

# FINANCIAL SECTOR LIBERALIZATION, BANK COMPETITION AND STABILITY IN SUB-SAHARA AFRICA

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# Outline

- **Motivation**
  - ▣ Major issues to be addressed
  - ▣ Rationale of the study on SSA
  
- **Related literature**
  - ▣ Banking sector liberalization and competition
  - ▣ Banking sector competition/concentration-stability/fragility nexus
  
- **Stylized facts of banking in SSA**
  - ▣ Overview of banking sector experience in SSA
  
- **Empirics and Results**
  - ▣ Duration model
  - ▣ Data sources/construction
  - ▣ What is the evidence of the financial reform, banking competition-stability nexus in SSA?
  
- **Conclusion and policy recommendations**

# Motivation

- ▣ Banks occupy a ubiquitous position in the financial system of LICs in resource mobilization and allocation
- ▣ Banks potential source of systemic risk to financial structure
- ▣ SSA countries characterized by bank-based financial system – 70%
- ▣ Contentious relationship between competition-stability/fragility nexus
- ▣ What is the relationship between bank competition and stability in SSA?
- ▣ What determines the likelihood of systemic bank failures/crises in SSA?
- ▣ Differentiating healthy banks from troubled ones raises policy issues
- ▣ What is the role of macroeconomic stability, regulatory environment and institutions in enhancing banking stability in SSA?
- ▣ Early banking distress warning surveillance system in developing countries

# Related Literature

Literature tied around 3 interrelated elements

- ✓ Financial sector reforms – competition
- ✓ Competition-stability nexus
- ✓ Competition-fragility nexus

## □ **Liberalization - competition nexus**

- Fisher & Chenard (1997), Demirguc-Kunt & Detragiache (1998), Barth et al. (2004), Podpiera (2004), and Beck et al. (2005)

## □ **Competition-Stability Nexus**

- Arguments for competition/low concentration-stability in the banking sector
  - ✓ Mishkin (1999) lack of competition - “too big to fail” mentality
  - ✓ Beck et al., (2003); Allen & Gale (2004); Boyd and Nicolo (2005)– monopolistic market environment - risky-taking investment decisions

## □ **Competition-Fragility (crises) Nexus**

- Arguments against competition in the banking sector
  - ✓ Keeley (1990) erosion of US banks’ charter increased with competition
  - ✓ Bordo, et al. (1995); Canadian banks failed less than US - Oligopoly
  - ✓ Allen and Liu (2007); Beck et al. (2005) – competition erodes profits

# Stylized Facts of Financial System in SSA

- Narrow financial infrastructure, not equipped to handle comprehensive banking sector reforms.
- Importance of timing, sequencing and scope of reforms in SSA vs. other LICs
- Dominance of large (foreign) banks
- Notable progress has been made over the past two decades with varying degree of success
- Heterogeneous financial systems in terms of depth and sophistication
- Rapid financial liberalization led to instability in number of SSA (Brownbridge, 1998 ; Kasekende, 2010;). These attributed to:
  - ✓ Macroeconomic imbalances;
  - ✓ Liberalization translated to wide spreads in interest rates
  - ✓ Weak regulatory and supervisory environment led to failure of banks
  - ✓ Reforms undertaken for the sake of rent seeking by politicians
  - ✓ Erosion of quality of loans and imprudent lending due to political rather than economic considerations in advancing the loans without collateral (e.g. political banks phenomenon in Kenya in mid 1980s and early 1990s)

# Stylized Facts of Financial System in SSA Contd...

**Table 1: Characteristics of Financial System in Selected SSA Countries, 2008-2010**

| Country      | Depth of financial institutions |                           |                            | Sophistication of financial markets        |                                 |
|--------------|---------------------------------|---------------------------|----------------------------|--|---------------------------------|
|              | Private credit/GDP (%)          | Accounts per 1,000 people | Lending-deposit spread (%) | Commercial bank's weighted average Z-Score | Stock market turnover ratio (%) |
| Ethiopia     | 17.2                            | 91.7                      | 3.3                        | 10.3                                       | 3.5                             |
| Ghana        | 14.0                            | 298.8                     | 5                          | 15.4                                       | 5.9                             |
| Kenya        | 29                              | 328.4                     | 9.1                        | 19.2                                       | 13.9                            |
| Malawi       | 11.7                            | 102.4                     | 21.5                       | 18.9                                       | 2.1                             |
| Mauritius    | 80.8                            | 823.4                     | 11.0                       | 23.5                                       | 10.1                            |
| Namibia      | 44.5                            | 635.3                     | 5.0                        | 41.1                                       | 3.4                             |
| Nigeria      | 31.1                            | 245.6                     | 6.5                        | 13.3                                       | 24.3                            |
| South Africa | 75.8                            | 882.9                     | 3.4                        | 27.1                                       | 69.9                            |
| Tanzania     | 14.4                            | 126.6                     | 17.3                       | 19.9                                       | 6.7                             |
| Uganda       | 12.3                            | 169.5                     | 11.2                       | 10.6                                       | 0.5                             |
| Zambia       | 11.8                            | 153.7                     | 13.7                       | 7.6  | 14.8                            |

Source: (Cihak, Demirguc-Kunt, Feyen, & Levine, 2012). Note: The countries were selected on the basis of availability of data on all metrics

# Stylized Facts of Financial System in SSA Contd...

**Table 2: Bank Performance Indicators of SSA Countries, (period average, %),**

|  | 1998-2002 | 2003-2007 | 2008-2011 |
|--|-----------|-----------|-----------|
| Bank assets to GDP                         | 18.27     | 21.10     | 26.22     |
| Bank private sector credit to GDP (FinDev) | 13.85     | 16.29     | 20.48     |
| Bank deposits to GDP                       | 17.73     | 21.07     | 26.72     |
| Bank credit to deposits                    | 73.59     | 70.12     | 70.91     |
| Bank overhead costs to total assets        | 5.85      | 6.35      | 5.53      |
| Net interest margin (NIM )                 | 7.65      | 7.24      | 6.35      |
| Bank concentration ratio, CR3              | 84.39     | 77.01     | 73.06     |
| Return on assets, (ROA)                    | 2.37      | 4.49      | 1.95      |
| Return on equity (ROE)                     | 21.26     | 23.29     | 16.96     |
| Bank cost to income ratio (CIR)            | 56.84     | 56.80     | 58.33     |
| Bank Z-Score                               | 13.76     | 13.96     | 14.91     |
| Non-performing loans to gross loans (NPLs) | ..        | 10.59     | 7.42      |

Source: Authors' computations based on data from Demirgüç-Kunt, et al., (2012); World Development Indicators, 2013 (Online Version)

Notes: ..= not available

# Methodology

- A lot of studies on systemic banking crises used logit models. We follow Cihak et al. (2006) in using time-varying duration model (DM), provides conditional probability of observing banking distress at period  $t$ , assuming no such distress has occurred
- Importance of this model over logit, recognizes that probability of bank becoming distress vary over time and does not require strong assumptions
- Underlying principles of DM = survival function ( $S(t)$ ) and hazard function ( $h(t)$ )
- Variable of interest – likelihood of bank distress given bank-specific, macro and inst. factors
- Basics of model:

Survival Function:  $S(t) = \text{Prob}(T \geq t)$

We can therefore formulate the conditional probability of leaving the state of being a non-distressed banking system within the time interval  $t$  until  $t + h$ , given the survival time as

$$P\{t \leq T[t(t+h)] | T \geq t\}$$

$$h(t) = \lim_{\Delta t \rightarrow 0} \frac{P\{t \leq T[t(t+h)] | T \geq t\}}{\Delta t} = \frac{f(t)}{S(t)}$$

$$h(t, X(t), \beta) = \lim_{\Delta t \rightarrow 0} \frac{P\{t \leq T[t(t+h)] | T \geq t, X(t), \beta\}}{\Delta t} = h_0(t) \exp(\beta' X_t)$$



# Data

- Based on data set of 14 SSA countries, 1995 – 2010.

|               |                     |
|---------------|---------------------|
| Botswana      | <b>South Africa</b> |
| Cote d'Ivoire | Tanzania            |
| Cameroon      | Uganda              |
| Ethiopia      | Zambia              |
| Ghana         |                     |
| Kenya         |                     |
| Madagascar    |                     |
| Malawi        |                     |
| Mauritius     |                     |
| Mozambique    |                     |
| Nigeria       |                     |
| Senegal       |                     |

- Four categories of control variables (4 sections):
  - ▣ Bank-specific CAMEL
  - ▣ Bank aggregate
  - ▣ Macroeconomic
  - ▣ Institutional
- Bank distress categories (Gonzalez-Hermosillo, 1996):
  - ▣ Financial institution was recapitalized by either the central bank (liquidity injection) or strategic investor.
  - ▣ Financial institution was acquired by another financial institution.
  - ▣ Financial institution's operations or license was temporary suspended by the regulatory authority.
  - ▣ Regulatory authority closed the financial institution

# Empirical Analysis I

**Table 5.1: Duration Model Results**

| <b>Indicators</b>            | <b>Full Sample<br/>1995-2010</b> | <b>Pre-reform<br/>1995-2000</b> | <b>Post-reform<br/>2000-2010</b> |
|------------------------------|----------------------------------|---------------------------------|----------------------------------|
| Baseline hazard              | 1.043**<br>(2.471)               | 1.159**<br>(3.060)              | 1.702*<br>(5.272)                |
| <b><i>Bank Specific</i></b>  |                                  |                                 |                                  |
| CAP                          | 12.051***<br>(5.784)             | 13.066**<br>(2.381)             | 12.872**<br>(2.906)              |
| ASQ                          | 1.259<br>(0.723)                 | 2.380<br>(0.942)                | 2.191<br>(0.264)                 |
| MAGT                         | -1.167<br>(-0.792)               | 4.096<br>(0.975)                | -0.261<br>(-0.538)               |
| EARN                         | 2.902***<br>(4.618)              | 2.206***<br>(5.276)             | 3.070***<br>(4.773)              |
| LIQ                          | 9.548**<br>(2.156)               | 5.232**<br>(3.284)              | 3.046<br>(1.042)                 |
| <b><i>Bank Aggregate</i></b> |                                  |                                 |                                  |
| FOREN                        | 0.224<br>(0.309)                 | 0.034<br>(0.047)                | 0.673<br>(0.264)                 |
| NATOW                        | 1.281<br>(0.512)                 | 1.746<br>(0.505)                | 1.470**<br>(2.173)               |
| FOROW                        | -0.615<br>(-0.194)               | 0.008<br>(0.015)                | 1.319**<br>(2.284)               |
| BANKZ                        | 1.016**<br>(2.193)               | 0.419<br>(0.135)                | 0.182<br>(0.274)                 |
| BANKFRED                     | 0.517<br>(0.156)                 | 0.711<br>(0.318)                | 0.928<br>(1.062)                 |
| H-STAT                       | 1.206**<br>(2.343)               | 0.629<br>(0.704)                | 1.278**<br>(2.452)               |
| FOREST                       | 2.084**<br>(2.003)               | -0.481<br>(-0.206)              | 1.101**<br>(2.365)               |

# Empirical Analysis I Contd..

**Table 5.1b: Duration Model Results**

| Indicators           | Full Sample<br>1995-2010   | Pre-reform<br>1995-2000    | Post-reform<br>2000-2010   |
|----------------------|----------------------------|----------------------------|----------------------------|
| <i>Macroeconomic</i> |                            |                            |                            |
| RGDPG                | <b>1.460***</b><br>(5.026) | <b>1.312***</b><br>(5.297) | <b>0.961**</b><br>(2.518)  |
| INFL                 | -0.166**<br>(-2.409)       | 0.224<br>(1.041)           | -1.914**<br>(-3.208)       |
| M2RES                | 0.042<br>(1.412)           | 0.136<br>(0.273)           | 1.271<br>(0.328)           |
| INTER                | -2.610**<br>(-2.201)       | -1.426<br>(-1.472)         | -1.061***<br>(-5.287)      |
| PRIVGDP              | -0.781**<br>(-2.201)       | 1.047<br>(1.510)           | -1.197**<br>(-2.426)       |
| TOTCHAN              | 0.372<br>(0.210)           | 0.191<br>(1.153)           | 1.301<br>(1.014)           |
| FISCDEF              | 1.301<br>(0.278)           | 0.571<br>(0.672)           | 1.418<br>(0.519)           |
| EXVOL                | -1.401**<br>(2.635)        | 0.297<br>(0.432)           | -2.629**<br>(2.815)        |
| <i>Institutional</i> |                            |                            |                            |
| CONTRA               | <b>1.842**</b><br>(2.314)  | <b>1.134**</b><br>(2.109)  | <b>2.872***</b><br>(5.381) |
| ECONFRED             | 2.071**<br>(1.849)         | 2.337<br>(0.274)           | 2.276**<br>(2.761)         |
| ACTREST              | 0.206<br>(1.360)           | -0.217<br>(-0.205)         | 1.428***<br>(7.874)        |
| LEGOR_FRE            | 0.364<br>(0.264)           | 0.302<br>(0.514)           | 0.037<br>(0.246)           |
| LEGPR_OTHER          | -0.297<br>(-1.478)         | -0.067<br>(-0.810)         | -0.015<br>(-0.1392)        |
| RELIG_MUS            | 0.212<br>(0.166)           | 0.516<br>(0.922)           | 0.006<br>(0.193)           |
| RELIG_OTHER          | 1.307<br>(0.290)           | 1.326<br>(0.217)           | 0.781<br>(0.101)           |

# Empirical Analysis II - Prediction

$$\hat{S}(t|X) = \hat{S}_0(t) \exp\left(\int_0^t \hat{h}(u) du\right)$$

$$\text{With } \hat{S}_0(t) = \exp\left\{-\int_0^t \hat{h}_0(u) du\right\}$$

**Table 5.2: Model Predictive Power**

|                     | Predicted Values |     |       |
|---------------------|------------------|-----|-------|
|                     | 0                | 1   | Total |
| 2 years predictions |                  |     |       |
| 0                   | 23               | 6   | 29    |
| 1                   | 18               | 615 | 633   |
| <b>Total</b>        | 41               | 621 | 662   |

# Conclusion

- Financial liberalization – fosters competitive conduct, important for efficiency & stability
- Compared to pre-reform regime, increased competition in the post-reform regime period corresponded with increased lead time to bank distress episodes.
- Indicators appropriate for micro & macroprudential policies
- Robust institutional framework critical
- Implications for monetary policy framework in SSA