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Financial Determinants of Human Development in Developing Countries

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Abstract

Hitherto financial drivers of human development have been unexplored by the UNDP. This paper assesses determinants of human development from financial dynamics of depth, efficiency, size and activity on data from 38 developing countries. While the importance of financial activity, size and depth (in decreasing order) is significant for inequality adjusted human development, financial allocation efficiency significantly undermines welfare. As a policy implication results do not support financial allocation efficiency as a driver of human development.

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1. Introduction

Do profit margins in financial institutions have an adverse effect on welfare? Why do countries with overwhelming dominance in financial allocation efficiency lag behind in prospects for human development? Which macroeconomic financial determinants really matter for human emancipation? Does financial activity matter as much as financial depth in welfare? Which side of the bank's balance sheet really matters for the common man in the street? Should economic policy prioritize financial size over financial depth? Why are English common-law countries less concerned about the effectiveness of banks in their fundamental role of transforming mobilized funds into credit for economic operators; but more focused on the asset side of the balance sheet(banking activity)? Such are the concerns this papers seeks to elucidate.

Drawing inspiration from above questions the aim of the study is to examine the relative contributions of financial intermediary development indicators to human development as observed in developing countries. Section 2 reviews some pertinent literature relative to human development and financial factors that could influence it. Section 3 provides the data source and a description of the methodology for the proposed study. Results are presented and discussed in Section 4 while the conclusion is contained in the last section.

2. Human Development and Finance

2.1 Human Development

2.1.1 Meaning and measurement of human development

According to the United Nations Development Program (hence UNDP, 1990) human development is a process of enlarging the people's choice. These choices can in principle be infinite or change over time. However, off all levels of development the three most essential are for people to live a long and healthy life, acquire knowledge and have access to resources crucial

for a decent living standard. Apart from those mentioned above, other choices identified vary from economic, social and political freedoms to opportunities for being creative, productive, enjoying personal self-respect and guarantee of human rights. (UNDP, 1990; UNDP, 1991; Narayan, 2005).

A summary of these definitions include two sides of human development: (1) the establishment of human capabilities such as improved health, skills and knowledge; (2) the usage of acquired capabilities either for leisure, productive purposes or activity in social, cultural and political affairs. Linked to this definition is the measurement of human development based on three essential elements of human life, namely: longevity (measured by life expectancy at birth); knowledge or educational attainment (measured by a combination of adult literacy and combined primary, secondary and tertiary enrolment ratios); and decent living standard measured by GDP. The first pertaining to life expectancy is related to survival: vulnerability to death at a relatively early age. The second is linked to the probability of being excluded in the world of reading and communication (knowledge). The third reflects a decent standard of living with respect to overall economic provisioning (Kankwanda et al., 2000; UNDP, 2005).

The 2010 Human Development report adjusted the three dimensions of human development for inequality. Thus the Human Development Index (HDI) has been reframed to the Inequality adjusted Human Development Index (IHDI).

2.1.2 Determinants of human development

Sen(1985) underlined human capabilities and entitlements. With respect to determinants of human development, human capabilities refer to what people do and can do of their lives. They entail things that can lead to a healthy life such as the access to resources needed for a decent livelihood. Entitlement deflects attention from the mere possession of goods and services

towards rights and command families have over goods; in relation to various political, economic and social opportunities within the legal system.

As pointed-out by Beoninger(1991), Brautigam(1991) and Isham et al.(1997), good governance provides for civil and economic liberties. Civil liberties include freedom of individual expression, free media...etc. Freedom of dissent, criticisms and the ability of groups to organize are essential elements of civil liberties since they enable greater citizen voice and enhance effective governance on development. On the other side of the coin, with fewer restrictions and regulations to individual economic opportunities, economic liberties will foster entrepreneurship, market activities and economic growth for the improvement of human development.

The importance of people's participation in the development process is highlighted by Picciotto (1992). With respect to him, when people participate in a development process that affects their lives there is a tendency for human development to improve because participation entails partaking-in and sharing a particular project with the people. Participation is therefore a process or a means to an objective. As a process, it points out individual involvement in a collective activity. As a goal driven concept, it denotes the social interaction that characterizes a group, as well as their contributions towards targeted results (UNDP, 1993).

In accordance with the UNDP (1990), the degree by which people can improve their capabilities largely depend on their incomes as well as their access to basic goods and services. A critical element to improving human development is growth and equal distribution of per capita income as it provides access to resources for a convenient livelihood. Safe water, sanitation and education; readily available and affordable health care; and food are the most important basic goods and services (Narayan et al., 2000a, 2000b).

The respect of human rights is also an important determinant of human development (UNDP, 2000). This assertion is premised on the fact that human development represents the claims that individuals have on the conduct of other individuals and collective agents of the society in the design of social arrangements to facilitate or secure human development capabilities and freedoms.

Development aid and assistance via partnerships (global, regional or local) are also acknowledged as important determinants of human development (UNDP, 2005). Global partnerships could foster the development of international trade; particularly the export of labor-intensive goods that could potentially increase the share of the world's poorest in the participation to global prosperity. The need for human security and avoidance of war's terrible destructiveness are also canvassed in the need to allow conflict not to blight the lives of millions of people.

Democracy is also an important factor in the course of human development. As pointed-out by the UNDP (2002), democracy is a universally recognized idea based on values common to people everywhere regardless of political, cultural, economic and social differences. In its conception democracy seeks to protect and promote the dignity and fundamental rights of an individual, instill social justice and foster social and economic development. It is a political system that enables people to choose an effective, honest, accountable and transparent government. Democracy is premised on two principles: participation and accountability. In the system, everyone has the right to participate in the management of public affairs; in the same vein everyone has the right to access information on government activities, to petition government and even seek redress through impartial administrative and judicial mechanisms. With respect to the UNDP (2005), Democracy is also inseparable from human rights and based

on the primacy of law for which judicial institutions and independent impartial effective oversight mechanisms are the guarantors.

Other aspects include investment in technology; education and infrastructure which could considerably foster the ability of poorer people to improve environments for democracy, accountability, human rights...etc. The advent of the internet, social media and networking and the corresponding influence these have had on the Arab 2011 spring cannot be undermined.

Above all, fundamental to human development is economic growth characterized by macroeconomic stability that stresses low inflation, stable exchange and interest rates and little or absence of debt overhang. The financial sector has hitherto been unexplored by the UNDP and plays quite a significant role in the course of human emancipation.

2.2 The Financial perspective of human development

As outlined above, interest rates, investment, savings and credits play an important role in human development as they characterize macroeconomic growth. The contribution of economic operators to a country's growth and progress depend to a large extent on the financial sector of the economy. Investment of private sector organizations in national human development projects depend much on financial sector lending policies. For instance, policies within a set of financial institutions that encourage private sector organizations to invest in national human development, career building, procedures instituted by companies to increase the efficiency of their national human resources, offer motivation and incentives (to be a coherent part of the company human capital) and therefore increase their productivity. Given the practical difficulty of independently assessing the effects of bank-credit allocated to the private sector for human development initiatives in developing countries(as enumerated above), we shall limit our

analysis to macroeconomic financial indicators. The purpose of this paper is therefore to explore the effects of a plethora of financial intermediary indicators on welfare.

3. Data and Methodology

3.1 Data

A cross country data is drawn from 38 African countries for the period 1996 to 2008(see Appendix 1). The data is obtained from African Development Indicators (ADI) of the World Bank (WB) and the Financial Development and Structure Database (FDSD). For the purpose of clarity, the data is presented in the following categories.

3.1.1 Financial determinants

The choice of financial development indicators for our analysis is based on a broad set of variables from the FDSD. As shown in Appendix 2 we narrow down the nine indicators into four main dynamics based on correlation analysis and usage in the literature. Consistent with the FDSD, measures of financial intermediary size reflect high correlations; for instance $Dbacba$, $Llgdp$, $Dbacba$, $Pcrdbgdp$ and $Fdgdgdp$ have respective correlations of 38%, 94%, 89%, 73.46%, 66% and 99.15% in relation to $Bdgdgdp$. Measures of financial intermediary activity also reflect significantly high correlations(91.22% for $Pcrdbgdp$ and $Pcrdbofgdgdp$). In line with the literature (Asongu, 2011b), we are poised to choose our financial intermediary indicators based on channels of depth (monetary based and financial system deposits), allocation efficiency (bank credit on bank deposits and financial system credit on financial system deposits), activity (private domestic credit on GDP and financial system credit on GDP) and size (deposit banks assets on central bank assets plus deposit bank assets). Our selected financial indicators could be summarized in the following channels.

a) Financial depth channel

Financial depth is appreciated both from overall-economic and financial-system perspectives, through indicators of broad money supply (M2/GDP) and financial system deposits (Fdgdp) respectively. These two variables should robustly check each other in the course of our analysis since more than 97% of ‘broad money supply’ information is contained in ‘financial system deposits’ (see Appendix 3).

b) Financial allocation efficiency channel

We neither refer to the profitability-oriented concept of financial efficiency nor to the production efficiency of decision making units in the financial sector (via Data Envelopment Analysis). What we seek to emphasize is the ability of banks to effectively address their fundamental role of transforming mobilized deposits into credit. We adopt two measures: banking system efficiency and financial system efficiency (respectively “bank credit on bank deposits” and “financial system credit on financial system deposits). Preliminary correlation analysis(see Appendix 3) certify the later can check the former and vice-versa, as the later contains over 87% of variability in the former.

c) Financial size channel

In accordance with the FDSB we measure financial intermediary activity as the ratio of “deposit bank assets” to the sum of “central bank assets and deposit bank assets”. Unfortunately, unlike proxies for other channels (where we have two measures for every driver) we do not find another ratio that overlap significantly with this variable.

d) Financial activity channel

This refers to the ability of banks to grant credit to economic operators. We check bank-sector- activity with financial-sector-activity, measured by “private domestic credit” and “private credit by domestic banks and other financial institutions” respectively. Correlation analysis in Appendix 3 reveals each contains more than 93% of information in the other.

3.1.2 Human development

We use two variables for human development. The Inequality adjusted Human Development Index (hence IHDI) which covers three aspects of human welfare (longevity, education attainment and income) and GDP per capita growth which measures individual income growth when GDP growth is evenly distributed. A critical element to improving human development is growth and equal distribution of per capita income as it provides access to resources for a convenient livelihood. The HDI index is a composite statistic used by the WB to rank countries by levels of human development. It is a comparative measure of life-expectancy, literacy, education and standards of living on a world scale. The 2010 Human Development Report was the first to adjust HDI for inequality. Thus the study has the added appeal of using a recently unexplored indicator of human development.

3.1.3 Instrumental variables

Consistent with the literature we use inflation (Asongu, 2011a), trade, GDP growth, regulation quality and rule of law (Asongu, 2011b) as instrumental variables.

3.1.4 Control variables

In accordance with the literature still, we control for population growth (Asongu, 2011c), English common-law origin, French civil-law origin (Asongu, 2011c, Beck et al., 2003), and government expenditure (Levine & King, 1993; Hassan et al., 2011; Asongu, 2011d).

3.2 Methodology

3.2.1 Estimation method

To access financial channels of human development we use the TSLS estimation technique in line with the literature (La Porta et al., 1998; Beck et al., 2003; Agbor, 2011; Asongu, 2011abcd). This estimation technique has the particular edge of addressing the issue of endogeneity. Therefore the instrumental variable estimator can avoid the bias that Ordinary Least Squares (OLS) estimates suffer-from when explaining variables in the regression are correlated with the error term. This Instrumental Variable (hence IV) regression will entail the following steps:

- first and foremost we provide justification for the use of a TSLS estimation technique in the stead of an OLS method through the Hausman test for endogeneity;
- secondly, we examine the first condition for the TSLS method where-by the instruments must explain the endogenous components of the explaining variables (financial channels) conditional on other covariates (control variables);
- lastly, we check the validity of the instruments through an Over-Identifying Restriction (OIR) test to ensure these (instruments) do not suffer from endogeneity.

This methodology will entail the following models:

First stage regression:

$$Finance_{it} = \gamma_0 + \gamma_1(Inflation)_{it} + \gamma_2(Trade)_{it} + \gamma_3(GDPg)_{it} + \gamma_4(Law)_{it} + \alpha_i X_{it} + \nu \quad (1)$$

Second stage regression:

$$HumanDevelopment_{it} = \gamma_0 + \gamma_1(Finance)_{it} + \beta_i X_{it} + \mu \quad (2)$$

In both equations, X is the set of exogenous variables that are included in some of the second-stage regressions. For equations (1) and (2), v and u , respectively denote the error terms. Instrumental variables are inflation, trade, GDP growth, rule of law and regulation quality.

3.2.2 Choice of endogenous explaining variables for control at the second-stage of the TSLS

The quality of control covariates at the second-stage of the TSLS method is very imperative. Such covariates for control must be justified by an underlying theory in which they are endogenous (explainable) to (by) the instruments. In this study we adopt the “lending rate” and the “interest rate spread” as our endogenous explaining variables of control because they are directly linked to financial intermediary activity (theoretical perspective). Empirical justification for these choices is outlined in the last two columns of Table 1.

4. Cross-country regressions

This section presents the results from cross-country regressions to assess the importance of the instruments in explaining cross-country variance in financial development, the ability of the instruments to explain cross-country differences in the endogenous explaining variables of control and the ability of the exogenous components of financial channels to account for cross-country differences in human development.

4.1 First-Stage regressions

In Table 1, we regress our financial drivers on instruments conditional on other covariates and also test for their joint significance. The significance of all the Fisher-test results suggests that distinguishing countries by inflation, trade, GDP growth, regulation quality and rule of law helps explain cross-country difference in financial development. In other words, the instruments are strong. The last two columns of Table 1 fully justify our choices of “lending-

rate” and “interest rate spread” as endogenous explaining variables of control. This empirical validity is supported by the theoretical justification outlined in Section 3.2.2 and suggests the exogenous components of the control variables could be used as financial channels at the second-stage of our TSLS methodology. Findings in Table 1 are in line with recent empirical literature (Agbor, 2011; Asongu, 2011abcd). The presence of two financial channels for each financial driver ensures the robustness of our results.

Table 1: Financial dynamics and instruments

| | Financial Intermediary Dynamics | | | | | | | Endogenous Explaining Control Variables | | |
|-------------------|---------------------------------|-----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|---|-----------------------------|------------------------------|
| | Financial Depth | | Financial Efficiency | | Financial Activity | | Fin. Size | Lending | Spread | |
| | M2 | Fdgd | BcBd | FcFd | Pcrb | Pcrbof | Dbacba | | | |
| | Model 1 | Model 1* | Model 2 | Model 2* | Model 3 | Model 3* | Model 4* | Model 5 | Model 5* | |
| Constant | 0.264*** (5.428) | 0.154*** (2.506) | 0.637*** (11.15) | 0.784*** (7.019) | 0.173*** (4.476) | 0.327*** (5.839) | 0.579*** (16.43) | 11.66*** (4.645) | 12.43*** (8.001) | |
| Inflation | -0.001* (-1.855) | -0.001 (-1.486) | -5.730 (-0.878) | -0.004* (-1.785) | -0.001*** (-2.625) | -0.002** (-2.160) | -0.004*** (-5.177) | 0.494*** (7.774) | 0.129*** (3.088) | |
| Trade | 0.000 (1.204) | 0.0007*** (2.730) | -0.001*** (-3.88) | -0.002*** (-4.823) | -0.0003 (-1.561) | -0.001*** (-4.468) | 0.0003 (1.222) | 0.012 (1.092) | 0.011 (1.501) | |
| Instruments | GDPg | 0.000 (0.209) | 0.002 (1.055) | -0.004 (-1.237) | -0.010* (-1.689) | 0.0003 (0.170) | -0.0002 (-0.092) | 0.0006 (0.227) | -0.071 (-0.594) | -0.122 (-1.566) |
| | Reg. Qua | --- | 0.431*** (6.478) | 0.389*** (4.470) | --- | 0.546*** (11.68) | --- | 6.966** (2.406) | --- | |
| | Rule of L | 0.614*** (11.43) | --- | --- | 0.273** (2.105) | --- | 0.526*** (8.189) | 0.335*** (6.281) | --- | -1.434 (-0.847) |
| | Gov. Exp | --- | 0.006*** (2.840) | --- | 0.009** (2.120) | --- | --- | 0.004** (2.377) | -0.35*** (-3.816) | -0.321*** (-4.648) |
| Control Variables | Popg | -0.06*** (-5.597) | -0.077*** (-6.134) | --- | --- | -0.059*** (-6.713) | -0.078*** (-5.577) | --- | 2.651*** (4.995) | 1.020*** (2.930) |
| | French | --- | --- | 0.196*** (6.158) | 0.128** (2.246) | --- | --- | --- | --- | |
| | English | --- | --- | --- | --- | 0.050* (1.847) | --- | --- | --- | |
| | Fisher test | 59.054*** | 35.106*** | 18.564*** | 7.487*** | 54.35*** | 28.518*** | 22.269*** | 22.41*** | 12.10*** |
| | Adjusted R ² | 0.480 | 0.403 | 0.208 | 0.114 | 0.458 | 0.344 | 0.257 | 0.364 | 0.237 |
| | Observations | 315 | 303 | 334 | 302 | 316 | 315 | 307 | 225 | 215 |

M2: Monetary Base. Fdgd: Financial system deposits. BcBd: Bank credit on Bank deposits. FcFd: Financial system credit on Financial system deposits. Pcrb: Private domestic credit by deposit banks. Pcrbof: Private domestic credit by financial institutions. Dbacba: Deposit bank assets on central bank assets plus deposit bank assets. Popg: Population growth. Gov.Exp: Government Expenditure. GDPg: GDP growth. *, **, ***: significance levels of 10%, 5% and 1% respectively. Student t-statistics are presented in brackets. English: English legal origin. French: French legal origin. Lending: Lending interest rate. Spread: Banking Interest rate spread.

4. 2 Second-Stage regressions

Table 2 addresses the issues of: (1) whether the exogenous components of financial channels explain human development and (2) whether the instruments explain human development through some other mechanisms than the financial channels. To make these assessments we use the TSLS methodology. So at this stage we add equation 2 to the estimations. A first glance the significance of the Hausman test for endogeneity in all eight regressions lends support for our choice of the TSLS estimation method. Rejection of the null hypothesis of the test implies OLS estimates are not consistent because explaining variables are correlated with the disturbance term.

The first issue is addressed by the significance of financial channel estimates in the regressions. These attest to the fact that the exogenous components of the financial intermediary drivers account for cross-country differences in human development. While the importance of financial channels in activity, size and depth (in decreasing order) is significant for human development, financial allocation efficiency significantly undermines human development. The detriment of intermediary allocation efficiency to welfare is further justified by the negative effects of lending-rates and interest-rate-spreads. Thus from common-sense and some extend banking theory, one could infer that in the process of financial intermediation, the more a bank increases its lending rate with the prime objective of increasing its interest rate spread, depositors who contribute a great chunk of mobilized funds are not favored: human development speaking. Thus when banks increase the proportion of credit in relation to deposits, customers are less privileged; either because the liquidity requirement ratio decreases or because the margin between lending and deposit rates increases.

The second issue is addressed by the OIR test. The null hypothesis of the test is that the instruments are not correlated with the error term in the equation of interest (equation 2). Thus a rejection of the test is a rejection of the view that the instruments explain human development only through the financial channels. When endogenous variables of control (lending rate and interest rate spread) are controlled for, the OIR test becomes a general specification test of the validity of the instruments. Thus failure to reject the null hypothesis of the OIR test in all 8 regressions implies the instruments are not correlated with the error term in the equation of interest. To put this in plainer terms, it suggests that when other potential exogenous financial determinants of human development are controlled for, the instruments do not explain human development through other mechanisms than financial channels (drivers).

Table 2: Inequality adjusted human development regressions

| | | Inequality adjusted Human Development Index | | | | | | | |
|-------------------------|---------|---|-----------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|
| | | Model 6 | Model 6* | Model 7 | Model 7* | Model 8 | Model 8* | Model 9 | Model 9* |
| Constant | | 0.312** (2.566) | 0.375*** (2.949) | 0.406*** (3.419) | 0.464*** (3.608) | 0.674*** (4.988) | 0.707*** (5.075) | 0.742*** (4.512) | 0.657*** (4.283) |
| Financial Depth | M2 | 0.165** (2.228) | --- | --- | --- | --- | --- | 0.296*** (3.688) | --- |
| | Fdgdg | --- | 0.225*** (3.000) | --- | --- | --- | --- | --- | 0.348*** (4.389) |
| Financial Efficiency | BcBd | -0.173* (-1.920) | --- | -0.193** (-2.401) | --- | -0.097 (-1.067) | --- | --- | -0.044 (-0.418) |
| | FcFd | --- | -0.154* (-1.827) | --- | -0.206*** (-2.635) | --- | -0.125 (-1.213) | -0.132 (-1.069) | --- |
| Financial Activity | Pcrb | --- | --- | 0.317** (2.496) | --- | 0.495*** (4.955) | --- | --- | --- |
| | Pcrbf | --- | --- | --- | 0.350*** (3.193) | --- | 0.478*** (4.683) | --- | --- |
| Financial Size | Dbacba | 0.406*** (3.834) | 0.307*** (2.790) | 0.315** (2.560) | 0.247** (2.095) | --- | --- | --- | --- |
| Control Variables | Lending | -0.003* (-1.956) | -0.003** (-2.362) | -0.004** (-2.507) | -0.004*** (-2.777) | --- | --- | --- | --- |
| | Spread | --- | --- | --- | --- | -0.018** (-2.294) | -0.019** (-2.438) | -0.023*** (-2.606) | -0.021** (-2.459) |
| Hausman test | | 34.966*** | 25.213*** | 21.307*** | 17.377*** | 22.000*** | 21.454*** | 25.433*** | 22.484*** |
| OIR(Sargan) test | | 1.157 | 1.674 | 1.120 | 1.718 | 3.351 | 3.102 | 4.261 | 4.152 |
| P-values | | [0.282] | [0.195] | [0.289] | [0.189] | [0.187] | [0.211] | [0.118] | [0.125] |
| Adjusted R ² | | 0.482 | 0.547 | 0.524 | 0.570 | 0.491 | 0.486 | 0.445 | 0.475 |
| F-stats | | 28.069*** | 35.321*** | 33.830*** | 39.485*** | 28.846*** | 27.308*** | 18.766*** | 23.741*** |
| Observations | | 168 | 168 | 168 | 168 | 162 | 162 | 162 | 162 |

M2: Monetary Base. Fdgdg: Financial system deposits. BcBd: Bank credit on Bank deposits. FcFd: Financial system credit on Financial system deposits. Pcrb: Private domestic credit by deposit banks. Pcrbf: Private domestic credit by financial institutions. Dbacba: Deposit bank assets on central bank assets plus deposit bank assets. Popg: Population growth. Gov.Exp: Government Expenditure. GDPg: GDP growth. *, **, ***: significance levels of 10%, 5% and 1% respectively. Student t-statistics are presented in brackets. () : z-statistics. Chi-square statistics for Hausman test. LM statistics for Sargan test. [] : p-values.

As in Table 2, Table 3 looks at two main issues: (1) if the exogenous components of financial channels explain GDP per capita growth and (2) if the instruments explain GDP per capita growth through some other mechanisms than the financial channels. To make these assessments we use the TSLS methodology as outlined above. Rejection of the null hypothesis in all eight regressions provides justification for the TSLS estimation method over an OLS approach.

Table 3: GDP per capita growth regressions

| | | GDP per capita growth | | | | | | | |
|-------------------------|---------|------------------------------|------------------------------|------------------------------|-----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| | | Model 10 | Model 10* | Model 11 | Model 11* | Model 12 | Model 12* | Model 13 | Model 13* |
| Constant | | -0.084 (-0.011) | -17.760** (-2.425) | -27.802** (-2.496) | -38.22** (-2.573) | -35.97*** (-3.492) | -41.71*** (-3.269) | -18.47*** (-4.205) | -20.39*** (-4.189) |
| Financial Depth | M2 | -22.23*** (-3.338) | --- | --- | --- | --- | --- | -4.28 (-1.537) | --- |
| | Fdgdg | --- | -21.02*** (-2.955) | --- | --- | --- | --- | --- | -5.941* (-1.743) |
| Financial Efficiency | BcBd | -25.20*** (-3.462) | --- | -6.776 (-1.290) | --- | --- | --- | --- | --- |
| | FcFd | --- | -15.04*** (-3.317) | --- | -0.559 (-0.112) | --- | --- | --- | --- |
| Financial Activity | Pcrb | --- | --- | -36.11*** (-2.942) | --- | -29.663** (-2.517) | --- | --- | --- |
| | Pcrbof | --- | --- | --- | -30.719** (-2.427) | --- | -26.625** (-2.551) | --- | --- |
| Financial Size | Dbacba | 36.076*** (3.667) | 48.118*** (3.718) | 52.583*** (3.413) | 60.066*** (3.059) | 52.504*** (3.479) | 60.118*** (3.300) | 23.921*** (4.448) | 26.726*** (4.247) |
| Control Variables | Lending | 0.0008 (0.014) | 0.048 (0.899) | 0.078 (1.475) | 0.106* (1.759) | --- | --- | --- | --- |
| | Spread | --- | --- | --- | --- | 0.334** (2.156) | 0.349* (1.923) | 0.366*** (3.850) | 0.368*** (3.733) |
| Hausman test | | 166.97*** | 183.00*** | 136.52*** | 150.27*** | 118.07*** | 158.01*** | 58.29*** | 61.67*** |
| OIR(Sargan) test | | 22.384*** | 18.866*** | 22.820*** | 16.901*** | 24.901*** | 15.838*** | 82.621*** | 74.737*** |
| P-values | | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| Adjusted R ² | | 0.015 | 0.018 | 0.013 | 0.011 | 0.015 | 0.015 | 0.024 | 0.022 |
| F-stats | | 4.667*** | 4.308*** | 3.927*** | 3.225** | 4.991*** | 4.232*** | 8.595*** | 8.160*** |
| Observations | | 234 | 234 | 234 | 234 | 225 | 225 | 225 | 225 |

M2: Monetary Base. Fdgdg: Financial system deposits. BcBd: Bank credit on Bank deposits. FcFd: Financial system credit on Financial system deposits. Pcrb: Private domestic credit by deposit banks. Pcrbof: Private domestic credit by financial institutions. Dbacba: Deposit bank assets on central bank assets plus deposit bank assets. Popg: Population growth. Gov.Exp: Government Expenditure. GDPg: GDP growth. *, **, ***: significance levels of 10%, 5% and 1% respectively. Student t-statistics are presented in brackets. (): z-statistics. Chi-square statistics for Hausman test. LM statistics for Sargan test. []: p-values.

The first issue is addressed by the significance of the estimates of various financial channels. But for financial intermediary size, financial channels of depth, efficiency and activity all have adverse effects on GDP per capita growth. For the second issue, rejection of the null

hypothesis of the OIR test implies, the instruments explain GDP per capita through some other mechanisms beyond financial channels. While these results could confirm the positive (negative) effects of financial size (allocation efficiency) on human development (obtained from Table 2), results of financial depth and financial activity remain unclear with respect to GDP per capita growth. This is because; the instruments are correlated with the error term in the equation of interest, and thus explain GDP per capita growth beyond the financial channel mechanisms.

5. Conclusion

Hitherto financial drivers of human development have been unexplored by the UNDP. Narrowing down from a plethora of financial intermediary development indicators, this paper has assessed financial determinants of human development from financial dynamics of depth, efficiency, size and activity. The study is based on data from 38 African countries. Findings mainly indicate a positive (negative) relationship between financial size (allocation efficiency) and human development. While financial activity and depth are instrumental for human development, they are not for GDP per capita growth. However their effects on GDP per capita growth should be treated with caution because the instruments at the second-stage of the regressions explain GDP per capita growth beyond the financial drivers of depth and activity. While the importance of financial channels in activity, size and depth (in decreasing order) is significant for inequality adjusted human development, financial allocation efficiency significantly undermines it. These results could be extended to the findings of Asongu (2011a) with the inference that contrary to English common-law countries, French civil-law origin countries will benefit less from human development because they overwhelmingly dominate in financial allocation efficiency. As a policy implication results do not support financial allocation efficiency as a driver of human development.

Appendices

Appendix 1: Countries selected for the study

| Legal origin | Countries | Num. |
|---------------------------|--|------|
| English | Botswana, Egypt, Gambia, Ghana, Kenya, Lesotho, Malawi, Mauritius, Nigeria, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Zambia. | 16 |
| French | Algeria, Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo Republic, Côte d'Ivoire, Gabon, Madagascar, Mali, Morocco, Niger, Rwanda, Senegal, Togo, Tunisia. | 18 |
| Portuguese | Angola, Cape Verde, Guinea-Bissau, Mozambique. | 4 |
| French sub-Saharan Africa | Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo Republic, Côte d'Ivoire, Gabon, Madagascar, Mali, Niger, Rwanda, Senegal, Togo. | 15 |
| North Africa | Algeria, Egypt, Morocco, Tunisia. | 4 |

Num: Number of countries.

Appendix 2: Correlation analyses for financial intermediary variable selection

| Correlation Matrix | | | | | | | | | |
|--------------------|---------|---------|---------|---------|----------|------------|---------|---------|---------|
| | Dbacba | Llgdp | Cbagdp | Dbagdp | Pcrdbgdp | Pcrdbofgdp | Bdgdg | Fdgdg | Bcbd |
| Dbacba | 1.0000 | 0.2691 | -0.5197 | 0.4755 | 0.5157 | 0.4642 | 0.3809 | 0.3810 | 0.2716 |
| Llgdp | 0.2691 | 1.0000 | 0.0992 | 0.8226 | 0.6515 | 0.5513 | 0.9435 | 0.9522 | -0.1340 |
| Cbagdp | -0.5197 | 0.0992 | 1.0000 | -0.0248 | -0.1025 | -0.1122 | 0.0418 | 0.0362 | -0.1647 |
| Dbagdp | 0.4755 | 0.8226 | -0.0248 | 1.0000 | 0.9302 | 0.8392 | 0.8940 | 0.8792 | 0.2541 |
| Pcrdbgdp | 0.5157 | 0.6515 | -0.1025 | 0.9302 | 1.0000 | 0.9122 | 0.7346 | 0.7168 | 0.4592 |
| Pcrdbofgdp | 0.4642 | 0.5513 | -0.1122 | 0.8392 | 0.9122 | 1.0000 | 0.6604 | 0.6582 | 0.3506 |
| Bdgdg | 0.3809 | 0.9435 | 0.0418 | 0.8940 | 0.7346 | 0.6604 | 1.0000 | 0.9915 | -0.1297 |
| Fdgdg | 0.3810 | 0.9522 | 0.0362 | 0.8792 | 0.7168 | 0.6582 | 0.9915 | 1.0000 | -0.1459 |
| Bcbd | 0.2716 | -0.1340 | -0.1647 | 0.2541 | 0.4592 | 0.3506 | -0.1297 | -0.1459 | 1.0000 |

Dbacba: deposit bank assets on central bank assets plus deposit bank assets. Llgdp: monetary base. Cbagdp: Central bank assets on GDP. Dbagdp: Deposit bank assets on GDP. Pcrdbgdp: Private domestic credit on GDP. Pcrdbofgdp: Private domestic of deposit banks and other financial institutions on GDP. Bd: Bank deposits on GDP. Fdgdg: Financial system deposits on GDP. Bcbd: Bank credit on bank deposits.

Appendix 3: Correlation analysis for model specification

| Financial Intermediary Determinants | | | | | | | Human Development | | Second-stage Control Vbls | | First-Stage Control Variables | | | | | | | | | |
|-------------------------------------|-------|----------------|-------|---------------|--------|--------|-------------------|-------|---------------------------|-------|-------------------------------|--------|--------|-------|-------|-------|--------------|-------|-------|--------|
| Fin. Depth | | Fin.Efficiency | | Fin. Activity | | F.Size | IHDI | GDPpc | Lend | Sprd | Macro economic | | | | Law | | Legal origin | | | |
| M2 | Fdgdg | BcBd | FcFd | Pcrb | Pcrbof | Dbacba | | | | | Infl. | Trade | GDPg | G.E | Popg | R.Q | R.L | Eng. | Frch. | |
| 1.000 | 0.974 | -0.07 | -0.00 | 0.748 | 0.598 | 0.394 | 0.716 | 0.057 | -0.28 | -0.34 | -0.06 | 0.304 | -0.052 | 0.33 | -0.46 | 0.40 | 0.63 | 0.21 | -0.23 | M2 |
| | 1.000 | -0.04 | 0.069 | 0.805 | 0.685 | 0.460 | 0.745 | 0.101 | -0.27 | -0.36 | -0.05 | 0.327 | -0.015 | 0.37 | -0.49 | 0.48 | 0.68 | 0.29 | -0.28 | Fdgdg |
| | | 1.000 | 0.870 | 0.403 | 0.421 | 0.259 | -0.20 | -0.08 | -0.25 | -0.20 | -0.11 | -0.230 | -0.091 | -0.07 | 0.01 | 0.19 | -0.00 | -0.26 | 0.41 | BcBd |
| | | | 1.000 | 0.530 | 0.679 | 0.282 | -0.21 | -0.07 | -0.20 | -0.21 | -0.08 | -0.235 | -0.090 | 0.04 | -0.04 | 0.30 | 0.10 | -0.11 | 0.25 | FcFd |
| | | | | 1.000 | 0.930 | 0.515 | 0.644 | 0.077 | -0.26 | -0.34 | -0.06 | 0.106 | -0.023 | 0.24 | -0.41 | 0.61 | 0.62 | 0.15 | -0.11 | Pcrb |
| | | | | | 1.000 | 0.454 | 0.635 | 0.055 | -0.21 | -0.30 | -0.05 | 0.050 | -0.031 | 0.26 | -0.35 | 0.57 | 0.53 | 0.19 | -0.14 | Pcrbof |
| | | | | | | 1.000 | 0.461 | 0.133 | -0.29 | -0.33 | -0.09 | 0.210 | 0.063 | 0.27 | -0.29 | 0.48 | 0.45 | 0.00 | 0.01 | Dbacba |
| | | | | | | | 1.000 | 0.136 | -0.26 | -0.44 | -0.08 | 0.427 | -0.032 | 0.17 | -0.57 | 0.48 | 0.51 | 0.31 | -0.23 | IHDI |
| | | | | | | | | 1.000 | 0.04 | 0.00 | 0.07 | 0.082 | 0.971 | 0.06 | -0.01 | 0.08 | 0.08 | 0.05 | -0.14 | GDPpc |
| | | | | | | | | | 1.00 | 0.86 | 0.68 | 0.111 | 0.100 | -0.29 | 0.30 | -0.16 | -0.21 | -0.04 | -0.16 | Lend |
| | | | | | | | | | | 1.00 | 0.42 | 0.087 | 0.069 | -0.40 | 0.25 | -0.28 | -0.30 | -0.19 | -0.00 | Sprd |
| | | | | | | | | | | | 1.00 | 0.103 | 0.078 | -0.14 | 0.03 | -0.09 | -0.09 | -0.03 | -0.07 | Infl. |
| | | | | | | | | | | | | 1.000 | -0.01 | 0.37 | -0.40 | 0.04 | 0.23 | 0.22 | -0.29 | Trade |
| | | | | | | | | | | | | | 1.000 | -0.02 | 0.22 | 0.02 | 0.00 | 0.01 | -0.09 | GDPg |
| | | | | | | | | | | | | | | 1.00 | -0.33 | 0.19 | -0.27 | 0.30 | -0.27 | GE |
| | | | | | | | | | | | | | | | 1.00 | -0.27 | -0.34 | -0.20 | 0.22 | Popg |
| | | | | | | | | | | | | | | | | 1.00 | 0.79 | 0.23 | -0.14 | R.Q |
| | | | | | | | | | | | | | | | | | 1.00 | 0.30 | -0.23 | RL |
| | | | | | | | | | | | | | | | | | | 1.00 | -0.80 | Eng |
| | | | | | | | | | | | | | | | | | | | 1.00 | Frch |

M2: Monetary Base. Fdgdg: Financial system deposits. BcBd: Bank credit on Bank deposits. FcFd: Financial system credit on Financial system deposits. Pcrb: Private domestic credit by deposit banks. Pcrbof: Private domestic credit by financial institutions. Dbacba: Deposit bank assets on central bank assets plus deposit bank assets. R.Q: Regulation Quality. RL:Rule of Law. Infl: Inflation. Popg: Population growth. GE: Government Expenditure. GDPg: GDP growth. GDPpc: GDP per capita growth. Eng: English legal origin. Frch: French legal origin.IHDI: Inequality adjusted Human Development Index. Popg: Population growth. Vbls: Variables.

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