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Globalization, Financial Development and Regional Economic Dynamics: asymmetric panel evidence from Africa

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Abstract

This paper examines how regionalization in the face of globalization has affected financial development in the context of banking system efficiency in Africa. Results which are robust to financial system efficiency and growth-led-finance nexus reveal that in the post-regionalization era: (1) UEMOA and CEMAC regional banks' ability to finance credit by deposits has reduced; (2) financial institutions of COMESA have improved their capacity to fund openness related activities/projects with deposits; (3) increase in welfare has positively affected the intermediary role of banks; (4) globalization tends to be more detrimental to financial systems of 'economic and monetary' regions than to those of purely economic regions. As a policy implication, national and regional authorities should gain knowledge of the fact that with openness, the role of domestic and regional banks seems to lessen in the funding of openness related activities and projects. Much needs to be done on the improvement of infrastructure that curtails information asymmetry in the banking industry.

JEL Classification: A10 ; D60 ; E40 ; O10 ; P50
Keywords: Globalization; Financial Development; Regional Integration; Panel; Africa

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1. Motivation

Benefits of globalization to developing countries are still subject to debate. Some export driven economies like China have witnessed double digit GDP growth rates over the last decade thanks to their integrating the World Trade Organization at the turn of the last century. Though there is more consensus on the positive welfare effects of openness (Spatareanu and Manole, 2010; Welch and Romain, 2008), some authors still caution the need to progressively lift trade barriers only in tandem with economic development (Dornbusch, 1992). Openness is seen by many as a means of improving efficiency through allocation of savings into profitable and productive projects. The World Bank (WB) and International Monetary Fund (IMF) have been forerunners of this thesis; propagating and spreading the message to indebted poor and developing countries even at the expense of autonomous national economic policies. They stress that openness exposes countries to more advanced new ideas and methods of production; there-by increasing international competition and enhancing efficiency. As a consequence in the mid 1980s, under the pressure of mounting debt servicing African countries were obliged by the IMF and WB to adopt structural adjustment policies that encouraged trade liberalization, privatization and progressive meandering towards market-focused economies. In effect, these countries began clubbing into economic and monetary units in an attempt to facilitate openness and accelerated regionalization. Two decades on, the need to take stock of the effects of these policies on regional development is pressing. Capital and trade account openness (globalization) are seen by many an author not only as a source of growth, but also as a means to financial development (Baltagi et al., 2009; Hanh, 2010). Owing to abundant literature on the openness-growth nexus and the imperative of financial development in the continent, the goal of this paper is to appreciate how globalization has affected the allocation efficiency of African banks. In plainer terms, we shall

seek to investigate how regionalization has improved the ability of banks to transform mobilized funds into credit destined to economic operators[2]. Results could be interesting to national and regional policy makers in defining the role domestic and regional banks play in financing openness oriented activities in the face of globalization. The rest of the paper is organized as follows: we thoroughly review related literature in section 2**;** section 3 describes data and outlines our methodology; we present empirical results in section 4 before concluding with section 5.

2. Literature review

2.1 Literature on openness-finance nexus

There is abundant openness-finance literature. While some authors are explicit enough to distinguish between capital account and trade account openness, others simply combine both concepts. Rajan and Zingales (2003) have professed that developing countries (especially closed economies) would most likely benefit from financial development only through the interaction of trade and financial openness. Plainly put, they imply developing countries would less likely benefit from financial development if capital and trade accounts are not opened simultaneously. However in much recent literature Baltagi et al. (2009) and Hahn (2010) have independently partially rejected the hypothesis through studies focused on a broad range of developing countries. It follows that, though simultaneously opening of the financial and foreign-trade sectors could be more beneficial to the economy, trade and financial openness are independent significant determinants of financial development. An important question we could be poised to ask is to know if the Rajan and Zingales (2003) hypothesis could be validated in African economic region

[2] Suffice to note, one of the goals of regionalization with respect to the IMF and the WB was to improve allocation efficiency, so as to reduce foreign reliance on debt in a distant future. Decades on, evaluating the impact of regionalization on the ability of the financial system to fund credits is imperative.

Hypothesis 1: The Rajan and Zingales (2003) hypothesis holds true in the context of African regionalization[3].

2.1.1 Financial globalization and financial sector development

Financial globalization can obviously lead to the development of the financial sector. The presence of asymmetric information presents an important concern for lenders who do not always have an adequate knowledge of the project to be undertaken with borrowed funds. This could affect intermediation efficiency as deposits would not fully be exploited by banks. Financial globalization could enhance the functioning of the financial system by the provision of funds for investment opportunities as well as improvement of infrastructure that curtail information asymmetry. Therefore, financial globalization increases the availability of credit by reducing adverse selection and moral hazard.

Regarding how financial globalization could specifically affect financial intermediary efficiency, Shumkler(2004) supports the view of Claessens et al.(2001) and Peria et al.(2003) in asserting that competitive pressure created by foreign banks lead to improvement in banking system efficiency in the perspectives of lowering operating costs and smaller margins between lending and deposit interest.

2.1.2 Trade globalization and financial section development.

The financial success of China as an export driven economy in the aftermath of her joining the World Trade Organization (WTO) at the beginning of the millennium presents strong evidence for trade account openness as a means to financial development.

[3] Baltagi et al. (2009) and Hahn (2010) have verified the Rajan and Zingales(2003) hypothesis on a broad range of developing countries. In limiting our investigation to regions in Africa and applying robust interaction (between trade openness and financial openness) variables (globalization indexes), we provide a more narrowed approach which could have more focused policy implications.

Much earlier in the literature, Dornbusch (1992) presented a case for trade liberalization for developing countries in which he pointed out the essence of regional trade agreements and service-trade liberalization in the effort to economic development. However, he stressed that trade restrictions should be lifted only in tandem with development. Therefore one may be poised to assert that complete trade liberalization could not be instrumental to some underdeveloped countries; especially in the short-run. Conversely, in recent literature Kim et al. (2010) have used Pool Mean Group on eighty-eight countries with data spanning from 1960-2005 to find a positive long-run link between trade openness and financial development.

Some studies have exclusively focused on the African continent. Mbabazi et al. (2008) use cross-section and panel econometric techniques to investigate the link between growth, inequality and openness in forty-four sub-Saharan African countries. Using data ranging from 1970 to 1995, they provide evidence of the existence of a positive association between openness and growth. Well before, Kandiero and Chitiga (2003) had probed into linkages between openness and FDI in the continent. Their findings revealed: for the economy in general and service sector in particular, per capita FDI responds well to increased openness. To put this finding in the context of our paper, in accordance with Lane and Milesi-Ferreti (2006), FDI represents financial openness. Thus one could paraphrase and revise their conclusion as: trade account openness cause capital account openness. The literature above inspires the following hypothesis.

Hypothesis 2: Globalization (finance and trade) in the post-regionalization era has improved African regional financial systems in their ability to allocate mobilized funds to investment opportunities[4]

[4] In recent openness literature, financial development has been conceived with respect to variation in private domestic credit (Baltagi et al., 2009) or between private domestic credit and financial depth (Hahn, 2010). Our indicator of finance shall combine both financial depth (aka financial deposits) and private domestic credit (aka financial credits).

2.2 Related literature on regionalization in Africa

The case for economic and financial regionalization in Africa has been widely covered in the literature. Regional corporation (Irving, 2005) and regional integration (Okeahalam, 2001; Irving, 2005; Yartey and Adjasi, 2007; Wakeman-Linn and Wagh, 2008 and Kumo, 2008) have been widely seen as the path to economic growth and development in the continent.

With respect to Irving (2005) who largely lends credit to Okeahalam (2001), a strong case for corporation and integration of stock markets in southern and eastern Africa would improve diversification of risks in a wider market, produce more efficient and competitive markets, procure higher returns and lower cost, as well as increase cross boarder capital flows. He further stresses, regionalization could boost liquidity and the capacity of markets to mobilize international and local capital for private sector and infrastructural development. This position is largely shared by Yartey and Adjasi (2007) in their work on critical issues and challenges for stock market development in Africa. A principal setback emphasized in the report is the presence of a core political challenge that still needs to be overcome. Indeed many still view stock markets as issues of national pride like Airline companies, which remains a great obstacle to regionalization. This political challenged is also outlined by Kumo (2008)[5].

Wakeman-Linn and Wagh (2008) largely dedicate their work to the benefits of regionalization in financial sector development. Comparing their study with those earlier elucidated above on the type of regionalization that would most benefit African financial markets, one important hypothesis draws our attention.

The choice of this new indicator is inspired by the continents surplus liquidity issues as well as the need to take stock of structural adjustment policy effects.

[5] With respect to Kumo(2008), the main challenges to stock market development are: political instability in some economies, high volatility in economic growth, , liquidity constraints, macroeconomic uncertainty, limited domestic investor base, underdeveloped trading and settlement structures and limited market information.

Hypothesis 3: The type of regionalization (economic, monetary or both) affects the quality of financial intermediation efficiency[6]

2.3 Literature on measuring financial intermediary efficiency

Hitherto, much research on the efficiency of banks has been based on Data Envelopment Analysis (hence DEA); which is a non parametric method in operations research applied to estimate the production efficiency of decision making units: production frontiers. Although this methodology has the advantage of not adopting a particular functional form (non parametric approach), it has the short coming of being unable to present a link between endogenous and exogenous variables (output and input). For instance Sathye (2002) uses the DEA method to measure differing efficiency of Indian banks across sectors. Findings based on data from 1997-1998 reveal the mean efficiency score of Indian banks and that of world banks are comparable. More specifically, the efficiency of the private sector commercial banks as a group is found to be lower than those of foreign and public banks. While this work could have the advantage of presenting a case for the privatization of commercial banks, its policy implication has the shortcoming of being purely qualitative. Much recently, Staub et al. (2010) have used DEA to probe into the technical and allocation efficiency of Brazilian firms from 2000-2007. Findings show that compared to banks in Europe and the USA, Brazilian banks have lower levels of efficiency. More so, compared to banks with foreign, private-domestic and private with foreign participation, banks owned by the state are more cost efficient. This later study on DEA yet reveals that the concept of bank efficiency is cost oriented. Beside the use of DEA, recent studies

[6] As far as our perusal of the literature is concern, to the best of our knowledge, we have not found a study that compares how the type of regionalization could affect financial development (aka financial efficiency). In other words, How does the concept of surplus liquidity differ across regions in the African banking sector. As per our conception and definition of efficiency, financial intermediary allocation efficiency and bank sector liquidity are mutually exclusive. The more efficient a bank is the less liquid it is.

based on other methodologies dedicated to the efficiency of banks in Africa have been tilted toward the cost/profit oriented concepts of efficiency (Kiyota, 2009; Kablan, 2010).

Borrowing from Demirgüç-Kunt and Beck (2009) there are four main indicators of financial intermediary efficiency in the literature:

-ratio of bank credit to bank deposits that appreciates the extent to which savings can fund loans;

-overhead cost representing the accounting value of a banks overhead cost as a share of its total assets;

-cost/income ratio, that accounts for overhead cost in relation to gross revenues; and

-'net interest margin': which indicates the accounting value of a bank's net interest revenues as a share of total earnings assets.

While the last three indicators are profitability-oriented, our conception of efficiency in this paper is best defined by the first measure. This reflects evaluating how "private sector credit" is financed by "deposits". The existence of a high loan-deposit ratio is therefore synonymous to high intermediation efficiency and vice-versa.

Our study will be unique in the following ways: (1) usage of efficiency indicators that are compatible with the fundamental financial intermediary role and present banking liquidity issues in Africa[7]; (2) investigate the role regionalization has played on financial intermediary efficiency in the face of globalization; (3) control for how welfare has influenced financial development in the sub-regions; (4) verify the Rajan and Zingales(2003) hypothesis from regional perspectives and exclusively in Africa; (5) assess if banking system efficiency is robust to financial system efficiency.

[7] The financial intermediary role is to convert deposits into credit; not profit making. African banks are suffering from over liquidity. We differ from mainstream studies that appreciate efficiency from cost and profit perspectives(Kiyota, 2009;Kablan,2010)

3. Data and Methodology

3.1 Data

3.1.1 Globalization data

As summarized in table 1, in this study we defined globalization as a combination of trade and capital account openness. While Financial Openness (F.O) is proxied by Gross private capital flows on GDP and Gross foreign direct investment on GDP, Trade Openness (T.O) is assimilated to per capita Imports and per capita Exports. In a bid to ensure robustness of results we further use variables that combine the effects of F.O indicators (financial openness index) and T.O proxies (Import plus Exports on GDP); as well as a globalization index (interaction of T.O and F.O). All flow variables are in current US dollar terms.

Table 1: Openness data

Variables	Globalization(Openness)					
	Financial Openness(F.O)			Trade Openness(T.O)		
	GPCFgdp	GFDIgdp	Finopex	Igdp	Xgdp	Tropex
Definitions	Gross Private Capital Flows on GDP	Gross Foreign Direct Investment on GDP	Financial Openness Index	Imports on GDP	Exports on GDP	Imports plus Exports on GDP
Sources	ADI	ADI	PCA	ADI	ADI	ADI
Usages in Openness literature	Lane and Milesi-Ferreti (2006),Baltagi et al. (2009), Hanh(2010)		Gries et al.(2009)	Standard Proxies		Hanh(2010), Gries et al.(2009)

Variables	Principal Financial Development Indicators(Main Model)				
	Depth	**E**fficiency	**S**ize	**A**ctivity	**DESA-1**
	llgdp	bcbd	dbacba	prdcgdp	Findex1
Definition	Liquid liability on GDP	Bank Credit on Bank Deposits	Deposit bank assets on Total financial assets	Private credit by domestic banks on GDP	Financial development Index1
Sources	FDSD	FDSD	FDSD	FDSD	PCA
Usages in Financial development literature	Hanh(2010), Gries et al.(2009)	Demirgüç-Kunt et al. (1999), Demirgüç-Kunt & Beck (2009)		Baltagi et al. (2009), Hanh(2010)	Gries et al.(2009)

Variables	Robustness tests financial development Indicators				
	Depth	**E**fficiency	**S**ize	**A**ctivity	**DESA-2**
	fdgdp	prdcfsd	**?**	prdcofgdp	Findex 2

Definition	Financial system deposits on GDP	Private domestic credit on financial system deposit		Private credit from domestic banks and other financial institutions	Financial development index
Sources	FDSD	FDSD	**?**	FDSD	PCA
Usages in literature/ justification	Authors correlation analysis	Authors correlation analysis	**?**	Authors correlation analysis	Gries et al. (2009)

ADI: African Development Indicators. PCA: Principal Component Analysis. FDSD: Financial Development and Structure Database.

3.1.2 Financial Intermediary Development (FID) data

Referring to table 1, there are many indicators of F.I.D that could be clubbed into four main categories based on conceptual and correlation criteria[8]. In this study, we identify the following:

-financial depth proxied by liquid liabilities on GDP or per capita financial system deposits;

-financial efficiency, expressed by bank credit on bank deposits or financial system credit on financial system deposits;

-financial size represented by deposit banks assets on central bank assets plus deposit bank assets;

-financial activity explained by private credit from domestic banks as well as private credit from domestic banks and other financial institutions.

All flow variables are in current US dollar terms. Due to the specific nature of our research hypotheses we shall adopt only the concept of efficiency[9] as the measure of financial development.

[8] First of all, ten main indicators of financial intermediary development are classified into four conceptual categories. Then correlation analysis is used to test if data structure reflects conceptual assumptions. Lastly, the choice of a proxy in each category is based on usages in literature.

[9] The three other indicators are either broad or too narrow with respect to understanding how regionalization has improved allocation efficiency in Africa. For instance, while the concept of financial depth is largely correlated with the liability (deposit) side of a bank's balance sheet, financial activity is mostly sensitive to asset side (credit). Meanwhile, the ratio of credit by domestic banks to total credit which explains financial size is too broad here.

3.1.3 Control and robustness tests variables

We control for the growth-led-finance nexus using two distinct but highly correlated variables. While "*Gross domestic product per capita growth rate*" is used on the main model, "*Gross domestic product growth rate*" is used for robustness checks. In the same vein "*Private domestic credit from deposit banks and other financial institutions on financial system deposit*" which proxies' financial-system-efficiency will robustly check banking-system-efficiency (proxied by "*private domestic credit from deposit banks on bank deposits*")

3.1.4 Regionalization data

There are eleven main economic and/or monetary regions in Africa (Appendix 1):

- *Economic Community of West African States (ECOWAS);*
-*West African Economic and Monetary Union (UEMOA);*
-*Economic Community of Central African States (ECCAS);*
-*Economic and Monetary Authority of Central Africa (CEMAC);*
-*Franc Zone (CEMAC plus UEMOA countries);*
-*South African Development Community (SADC);*
-*East African Community (EAC);*
-*South African Customs Union (SACU);*
-*Common Market for East and Southern Africa (COMESA);*
- *Intergovernmental Authority on Development (IGAD);*
- *Arab Maghreb Union (UMA)*

ECOWAS, The Franc Zone, SADC, SACU, IGAD and UMA regions are not retained for our study because with respect to their creation dates, data was either unavailable or very limited for the application of a policy-time-dummy estimation technique. For the remaining

economic and/or monetary unions we were further constrained by unavailability of data to narrow down the number of counties (see Appendix 2) in the database to the following:

-for the West African Economic and Monetary Union (UEMOA), Benin, Ivory Coast, Mali, Niger and Senegal are retained;

-Cameroon, Gabon and Congo Republic for the CEMAC zone;

-Kenya, Tanzania and Uganda make up the EAC; and

-within the framework of COMESA, Burundi, Kenya, Madagascar, Mauritius, Malawi, Rwanda, Sudan, Swaziland, Uganda and Zambia are retained;

In the Economic Community of Central African States (ECCAS), Burundi, Cameroon, Congo Republic, Gabon and Rwanda are selected. However after analysis, we are unable to test for robustness because the financial-efficiency indicator used to check results of the bank- efficiency proxy has a different degree of integration[10].

3.2 Methodology

3.2.1 Correlation and Principal Component Analyses (PCA)

Table 2: Derivation of Indexes (Financial Openness and Globalization indexes)

Principal Indicator	Indexes	Cor. coef. (t-stats)	Eigen Value	First PC variation	Component Matrix	
			UEMOA			
Financial Openness	Finopex	0.898*** (23.53)	1.898	0.949	FDIgdp 0.707	PCFgdp 0.707
Globalization	Globex	0.199** (2.34)	1.199	0.599	Finopex 0.707	(I+X)gdp 0.707
			COMESA			
Financial Openness	Finopex	0.981*** (82.51)	1.981	0.990	FDIgdp 0.707	PCFgdp 0.707
Globalization	Globex	0.250*** (4.15)	1.250	0.625	Finopex 0.707	(I+X)gdp 0.707
			CEMAC			
Financial Openness	Finopex	0.994*** (64.94)	1.994	0.997	FDIgdp 0.707	PCFgdp 0.707
Globalization	Globex	0.360** (2.58)	1.360	0.680	Finopex 0.707	(I+X)gdp 0.707

[10] From an empirical point of view, the high correlation (88%) between banking system efficiency and financial system efficiency for ECCAS is a necessary but insufficient condition for a robustness test application. Compatibility of integration orders in endogenous variables is also crucial for the purpose of robustness check.

		EAC				
Financial		0.996***			FDIgdp	PCFgdp
Openness	Finopex	(88.912)	1.996	0.998	0.707	0.707
Globalization		-0.352***			Finopex	(I+X)gdp
	Globex	(-2.744)	1.352	0.676	-0.707	-0.707

Globex: Globalization Index. Finopex: Financial Openness Index. FDIgdp and PCFgdp are capital account openness indicators. (I+X) gdp is the trade openness variable. PC: Principal Component. Cor. Coef: Correlation coefficient. *, **, ***: are respectively 10%, 5% and 1% significance levels.

As shown in table 2, the objective of PCA is to reduce the dimension of variables while retaining as much information as possible on initial variability. As opposed to recent openness literature where PCA is not empirically justified by correlation analyses (Gries et al., 2009), we provide evidence of significant correlations analyses (column 3) prior to PCA. With respect to Kaiser 1 criterion (Kaiser, 1960), we stop at first principal components which represent our indexes. In the case of CEMAC for instance, the financial openness index which is a combination of FDIgdp and PCFgdp for the region retains about 99.7% of initial information. By the same token, the globalization index which is the combination of the derived financial openness index and trade openness indicator represents close to 68% of their initial variability.

3.2.2 *Cross Sectional Dependence tests*

A cross sectional dependence test determines if a first generation (cross sectional independence) or second generation (cross sectional dependence) panel unit root test should be applied to investigate series stationary properties. However these tests are valid only and only if the numbers of cross-sections (N) in a panel are greater than the time series (T) interval in each cross-section. Characteristics of our panels are incompatible with recommendations for this test (T>N); implying only first generational tests are applicable.

3.2.3 Panel Unit root tests (both homogenous and heterogeneous based tests)

Following Hanh (2010) we apply both homogenous and heterogeneous oriented first generational panel unit root tests. Levin, Lin and Chu (LLC-2002) and Im, Pesaran and Shin (IPS-

2003) tests respectively for common unit roots and individual unit roots have been widely applied on macro economic variables in recent openness-finance literature(Hanh,2010). In selecting stationary properties of variables, we refer to both tests but base our decisions on IPS in case of conflict of interest.[11] Borrowing from Khim (2004) optimal lags selection for LLC and IPS tests are determined by Hannan-Quinn Information Criterion (HQC) and Akaike Information Criterion (AIC) respectively[12]. Results are presented in table 3, with variables without unit roots (stationary) in bold.

[11] As pointed out by Maddala and Wu (1999), the alternative hypothesis of the LLC test (on the absence of a common unit root) is too strong.

[12] While the AIC and Final Prediction Error (FPE) best estimate lags when observations are more or less 60, the HQC best avoids the underestimation of lags when observations are about 120 and above. Suffice to mention, the LLC is based on pooled data. The Schwarz Information Criterion (SIC) also known as the Bayesian Information Criterion (BIC) presents the short-coming of underestimating lags in the auto regression process.

Table 3: Homogenous and heterogeneous panel unit root tests

Zones	Vbles	Homogenous(LLC) tests				Heterogeneous(IPS) tests				Homogenous(LLC) tests				Heterogeneous(IPS) tests			
		Level		First diff.		Level		First diff.		Level		First diff.		Level		First diff.	
		c	ct	c	ct	c	ct	c	ct	c	ct	c	ct	c	ct	c	ct
UEMOA	FDIgdp	**-2.90*** **	**-3.01*** **	n.a	n.a	**-3.89*** **	**-4.68*** **	n.a	n.a	CEMAC	-1.78**	-2.97***	n.a	n.a	-1.18	-1.16	**-6.24*** **	**-5.05*** **
	PCFgdp	**-2.86*** **	**-2.79*** **	n.a	n.a	**-4.87*** **	**-4.92*** **	n.a	n.a		-1.83**	-2.92***	n.a	n.a	-0.73	-0.67	**-5.09*** **	**-3.29*** **
	Finopex	**-1.90** **	**-2.46*** **	n.a	n.a	**-3.40*** **	**-4.26*** **	n.a	n.a		-1.72**	-3.10***	n.a	n.a	-0.91	-0.88	**-5.62*** **	**-4.40*** **
	Igdp	**-1.55***	**-2.34*** **	n.a	n.a	**-2.24** **	**-1.60***	n.a	n.a		-1.36*	-1.87**	n.a	n.a	-0.60	-0.83	**-3.94*** **	**-4.35*** **
	Xgdp	**-2.42*** **	**-3.03*** **	n.a	n.a	**-1.57***	**-1.42***	n.a	n.a		-0.32	0.86	**-4.06*** **	**-3.71*** **	0.09	0.17	**-4.38*** **	**-3.26*** **
	Tropex	2.05	1.53	**-9.47*** **	**-6.67*** **	0.96	1.74	**-7.03*** **	**-5.67*** **		3.18	4.31	**-1.43***	-1.19	1.17	2.31	**-2.31** **	**-1.42***
	Globex	-1.100	-0.720	-9.72***	-8.91***	**-1.90** **	**-1.40***	n.a	n.a		-1.98**	-3.32***	n.a	n.a	-0.78	-1.35*	**-5.99*** **	**-4.66*** **
	GDPg	**-8.52*** **	**-6.84*** **	n.a	n.a	**-7.20*** **	**-6.18*** **	n.a	n.a		**-3.52*** **	**-1.82** **	n.a	n.a	**-3.66*** **	**-2.16** **	n.a	n.a
	GDPpcg	**-6.70*** **	**-6.89*** **	n.a	n.a	**-6.94*** **	**-6.12*** **	n.a	n.a		**-3.45*** **	**-1.77** **	n.a	n.a	**-3.61*** **	**-2.05** **	n.a	n.a
	bcbd	**-5.76*** **	**-6.22*** **	n.a	n.a	**-6.49*** **	**-4.67*** **	n.a	n.a		**-1.37***	3.37	n.a	n.a	**-1.46***	-0.82	n.a	n.a
	prdcfsd	**-2.02** **	0.18	n.a	n.a	-0.55	0.63	n.a	n.a		**-3.25*** **	**-5.63*** **	n.a	n.a	**-2.37*** **	**-4.79*** **	n.a	n.a
COMESA	FDIgdp	-1.04	**-2.90** **	21.58	-4.38***	**-2.97*** **	**-4.10*** **	n.a	n.a	EAC	-1.58*	-1.58*	n.a	n.a	-1.40*	-0.77	**-4.43*** **	**-3.12*** **
	PCFgdp	**-1.87** **	**-3.54*** **	n.a	n.a	**-3.15*** **	**-4.60*** **	n.a	n.a		-1.54*	-2.16**	n.a	n.a	-1.11	-0.93	**-5.14*** **	**-3.85*** **
	Finopex	**-1.41***	**-3.18*** **	n.a	n.a	**-3.04*** **	**-3.97*** **	n.a	n.a		**-1.63***	**-2.53*** **	n.a	n.a	**-4.46*** **	**-3.08*** **	n.a	n.a
	Igdp	**-1.09**	**-3.04*** **	-12.0***	-9.78***	**-1.32***	**-2.92*** **	n.a	n.a		2.05	0.06	**-4.17*** **	**-2.90*** **	2.13	0.19	**-4.45*** **	**-3.61*** **
	Xgdp	**-2.03** **	**-3.52*** **	n.a	n.a	**-3.14*** **	**-3.45*** **	n.a	n.a		-0.12	-0.55	**-5.13*** **	**-5.17*** **	-0.66	-1.55*	**-5.38*** **	**-4.95*** **
	Tropex	-0.79	**-5.29*** **	-9.16***	-4.91***	**-2.59*** **	**-4.96*** **	n.a	n.a		2.45	-0.30	**-4.32*** **	**-2.64*** **	2.06	-0.95	**-5.06*** **	**-4.37*** **
	Globex	2.21	8.66	27.08	-6.45***	**-1.89** **	**-4.33*** **	n.a	n.a		-1.02	-1.58*	**-3.05*** **	**-2.39*** **	-0.59	-1.45*	**-3.48*** **	**-2.09** **
	GDPg	**-9.62*** **	**-8.63*** **	n.a	n.a	**-9.17*** **	**-9.30*** **	n.a	n.a		**-1.61***	**-1.71** **	n.a	n.a	**-1.45***	**-2.57*** **	n.a	n.a
	GDPpcg	**-8.61*** **	**-6.25*** **	n.a	n.a	**-8.98*** **	**-9.40*** **	n.a	n.a		**-1.49***	**-4.49*** **	n.a	n.a	**-1.25**	**-3.95*** **	-7.09***	-5.48***
	bcbd	**-8.48*** **	**-6.05*** **	n.a	n.a	**-8.98*** **	**-9.36*** **	n.a	n.a		**-2.58*** **	-0.10	n.a	n.a	**-2.18** **	1.85	n.a	n.a
	prdcfsd	**-2.88*** **	4.76	n.a	n.a	**-2.61*** **	-0.90	n.a	n.a		**-3.17*** **	**-1.75** **	n.a	n.a	**-2.51*** **	0.15	n.a	n.a

*, **, *** denote significance at 10%, 5% and 1% respectively. Optimal lag selection is governed by AIC and H&Q for IPS and LLC tests respectively. Maximum lags applied are based on time series length: with 3 for 'UEMOA and COMESA' and 2 for 'CEMAC, ECCAS and EAC'. 7 lags are applied on ' prdcfsd' for COMESA . 'c' and 'ct': 'constant' and 'constant and trend' ;respectively. n.a: not applicable. Stationary series are in bold and decision rule depends on both tests but priority is given the IPS in case of conflict of interest. LLC; Levin, Lin and Chu (2002). IPS: Im, Pesaran and Shin (2003). First diff: First difference. Vbles: variables.

3.2.4 Model specification tests (Goodness of fit tests)

We have earlier emphasized our objective of investigating post-regionalization policy effects. This requires the application of policy-time dummies which is by definition a fixed effect regression. Therefore, the Hausman test which aims to specify whether a random-effect or fixed-effect model should be applied is not deserving of examination within our context. To add more flesh to the bone, Dummy or Fixed-effect (FE) regressions have the added advantage of not hypothetically assuming that explanatory variables are not correlated with residuals. Beyond this truism, the use of FE accounts for the unobserved heterogeneity between countries in the region. More generally, in the literature when a panel consist of observations on a fixed and relatively small sets of interest units (say member states of a given region), there is a presumption in favor of FE. Pragmatically speaking, we verified the application of a random effect model and found that, this could not be possible due to insufficient degrees of freedom.

On whether Ordinary Least Squares (OLS) with FE or Generalized Least Squares (GLS) with FE should be applied, we opt for the later and justify our choice after regression by testing for the significance of heteroskedasticity.

3.2.5 Model formulation

Based on results from correlation analyses[13] presented in Appendix 3, we derived the following binary dummy models for banking intermediary efficiency (BcBd):

$$BcBd_{it} = \gamma_0 + \gamma_1 I_{it} + \gamma_{1a} A_{it} I_{it} + \gamma_2 PCF_{it}\ \gamma_{2a} A_{it} PCF_{it} + \gamma_3 GDPpcg_{it} + \gamma_{3a} A_{it} GDPpcg_{it} + \varepsilon_{it} \quad (1)$$

$$BcBd_{it} = \gamma_0 + \gamma_1 X_{it} + \gamma_{1a} A_{it} X_{it} + \gamma_2 FDI_{it} + \gamma_{2a} A_{it} FDI_{it} + \gamma_3 GDPpcg_{it} + \gamma_{3a} A_{it} GDPpcg_{it} + \varepsilon_{it} \quad (2)$$

[13] Correlation analyses helps to avoid problems linked to overparametization and multicolinearity.

$$BcBd_{it} = \gamma_0 + \gamma_1 Tropex_{it} + \gamma_{1a} A_{it} Tropex_{it} + \gamma_2 Finopex_{it} + \gamma_{2a} A_{it} Finopex_{i_t} + \gamma_3 GDPpcg_{it} + \gamma_{3a} A_{it} GDPpcg_{it} + \varepsilon_{it} \quad (3)$$

$$BcBd_{it} = \gamma_0 + \gamma_1 Globex_{it} + \gamma_{1a} A_{it} Globex_{it} + \gamma_2 GDPpcg_{it} + \gamma_{2a} A_{it} GDPpcg_{it} + \varepsilon_{it} \quad (4)$$

The robustness of models (1), (2), (3) and (4) will be checked with models (1*), (2*), (3*) and (4*) which have different dependent and control variables. While the first sets of equations appreciate banking intermediary system efficiency, the later verify financial intermediary system efficiency.

$$prdcfsd_{it} = \gamma_0 + \gamma_1 I_{it} + \gamma_{1a} A_{it} I_{it} + \gamma_2 PCF_{it} + \gamma_{2a} A_{it} PCF_{it} + \gamma_3 GDPg_{it} + \gamma_{3a} A_{it} GDPg_{it} + \varepsilon_{it} \quad (1^*)$$

$$prdcfsd_{it} = \gamma_0 + \gamma_1 X_{it} + \gamma_{1a} A_{it} X_{it} + \gamma_2 FDI_{it} + \gamma_{2a} A_{it} FDI_{i_t} + \gamma_3 GDPg_{it} + \gamma_{3a} A_{it} GDPg_{it} + \varepsilon_{it} \quad (2^*)$$

$$prdcfsd_{it} = \gamma_0 + \gamma_1 Tropex_{it} + \gamma_{1a} A_{it} Tropex_{it} + \gamma_2 Finopex_{it} + \gamma_{2a} A_{it} Finopex_{i_t} + \gamma_3 GDPg_{it} + \gamma_{3a} A_{it} GDPg_{it} + \varepsilon_{it} \quad (3^*)$$

$$prdcfsd_{it} = \gamma_0 + \gamma_1 Globex_{it} + \gamma_{1a} A_{it} Globex_{it} + \gamma_2 GDPg_{it} + \gamma_{2a} A_{it} GDPg_{it} + \varepsilon_{it} \quad (4^*)$$

Where:

- Countries $i = 1,2,..., p$; time $t = 1,2,..., n$

-for Effect **B**efore Policy; $A_{it} = 0$

-for Effect **A**fter Policy; $A_{it} = 1$

-*X, I, Tropex FDI, PCF, Finopex* and *Globex* are all on GDP.

For ease in interpretation of estimators upon regression, parameters of the models in estimated form are represented as in tables 4 and 5 as follows:

-constant, *Igdp*, ***a****Igdp, PCFgdp,* ***a****PCFgdp, GDPpcg*, ***a****GDPpcg* (Model 1)

-constant, *Xgdp*, ***a****Xgdp, FDIgdp*, ***a****FDIgdp,GDPpcg*, ***a****GDPpcg* (Model 2);

-constant, *Tropexgdp*, ***a****Tropexgdp, FDIgdp*, ***a****FDIgdp, GDPpcg*, ***a****GDPpcg* (Model 3);

-constant, *Globex*, ***a****Globex, GDPpcg*, ***a****GDPpcg* (Model 4);

-constant, *Igdp*, ***a****Igdp, PCFgdp,* ***a****PCFgdp, GDPpcg*, ***a****GDPg* (Model 1*);

-constant, *Xgdp, **a**Xgdp, FDIgdp, **a**FDIgdp,GDPpcg, **a**GDPg* (Model 2*);

-constant, *Tropexgdp, **a**Tropexgdp, FDIgdp, **a**FDIgdp, GDPpcg, **a**GDPg* (Model 3*);

-constant, *Globex, **a**Globex, GDPg, **a**GDPg* (Model 4*)

Where: '**a**' is estimated parameter for the regionalization implication.

3.2.6 Empirical analyses and Robustness tests

Models 1 to 4 which appreciate banking system efficiency shall be replicated to all regions under consideration. Robustness check for financial system efficiency is ensured by models 1* to 4*. Results are presented in tables 4 and 5.

4. Empirical Results

4.1 A general look at tested hypotheses

Hypothesis 1[14]: Like Baltagi et al. (2009) and very recently Hanh (2010), results presented in tables 4 and 5 suggest that trade openness and financial openness are independent significant determinants of bank sector efficiency or inefficiency; though regions could more or less benefit by simultaneously opening their trade and capital accounts. Therefore our findings provide only partial support for the Rajan and Zingales (2003) hypothesis, which stipulates that both types of openness are imperative to account for financial development.

Another relevant discovery which is analogous to the hypothesis above is the fact that bank efficiency is more sensitive to financial account openness than it is to trade account openness (see UEMOA and CEMAC results).

[14] The Rajan and Zingales (2003) hypothesis holds true in the context of African regionalization.

Hypothesis 2[15]

While for UEMOA and CEMAC, globalization has decreased the ability of the banking system to provide funds for investment projects, COMESA has experienced the opposite; albeit, with negative effects from financial openness and trade openness. EAC results are insignificant. With the partial exception of COMESA, regionalization for the most part has not been instrumental to financial intermediary efficiency over the past decade. UEMOA is the region with the highest surplus liquidity, followed by CEMAC. COMESA on the other hand is less affected by issues related to over-liquidity.

Hypothesis 3 [16]

Our results reveal 'economic and monetary' regions have more surplus liquidity than purely economic regions. The impact of globalization has a more detrimental effect to 'economic and monetary' regions (UEMOA and CEMAC) than to purely economic regions (COMESA and EAC)[17].

4.2 Specific look at effects of regionalization and globalization

For UEMOA: (1) increase in exports and imports have independently decreased banking efficiency; (2) when the region is opened to exports and imports simultaneously, the effect on banking system inefficiency decreases; (3)while globalization has also degraded financial system efficiency, GDP growth has improved it.

In the context of CEMAC, financial openness, trade openness and globalization have been detrimental to improving the ability of bank deposits to finance economic operators.

[15] Globalization (finance and trade) in the post regionalization era has improved African regional financial systems in their ability to allocate mobilized funds to investment opportunities.
[16] The type of regionalization (economic, monetary or both) affects the quality of intermediation efficiency.
[17] Should we increase the significance level for EAC, the sign-effect of the globalization parameter would satisfy this inference.

Looking at COMESA, we find more appealing results in the perspective that financial openness and globalization have improved banking efficiency. Improvement of welfare (GDP per capita growth) in the region has also led to an increase in bank credit with respect to bank deposits.

Results are insignificant for the East African Community (EAC).

While for UEMOA GDP growth has increased financial system efficiency, in COMESA GDP per capita growth has increased banking system efficiency. We could therefore infer a positive growth-led-finance nexus for these two regions.

4.3 Discussion of results

General results seem to posit that with regionalization in the face of globalization, African banking and/or financial systems have faced much competition from foreign banks. This is logical from common sense and to some extends competitive advantage theory which suggests that developed economies seem to have a relative advantage in the service (banking) sector. Therefore, openness oriented activities and projects are for the most part funded by foreign banks, not domestic ones. On a negative note, one could infer that contrary to assertions of Shumkler (2004), Claessens et al. (2001) and Peria et al. (2003), regionalization has not increased banking competitive pressures to the benefit of regional banks. Regionalization from a financial view-point has increased the presence of asymmetric information which remains an important concern for lenders(banks) who might not always have a good knowledge of what exactly economic operators intent to do with borrowed funds, especially if the project/activity is to be implemented without(across) national borders. This has greatly affected intermediation efficiency as savings are not fully exploited by financial institutions.

The presence of a positive growth-led-finance nexus in our findings is not unexpected. This stems from the fact that with increase in welfare, economic agents turn to rely more on credit for their activities.

As a policy implication, national and regional authorities should gain knowledge of the fact that in the face of globalization, the role of domestic and regional banks turn to lessen in the financing of openness related activities and projects. Much needs to be done on the improvement of infrastructure that curtails information asymmetry in the banking industry.

Table 4: Regressions results for UEMOA and CEMAC (Economic and Monetary Regions)

Regions	UEMOA								CEMAC							
Estimated	Main Models (Banking System Efficiency)				Robustness tests (Financial System Efficiency)				Main Models (Banking System Efficiency)				Robustness tests(Financial System Efficiency)			
Parameters	Model 1	Model 2	Model 3	Model 4	Model1*	Model2*	Model3*	Model4*	Model 1	Model 2	Model 3	Model 4	Model1*	Model2*	Model3*	Model4*
Constant	**0.945*** **	**1.106*** **	**1.52*** **	**1.23*** **	**0.632*** **	**0.544*** **	**1.51*** **	**1.36*** **	**0.90*** **	**0.90*** **	**0.93*** **	**0.78*** **	**1.01*** **	**1.02*** **	**1.03*** **	**0.86*** **
	(3.947)	(4.508)	(25.01)	(22.73)	(4.328)	(4.100)	(30.40)	(29.41)	(16.09)	(17.08)	(17.84)	(20.37)	(14.57)	(14.21)	(14.98)	(17.90)
FDIgdp	---	-0.025	---	---	---	0.009	---	---	---	0.011	---	---	---	0.006	---	---
		(-0.559)				(0.298)				(1.324)				(0.801)		
a *FDIgdp*	---	0.025	---	---	---	0.023	---	---	---	**-0.023** **	---	---	---	**-0.015***	---	---
		(0.385)				(0.580)				**(-2.528)**				**(-1.759)**		
PCFgdp	-0.029	---	---	---	-0.008	---	---	---	**0.017***	---	---	---	0.011	---	---	---
	(-0.698)				(-0.242)				**(1.990)**				(1.420)			
a*PCFgdp*	0.059	---	---	---	0.042	---	---	---	**-0,02*** **	---	---	---	**-0.022** **	---	---	---
	(1.036)				(1.046)				**(-2.732)**				**(-2.489)**			
Finop	---	---	-0.041	---	---	---	0.009	---	---	---	**0.079***	---	---	---	0.035	---
			(-0.895)				(0.216)				**(1.945)**				(0.894)	
a*Finop*	---	---	0.093	---	---	---	0.049	---	---	---	**-0.15*** **	---	---	---	**-0.113** **	---
			(1.483)				(0.939)				**(-3.338)**				**(-2.412)**	
Igdp	**0.020*** **	---	---	---	**0.029*** **	---	---	---	-0.006	---	---	---	**-0.012***	---	---	---
	(2.83)				**(6.350)**				(-0.888)				**(-1.823)**			
a*Igdp*	**-0.02*** **	---	---	---	**-0.02*** **	---	---	---	**-0.004***	---	---	---	**-0.006** **	---	---	---
	(-8.41)				**(-11.85)**				**-1.748**				**(-2.380)**			
Xgdp	---	**0.021***	---	---	---	**0.040*** **	---	---	---	-0.009	---	---	---	0.001	---	---
		(1.943)				**(7.380)**				(-1.263)				(0.187)		
a*Xgdp*	---	**-0.02*** **	---	---	---	**-0.03*** **	---	---	---	**-0.001***	---	---	---	**-0.004** **	---	---
		(-6.557)				**(-13.69)**				**(-1.802)**				**(-2.456)**		
Tropex	---	---	0.003	---	---	---	**0.006***	---	---	---	**-0.014** **	---	---	---	**-0.01***	---
			(0.764)				**(1.855)**				**(-2.359)**				**(-1.699)**	
a*Tropex*	---	---	**-0.01*** **	---	---	---	**-0.01*** **	---	---	---	**-0.002*** **	---	---	---	**-0.003*** **	---
			(-8.040)				**(-9.37)**				**(-3.542)**				**(-3.125)**	
Globex	---	---	---	-0.147	---	---	---	**0.18** **	---	---	---	0.089	---	---	---	-0.000
				(-1.504)				**(2.244)**				(1.093)				(-0.008)
a*Globex*	---	---	---	(-0.032)	---	---	---	**-0.27*** **	---	---	---	**-0.164** **	---			-0.096
				0.027				**(-3.034)**				**(-2.438)**		---	---	(-1.230)
GDPg	---	---	---	---	**-0.02*** **	**-0.016** **	**-0.017** **	-0.013	---	---	---	---	**-0.037** **	**-0.042** **	**-0.040*** **	-0.022
					(-3.081)	**(-2.528)**	**(-1.983)**	(-1.202)					**(-2.532)**	**(-2.716)**	**(-2,749)**	(-1.567)
a*GDPg*	---	---	---	---	**0.032** **	**0.018***	0.020	**-0.05*** **	---	---	---	---	0.013	0.015	0.014	---
					(2.599)	**(1.664)**	(1.503)	**(-3.24)**					(0.678)	(0.762)	(0.719)	
GDPpcg	**-0.03*** **	**-0.027** **	**-0.021***	**-0.05*** **	---	---	---	---	-0.019	-0.021	-0.021	**-0.028***	---	---	---	---
	(-2.75)	**(-2.36)**	**(-1.893)**	**(-3.97)**					(-1.261)	(-1.439)	(-1.471)	**(-1.714)**				
a*GDPpcg*	0.034	0.014	0.021	0.027	---	---	---	---	-0.016	-0.016	-0.015	-0.009	---	---	---	---
	(1.49)	(0,592)	(0.980)	(0.960)					(-0.738)	(-0.783)	(-0.763)	(-0.414)				
R^2 ajust.	0.51	0.45	0.47	0.19	0.77	0.80	0.69	0.45	0.26	0.29	0.37	0.15	0.33	0.28	0.34	0.14
F-Stats	**14.87*** **	**12.08*** **	**12.72*** **	**5.11*** **	**39.63*** **	**48.01*** **	**27.13*** **	**13.29*** **	**2.96** **	**3.25*** **	**4.21*** **	**2.32***	**3.55*** **	**3.01** **	**3.68*** **	**2.17***

*, **, *** denote respectively, 10%, 5% and 1% significance levels. Estimated parameters with '**a**' represent after policy implications to banking and financial system efficiencies. UEMOA: West African Economic and Monetary Union. CEMAC: Central African Economic and Monetary Authority.

Table 5: Regression results for COMESA and EAC (Economic regions)

Regions	COMESA								EAC							
Estimated	**Main Models(Banking System Efficiency)**				**Robustness tests (Financial System Efficiency)**				**Main Models(Banking System Efficiency)**				**Robustness tests(Financial System Efficiency)**			
Parameters	Model 1	Model 2	Model 3	Model 4	Model1*	Model2*	Model3*	Model4*	Model1	Model2	Model 3	Model 4	Model1*	Model2*	Model3*	Model4*
Constant	**0.89*** **	**0.85*** **	**0.84*** **	**0.70*** **	**1.02*** **	**0.94*** **	**0.93*** **	**0.76*** **	**0.59*** **	**0.59*** **	**0.55*** **	**0.58*** **	**0.68*** **	**0.68*** **	**0.61*** **	**0.67*** **
	(12.45)	(12.95)	(10.80)	(49.61)	(15.30)	(15.02)	(12.68)	(41.88)	(24.68)	(24.29)	(24.88)	(25.50)	(14.13)	(13.78)	(14.31)	(14.54)
FDIgdp	---	-0.015	---	---	---	-0.015	---	---	---	-0.007	---	---	---	-0.003	---	---
		(-1.049)				(-1.094)				(-0.430)				(-0.20)		
a *FDIgdp*	---	0.013	---	---	---	0.021	---	---	---	-0.023	---	---	---	-0.006	---	---
		(0.865)				(1.378)				(-0.912)				(-0.193)		
PCFgdp	**-0.026** **	---	---	---	**-0.027** **	---	---	---	-0.004	---	---	---	-0.000	---	---	---
	(-2.00)				**(-2.232)**				(-0.245)				(-0.008)			
a*PCFgdp*	**0.028***	---	---	---	**0.035** **	---	---	---	-0.018	---	---	---	-0.009	---	---	---
	(1.909)				**(2.57)**				(-0.756)				(-0.318)			
Finop	---	---	**-0.05*** **	---	---	---	**-0.05*** **	---	---	---	**-0.08*** **	---	---	---	**-0.08*** **	---
			(-2.684)				**(-3.101)**				**(-4,189)**				**(-4.438)**	
a*Finop*	---	---	**0.064*** **	---	---	---	**0.08*** **	---	---	---	0.047	---	---	--	0.056	---
			(2.868)				**(3.925)**				(1.325)				(1.510)	
Igdp	**-0.003***	---	---	---	**-0.005*** **	---	---	---	0.006	---	---	---	0.006	---	---	---
	(-1.759)				**(-2.716)**				(1.152)				(1.251)			
a*Igdp*	**-0.001** **	---	---	---	**-0.002*** **	---		---	-0.000	---	---	---	-0.001	---	---	---
	(-2.586)				**(-2.837)**				(-0.255)				(-0.412)			
Xgdp	---	**-0.004***	---	---	---	**-0.005** **	---	---	---	0.001	---	---	---	0.005	---	---
		(-1.703)				**(-2.048)**				(0.248)				(0.796)		
a*Xgdp*	---	-0.001	---	---	---	-0.000	---	---	---	0.000	---	---	---	-0.000	---	---
		(-1.012)				(-0.544)				(0.094)				(-0.176)		
Tropex	---	---	-0.001	---	---		**-0.002** **	---	---	---	-0.000	---	---	---	0.000	---
			(-1.619)				**(-2.056)**				(-0.279)				(0.203)	
a*Tropex*	---	---	-0.000	---	---		-0.000	---	---	---	-0.000	---	---	---	-0.000	---
			(-1.565)				(-1.164)				(-0.226)				(-0.384)	
Globex	---	---	---	**-0.08*** **	---			**-0.08*** **	---	---	---	0.003	---	---	---	-0.002
				(-3.319)				**(-3.608)**				(0.108)				(-0.064)
a*Globex*	---	---	----	**0.06*** **	---			**0.10*** **	---	---	---	1.544	---	---	---	0.011
				(2.773)				**(4.239)**				(0.000)				(0.357)
GDPg	---	---	---	---	-0.006	-0.003	-0.004	8,10	---	---	---	---	**-0.018***	-0.017	-0.007	-0.017
					(-1.642)	(-0.874)	(-1.082)	(0.021)					**(-1.751)**	(-1.613)	(-0.769)	(-1.679)
a*GDPg*	---	---	---	---	0.002	-0.006	-0.001	**-0.008***	---	---	---	---	0.005	0.000	0.005	-0.003
					(0.416)	(-1.186)	(-0.304)	**(-1.809)**					(0.207)	(0.021)	(0.271)	(-0.508)
GDPpcg	**-0.01*** **	**-0.01*** **	**-0.01*** **	**-0.008***	---	---	---	---	-0.014	-0.016	-0.001	-0.013	---	---	---	---
	(-2.805)	**(-2.735)**	**(-2.601)**	**(-1.917)**					(-1.386)	(-1.526)	(-0.113)	(-1.278)				
a*GDPpcg*	**0.01*** **	**0.012** **	**0.012** **	0.008	---	---	---	---	0.017	0.021	0.010	0.003	---	---	---	---
	(2.602)	**(2.104)**	**(2.255)**	(1.451)					(0.643)	(0.789)	(0.470)	(0.267)				
R^2 ajust.	0.46	0.44	0.45	0.44	0.64	0.63	0.62	0.61	0.50	0.49	0.62	0.48	0.56	0.54	0.68	0.54
F-Stats	**15.70*** **	**14.28*** **	**15.31*** **	**16.86*** **	**31.24*** **	**25.72*** **	**27.60*** **	**31.10*** **	**7.41*** **	**7.03*** **	**11.56*** **	**8.86*** **	**9.03*** **	**8.62*** **	**14.68*** **	**11.36*** **

*, **, *** denote respectively, 10%, 5% and 1% significance levels. Estimated parameters with '**a**' represent after policy implications to banking and financial system efficiencies. COMESA: Common Markets for Eastern and Southern Africa. EAC: East African Community.

5. Conclusion

In this study, we have assessed post-regionalization benefits/ills of globalization in Africa with respect to financial intermediary efficiency. Results which are robust to financial system efficiency and growth-led-finance nexus reveal: (1) UEMOA and CEMAC regional banks' ability to finance credit by deposits has reduced; (2) financial institutions of COMESA have improved their capacity to fund openness related activities/projects with deposits; (3) increase in welfare has positively affected the intermediary allocation role of banks in UEMOA and COMESA; (4) globalization tends to be more detrimental to financial systems of 'economic and monetary' regions than to those of purely economic regions. As a policy implication, national and regional authorities should gain knowledge of the fact that with globalization, the roles of domestic and regional banks appear to lessen in the funding of openness related activities and projects. Much needs to be done in the improvement of infrastructure that curtails information asymmetry in the banking industry.

Appendices

Appendix 1: Presentation of regions with corresponding balanced panels

Regions	Definition (Number of member states)	Constituent countries(Founding date)	Panel/ Dummy
ECOWAS (CDEAO)	Economic Community of West African States. (15)	Benin, Burkina Faso, Cape Verde(1976), Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone , Togo, *Mauritania(2000)*. **(5/1975)**	**N/A**
UEMOA	West African Economic and Monetary Union(8)	Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau (5/1997) °, Mali, Niger, Senegal, and Togo. **(1/1994)**	**(80-08) /(94-08)**
ECCAS (UDEAC)*	Economic Community of Central African States(11)	Angola(1999)°, Burundi, Cameroon, Central African Republic, Chad, D.R.Congo, Equatorial Guinea, Gabon, Congo, Rwanda, Sao Tomé and Principe.**(1985)**	**(90-08)/ (99-08)**
CEMAC	Economic and Monetary Authority of Central Africa(6)	Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, and Gabon. **(1999)**	**(90-08)/ (99-08)**
Franc ZONE	CEMAC plus UEMOA (14)	Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon, Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo**(9/1939)**	**N/A**
SADC	South African Development Community (15)	Angola, Botswana, D.R Congo(1997)°, Lesotho, Malawi, Mauritius(1995)°, Mozambique, Namibia (1990)°, Swaziland, Tanzania, Zambia, Zimbabwe, South Africa(1990)°, *Seychelles(2004-2007°)* and Madagascar(2005)° **(1980)**	**N/A**
SACU	South Africa Customs Union(4)	South Africa, Botswana, Lesotho and Swaziland. **(1970)**	**N/A**
EAC	East African Community (5)	Burundi (2007), Kenya, Rwanda (2007), Tanzania and Uganda. **(2001)**	**(90-08)/ (02-08)**
COMESA	Common Market for Eastern and Southern Africa (19)	Burundi, Comoros, D.R Congo, Djibouti, Egypt(1999)°, Eritrea, Ethiopia, Kenya, Libya(2006)°, Madagascar, Malawi, Mauritius, Rwanda, Seychelles(2001)°, Sudan, Swaziland, Uganda, Zambia, Zimbabwe**.(1994)**	**(80-08) /(95-08)**
IGAD	Intergovernmental Authority on Development (7)	Djibouti, Ethiopia, Eritrea (1993)°, Kenya, Somalia, Sudan, Uganda. **(1986)**	**N/A**
UMA	Arab Maghreb Union (5)	Algeria, Morocco, Tunisia, Libya, Mauritania **(1989)**	**N/A**

Countries with dates in brackets are non-founding members. Countries in Italics have withdrawn their membership. °: countries not considered for panel because they entered the region very late or withdrew over time. N/A; denotes the region cannot be include in the study because creation date renders data incompatible with application of a policy-time dummy technique.* Founded in 1985 but became effective only by 1999.

Appendix 2: Selected regions and countries

Regions	Selected countries	Panel	Dummy
UEMOA	Benin, Ivory Coast, Mali, Niger and Senegal	1980-08	1994-08
COMESA	Burundi, Kenya, Madagascar, Mauritius, Malawi, Rwanda, Sudan, Swaziland, Uganda, Zambia	1980-08	1995-08
CEMAC	Cameron, Gabon, Congo Republic	1990-08	1999-08
ECCAS	Burundi, Cameroon, Congo Republic, Gabon, Rwanda	1990-08	1999-08
EAC	Kenya, Tanzania, Uganda	1990-08	2002-08

UEMOA: West African Economic and Monetary Union. CEMAC: Central African Economic and Monetary Authority. COMESA: Common Markets for Eastern and Southern Africa. EAC: East African Community. We dropped ECCAS because of incompatibility of robustness test.

Appendix 3: Correlation Analyses

UEMOA

FDI	PCF	X	I	F.O	Glob	Trop	GDP	GDPpc	bcbd	pdcd	
1.00	0.89	0.21	0.17	0.97	0.80	0.18	0.17	0.18	-0.25	-0.23	FDI
	1.00	0.20	0.16	0.97	0.79	0.18	0.14	0.15	-0.20	-0.18	PCF
		1.00	0.47	0.21	0.65	0.90	-0.07	-0.06	0.04	0.34	X
			1.00	0.17	0.55	0.79	0.09	0.14	0.12	0.21	I
				1.00	0.81	0.19	0.16	0.17	-0.23	-0.21	F.O
					1.00	0.72	0.09	0.11	-.08	0.06	Glob
						1.00	-0.09	-0.06	0.16	0.33	XI
							1.00	0.99	-0.36	-0.40	GDPg
								1.00	-0.36	-0.43	GDPpc
									1.00	0.98	bcbd
										1.00	pdcd

CEMAC

FDI	PCF	X	I	F.O	Glob	Trop	GDP	GDPpc	bcbd	pdcd	
1.00	0.99	0.34	0.34	0.99	0.81	0.35	-0.02	0.03	-0.23	-0.28	FDI
	1.00	0.35	0.34	0.99	0.82	0.36	-0.00	0.05	-0.25	-0.30	PCF
		1.00	0.79	0.35	0.80	0.96	0.12	0.16	-0.16	-0.29	X
			1.00	0.34	0.78	0.92	0.00	0.03	0.09	-0.04	I
				1.00	0.82	0.36	-0.01	0.04	-0.24	-0.29	F.O
					1.00	0.82	0.08	0.15	-0.22	-0.33	Glob
						1.00	0.03	0.06	0.02	-0.09	XI
							1.00	0.99	-0.41	-0.46	GDPg
								1.00	-0.43	-0.49	GDPpc
									1.00	0.92	bcbd
										1.00	pdcd

COMESA

FDI	PCF	X	I	F.O	Glob	Trop	GDP	GDPpc	bcbd	pdcd	
1.00	0.98	0.25	0.23	0.99	0.78	0.25	0.20	0.20	-0.25	-0.33	FDI
	1.00	0.25	0.23	0.99	0.77	0.25	0.21	0.20	-0.26	-0.34	PCF
		1.00	0.92	0.25	0.79	0.98	0.09	0.15	-0.03	-0.18	X
			1.00	0.23	0.77	0.98	0.05	0.10	-0.00	-0.12	I
				1.00	0.78	0.25	0.21	0.20	-0.25	-0.33	F.O
					1.00	0.79	0.19	0.23	-0.14	-0.27	Glob
						1.00	0.07	0.13	-0.02	-0.15	XI
							1.00	0.95	-0.14	-0.23	GDPg
								1.00	-0.13	-0.22	GDPpc
									1.00	0.90	bcbd
										1.00	pdcd

EAC

FDI	PCF	X	I	F.O	Glob	Trop	GDP	GDPpc	bcbd	pdcd	
1.00	0.99	-0.25	-0.31	0.99	0.84	-0.34	0.55	0.56	-0.70	-0.73	FDI
	1.00	-0.28	-0.31	0.99	0.84	-0.36	0.56	0.57	-0.70	-0.74	PCF
		1.00	0.57	-0.2	-0.67	0.90	-0.42	-0.37	0.30	0.35	X
			1.00	-0.3	-0.68	0.87	-0.40	-0.39	0.36	0.40	I
				1.00	0.83	-0.35	0.56	0.57	-0.70	-0.74	F.O
					1.00	-0.80	0.62	0.61	-0.62	-0.69	Glob
						1.00	-0.46	-0.44	0.25	0.33	XI
							1.00	0.99	-0.32	-0.43	GDPg
								1.00	-0.33	-0.45	GDPpc
									1.00	0.97	bcbd
										1.00	pdcd

FDI: Foreign Direct Investment. PCF: Private Capital Flows. X: Exports. I: Imports. F.O: Financial Openness. Glob: Globalization. Trop: Export and Imports. GDP: GDP growth. GDPpc: GDP per capita growth. bcbd: bank system efficiency. pdcd: financial system efficiency. UEMOA: West African Economic and Monetary Union. CEMAC: Central African Economic and Monetary Authority. COMESA: Common Markets for Eastern and Southern Africa. EAC: East African Community.

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