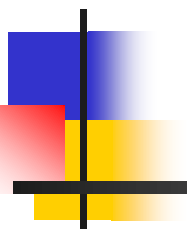


Resolving the African Financial Development Gap



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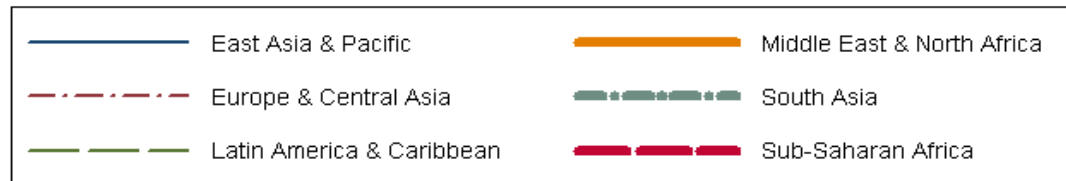
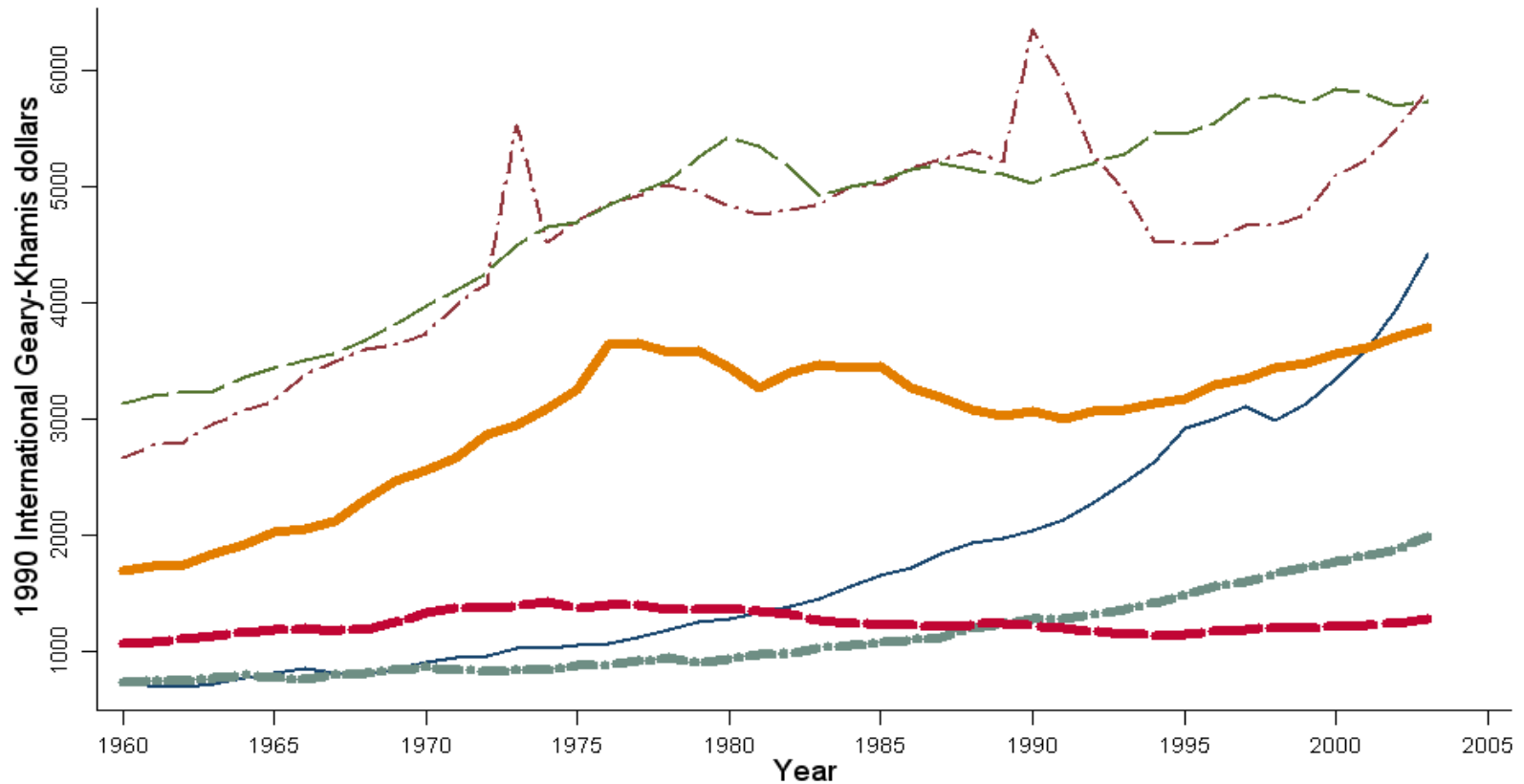
September 24, 2012



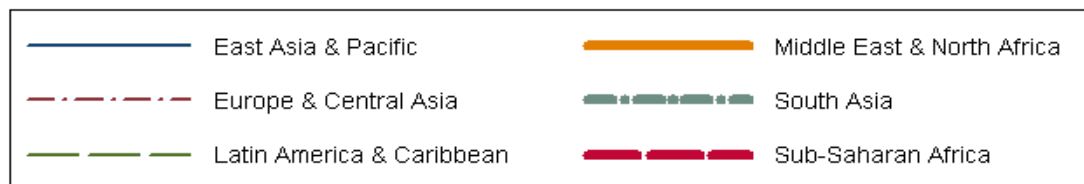
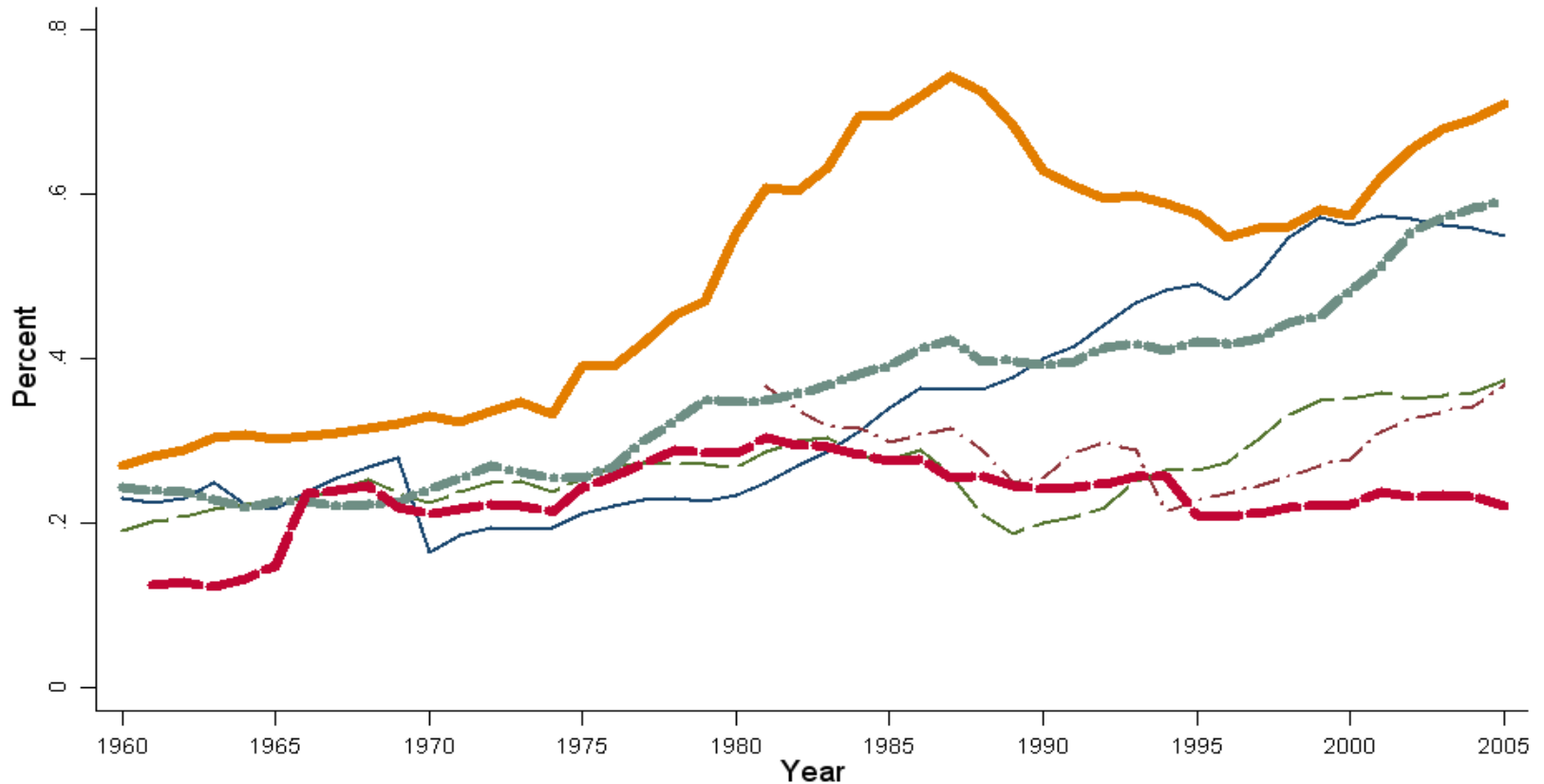
What do we know about Africa?

- Disappointing economic performance in Sub-Saharan Africa:
- What about financial sector development in this region?
 - There appears to be a significant gap between Sub-Saharan Africa (SSA) and other developing countries:
 - Banking sector: Liquid liabilities and private credit over GDP
 - Financial markets are in their infancy; dominated by one or two sectors
 - South Africa is an 'outlier'
 - Underdevelopment despite significant efforts in financial sector reforms over the past two decades:
 - Improvement but at a slower pace than other regions and developing countries.

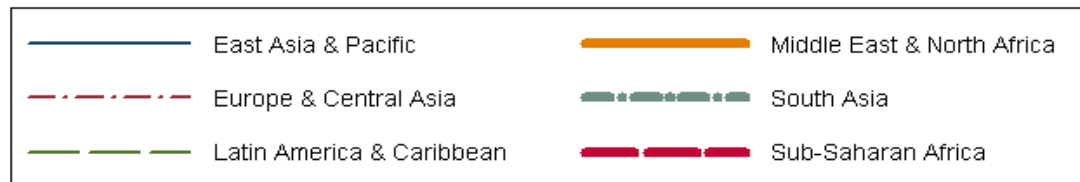
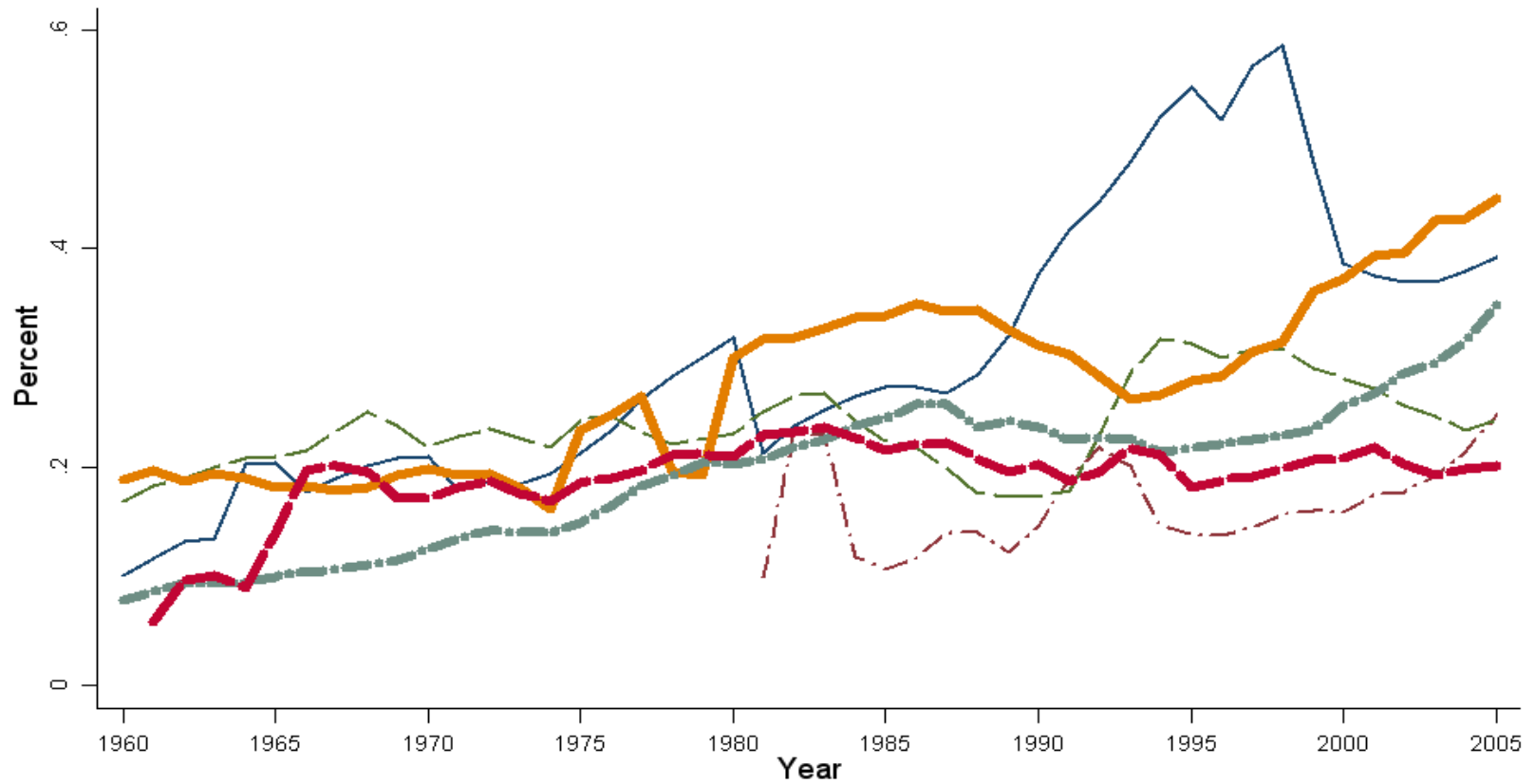
Per capita GDP growth: (1960-2005)



Liquid liabilities/GDP: (1960-2005)



Private credit/GDP: (1960-2005)





Research goals and main results

- Very little research on Africa's financial sectors:
 - Importance of developing financial sectors:
 - Extensive literature on finance and growth; alleviating poverty
- What we do and find in this paper:
 - Measuring the African financial development gap:
 - Obtain predicted levels of financial development for SSA countries, based on regression analyses of other low- and middle-income countries
 - For the majority of SSA countries, the actual levels of banking sector development are *below* predicted levels
 - Analyzing determinants of financial development:
 - Population density seems to matter more for Africa;
 - Natural resources 'curse': Similar in Africa and elsewhere;
 - Macroeconomic conditions and institutional environment: Not as important



Outline of the Rest of Talk

- Country-level data
- How to measure the financial development gap?
 - Predicted vs. actual levels of financial development
- Cross-country determinants of financial development:
 - Africa vs. other developing countries
- Firm-level evidence
 - Access to bank loans based on World Bank firm surveys
- Conclusion

Summary statistics (Table 1)

Variable	World (minus Africa)		Africa	
	Mean	Standard Deviation	Mean	Standard Deviation
Liquid liabilities / GDP	64.2%	47.4%	27.5%	17.7%
Private credit / GDP	57.7%	45.3%	17.6%	22.7%
Stock Market Capitalization / GDP	52.1%	60.0%	25.6%	43.8%
Stock Market Value Traded / GDP	34.1%	50.9%	6.5%	20.0%
Ln(Population)	2.44	1.59	2.24	1.33
Ln(Population density)	0.44	1.94	0.09	0.12
Natural resources	0.5	2.41	0.15	0.77
Offshore center	4.4%	20.7%	0.0%	0.0%
Ln(Per capita income)	2.25	1.04	0.38	0.94
Population * GDP per capita	0.48	1.35	0.03	0.07
Real GDP growth rate	4.1%	2.5%	4.8%	2.7%
Inflation rate	5.2%	5.2%	9.3%	15.0%
Current Account balance / GDP	0.2%	8.1%	-3.8%	6.7%
KKM index	0.33	0.9	-0.54	0.58
Bank concentration	0.65	0.19	0.81	0.14
Foreign ownership share	27.1%	25.9%	44.4%	24.4%
State ownership share	15.9%	19.7%	13.3%	16.6%
Manufacturing / GDP	16.8%	6.1%	11.0%	7.3%
Secondary/Primary school enrollment	0.81	0.24	0.33	0.18
Roads / Area	1.07	1.65	0.21	0.22
Railroads / Area	0.03	0.03	0	0
Urban population	63.6%	20.7%	36.2%	17.2%
Geographic branch penetration	29.76	80.07	7.97	22.49
Demographic branch penetration	16.51	17.28	2.86	3.64

Empirical model on financial development

$$\begin{aligned} FD_i = & \alpha + \beta_1 Population_i \\ & + \beta_2 Population Density_i \\ & + \beta_3 Natural Resources_i \\ & + \beta_4 Offshore Center_i \\ & + \beta_5 Per Capita Income_i \\ & + \beta_6 Population * GDP Per Capita_i \\ & + \beta_7 Real GDP Growth Rate_i \\ & + \beta_8 Inflation Rate_i \\ & + \beta_9 Current Account Balance/GDP_i \\ & + B_{10} KKM Index_i \\ & + \beta_{11} Bank Concentration \\ & + B_{12} Foreign Ownership Share_i \\ & + B_{13} State Ownership Share_i \\ & + B_{14} Manufacturing/GDP_i \\ & + B_{15} Secondary/Primary enrolment \\ & + \varepsilon_i \end{aligned}$$

Exogenous determinants, based on Beck *et al.* (2008)

Plausibly exogenous, Financial development affects these variables at a lag, Beck *et al.* (2008)

Macroeconomic variables

Index of institutional development

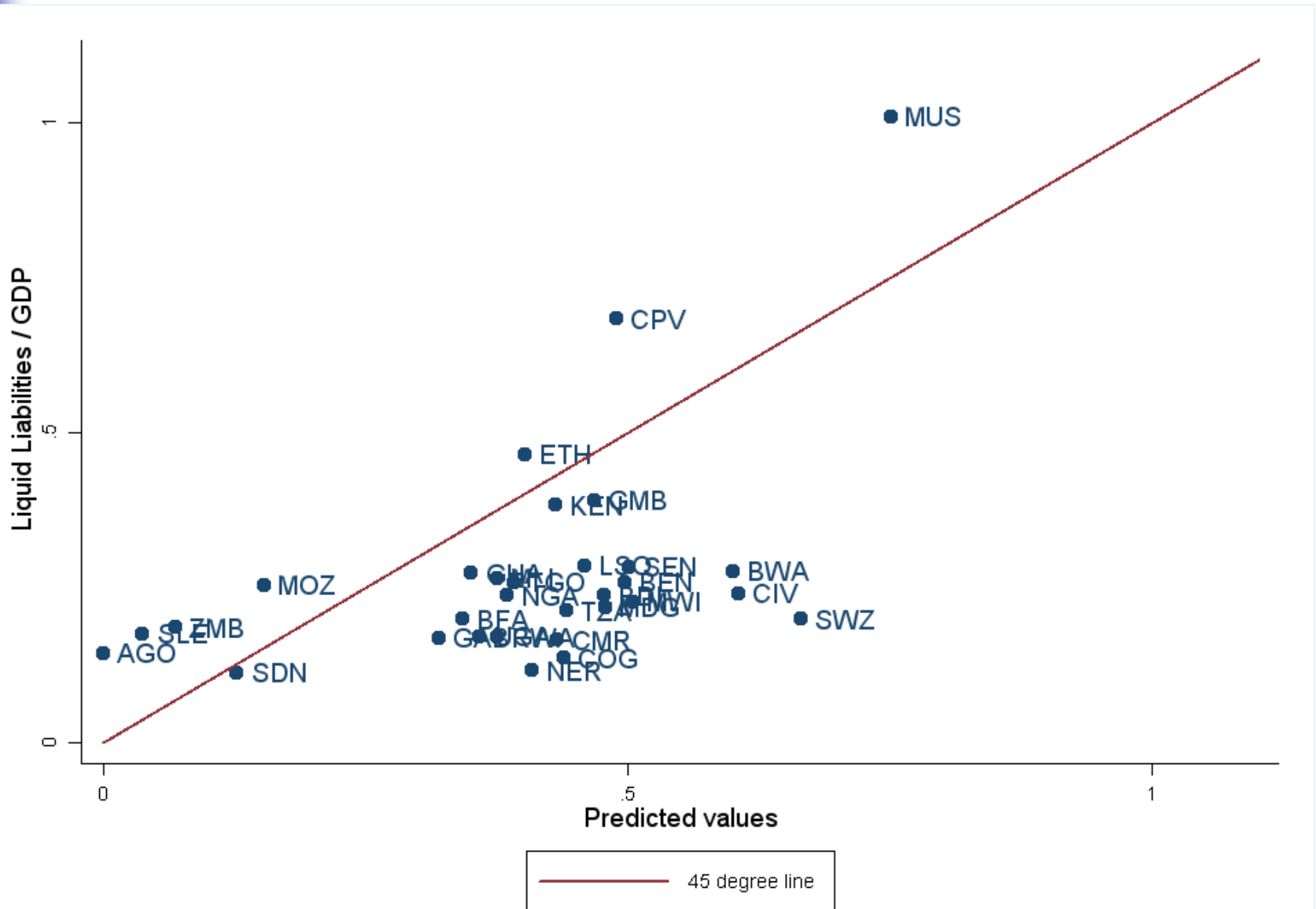
Banking sector structure and ownership variables

Other variables

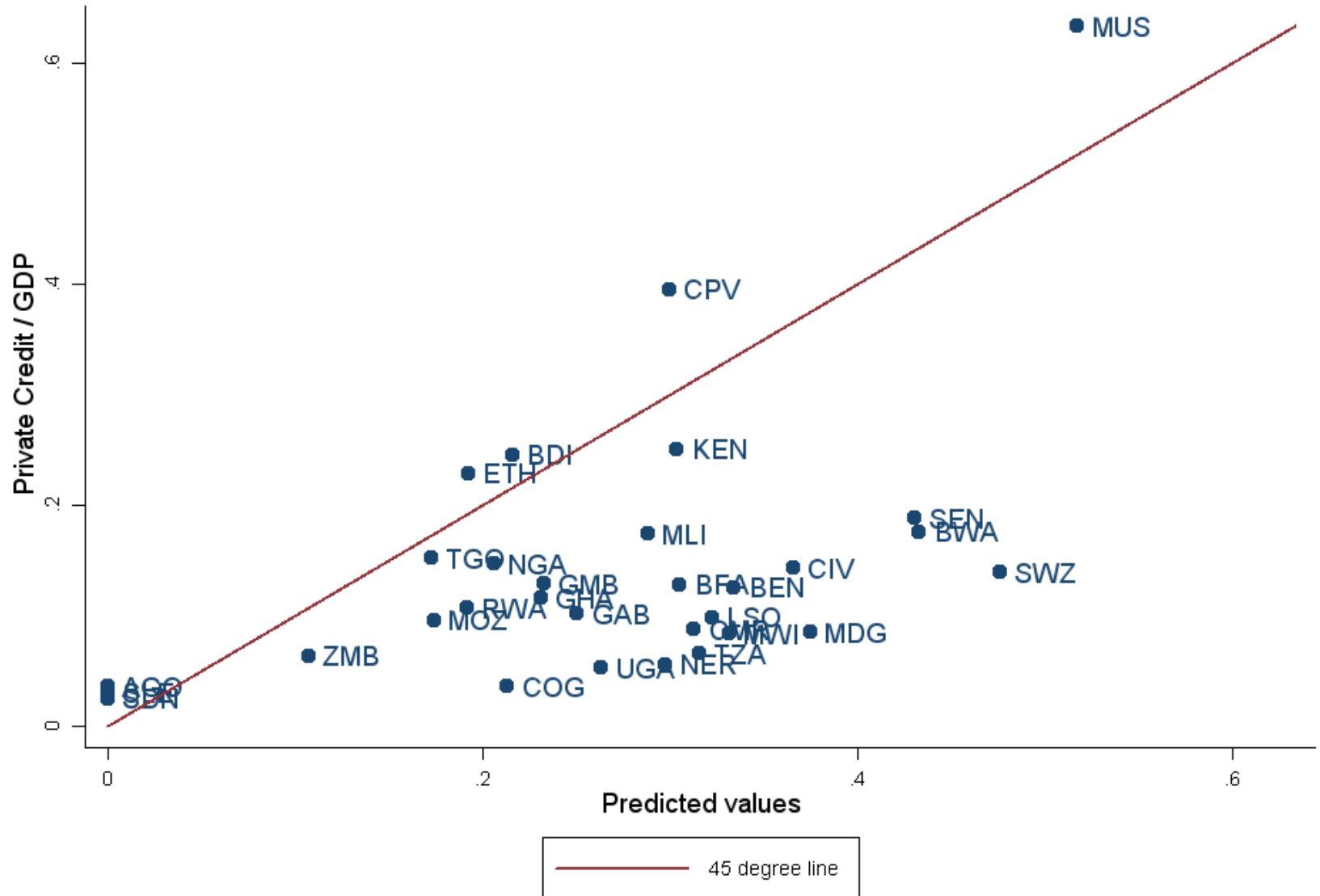
Table 3 Regressions for non-African countries

	Liquid liabilities / GDP				Private credit / GDP			
	All		Low + Middle income		All		Low + Middle income	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln(Population)	-0.017 (0.021)	-0.003 (0.028)	-0.001 (0.019)	-0.035 (0.030)	0.003 (0.018)	0.015 (0.021)	0.002 (0.017)	-0.027 (0.026)
Ln(Population Density)	0.074*** (0.023)	0.031 (0.027)	0.036 (0.022)	0.032 (0.022)	0.018 (0.019)	0.019 (0.020)	0.032* (0.019)	-0.020 (0.019)
Natural Resources	-0.038*** (0.014)	-0.069*** (0.019)	-0.034 (0.033)	-0.062* (0.036)	-0.022* (0.012)	0.0002 (0.014)	-0.010 (0.028)	-0.026 (0.031)
Offshore Center	0.247** (0.145)	0.155 (0.170)	0.369*** (0.112)	0.341*** (0.121)	0.191 (0.123)	0.159 (0.127)	0.374*** (0.096)	0.359*** (0.102)
Ln(Per Capita Income)	0.222*** (0.036)	0.061 (0.083)	0.056 (0.039)	-0.091 (0.065)	0.275*** (0.031)	-0.016 (0.062)	0.089** (0.034)	-0.063 (0.055)
Population * GDP Per Capita	0.004 (0.032)	-0.013 (0.033)	0.006 (0.100)	0.061 (0.101)	0.071** (0.027)	0.062** (0.024)	-0.031 (0.086)	0.015 (0.084)
Real GDP Growth Rate		-2.015 (1.514)		-2.619** (1.159)		-3.129*** (1.126)		-1.769** (0.974)
Inflation Rate		-1.219 (0.751)		-0.946* (0.505)		-1.092** (0.559)		-0.894** (0.424)
Current Account Balance / GDP		1.519*** (0.556)		1.565** (0.658)		0.392 (0.414)		1.236** (0.553)
KKM Index		0.239*** (0.093)		0.215*** (0.080)		0.362*** (0.069)		0.210*** (0.067)
Manufacturing / GDP		-1.313** (0.652)		0.436 (0.580)		-0.127 (0.485)		0.651 (0.487)
Secondary/Primary Enrollment		-0.335 (0.241)		-0.040 (0.179)		-0.130 (0.179)		-0.004 (0.150)
Constant	0.383*** (0.123)	1.188*** (0.223)	0.467*** (0.101)	0.990*** (0.167)	-0.041 (0.104)	0.782*** (0.166)	0.248*** (0.087)	0.640*** (0.141)
Adjusted R2	0.41	0.51	0.14	0.36	0.54	0.70	0.22	0.43
Observations/Countries	111	97	75	67	111	97	75	67

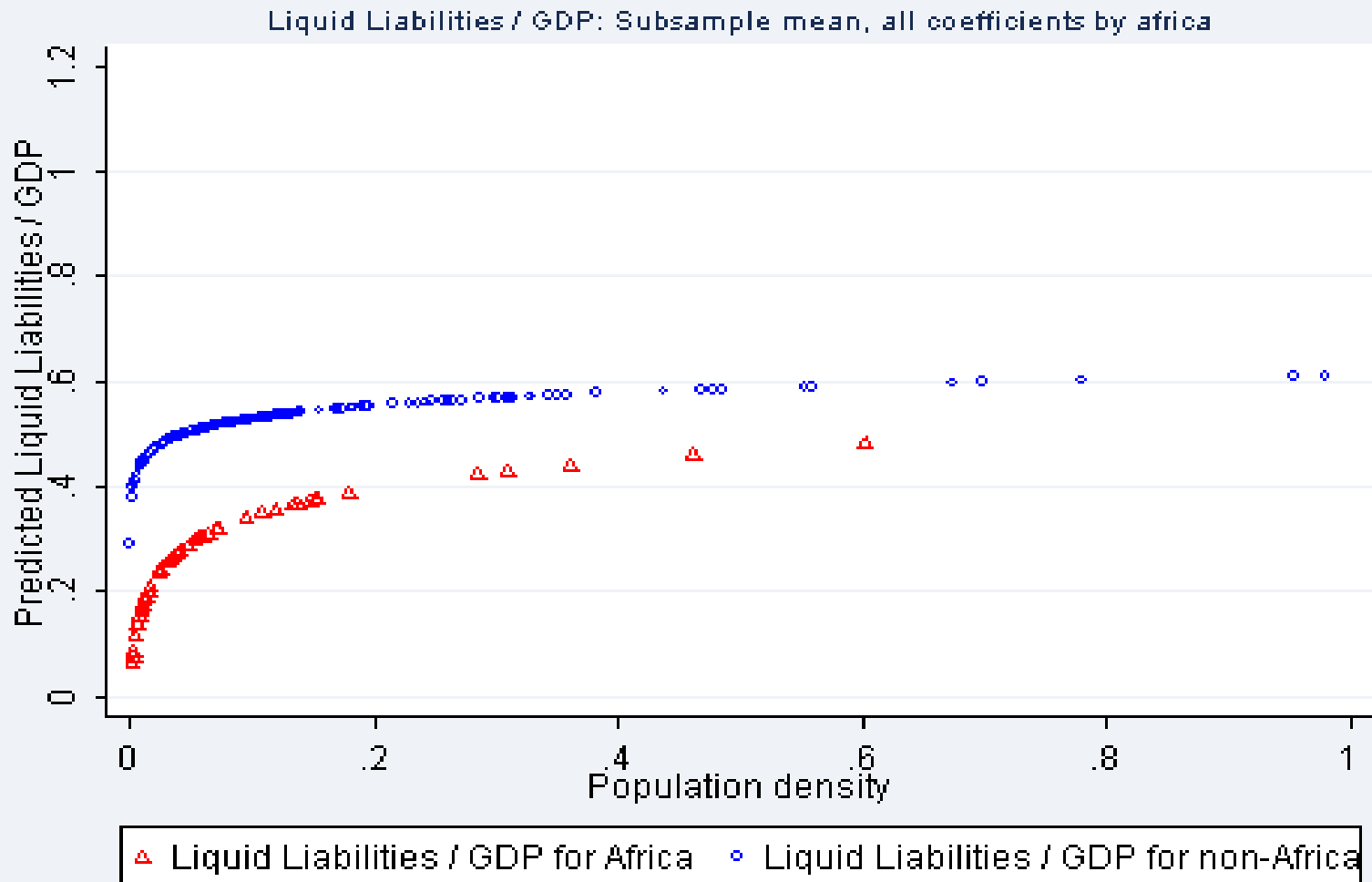
Liquid liabilities/GDP: Actual vs. predicted values (Fig. 1)



Private credit/GDP: Actual vs. predicted values (Fig. 2)



Relationship between Population Density and Liquid Liabilities/GDP (Fig. 3)



Relationship between Population Density and Private Credit/GDP (Fig. 4)

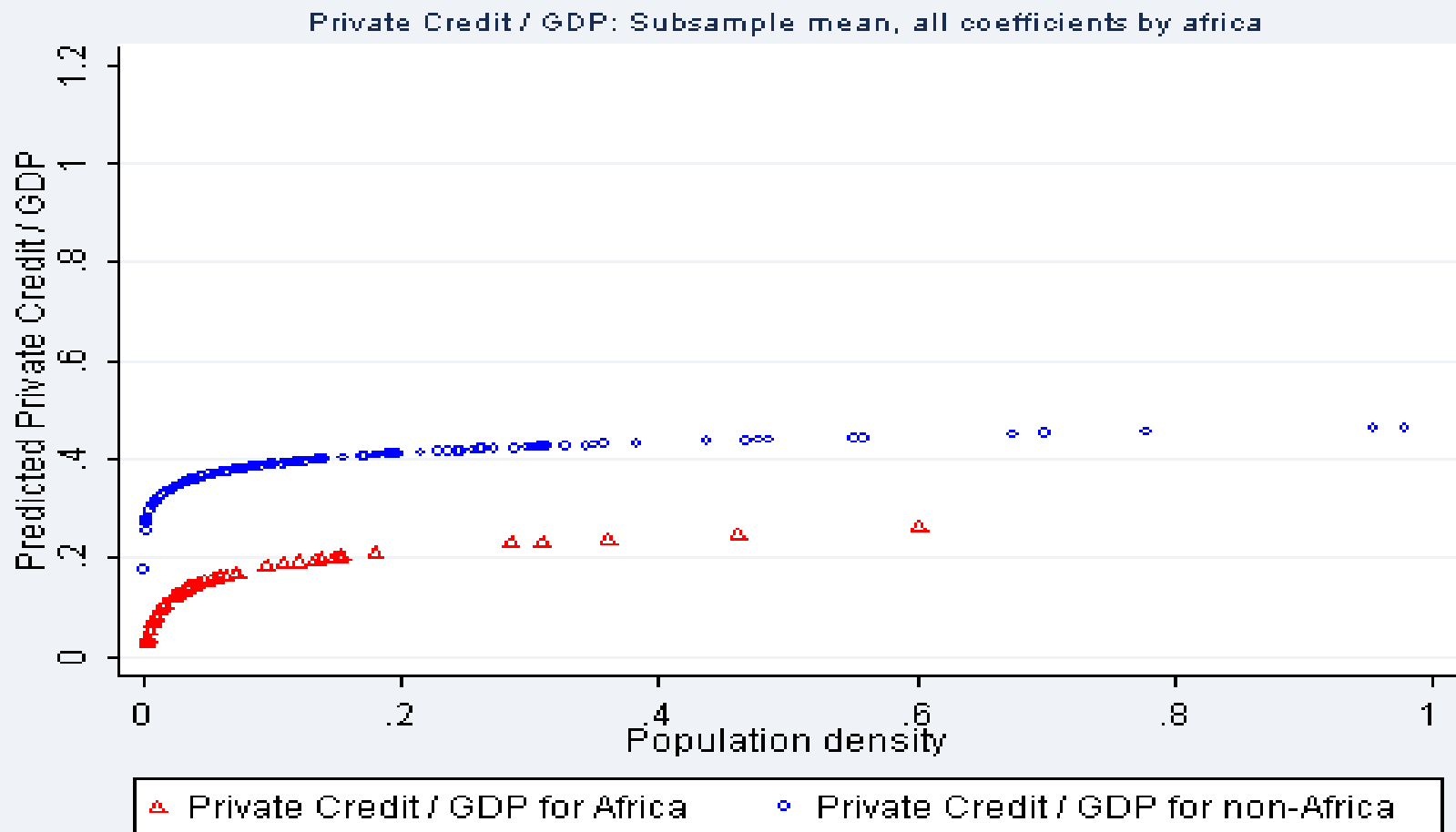
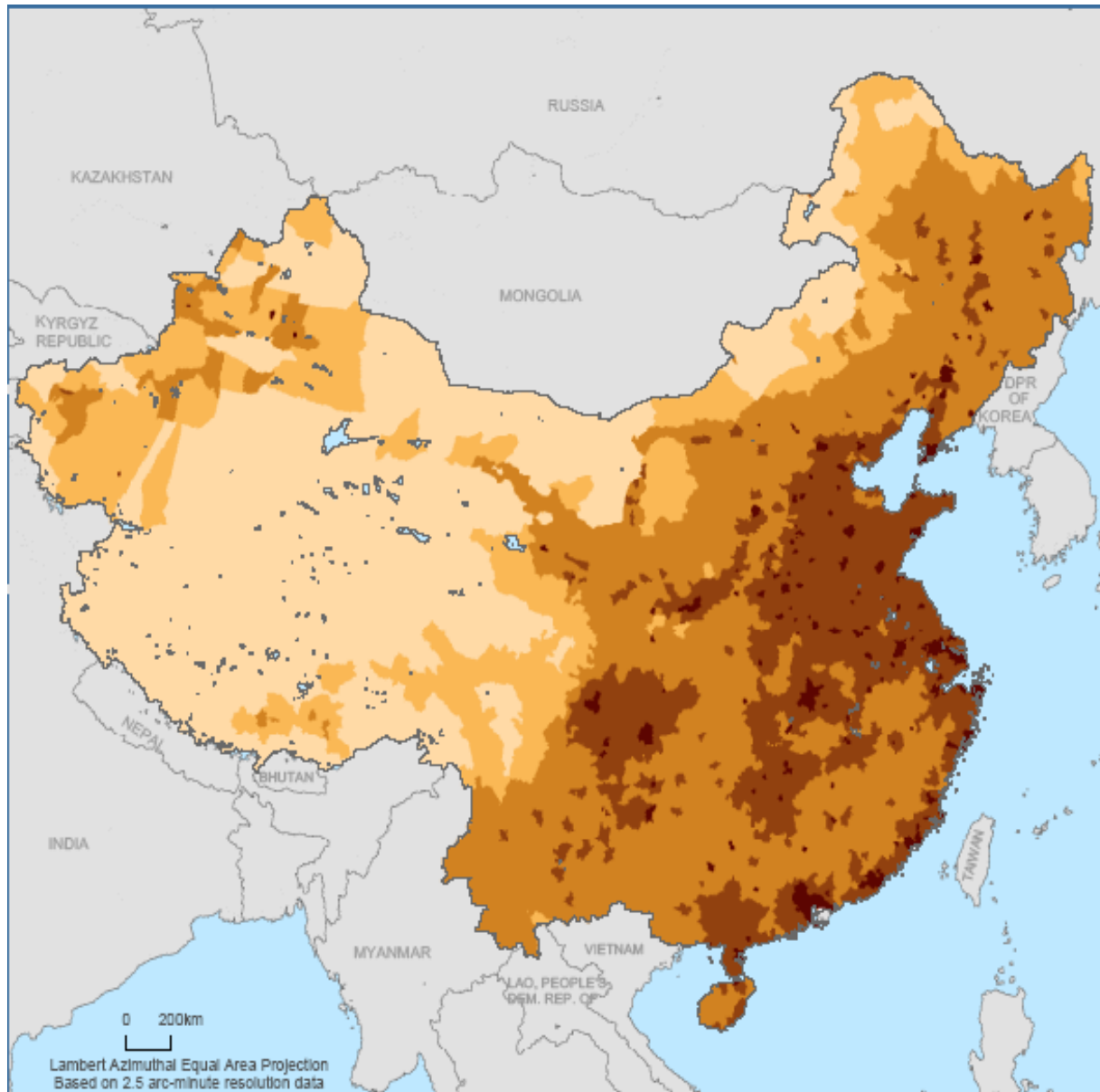


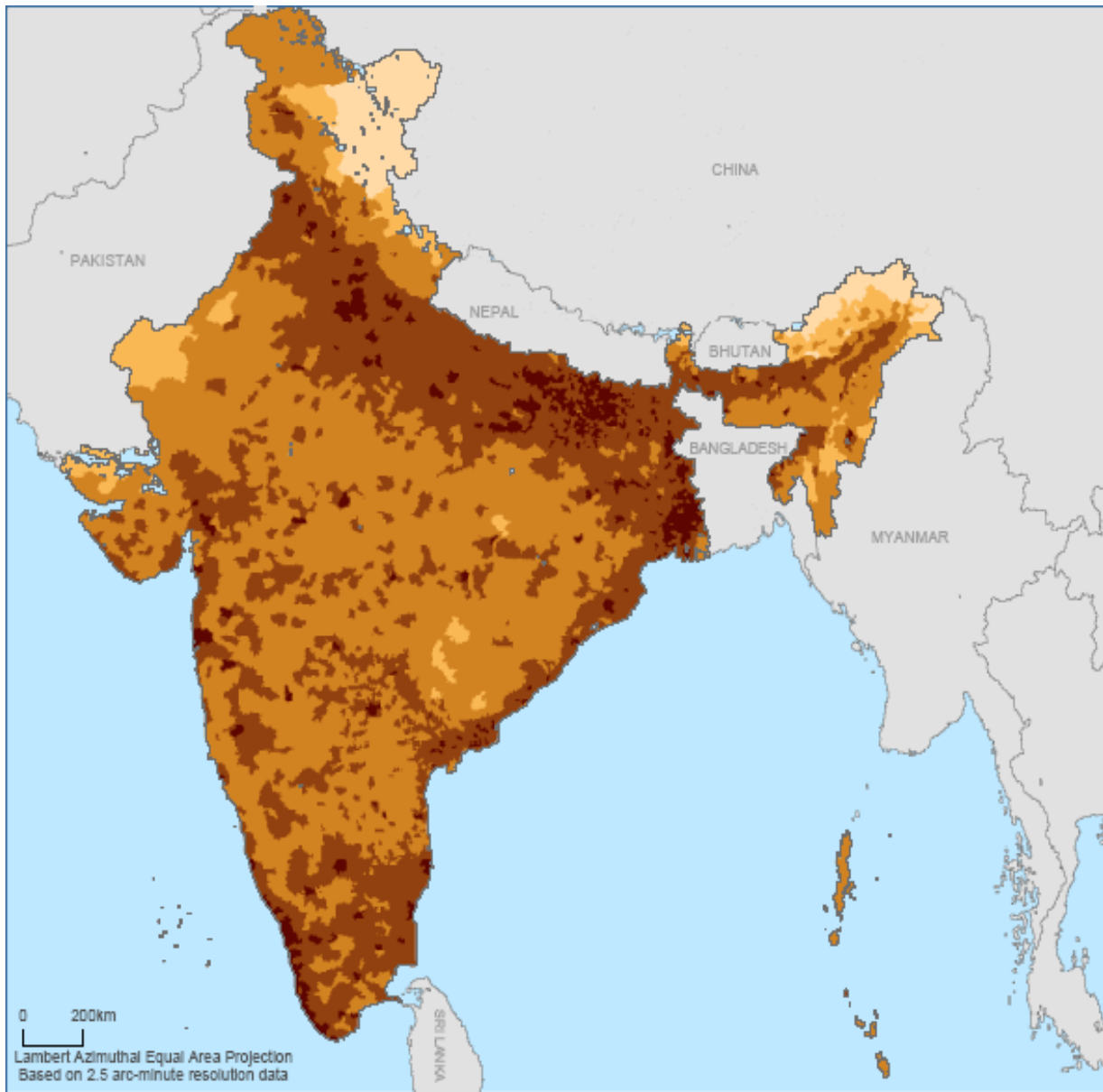
Table 4 Regressions for Sub-Saharan African countries

	Liquid liabilities / GDP				Private credit / GDP			
	All		Without South Africa		All		Without South Africa	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln(Population)	-0.035 (0.026)	-0.004 (0.026)	-0.029 (0.031)	-0.011 (0.030)	-0.058** (0.024)	-0.021 (0.023)	-0.007 (0.022)	0.013 (0.021)
Ln(Population Density)	0.074*** (0.019)	0.080*** (0.022)	0.075*** (0.020)	0.077*** (0.024)	0.0314* (0.018)	0.049** (0.020)	0.043*** (0.014)	0.061*** (0.016)
Natural Resources	-0.033 (0.036)	-0.013 (0.047)	-0.032 (0.037)	-0.010 (0.049)	-0.030 (0.033)	-0.001 (0.041)	-0.024 (0.027)	-0.015 (0.034)
Offshore Center	-	-	-	-	-	-	-	-
Ln(Per Capita Income)	0.038 (0.035)	0.022 (0.078)	0.043 (0.037)	0.018 (0.080)	0.009 (0.032)	0.054 (0.068)	0.048* (0.027)	0.073 (0.056)
Population * GDP Per Capita	0.441 (0.520)	-0.281 (0.508)	0.057 (1.12)	0.221 (1.197)	2.941*** (0.477)	2.396*** (0.442)	-0.141 (0.816)	-0.163 (0.834)
Real GDP Growth Rate		-0.447 (1.031)		-0.499 (1.057)		-0.607 (0.898)		-0.343 (0.736)
Inflation Rate		0.060 (0.192)		0.058 (0.196)		-0.076 (0.167)		-0.066 (0.136)
Current Account Balance / GDP		-0.082 (0.587)		-0.207 (0.656)		-0.879* (0.511)		-0.241 (0.457)
KKM Index		0.116* (0.062)		0.119* (0.063)		0.073 (0.054)		0.058 (0.044)
Manufacturing / GDP		-0.376 (0.455)		-0.341 (0.470)		-0.085 (0.396)		-0.265 (0.327)
Secondary/Primary Enrollment		0.372 (0.247)		0.379 (0.252)		0.179 (0.215)		0.144 (0.175)
Constant	0.548*** (0.078)	0.528*** (0.2613)	0.545*** (0.079)	0.518*** (0.3044)	0.297*** (0.071)	0.260* (0.130)	0.275*** (0.058)	0.309*** (0.243)
Adjusted R2	0.36	0.53	0.34	0.52	0.64	0.78	0.24	0.45
Observations/Countries	38	33	37	32	38	33	37	32

Population density: China (2000)



Population density: India (2000)



Population density: Africa (2000)

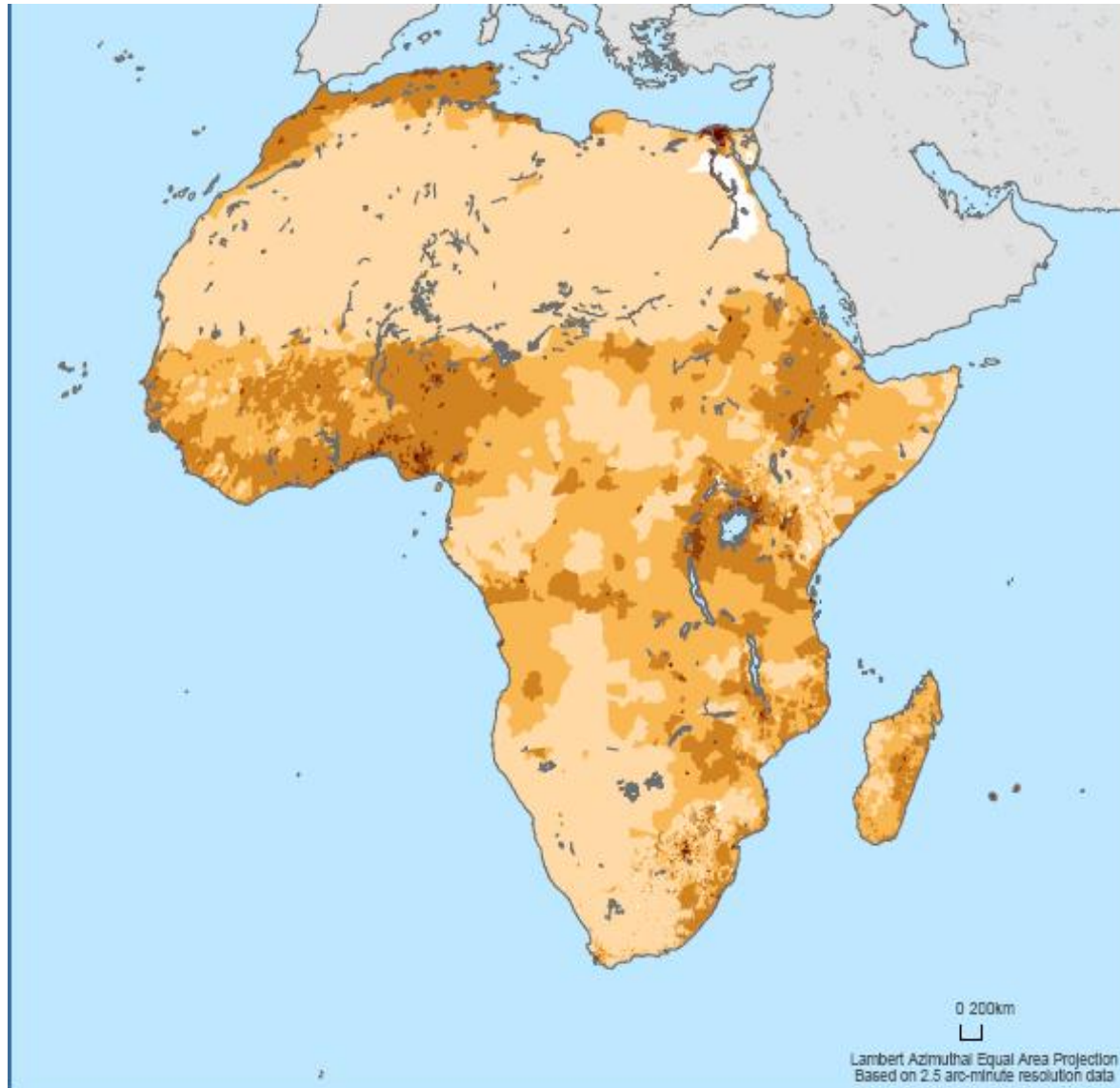


Table 5 (top half): Regressions for all developing countries

	Liquid Liabilities/GDP			Private Credit/GDP		
	(1)	(2)	(3)	(4)	(5)	(6)
Africa	-0.105*	0.078	-0.472*	-0.066	0.027	-0.331
	(0.054)	(0.147)	(0.280)	(0.045)	(0.124)	(0.231)
Ln(Population)	-0.009	-0.001	-0.035	0.0005	0.002	-0.027
	(0.015)	(0.017)	(0.028)	(0.013)	(0.015)	(0.022)
Ln(Population Density)	0.050***	0.036*	0.032	0.036***	0.032*	0.020
	(0.016)	(0.019)	(0.020)	(0.013)	(0.016)	(0.017)
Natural Resources	-0.031	-0.034	-0.062*	-0.012	-0.010	-0.026
	(0.025)	(0.030)	(0.033)	(0.021)	(0.025)	(0.027)
Offshore Center	0.363***	0.369***	0.341***	0.378***	0.374***	0.339***
	(0.098)	(0.101)	(0.110)	(0.082)	(0.085)	(0.091)
Ln(Per Capita Income)	0.052**	0.056	-0.091	0.070***	0.089***	-0.063
	(0.026)	(0.035)	(0.059)	(0.022)	(0.030)	(0.049)
Population * GDP Per Capita	0.030	0.006	0.061	-0.023	-0.031	0.015
	(0.084)	(0.089)	(0.091)	(0.071)	(0.075)	(0.075)
Real GDP Growth Rate			-2.619**			-1.769**
			(1.053)			(0.869)
Inflation Rate			-0.946**			-0.894**
			(0.458)			(0.378)
Current Account Balance / GDP			1.565**			1.236**
			(0.598)			(0.493)
KKM Index			0.215***			0.210***
			(0.072)			(0.060)
Manufacturing / GDP			0.436			0.651
			(0.526)			(0.434)
Secondary/Primary Enrollment			-0.040			-0.004
			(0.163)			(0.134)

Table 5 (bottom half): Regressions for all developing countries

<i>Interactions with Africa dummy</i>						
Ln(Population)	-0.027	0.024		-0.010	0.041	
	(0.048)	(0.054)		(0.040)	(0.044)	
Ln(Population Density)	0.039	0.046		0.010	0.041	
	(0.035)	(0.041)		(0.029)	(0.034)	
Natural Resources	0.001	0.052		-0.014	0.010	
	(0.061)	(0.081)		(0.051)	(0.067)	
Ln(Per Capita Income)	-0.013	0.109		-0.042	0.136	
	(0.065)	(0.136)		(0.054)	(0.112)	
Population * GDP Per Capita	0.051	0.160		-0.110	-0.178	
	(1.634)	(1.833)		(1.373)	(1.513)	
Real GDP Growth Rate		2.120			1.425	
		(1.930)			(1.592)	
Inflation Rate		1.004*			0.830*	
		(0.547)			(0.452)	
Current Account Balance / GDP		-1.773			-1.477	
		(1.168)			(0.963)	
KKM Index		-0.096			-0.152	
		(0.121)			(0.100)	
Manufacturing / GDP		-0.776			-0.916	
		(0.891)			(0.735)	
Secondary/Primary Enrollment		0.418			0.148	
		(0.418)			(0.345)	
Constant	0.525***	0.467***	0.990**	0.294***	0.248***	0.640***
	(0.073)	(0.091)	(0.152)	(0.061)	(0.076)	(0.125)
Adjusted R2	0.33	0.31	0.45	0.37	0.34	0.51
Observations	112	112	99	112	112	99
F(Population Density = 0 for Africa)		6.74	4.62		3.07	4.27
Corresponding p-value		0.011	0.035		0.083	0.042



Additional analyses and discussions

- More on population density (Table 8):
 - Including additional variables (infrastructure, branch penetration, etc) significantly reduce the number of observations (except for urbanization)
- Bank foreign ownership:
 - Appears to have opposite effect on Africa from other developing countries;
 - Not an exogenous variable (related to population density);
 - Indexes on the restrictions on foreign bank entry (Barth et al. 2008)
- Stock market development (Table 9): total market cap and value traded
 - Limited results from cross-country studies
- Macroeconomic policies and conditions and institutional environment:
 - Too early for (conditional) convergence as observed in other countries?



Firm-level analyses

- Data: World Bank Enterprise surveys
 - Coverage of developed and developing countries
 - Firm characteristics and financing patterns
 - Most firms have one year's data (2003-2007)
- Focus on bank (external) finance:
 - Do African firms rely *less* on bank finance than their counterparts in other developing countries?
 - Demand and supply factors
 - Determinants of bank finance:
 - Dependent variable: Bank finance for new investments (%) at the firm-level
 - Firm level and country-level variables

Summary stats (Table 7)

Panel A African countries (excluding South Africa)

	N	Mean	Std. Dev.	Fraction of 0
Firm Size-Small (0 or 1)	2,591	0.46	0.50	--
Firm Size-Medium (0 or 1)	2,591	0.30	0.46	--
Foreign (0 or 1)	2,591	0.25	0.43	--
Exporter (0 or 1)	2,591	0.18	0.38	--
Manufacturing (0 or 1)	2,591	0.70	0.46	--
Services (0 or 1)	2,591	0.17	0.37	--
Access to External Finance (0 or 1)	2,591	0.16	0.37	83.91%

Panel B Other Low- and Middle-income Countries (excluding Africa)

Firm Size-Small (0 or 1)	30,525	0.34	0.47	--
Firm Size-Medium (0 or 1)	30,525	0.33	0.47	--
Foreign (0 or 1)	30,525	0.13	0.33	--
Exporter (0 or 1)	30,525	0.24	0.43	--
Manufacturing (0 or 1)	30,525	0.66	0.47	--
Services (0 or 1)	30,525	0.27	0.44	--
Access to External Finance (0 or 1)	30,525	0.26	0.44	73.75%

Bank Loans for New Investment first section; Table 8)

	(1)	(2)	(3)	(4)	(5)
Africa Dummy	0.011	0.449**	0.230	-0.061	0.093
	[0.104]	[0.189]	[0.169]	[0.111]	[0.147]
Small	-0.151***	-0.144***	-0.140***	-0.142***	-0.142***
	[0.023]	[0.015]	[0.018]	[0.026]	[0.024]
Medium	-0.066***	-0.062***	-0.059***	-0.058***	-0.058***
	[0.011]	[0.012]	[0.011]	[0.012]	[0.012]
Foreign	-0.046***	-0.042***	-0.048***	-0.046***	-0.046***
	[0.013]	[0.014]	[0.013]	[0.013]	[0.013]
Exporter	0.053***	0.037***	0.059***	0.053***	0.053***
	[0.011]	[0.011]	[0.011]	[0.010]	[0.011]
Manufacturing	0.082***	0.048**	0.068***	0.091***	0.091***
	[0.030]	[0.024]	[0.025]	[0.030]	[0.029]
Services	-0.029	-0.033	-0.038	-0.035	-0.035
	[0.023]	[0.024]	[0.023]	[0.023]	[0.023]
KKM index	0.067*	0.032	0.092*	0.055	0.056
	[0.035]	[0.028]	[0.048]	[0.037]	[0.037]
Ln(Per Capita Income)	-0.007	-0.029	0.006	-0.001	-0.000
	[0.032]	[0.032]	[0.033]	[0.032]	[0.035]

Bank Loans for New Investment (second section; T8)

Natural Resources	0.015	0.019	0.001	0.018	0.018
	[0.023]	[0.018]	[0.029]	[0.022]	[0.022]
Age of the firm	-0.001**	-0.001**	-0.001**	-0.001***	-0.001***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Ln(Population Density)	0.054***	0.021	0.045**	0.060**	0.059***
	[0.019]	[0.026]	[0.018]	[0.026]	[0.020]
Roads/Area		0.060*			
		[0.034]			
Foreign Ownership Share			-0.197*		
			[0.119]		
Number branches per 1000km2				-0.004	
				[0.034]	
Number branches per 100k adults					-0.000
					[0.001]
Small*Africa	0.020	-0.014	0.008	-0.047	-0.022
	[0.042]	[0.037]	[0.045]	[0.037]	[0.041]
Medium*Africa	0.069	0.022	0.065	-0.028	0.000
	[0.043]	[0.040]	[0.043]	[0.029]	[0.033]
Foreign*Africa	0.013	0.017	0.049	0.005	0.000

Bank Loans for New Investments (third section; T8)

Exporter*Africa	0.019	0.034	0.002	-0.037	-0.012
	[0.031]	[0.029]	[0.031]	[0.033]	[0.028]
Manufacturing*Africa	-0.110***	-0.076*	-0.118***	-0.097**	-0.103**
	[0.034]	[0.041]	[0.033]	[0.045]	[0.042]
Services*Africa	-0.184***	-0.148***	-0.179***	-0.157***	-0.180***
	[0.021]	[0.032]	[0.032]	[0.033]	[0.027]
KKM index*Africa	0.035	0.108	0.072	-0.003	0.014
	[0.079]	[0.080]	[0.085]	[0.089]	[0.090]
Ln(Per Capita Income)*Africa	-0.045	-0.002	-0.049	-0.043	0.012
	[0.059]	[0.073]	[0.060]	[0.084]	[0.074]
Natural Resources*Africa	-0.035	-0.451	0.279	1.439***	0.725
	[0.484]	[0.453]	[0.614]	[0.476]	[0.909]
Age of the firm*Africa	0.002***	0.001	0.002**	0.002**	0.002***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Ln(Population Density)*Africa	-0.000	0.086*	-0.014	-0.018	0.030
	[0.031]	[0.051]	[0.027]	[0.045]	[0.039]
Roads/Area*Africa		-0.483**			
		[0.222]			
Foreign Ownership Share*Africa			-0.260		
			[0.170]		

Bank Loans for New Investments (fourth section; T8)

Num branches per 1000km2*Africa				0.340***	
				[0.100]	
Num branches per 100K adults*Africa					0.004
					[0.013]
Observations	35,912	30,054	34,622	32,276	32,276
Adjusted R square	0.0874	0.0785	0.0904	0.0921	0.0910
test ln_pd+ln_pd*africa chi2	4.574	5.909	2.396	1.285	7.006
p-value ln_pd	0.0325	0.0151	0.122	0.257	0.00812
test roads_area + roads_area_africa = 0 chi2		3.741			
p-value roads		0.0531			
test fos + fos_africa = 0 chi2			13.51		
p-value fos			0.000237		
test geobrpen + geobrpen_africa = 0 chi2				13.54	
p-value geobrpen				0.000233	
test demobrpen + demobrpen_africa = 0 chi2					0.0866
pvalue demobrpen					0.769
test ln_pd+ln_pd*africa chi2	4.574	5.909	2.396	1.285	7.006
p-value ln_pd	0.0325	0.0151	0.122	0.257	0.00812



Summary and ongoing work

- Document the African financial development gap:
 - Comparing actual banking sector development measures with predicted levels based on the analyses of other developing countries
- Analyze factors that are associated with fin. development:
 - Importance of population density: Role of mobile banking technology?
 - Natural resource curse;
 - Macroeconomic conditions and institutional environment
- Ongoing work:
 - *Nonlinear* relation between pop. density and banking development?
 - World Bank firm-level surveys;
 - Household surveys in Kenya.