of investment induces unemployment and this in turn affect household saving. Government policy directions in the ECOWAS countries may bring the necessary changes so as to promote household saving.

Policy Recommendations

In the light of the empirical evidence, the following are recommended for policy considerations.

i. Considering the fact that domestic credit was found to have a significant effect on domestic saving during the 10 quarter horizon in the selected ECOWAS countries, there is need for the Government and policy makers of the ECOWAS region to formulate monetary policy will lower the interest rate so as to deepen the credit market and to enhance investments, employment and ultimately household saving propensity.

ii. In order not to trigger inflationary pressure, the policy makers and the Central Bankers of the selected ECOWAS countries should implement restrictive monetary policy measures that will curtail excessive money supply in order to reduce inflation spiral and household purchasing power.

iii. Monetary sector financial liberalization was found to have contributed insignificantly to domestic savings in the selected ECOWAS countries. This calls for re-examination of the reform programmes with the aim of strengthening the reform measures to improve domestic savings.

iv. The growth rate of the impulse response function shows a declining relationship with household savings over the 10 quarters horizons. This necessitates policy action on the part the ECOWAS government for improving and sustaining the growth potentials of the economies.

v. Following (iv) above, the Government and policy-makers of the ECOWAS countries must institute growth enhancing mechanisms through product diversity and inclusion in the growth process. This policy stimulates employment through investment and enhancement of domestic saving rate.

Agenda for Further Studies

The analysis of the paper using Panel VAR no doubt is limited by data and by method. Therefore, further empirical attempts should incorporate: Structural breaks to capture the break-points in the policy regimes and construction of an index to measure the three segments of liberalization as well expanding and the number of ECOWAS countries in the analysis.

Declaration of Interest: None

Funding: None

Authors Contribution: All were involved in every stage of the paper.

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