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Article

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Financial sector development convergence in Africa: Evidence from bank- and market-based measures

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Abstract

In this paper, we employ data from 46 African countries over the period 1980–2014 to examine financial sector development convergence, using bank- and market-based measures of financial development. Within the framework of the generalized method of moments (GMM), we present evidence that both the bank– and market–based financial sector development in Africa diverge over time. However, we find strong evidence of financial development divergence when using bank-based financial sector development indicators whereas this evidence is weaker for market-based indicators. Given the divergence in the level of finance, the gap between countries with underdeveloped and well–developed financial markets will continue to widen as financially less developed countries do not appear to catch-up with the financially more developed economies.

Keywords: financial development; divergence; convergence; Africa
JEL Classification Codes: F15, F36, G01, O55

1. Introduction

Considering that financial development is largely argued to positively influence economic growth (see Azman–Saini, Law & Ahmad, 2010; Beck, Georgiadis & Straub, 2014; Breitenlechner, Gächter & Sindermann, 2015; Ibrahim & Alagidede, 2018), the last couple of decades have seen an enormous financial liberalization in developing countries. This is highly driven by the quest to pump international financial know–how into the financial market so as to bridge the gap between them and the developed economies (Bahadir & Valev, 2015). The pace of globalization has also necessitated the essence of this liberalization. Financial liberalization has ensured the establishment of international banks in developing countries and this has brought about skills in risk management, credit evaluation and other areas of

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development of the financial sector (Bahadir & Valev, 2015). The view on financial development convergence among countries is divided; while some scholars argue that globalization, deregulation and the stride of integration across the world have necessitated the convergence of financial sector characteristics, others are of the view that there exist vast heterogeneities in the level of finance (see Bruno, De Bonis & Silvestrini, 2012).

Not exceptionally, African countries have also moved with the speed of light to develop and liberalize their financial sector to hasten the convergence process with other regions of the world. Convergence in several areas among countries with differing levels of macroeconomic, structural and fundamental developments presents a springboard to accelerate the catching up process for these countries. As a result, convergence criteria in a number of areas of interests are being championed by the several regional economic communities and monetary zones in Africa, with the aim of quickening monetary integration leading to the single continental market (continental free trade area). This integration is expected to massively enhance competition and trade, movement of factors and labour, and increase economic growth. On a number of fronts, financial development convergence is one of the key areas required to drive this integration. As the advantages of financial development are well–known, evidence of its convergence in Africa is elusive. However, recent literature is skewed towards examining the factors influencing financial development in Africa. For instance, in the case of sub-Saharan Africa, Ibrahim & Alagidede (2017) argue that the legal origin of countries matters in their level of financial sector development. In particular, the authors find that, relative to countries practicing civil law, English common law countries have higher financial sector development both in terms of financial activity and banking sector efficiency. More recently, after examining how the interactive effect of trade openness and human capital influence financial sector development in Africa, Ibrahim & Sare (2018) conclude that human capital accumulation and trade openness are substitutable in their effect on domestic financial development. While these studies carry important implications for policy, little is known regarding the (di)convergence of the financial sector. Sprat (2009) documents two types of financial systems: (i) bank-based and (ii) market-based financial systems. While the bank-based considers issues in the financial institutions where banks forge long-term relationships with corporate borrowers, the market-based financial sector revolves around the equity/capital markets. This notwithstanding, the existing studies are mainly centered on the bank-based measures while remaining mute on the market-based measures. In this paper, we deviate from the earlier studies by examining the convergence or otherwise of financial development across a substantial number of African countries by using bank and market–based measures of financial development.

Our analysis follows the few existing literature seeking to examine financial development convergence in a number of countries. For example, Bruno et al., (2012) find mixed evidence of convergence for OECD countries. Kılınç, Seven & Yetkiner (2017) find evidence of convergence for the European Union countries. In 38 developed and developing countries, Antzoulatos, Panopoulou & Tsoumas (2011) find evidence of no convergence, and also a widening disparity in financial systems among the countries. Dekle & Pundit (2016) build an index of financial development for 23 Asian countries and find evidence of convergence between countries with weaker financial systems and Asian benchmark economies; Hong Kong, Japan, South Korea and Singapore. In the case of Africa, Asongu's (2014) evidence suggests that countries with small–sized financial intermediary depth, efficiency, activity and size are catching–up countries with large–sized financial intermediary depth, efficiency, activity and size, respectively. While Asongu's (2014) study is able to identify the extent of convergence, the study is only limited to the bank-based measures of financial development with disregard to the market-based indicator of financial sector. Indeed, given the continent's preoccupation of improving the equity markets as part of efforts of improving the overall

financial sector, examining the (di)convergence of both the bank- and market-based indicators deserve far more nuanced and in-depth analysis and that is the aim of this study.

This paper makes significant contributions to the literature in so many ways. First, our paper however differs from these studies as we make a case for 46 African countries over the period 1980–2014. Given the financial liberalization and reforms that happened in the 1980s, to the best of our knowledge, this is the first study examining whether the bank– and market–based measures of financial markets converge or diverge in Africa. Second, by conducting a comparative analysis, we are able to show the different level of (di)convergence and their associated speed in addition to examining how other critical factors influence the different types of financial systems. Third, we rely on an estimation approach that controls for potential endogeneity eminent in financial development studies and by so doing, we are able to produce consistent and unbiased results.

Our system-generalized method of moments (GMM) based on data from 46 African countries over the period spanning 1980 to 2014 suggests that, both the bank– and market–based financial sector development diverge over time. However, we find strong evidence of divergence for the bank-based financial sector development indicators (private and domestic credit to GDP). However, with regard to the market-based indicator, the extent of divergence is weak. The rest of the paper is structured as follows. In the next section we provide a brief discussion on the background to the study. Section 3 presents the data and methodology while the results are discussed in Section 4. Section 5 concludes the study.

2. Financial development in Africa

The African region has seen enormous reforms in the financial sector in the last couple of decades; these reforms have included removal of credit ceilings, liberalization of interest rates, privatization of state-owned banks, promotion of private banking among others. All these have been in the quest to boost financial development. Despite these reforms, the financial sector of the region is still underdeveloped, and it is unmatched with even that of other developing regions (Green, 2013; Allen et al. 2014; IMF, 2016). Financial depth for example has increased but it is not at the level of other developing regions, making financial development in the region to be below benchmark levels. Over the past decade, it is only a few middle-income countries and large oil exporting countries (Cabo Verde, Mauritius, South Africa, Côte d'Ivoire, Angola, Chad, Nigeria) in the African region that have achieved relatively better financial development comparable to the benchmarks. Angola has in particular seen enormous financial development, as between 2005 and 2013 its bank deposits surged from 12.55% to 49% of GDP and loans from 5% to 24% of GDP (IMF, 2016).

The region's median private sector credit to GDP has surged about 10% since 1995 to about 21% in 2014 (IMF, 2016). Despite this improvement, the size of the private sector credit to GDP is virtually about a half of that of Middle East and North Africa, East Asia, and Latin America and the Caribbean. It is also remarkable to mention that in recent years the region has seen several innovative financial services driving its financial sector. Embedded in mobile telephony, a number of widespread financial services such as M-Pesa, M-Shwari, and M-Kopa have helped reduce transaction costs and enhanced personal transactions particularly in East Africa (IMF, 2016). The rapid growth and expansion of Pan-African banks is also helping promote financial development in the region. The IMF (2016) notes that the scale of operations of these Pan-African banks have outgrown that of traditional European and American banks. Despite these glimpses of hope there is still more to catch-up with, especially in this era of regional and global financial integration.

Beyond the bank-based financial sector, the market-based financial sector which comprise the equity market has seen some improvement. According to PwC (2018), since 2013, there have been 519 African transactions in the equity markets, raising a total of $52.7 billion. This figure

represents a 17% increment in terms of capital raised over the previous five-year period. In terms of value, 2017 also saw the largest Initial Public Offering (IPO) and an increase in the total value of transactions of 49% between 2016 and 2017 in US dollar terms. According to PwC (2018), the improvement in the volume of transactions in 2017 was largely influenced by the activities in South Africa, Egypt and Tunisia, and the renewed listing activity in Namibia, which saw two IPOs in 2017.

3. Methodology

3.1. Data and preliminary findings

Our study uses data on financial, macroeconomic and demographic aggregates obtained from the World Development Indicators of the World Bank for 46 African countries over the period 1980–2014.[1] The countries were selected based on data availability over a longer time span. We use three financial sector development indicators namely the private credit, domestic credit and stock market capitalization all expressed as a proportion of GDP. For the macroeconomic variables, we include trade openness, economic growth measured by real GDP per capita, government expenditure and inflation. To account for demographic influence on financial development, we control for human capital – proxied by primary school enrolment as a percentage of gross – and active population [ages 15–64 (% of total)]. We present the descriptive statistics of our variables in Table 1 below.

Table 1. Descriptive statistics.

	Private credit	***Domestic credit***	***Market cap***	***Human capital***	***Trade openness***	***Economic growth***	***G. Exp***	***Inflation***	***Population***
Mean	20.37	32.97	7.62	33.79	72.99	1,886.42	15.43	59.69	53.64
St. dev	21.62	62.54	17.69	23.45	45.38	2580.28	6.72	896.89	4.62
Minimum	0.156	–114.69	0.0004	2.48	6.32	115.79	0.00	–35.83	46.94
Maximum	160.12	2,066.18	136.49	108.26	531.73	20,333.94	84.51	24,411.03	70.78
Observations	1,561	1,565	259	1,068	1,575	1,656	1,517	1,508	1,702
Correlations									
Private credit	1.00								
Domestic credit	0.93	1.00							
Market cap	0.76	0.73	1.00						
Human capital	0.79	0.72	0.49	1.00					
Trade openness	–0.13	–0.22	–0.29	0.08	1.00				
Economic growth	0.80	0.66	0.48	0.85	0.24	1.00			
G. Exp	0.30	0.12	0.25	0.27	0.07	0.27	1.00		
Inflation	–0.32	–0.27	–0.15	–0.31	–0.06	–0.34	–0.24	1.00	
Population	0.67	0.68	0.30	0.81	0.14	0.72	0.11	0.41	1.00

Notes. Market cap and G. Exp respectively denote stock market capitalization and government expenditure.

Fig. 1 to 3 respectively presents a scatter plot of private credit, domestic credit and stock market capitalization – all as a share of GDP – against their initial values for the period under study. For all the proxies of finance, we find a positive relationship between the respective

[1] The countries are Algeria, Angola, Benin, Botswana, Burundi, Burkina Faso, Cabo Verde, Cameroon, Central African Republic, Chad, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Ethiopia, Egypt Arab Rep., Equatorial Guinea, Gabon, Ghana, The Gambia, Guinea-Bissau, Guinea, Kenya, Liberia, Libya, Lesotho, Mali, Malawi, Mauritania, Mauritius, Morocco, Niger, Nigeria, Namibia, Mozambique, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe.

measures of finance and their initial values suggesting divergence in financial development. Thus, average growth of finance is higher (lower) in economies with higher (lower) initial levels of domestic financial development. Beyond the cursory view, we formulate a more detailed approach to examining the financial development divergence using a dynamic panel estimation.

Figure 1. Private credit divergence.

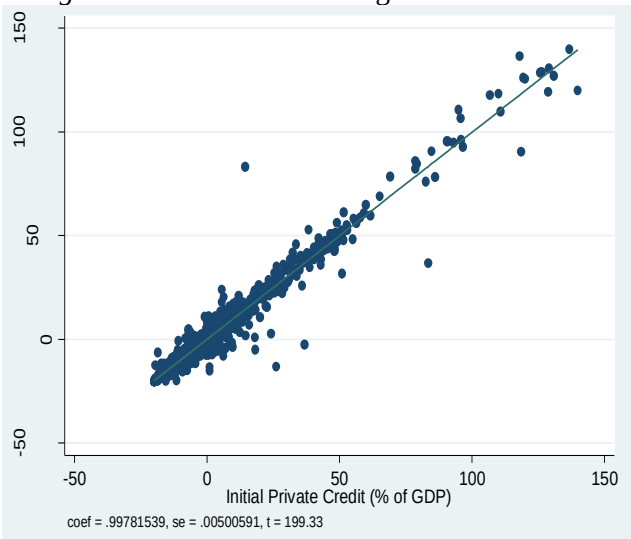


Figure 2. Domestic credit divergence.

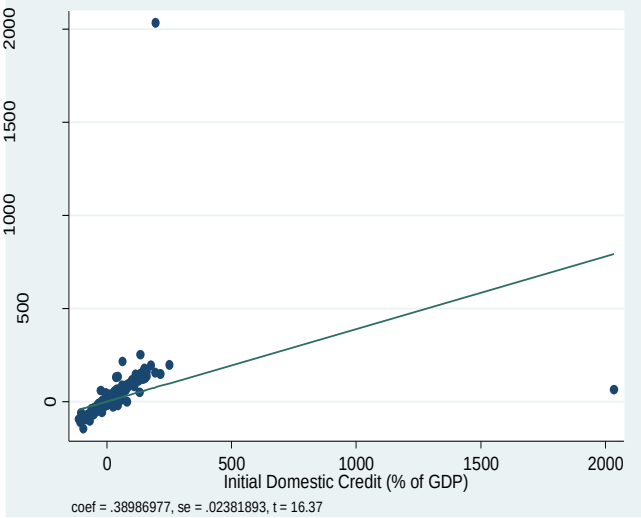
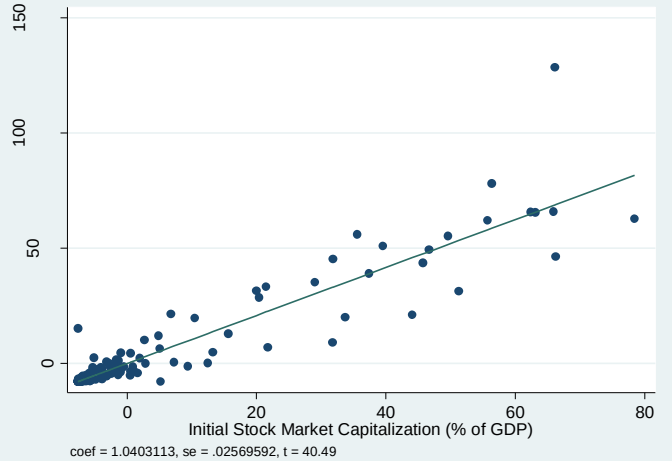


Figure 3. Stock market capitalization divergence.



3.2. Empirical strategy

To avoid biased estimates in addition to abstracting from business cycle components, we transformed the annual data into 5–year averages yielding seven non–overlapping periods: 1980–1984, 1985–1989, 1990–1994, ……., 2010–2014. This averaging process smooths out the annual variations at the country levels. We examine the (di)convergence of financial development in Africa by specifying unconditional di(convergence) of the following:

$$FINANCE_{it} = \beta FINANCE_{it-1} + \delta_1 CONTROLS_{it} + \varepsilon_{it}; \varepsilon_{it} = \alpha_i + \nu_t + \mu_{it} \quad (1)$$

where $FINANCE_{it}$ is a level of financial development while $FINANCE_{it-1}$ is their respective lag and $CONTROLS_{it}$ is a vector of the control variables. On the right hand side, β as the coefficient of the initial values of finance measures the (di)convergence of finance; where α_i is unobserved country–specific fixed effects; ν_t is the time effects; ε_{it} is the idiosyncratic error term while μ_{it} is the error term.

Our interest in this study is β where we examine whether β is positive or negative. By construction, variations in the last period financial development explain the starting level for the next period. Thus, from equation (1), if $\beta < 0$, it implies financial sector development in Africa converges in such a way that domestic level of financial development expands more quickly in countries or periods with a lower initial level of financial sector development. Furthermore, if $\beta > 0$; it implies that domestic level of finance diverges suggesting that financial sector development grows more quickly in economies with well–developed financial sectors (Bahadir & Valev, 2015). Implicitly, the inclusion of the lagged dependent potentially results in endogeneity and reverse causality. For instance, the level of countries' domestic financial sector development at a particular point in time could potentially be the result of subsequent changes which includes the level of finance at the beginning of each period. In this case, the lagged dependent maybe correlated with the error term. We address the endogeneity and reverse causality problems using the system Generalized Method of Moments (GMM) dynamic panel estimation approach as suggested by Arellano and Bover (1995) and Blundell and Bond (1998).[2] The GMM estimator is a dynamic one that estimates our financial development model in equation (1) above in first differences and uses lagged values of the variables as instruments. Differencing the model eliminates the endogeneity and country–specific effects and as well as ensuring that all the regressors are stationary (Baltagi et al., 2009). However, when the explanatory variables such as inflation are persistent over time, the lagged levels become weak instruments leading to biased estimators (Blundell and Bond, 1998). We overcome this weakness through the system GMM which uses a set of difference equations instrumented with lags of the equation in levels (Bond, 2002).

We test the validity of the instruments using the standard Hansen test of over–identification, with the null hypothesis that our instruments are uncorrelated with the error terms. We also test for serial correlation, where the null hypothesis is that there is no second–order serial correlation in the error term.

4. Findings and discussions

In this section, we discuss the results of the estimations. Tables 2 and 3 respectively present results based on bank–based measures namely private and domestic credits. In Table 4 however, the results are based on market capitalization. For each estimation, we start with conditional (di)convergence where we include all our control variables. We subsequently examine the unconditional (di)convergence by sequentially dropping the controls until the lagged finance appears as the only exogenous variable.

[2] To the extent that $N = 46 > T = 7$, the GMM approach is particularly suitable.

Table 2. Bank–based measure (Dependent variable: Private credit).

Variables	***1***	***2***	***3***	***4***	***5***	***6***	***7***
Constant	1.508	0.659	1.292	0.616	0.092	0.154	0.163
	(0.714)	(0.306)	(0.333)	(0.286)	(0.052)	(0.024)	(0.026)
Finance(–1)	0.647***	0.652***	0.562***	0.623***	0.642***	0.626***	0.861***
	(0.049)	(0.046)	(0.051)	(0.028)	(0.026)	(0.020)	(0.026)
Human capital	0.051	0.060	0.082	0.104*	0.187***	0.196***	–
	(0.106)	(0.099)	(0.064)	(0.055)	(0.036)	(0.021)	
Trade	0.059	0.046	0.042	0.051	0.138***	–	–
	(0.069)	(0.067)	(0.036)	(.041)	(0.029)		
GDPPC	0.539***	0.226	0.418***	0.268**	–	–	–
	(0.197)	(0.161)	(0.139)	(0.133)			
Govt. exp	0.182***	0.197***	0.292***	–	–	–	–
	(0.024)	(0.026)	(0.027)				
Inflation	–0.032***	–0.029***	–	–	–	–	–
	(0.004)	(0.005)					
Population	–1.792***	–	–	–	–	–	–
	(0.592)						
Diagnostics:							
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald χ^2	1,100.97	1,433.10	2,009.04	1,465.16	3,477.15	2,331.46	1,081.63
Prob > χ^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2)	0.12	0.28	0.34	0.33	0.45	0.23	0.10
Hansen test	0.34	0.44	0.38	0.49	0.46	0.31	0.29
No. of groups	46	46	46	46	46	46	46
Observations	322	321	312	304	299	281	202

Notes. *, ** and *** denote significance at 10, 5 and 1% respectively. Windmeijer (2005) robust standard errors are in parentheses. We report the *p*–values for the 2nd order serial correlation [AR(2)] and Hansen test. GDPPC and Govt. exp respectively denote real GDP per capita and government expenditure.

Table 3. Bank–based measure (Dependent variable: Domestic credit).

Variables	***1***	***2***	***3***	***4***	***5***	***6***	***7***
Constant	1.452	0.096	0.254	0.471	0.423	0.473	0.330
	(1.224)	(0.365)	(0.446)	(0.501)	(0.100)	(0.031)	(0.019)
Finance(–1)	0.601***	0.559***	0.588***	0.640***	0.618***	0.632***	0.764***
	(0.054)	(0.042)	(0.054)	(0.030)	(0.017)	(0.023)	(0.016)
Human capital	0.145	0.154*	0.091	0.060	0.063*	0.025	–
	(0.097)	(0.087)	(0.063)	(0.059)	(0.032)	(0.030)	
Trade	0.010	0.020	0.094**	0.0008	0.007	–	–
	(0.055)	(0.048)	(0.046)	(0.040)	(0.041)		
GDPPC	0.086	–0.044	–0.064	–0.018	–	–	–
	(0.173)	(0.135)	(0.141)	(0.181)			
Govt. exp	0.491***	0.584***	0.470***	–	–	–	–
	(0.103)	(0.062)	(0.113)				
Inflation	–0.025***	–0.022***	–	–	–	–	–
	(0.003)	(0.003)					
Population	–1.098	–	–	–	–	–	–
	(0.970)						
Diagnostics:							
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald χ^2	2,564.82	3,508.23	1,346.10	3,309.72	1,852.98	1,447.52	2,173.61
Prob > χ^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2)	0.15	0.23	0.16	0.43	0.65	0.26	0.23
Hansen test	0.25	0.24	0.27	0.46	0.53	0.44	0.26
No. of groups	46	46	46	46	46	46	46
Observations	322	321	312	304	299	281	202

Notes. *, ** and *** denote significance at 10, 5 and 1% respectively. Windmeijer (2005) robust standard errors are in parentheses. We report the *p*–values for the 2nd order serial correlation [AR(2)] and Hansen test. GDPPC and Govt. exp respectively denote real GDP per capita and government expenditure.

From Table 2 above, we find strong evidence of divergence of financial development given the positive and significant coefficient. This finding holds whether or not we estimate a conditional or unconditional finance regression. The results are generally consistent with decreasing number of controls. The coefficients of the conditional regressions range between 0.562% (column 3) to 0.652% (column 2). Interestingly, the speed of divergence is more rapid under unconditional regression where a coefficient of 0.861 is noticed (column 7). In essence an increase in the initial level of private credit of 10 percentage points is associated with a rise in the growth of private credit of about 8.61 percentage points. Similarly, column 7 of Table 3 indicates that increases in the initial level of domestic credit by 10 percentage points are associated with increases in the growth of domestic credit and market capitalization of about 7.64 percentage points. Indeed, for both the bank–based measures, divergence is more rapid under the unconditional regressions suggesting that countries with high initial level of financial sector are the ones with more developed financial markets relative to those with low initial levels of finance. This evidence is consistent with Bahadir & Valev (2015). However, for both private and domestic credits, the process of divergence slows once we control for additional variables.

Table 4. Market–based measure (Dependent variable: Market capitalization).

Variables	***1***	***2***	***3***	***4***	***5***	***6***	***7***
Constant	16.178	35.213	20.014	26.342	0.328	3.083	0.190
	(114.648)	(13.017)	(17.469)	(25.654)	(5.415)	(3.917)	(0.057)
Finance(–1)	0.360	0.263	0.357*	0.333**	0.409***	0.468***	0.457***
	(0.317)	(0.188)	(0.138)	(0.134)	(0.097)	(0.077)	(0.050)
Human capital	–0.558	–3.686	–2.503	–8.191	–0.828	–1.657	–
	(12.770)	(10.809)	(6.744)	(6.118)	(2.483)	(2.208)	
Trade	2.219	1.444	1.735	0.149	1.054	–	–
	(2.852)	(2.350)	(1.391)	(0.989)	(1.006)		
GDPPC	7.450	11.511	5.610	11.928	–	–	–
	(12.896)	(7.994)	(8.588)	(10.438)			
Govt. exp	0.685	–0.362	1.637**	–	–	–	–
	(3.893)	(2.779)	(0.809)				
Inflation	–0.016	0.053	–	–	–	–	–
	(0.331)	(0.300)					
Population	–25.689	–	–	–	–	–	–
	(55.017)						
Diagnostics:							
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald χ^2	170.61	175.05	65.69	78.37	75.47	74.53	82.85
Prob > χ^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2)	0.11	0.18	0.21	0.31	0.40	0.49	0.32
Hansen test	0.50	0.58	0.56	0.45	0.65	0.62	0.59
No. of groups	46	46	46	46	46	46	46
Observations	153	143	138	135	122	118	101

Notes: *, ** and *** denote significance at 10, 5 and 1% respectively. Windmeijer (2005) robust standard errors are in parentheses. We report the *p*–values for the 2nd order serial correlation [AR(2)] and Hansen test. GDPPC and Govt. exp respectively denote real GDP per capita and government expenditure.

For most part, GDP per capita spurs private credit with no apparent impact on domestic credit while government expenditure significantly influences both indicators of bank–based finance with economically huge impact of domestic credit. Inflation inhibits financial development and so is population. The efficiency of the financial sector is distorted by high rate of inflation. This is the case as it causes financial market frictions which in turn slows down the performance of the economy. Inflation also works to reduce the level of investment in the economy. This is the case as in high inflation economies, intermediaries will tend to channel lesser financial

resources and as a result capital distribution will be less efficient. This will affect the size of equity markets and make them less liquid (Huybens & Smith, 1998, 1999; Shahbaz, Wahid & Kalim, 2010). De Gregorior & Guidotti (1995) and Boyd & Champ (2003) for example found that inflation impeded economic growth through its detrimental effect on financial markets (financial development). High fertility rates or population can adversely affect per capita incomes, and hence the economy as a whole if this growing population is exerting pressure on limited resources. A bad health of the economy is detrimental to the development of the financial sector. We find human capital and trade have positive coefficients, albeit statistically insignificant in some instances. Generally, human capital and trade openness are found to foster financial development (Outreville, 1999; Law, 2009; Baltagi, Demetriades & Law, 2009; Kim, Lin & Suen, 2010; Hakeem & Oluitan, 2012). However, the impact of population on domestic credit is not significant.

Turning to market–based measure proxied by stock market capitalization, we find weak evidence of divergence for financial development (market capitalization). Generally, we observed that capital markets in Africa are generally influenced by its initial conditions. All the other independent variables are not robustly related to stock market capitalization. This evidence confirms the widely held view that capital markets in the continent are relatively narrow. On the validity of our models, we find that our instruments are valid and that there is no second order serial correlation.

5. Conclusion

We present evidence that the bank–based financial sector development indicators proxied by private and domestic credits to GDP in Africa, and the market–based indicator measured by stock market capitalization measures of financial development diverge over time. A strong evidence of financial divergence is however found when using bank-based financial sector development indicators (private and domestic credit to GDP), whereas this evidence is weaker for market-based indicators. We find that divergence for different measures of financial development slows once other control variables are included. Thus, countries with a higher initial level of financial development experience more rapid growth of credit. Indeed, the financial liberalization in Africa and the subsequent move toward more market–based economies have provided opportunities for capital investment injection into the financial sector. Given the divergence in the level of finance, the gap between countries with underdeveloped and well–developed financial markets will continue to widen as financially less developed countries do not appear to catch up with the financially more developed economies with regard to the size of the financial sectors. Undoubtedly, this has crucial implications for both the overall financial markets and economic growth more generally.

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