



ACTUARIAL SOCIETY
OF SOUTH AFRICA

Advancing Actuarial Excellence

From Models to Markets

How actuaries can help African banks build for informality, digital rails and climate volatility

African banking models could under-reading three realities: informality, digital transaction behaviour, and climate volatility.

Themes covered



0–3 min

Opening thesis

Risk has moved beyond formal balance-sheet data.

3–10 min

Three market shifts

Informality, digital rails and climate volatility are now central banking risks.

10–17 min

Digital rails as observatories

Mobile-money behaviour can reveal income rhythm, liquidity and stress.

17–22 min

Climate as credit risk

Physical shocks are already household and SME balance-sheet shocks.

22–27 min

Actuarial role

Move from model validation to product, underwriting and governance design.

27–30 min

Close

Define the next frontier of African banking — or validate it after others design it.

Africa is mis-modelled – Risk has moved



The next banking crisis in Africa may not begin in a trading book. It may begin in a drought, a failed harvest, a mobile wallet, a taxi rank, or an informal trader's broken supply chain or **failure to take opportunities**.

83% 85% in SSA

of African employment is informal

The formal payslip is not the economy. Real income can be irregular, seasonal, cash-based and network-supported.

INFORMAL

\$1.4tn 66% of World volume
23% y-o-y growth

through SSA mobile money in 2025

Digital rails carry real economic signals. velocity, recurrence, liquidity, stress and recovery behaviour.

DIGITAL

35%

of adults in low-income countries hit by disaster / extreme weather in 3 years

Climate is already household credit risk. Climate shocks are not distant ESG narratives; they affect affordability, arrears and working capital now.

VOLATILE

The potential customer is working. The money is moving. The climate is biting. The models could be lagging.

All this happening invisibly

Our traditional models



The African customer is not undocumented, they are differently documented

Current Inputs

Traditional model input	In African context
Payslip	Excludes irregular but real income
Audited statements	Excludes small merchants and micro-enterprises
Fixed address	Weak for mobile, rental, peri-urban and informal settlements
Collateral	Weak for asset-light households and traders
Credit bureau history	Thin-file does not mean no economic activity

Potential Inputs

Alternative signal	Actuarial use
Mobile money inflows	Income rhythm and persistence
Merchant collections	Turnover proxy
Airtime/data purchases	Stability and affordability signal
Wallet balances	Liquidity behaviour
Cash-in/cash-out frequency	Financial stress or operating pattern
Supplier payments	Business continuity
Remittances	Household support network
Weather/location overlays/Satellite data	Climate exposure

The future of credit scoring is not just more data. It is better interpretation of messy, behavioural, high-frequency data, without confusing challenges that come with the process with inability.

Too big to be ignored



Africa is not waiting to be digitised. Significant parts of its informal economy are already transacting on digital rails.

>\$2tn

global mobile-money transaction value in 2025

23% growth vs 2024

\$1.4tn

SSA mobile-money transaction value in 2025

~two-thirds of global value

2.3bn

registered mobile-money accounts globally

268m added in 2025

\$1400bn



SSA mobile money transactions

66%

SSA share of global mobile-money value

\$97bn



Africa FDI inflows

\$56bn



SSA remittances (approx.)

The point is not that these figures are the same economic concept. They are not. The point is that **the scale of digital transaction behaviour is now too large for banks and actuaries to treat as peripheral.**

Capital flows into Africa are studied intensely. But everyday money flows inside Africa is huge, and may trigger a big underwriting revolution.

Mobile-money value is a gross flow, not GDP. But **for underwriting, gross flow is exactly the signal: velocity, frequency, liquidity and stress.**

Digital rails are risk observatories



In insurance, actuaries understand that high-frequency behavioural data can change pricing. Telematics changed motor insurance. Wearables changed health engagement. Persistency data changed life insurance distribution.

Banking now has a similar opportunity

Actuarial concept	Digital proxy
Frequency	Transaction count
Severity	Transaction size
Volatility	Variability of inflows/outflows
Persistency	Repeat activity over time
Exposure	Active wallet / merchant activity
Shock response	Behaviour before and after stress events
Correlation	Common deterioration by geography or sector
Fraud risk	Circular or abnormal transaction patterns
Liquidity strain	Sudden cash-outs or balance depletion
Resilience	Recovery speed after income shock

Mobile money is not only a payment rail. It is a behavioural dataset for underwriting the real economy.

...But for Africa Climate risk is more real



In Africa, climate risk does not wait for a 2050 scenario. It shows up this month as missed income, food-price pressure, school-fee stress, working-capital strain and loan arrears.

35%

of adults in low-income countries personally experienced disaster / extreme weather in the last 3 years

Climate is already a household balance-sheet shock.

>50%

affected in 10 highly exposed countries

this is systemic risk, not isolated bad luck.

80%

of those highly affected countries are in Africa

The African banking system is close to the physical-risk frontier.

CGAP reports that more than **one-third of adults in low-income countries** personally experienced a natural disaster or extreme weather event in the last three years; in 10 highly affected countries, more than half the population was affected, **and 80% of those countries are in Africa.**

- Affordability should vary by geography, livelihood, seasonality and shock exposure.
 - Portfolio monitoring should detect localised stress before arrears become visible.
 - Restructuring triggers should be designed before a climate shock hits the loan book.
-

The Actuarial Toolkit is relevant



The actuarial profession does not need a new identity to matter in banking. It needs to apply its existing identity earlier in the value chain.

Banking problem	Actuarial capability
Informal income volatility	Survival models, transition models, credibility theory
Thin-file customers	Alternative data, Bayesian updating, segmentation
Climate shocks	Scenario testing, catastrophe-style thinking, tail-risk modelling
Digital behaviour	Experience analysis, persistency, behavioural risk modelling
Product rigidity	Dynamic pricing, benefit design, embedded options
Portfolio stress	Capital modelling, dependency structures, correlations
Model fairness	Governance, validation, bias testing, explainability
Early warning systems	Trigger design, leading indicators, monitoring frameworks

But move from model validators to market designers



Strategic relevance starts before the model is built.

Question 1

What economy is this bank actually modelling?

Question 2

Whose income is invisible in the dataset?

Question 3

Where is the model confusing informality with inability?

Question 4

What shocks are missing from the credit model?

Move actuarial work
upstream:



The goal is not just to design or approve the model. It is to shape the market the model will serve.

What Banks should build next



Do not just lend to the informal economy. Build products that understand how it survives.

1

Informal-income scorecards

Build on income rhythm, stability, recurrence, volatility and resilience.

2

Climate-adjusted affordability

Affordability should vary by geography, livelihood, seasonality and shock exposure.

3

Mobile-money behavioural underwriting

Use transaction frequency, merchant flows, wallet persistence and liquidity patterns.

4

Embedded resilience products

Credit plus savings buffers, insurance, payment holidays and shock-triggered restructuring.

5

Dynamic credit limits

Limits that respond to real-time income and stress signals.

6

Fairness-tested alternative-data models

Digital models must be tested for exclusion by geography, gender, age, device access and connectivity.

The African economy is not waiting for banks to understand it. It is already transacting.



**Informality is not absence of income.
Climate is not only ESG.
Digital rails are not only channels.**

Banks that learn to underwrite the informal, climate-exposed, digitally connected African economy will define the next frontier of banking.

The question is whether actuaries will help build that future - or merely validate it after someone else has designed it.

Claxon Actuaries International

Actuarial • Risk • Investments • Analytics • Digital Enablement

michael.t@claxonactuaries.co.za | trevor.t@claxonactuaries.co.za | <https://claxonactuaries.co.za>



Claxon Actuarial International

Insurance | Banking | Investments | Impact
Investing | Infrastructure | Real Estate | ERM

Head Office: Regus Business Centre, Ground Floor, West Wing, 6 Kikuyu Road, Sunninghill,
Johannesburg, 2191, South Africa

Tel: : +27 (0) 11 236 8676/ +27 (0) 82 445 9303

Email: michael.t@claxonactuarial.co.za / trevor.t@claxonactuarial.co.za

Website: <https://claxonactuarial.co.za>

Actuarial • Risk • Investments • Analytics • Digital Enablement