COVID-19
MACROECONOMIC POLICY RESPONSES IN AFRICA
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Building Macroeconomic Resilience Through Counter-Cyclical Policy in Sub-Saharan Africa

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About CoMPRA

The COVID-19 Macroeconomic Policy Response in Africa (CoMPRA) project was developed following a call for rapid response policy research into the COVID-19 pandemic by the IDRC. The project's overall goal is to inform macroeconomic policy development in response to the COVID-19 pandemic by low and middle-income countries (LMICs) and development partners that results in more inclusive, climate-resilient, effective and gender-responsive measures through evidence-based research. This will help to mitigate COVID-19's social and economic impact, promote recovery from the pandemic in the short term and position LMICs in the longer term for a more climate-resilient, sustainable and stable future. The CoMPRA project will focus broadly on African countries and specifically on six countries (Benin, Senegal, Tanzania, Uganda, Nigeria and South Africa). SAIIA and CSEA, as the lead implementing partners for this project, also work with think tank partners in these countries.

Our Donor

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Glossary and definitions

The following definitions are offered as topic-specific and quantifiable terms of description in the textual analysis of macroeconomic resilience, its determinants and relationship with growth.

Table 1 Glossary of terms

Time periodisation for strategic planning and contracting	
Short term = short run	Less than 1 year
Medium term = medium run	Between 1 and 5 years
Long term = long run	Between 5 and 15 years
Generational	Between 15 and 25 years
Structural versus cyclical	
Structural	Long-term to generational trend (line)
	Incrementally built up or dismantled
Cyclical	Medium-term business, electoral or planning cycle
Production = real GDP cycle	Upcycle = acceleration, downcycle = deceleration, crisis = negative real per capita growth
Price = inflation cycle	Inflationary surge = price growth accelerating, disinflation = price growth decelerating, deflation = prices dropping
Real	Nominal value stripped of the effect of price inflation and indicating changes in output
Countercyclical	Reacting in the opposite direction to the cycle in the short term
Procyclical	Moving in the same direction as the cycle in the short term
Peak/trough	When real per capita growth rates are above/below average
Crisis versus resilience	
(Socio-economic) crisis	Declining real per capita growth in GDP = socio-economic recession
Deceleration	Positive but declining growth rates = downcycle
Acceleration	Positive and increasing growth rates = upcycle
Resilience	Capacity for and duration of recovery from crisis
Exogenous	Emanating from outside the nation/region
Endogenous	Emanating from within the nation/region
Shock	Impulse causing a deviation from a growth trend line into crisis or deceleration

Magnitudes	
Positive	Either above-zero growth rates or moving in the same direction as
Negative	Either below-zero growth rates or moving in the opposite direction to
Low	Real per capita growth rates below 2% per year
Medium	Real per capita growth rates between 2% and 4% per year
High	Real per capita growth rates higher than 4% per year
Negligible = undetectable	Correlations = co-movements = correspondence less than 0.1 or 10% probability of being related
Weak	Correlations between 0.1 and 0.3 or 10% to 30% likelihood
Weakly moderate	Correlations between 0.3 and 0.4 or 30% to 40% likelihood
Moderate	Correlations between 0.4 and 0.4 or 40% to 70% likelihood
Strong	Correlations above 0.7 or 70%+ probability of being related[1]
Coincident = concordant	Occurring simultaneously within the same year
Discordant	Occurring in different years (possibly with a lead or lag)
Monetary policy	
Monetary policy	Focussing on moderating the inflationary over the production cycle, which may/not coincide over the short term
(Conventional) monetary policy tools[2]	These include raising/lowering base money supply, reserve requirements on commercial banks or the central bank policy rate
Active monetary policy	Where the central bank has the institutional and political autonomy and capacity to exogenously shift the money supply curve or alter interest rates (or uses one or both instruments to counter the cycle)
Passive monetary policy	Where the central bank lacks the institutional and political autonomy or capacity to counter endogenous movement along the money supply curve (or uses one or both instruments to accentuate the cycle)
Financial market deepening	Extending and diversifying the range of money, credit and insurance products available differentiated by maturity, risk premiums, collateral requirements and legislative frameworks
Fiscal policy[3]	
Fiscal policy	Focussed on moderating the production over the inflationary cycle with a view to securing fiscal balance between spending measures and revenue generation
Active fiscal policy	Where government has the institutional capacity to control spending and revenue growth and uses one or both instruments to counter the cycle
Passive fiscal policy	Where government lacks the institutional capacity to control spending and revenue growth and uses one or both instruments to accentuate the cycle

1 Patrick Schober, Christa Boer and Lothar A Schwarte, "Correlation Coefficients: Appropriate Use and Interpretation", *Anesthesia & Analgesia* 126, no. 5 (May 2018): 1763–1768.

2 Micro- and macro-prudential tools are not explicitly considered in this analysis due to insufficient data for most of the cohort except South Africa.

3 Chorng-Huey Wong, "Adjustment and Internal-External Balance", in Chorng-Huey Wong, Mohsin Khan and Saleh Nsouli, *Macroeconomic Management: Programs and Policies* (Washington DC: International Monetary Fund, April 2002).

Social spending	Expenditure on realising the four primary Sustainable Development Goals (SDG 1–4) on poverty reduction, food security, health and education
Automatic stabilisers	Fiscal measures that are formulaically procyclical, such as welfare and food security benefits or progressive income taxes, and can be effected over the short run
Mandatory vs discretionary spending	Mandatory spending is fixed against the numbers of beneficiaries requiring public service (such as education and healthcare); discretionary spending can be adjusted according to the economic cycle and includes infrastructure and non-essential services
Macroeconomic balance[4]	
Internal balance/imbalance	The combination of government expenditure and net domestic credit that maximises the chances of a low(er) and stable output growth and inflation path; imbalances include recessions (decelerations into crisis) and inflationary surges
Net domestic credit	Base money (M1) + broad money (M3-M1) + reserve assets + net credit to government + net credit to private sector + net foreign assets[5]
External balance/imbalance	The combination of real effective exchange rates (REER) and real output (GDP) that maximises the chances of internal balance corresponding with balance between the current and financial accounts; imbalances include recessions/inflationary surges with deficits or surpluses on the overall balance of payments
Real effective exchange rate	The inflation-adjusted exchange rate of the domestic currency to a trade-weighted basket of international currencies
Components of macroeconomic resilience	
Monetary	Capacity to both control cost-push inflation while allowing accommodation of the growth cycle – implies deepening of financial markets
Fiscal	Capacity to effect countercyclical policy reducing deficits during the upcycles, sustaining them during downcycles and accumulating them to stimulate out of a crisis
External debt	Capacity to limit accumulation of debt (countercyclically) and control debt-servicing burdens that crowd out social and infrastructure spending
Trade[6]	Capacity to stimulate and diversify exports, limit and diversify imports and sustain current account balance
Investment	Capacity to stimulate gross fixed capital formation, attract net foreign (direct) investment and sustain financial account balance
Governance	Capacity to control corruption, implement rule of law, provide quality regulation, negotiate and effect policy, ensure institutional and policy stability, prevent violence and enable voice and accountability
Human capital	Reflected in increasing employment ratios, improved educational and health outcomes and the demographic dividend of sustainable dependency ratios

4 Wong, "Adjustment and Internal-External Balance".

5 Central Bank of Nigeria, Monetary Programme, "Understanding Monetary Policy: Series 2", 2021.

6 With respect to the macro-econometric companion paper on South Africa (see Eliphas Ndou, "The information Content of Macroeconomic Resilience Indices: Evidence from GDP Growth Dynamics in South Africa", South African Institute of International Affairs [forthcoming]), an alternative configuration to the trade and investment sub-indices is used with the same indicator set. This configuration reflects external balance and economic diversification respectively.

Abstract

Macroeconomic resilience is the capacity of a country to withstand and recover from exogenous and endogenous shocks causing socio-economic crises and to revert to a positive structural growth path. This paper analyses the relationships between key explanatory variables of resilience and gross domestic product (GDP) growth for 12 sub-Saharan African countries (ranging from low- to upper-middle-income status) for 2000–2021 with a focus on the application of monetary and fiscal instruments of cycle stabilisation. It contextualises structural vulnerability in terms of currency regimes, inherited growth paths and trade dependence and diversification. Correlation analysis reviews the relationships between monetary and fiscal policy variables and their inflation and production cycle stabilisation performance. A macroeconomic resilience index consisting of trade, investment, external debt, monetary, fiscal, governance and human capital sub-indices is constructed as an indication of cyclical and structural resilience. Further correlation analysis reveals the direction and probability of the relationship between these components of resilience and GDP growth for each country. Policy recommendations are made in respect of the progressive synchronisation of exchange rate regimes across regional economic communities and the AU, trade dependence and diversification, and the tracking and consistent use of countercyclical monetary and fiscal policy to build resilience. Some suggestions are also made on stabilising infrastructure and protecting social wage expenditure for inclusive growth.

Introduction

This policy-synthesis report is a comparative summary of (a) six sub-Saharan country-partner policy insights into macroeconomic crises and their management; (b) statistical analysis of the utilisation of monetary and fiscal policy instruments; and (c) the relationship between (components of) macroeconomic resilience and GDP growth. This serves as a prelude to (d) the econometric modelling of monetary and fiscal policy impulse and response functions in South Africa, the country with the highest data availability and institutional policy capacity.[7] These outputs bring to fruition the third phase of the COVID-19 Macroeconomic Policy Responses in Africa (CoMPRA) project funded by the International Development Research Centre. During this phase, a longitudinal (2000–2021 or, data permitting, 2023) study of six partner countries (Nigeria, South Africa, Tanzania, Uganda, Senegal and Benin) and their regional and income-status peers (Ghana, Botswana, Kenya, Rwanda, Mali and Togo) was undertaken.

7 Ndou, "The information Content of Macroeconomic".

Rationale and objectives

In the first phase of the CoMPRA project, the six partner countries' vulnerability and policy responses to the COVID shock were assessed. This final phase examines the resilience of the case study and peer countries to recover from these shocks and sustain positive real per capita growth. Although the study is limited to the 20-year period prior to the COVID shock in 2020–2021, the historical review of capacity to recover from shocks is relevant to the current period of escalating geopolitical tensions and the exogenous shocks these generate on the African continent.

The objective of this report is to assess the capacity of sub-Saharan African national governments to implement macroeconomic (especially monetary and fiscal) policy within the constraints of the global trade and investment regime. Assessing these limitations enables insight into the extent of national agency in responding to both external and internal shocks, and their effectiveness in doing so. Cross-country comparison of policy capacity and responsiveness allows for the identification of generic trends and what may/not be better able to be managed or negotiated at regional or continental level. Finally, both generic and country-specific policy recommendations can be generated on how resilience can be built, or vulnerability reduced.

Structure and methodology

This paper draws on 12 country working papers that were completed by the CoMPRA research team tracking the endogenous and exogenous shocks that the cohort experienced over the period 2000–2023. See Annexures A1-6 for an overview of the types of shocks the countries experienced. This work was complemented by the development of seven sub-indices structured around the following indicators: fiscal, monetary, external debt, trade, investment, governance and human capital development. These comprised annualised data drawn mainly from the World Bank's World Development Indicators (WDI) and the International Monetary Fund (IMF) and supplemented by country-level datasets where available (see Annexure C1-3). All in all, the analysis draws on over 15 000 datapoints.

The first section of this report sets out theoretical framing and then reviews the long-term structural trends characterising the 12 nations' macroeconomic performance in 2000–2023. It notes the importance of currency regimes in shaping policy capabilities and priorities. Although not the objective of this project, there are possible implications for the potential of (monetary and fiscal) policy coordination across regional economic communities (RECs) and the continent.

The second section identifies the proximate causes of both exogenous and endogenous shocks, their transmission mechanisms and their policy responses (both procyclical and countercyclical) for each of the 12 countries since 2000. Generic trends across the continent (or REC) are drawn from the individual country-partner policy insights that are summarised in the country-with-peer tables on crisis identification (Annexure A).

The third section reviews the policy implications from a correlation analysis between GDP growth, inflation and the main monetary and fiscal policy instruments that governments can manipulate at the margins. This starts an analysis of the capacity of national governments to effect countercyclical monetary and fiscal policies, and some of the trade-offs between them. This analysis is both country-specific and generic across countries or regions.

The fourth section defines macroeconomic resilience by constructing an index thereof with the seven sub-components reflecting the established theoretical relationships used in referenced studies (namely fiscal, debt, trade and investment positions and governance). This also includes a monetary sector sub-index and the compilation of a more comprehensive human capital component. Each of these seven sub-indices is constituted by relevant indicators available from internationally comparable databases compiled by the World Bank and the IMF. Each component indicator and sub-index is weighted equally (in the absence of principal components analysis)[8] and standardised according to the min-max formula, which serves to convert any indicator into a score between 0 and 1 on a scale of increasing resilience, but within the parameters of each country's own historical performance (rather than by indicator according to its multi-country historical range). The consequent analysis of the relationships between GDP growth and (components of) macroeconomic resilience is presented in graphical and tabular form for the country-specific findings. This is complemented with textual analysis of the cross-country results.

The fifth section pulls together the crisis identification, correlation and resilience index constituents of this analysis into a set of country-specific and regional or continent-wide policy recommendations on monetary, fiscal and other macroeconomic mechanisms. The aim of these is to develop resilience and shift or strengthen the relationship with per capita, real GDP growth.[9]

8 The paucity of data for many country indicators yields statistically insignificant results with which to enable a principal components analysis of most countries' performance. This problem is compounded if multi-country analysis is attempted.

9 The companion piece to this policy synthesis (referred to earlier) deepens an econometric analysis of South Africa's relationship between macroeconomic growth and resilience through principal components regression of the component indicators, vector autoregression to ascertain the dominant direction of causality, and impulse-response functions to determine the magnitude and duration of monetary and fiscal stimuli.

Theoretical framework

The theoretical framework informing the structure of this report, the choice of (available) indicators and the link between analysis and policy recommendations are drawn from the IMF's exposition of external and internal macroeconomic balance[10] and its sequentially programmed combinations of exchange rate, monetary and fiscal policy interventions to restore overall balance (recently adopted by the Central Bank of Nigeria).

There are significant spillovers between the fiscal, monetary and external sectors. A fiscal deficit that is debt financed will increase net domestic credit and/or net foreign assets unless used for consumption that crowds out private spending rather than investment, which can crowd it in. Government debt used for investment, however, is likely to induce deficit pressures on the current account with the importation of capital equipment.

Achieving fiscal balance is considered the most powerful tool for countering internal imbalances because of its direct impact on incomes, especially in fixed peg and more tightly managed currency float regimes, where degrees of freedom in the choice of policy instruments are more limited. The use of monetary policy instruments to control deficit induced inflation is less impactful in this regard because its transmission is more diffuse across both private and public sectors. However, to the extent that external imbalance in both current and financial accounts is prompted by interest rate differentials, monetary policy is more appropriate. Where current account deficits are the dominant imbalance and financial (money and credit) markets are shallow, exchange rate policy is the more appropriate instrument with a decision to devalue in more pegged or tightly managed currency regimes, or passively accept depreciation in freer-floating currency regimes. Exchange rate policies are preferred as short-run measures and for their complementarity with the appropriate monetary and fiscal contractions or expansions.

This policy continuum of short-run, diffuse to medium-run, focussed impact (ie, from exchange rate through monetary to fiscal policy) informs the internal structure and relative focus of this report. With the exception of South Africa, lack of internationally comparable data makes an analysis of the impact of exchange rate policies and financial market transmission mechanisms infeasible. Lag analysis of policy impacts into the medium term is too complex to undertake in cases where output and inflation cycles do not coincide as implicitly assumed in the theoretical framework, and which may be the result of inappropriate or delayed policy responses.

Nonetheless, exploring the macro-economic resilience of the 12 African cohort countries of this study through the above theoretical prism offers valuable lessons on how African policymakers

10 Wong, "Adjustment and Internal-External Balance".

could systematically improve their structural resilience to the rapidly increasing exogenous and endogenous shocks that African society faces and will increasingly face in the future.

Structural context and trends

Drawing on this approach, Tables 2a and 2b compare the macroeconomic performance of the six case study countries and their six regional and income peers over the generational period 2000–2023. This cohort covers a representative range of low-income, lower-middle-income and upper-middle-income nations in sub-Saharan Africa, displaying divergent trends in GDP growth, inflation and relative currency valuations. In line with the agenda of the AU's multi-generational objective of progressive currency, monetary and fiscal union, as much intra-regional co-movement of indicators was incorporated into the sample as possible with which to identify common regional or continental trends.

Table 2a Comparative long-term macroeconomic indicators for 12 African countries

Regional economic community (and exchange rate regime)[11]	Country	GDP per capita (constant 2015 $), 2023	Income status	Average annual real growth of GDP per capita, 2000 to 2023	Structural growth path, 2000 to 2023	Average inflation rate, 2000 to 2023	Average exchange rate appreciation, 2000 to 2023
ECOWAS (managed float)	Nigeria	$2,487	lower-middle	2.50%	moderate, decelerating	11.51%	-7.30%
ECOWAS (independent float)[12]	Ghana	$2,048	lower-middle	3.23%	moderate, decelerating slightly	**21.83%**	**-16.79%**
SACU (independent float)	South Africa	$5,956	upper-middle	1.22%	low, decelerating	6.55%	-5.02%
SACU (fixed adjustable peg)	Botswana	**$6,614**	upper-middle	1.36%	low, constant	6.49%	-4.42%
EAC (managed float)	Tanzania	$1,183	lower-middle	3.43%	moderate, decelerating slightly	7.06%	-5.41%
EAC (managed float)	Kenya	$1,926	lower-middle	1.67%	low, accelerating	8.12%	-2.17%
EAC (managed float)	Uganda	$959	low	2.75%	moderate, decelerating	8.66%	-4.86%

11 See International Monetary Fund, "Classification of Exchange Rate Arrangements and Monetary Policy Frameworks", June 2004.

12 "BoG reiterates Commitment to Flexible FX Regime", *The B&FT Online*, June 26, 2023.

Table 2b Comparative long-term macroeconomic indicators for 12 African countries

Regional economic community (and exchange rate regime)[13]	Country	GDP per capita (constant 2015 $), 2023	Income status	Average annual real growth of GDP per capita, 2000 to 2023	Structural growth path, 2000 to 2023	Average inflation rate, 2000 to 2023	Average exchange rate appreciation, 2000 to 2023
EAC (Crawling peg)	Rwanda	$962	low	**4.89%**	high, decelerating	5.58%	-5.16%
ECOWAS-WAEMU (fixed regional peg)	Senegal	$1,541	lower-middle	1.40%	low, accelerating	2.09%	**0.17%**
ECOWAS-WAEMU (fixed regional peg)	Mali	$758	low	1.25%	low, decelerating	3.08%	**0.17%**
ECOWAS-WAEMU (fixed regional peg)	Benin	$1,096	lower-middle	1.56%	low, accelerating	**2.08%**	**0.17%**
ECOWAS-WAEMU (fixed regional peg)	Togo	**$580**	low	**0.98%**	low, accelerating	3.93%	**0.17%**
		Worst performer				**Best performer**	

Source: Compiled by author from World Bank, "World Development Indicators", https://databank.worldbank.org/source/world-development-indicators

The most striking example of the role of currency regimes in influencing structural growth, inflation, and exchange rate trends is found in a comparison of the four members of the West African Economic and Monetary Union (WAEMU) and the remainder of the cohort. Members of WAEMU have long fixed their common currency, the West and Central African franc (CFA), to the euro, which has slowly appreciated against the dollar since 2000. With monetary policy effectively externalised, the regional central bank has little scope for independent monetary management other than controls on external capital flows, reserve and liquidity management. The CFA is considered structurally over-valued, such that it incentivises importation over domestic production. This is considered a drag on GDP growth, and the evidence below clearly implies that per capita GDP growth has been suppressed in the WAEMU countries relative to the rest of the cohort. More beneficially, and with the notable exception of Mali with its primary commodity dependence and deteriorating governance, growth is accelerating in the other WAEMU members. Proponents of pegged exchange rates argue that exchange rate and price stability encourage structural resilience through gross fixed capital formation and trade diversification.[14]

13 IMF, "Classification of Exchange Rate Arrangements".

14 IMF, "Exchange Rate Regimes in Sub-Saharan Africa: Experiences and Lessons", in *Regional Economic Outlook: Sub-Saharan Africa, Report* (Washington DC: IMF, October 2016).

The four members of the East African Community (EAC) are at various stages of liberalising their managed float regimes in preparation for their eventual harmonisation under a common currency. Kenya and Uganda have progressed furthest and longest in independently floating their currencies, while Tanzania has been slower to relinquish its controls over capital flows. Rwanda operates a crawling-peg type arrangement, adjusting its bands according to the inflation differentials with its major regional trading partners.[15]

Within the Southern African Customs Union (SACU), South Africa operates an independent float, allowing it to conduct monetary policy operations and inflation targeting separately from exchange rate management. Botswana operates a fixed peg against the Rand (ZAR) and the imputed value of special drawing rights (XDR), thereby forcing it to constrain inflation differentials with its major trading partners (primarily South Africa). This arrangement, supplemented with prudent macroeconomic management, has enabled Botswana to sustain higher real growth rates and a lower rate of depreciation against the US dollar than South Africa.

By comparison with the WAEMU members with a pegged regional currency, the independent or (liberalising) managed floats of the established or incipient currency unions of SACU and EAC indicate higher rates of depreciation and inflation over the 2000–2023 period. This suggests that (even partial) autonomy to revalue or passively allow depreciation (or appreciation) both enables inflation and requires increasingly autonomous monetary policy to control it.

The most extreme manifestation of devaluation–inflation cycles takes place in Nigeria and Ghana. Their independent currencies are not referenced against those of other members of the free trade organisation, ECOWAS. Both countries have floated their currencies but the inheritance of parallel exchange rates is proving to be a long-term endeavour of unravelling cross-subsidisations implicit in corruption and disincentivising speculative runs on the currency.

There is little evidence to suggest that there is any significant difference in the growth performance of the heavily or lightly managed floaters, or those in free trade areas versus those in customs unions.[16] For proponents of fixed pegs, the volatility of GDP growth and inflation, the encouragement of speculative over productive investment and the costs of monetary and fiscal management from buffer reserve accumulation mean that higher growth cannot be indefinitely sustained. Instead, it necessitates output and trade diversification, infrastructure development and governance reform.

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15 Christopher Adam, "Exchange Rate Arrangements in the Transition to East African Monetary Union", in Paulo Drummond, SK Wajid and Oral Williams, *The Quest for Regional Integration in the East African Community* (Washington DC: IMF, January 2015).

16 IMF, "Exchange Rate Regimes".

Crisis identification, transmission and response

The textual analysis in this section is drawn from tables A.1–A.6 (Annexure A), which are summaries of the six country-with-peer policy insights on macroeconomic crises and resilience. Actual or potential crises for each five-year period between 2000 and 2023 are described by (a) identifying the proximate causes or triggers for that country (and thereby (b) labelling them by geographical source, nature of trigger and level of governmental responsibility), (c) setting out the likely transmission mechanism to vulnerable households and enterprises and (d) outlining the de facto monetary and fiscal policy responses.

Proximate causes

The most consistent trigger (or leading indicator) of actual crisis (declining real per capita GDP) or potential crisis (sharp decelerations of GDP growth) across the cohort over the period 2000–2022 is a commodity price downcycle. Three countries are dependent on single commodity exports for their foreign exchange earnings, investment flows and government revenue: Nigeria (oil), Botswana (diamonds) and Mali (gold). Two countries' exports are strongly influenced by two commodities: South Africa (platinum and gold)[17] and Ghana (gold and oil). The export trade profile of two nations has been rapidly concentrating (towards gold in Uganda and refined petroleum in Togo) and slowly concentrating in a further three (towards gold in Tanzania, refined petroleum in Rwanda and cotton in Benin). Apart from South Africa, the most diverse exporters in the sample are Senegal and Kenya, and even these exports are mainly agricultural and mineral (primary) commodities.[18]

For nations that are dependent on fuel and food imports, there may be a stronger counter effect of declining (or increasing) commodity prices, namely disinflation (or an inflationary surge) and its impact on household consumption. This is particularly relevant for countries with over-valued exchange rate pegs (Senegal and Mali).

As Figure 1 indicates, commodity prices tend to move together in cycles responsive to shifts in global aggregate demand. Over the period studied, there have been four (possibly five) periods of commodity price decline:

- between 2000 and 2002;
- between 2007 and 2009, in response to the global financial crisis (GFC);

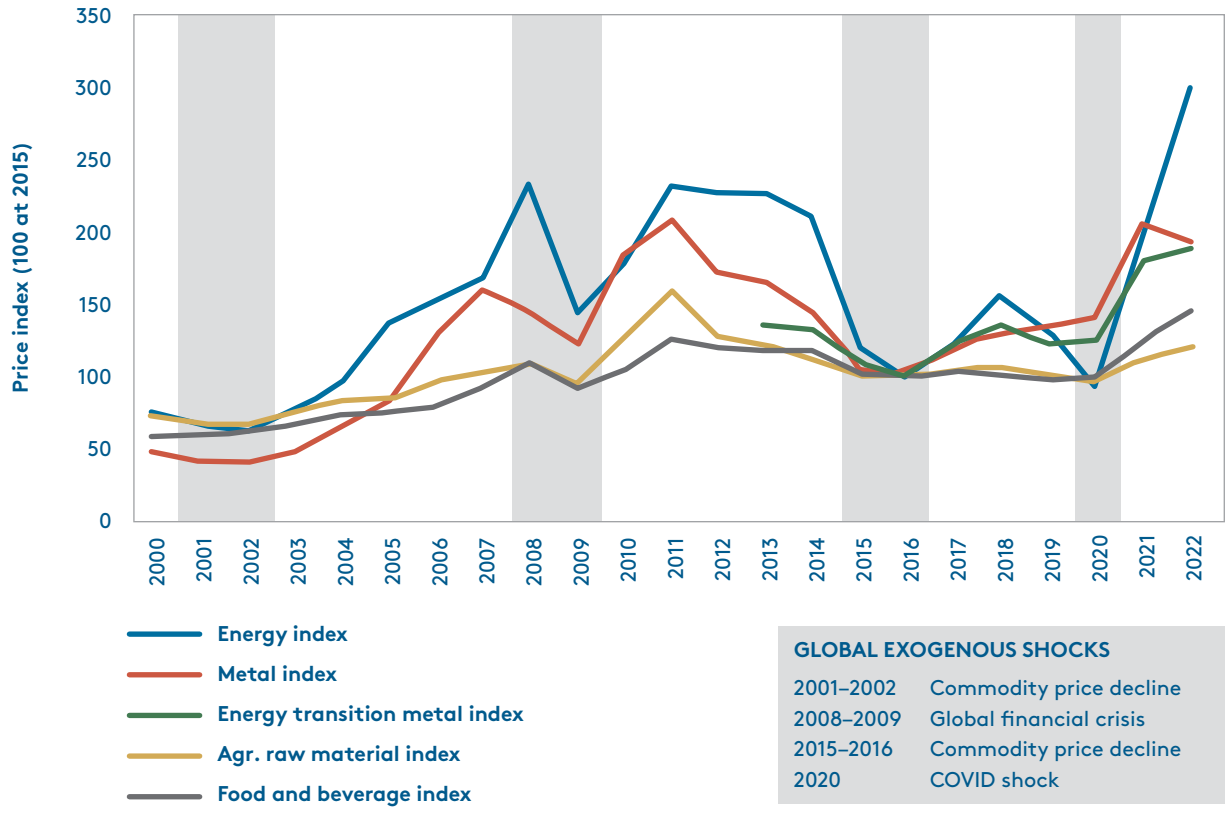
17 Although South Africa has the most diverse export profile of the cohort, its GDP growth prospects are also the most strongly correlated with commodity price movements. This suggests that, with domestic growth prospects stagnant, growth at the margins is driven by export performance.

18 For export and import trade composition and growth by country, see Observatory for Economic Complexity, "Historical Trends: Country Name", https://oec.world/en/profile/country/.

- between 2012 and 2016, possibly reflecting the Chinese switch from export production to domestic consumption;
- in 2019 to 2020, in the wake of trade and movement restrictions induced by the COVID-19 pandemic; and
- in 2023 (not shown in Figure 1), in response to supply chain disruptions from wars in Eastern Europe and the Middle East.

Figure 1 also demonstrates how the global agricultural and food commodity price cycle is more muted than that for fuel or metals. This can be attributed to the price and income inelasticity of demand for food and, to a lesser extent, the dampening of production cycles through diversification of supply chains in risk aversion to climatic or other environmental cycles at source. For Africa's food importers, global price movements are less a reason for inflationary cycles than the aftermath of currency depreciations on domestic non-food inflationary trends.

Figure 1 Composite primary commodity price indices (2000–2022)



Source: International Monetary Fund, "Primary Commodity Price System", https://data.imf.org/?sk=471dddf8-d8a7-499a-81ba-5b332c01f8b9

Eight countries experienced crises between 2000 and 2002 (Botswana, Kenya, Uganda, Rwanda, Senegal, Mali, Benin and Togo) and two decelerations (South Africa and Nigeria). Except for Botswana, exogenous commodity export price declines were a less important factor in determining GDP growth then than they are currently, as countries have become more trade-dependent in the interim. Many of these crises coincided with endogenous climatic shocks, with droughts or floods in five countries tipping these economies into per capita decline. In three countries, public health epidemics drained off resources through quarantining and redirection of government spending (HIV/AIDS in Southern Africa and Ebola in Uganda)).

Following the collapse of global aggregate demand after the GFC, commodity price declines and disinvestment flows led to socio-economic crises in three countries (South Africa, Botswana and Kenya) and decelerations in five (Nigeria, Ghana, Tanzania, Uganda and Rwanda). The four WAEMU countries were seemingly little affected by these GFC-induced commodity price drops. This cannot be attributed to their common exchange rate peg, which might be expected to intensify the contractionary impact of export commodity price declines. With the exception of Mali, the WAEMU countries have relatively diversified export profiles, which may have spread and dissipated the shock. Rather, Senegal and Mali were tipped into crisis by rising imported food prices in 2006–2007. Endogenous climatic shocks contributed to crisis formation in Mali (2007), Benin (2009), Togo (2007) and Kenya (2009). Governance disturbances such as election violence and border conflicts played an important independent role in exacerbating crises during this period because of a loss of confidence in government effectiveness (notably in Togo, Benin, Mali and Kenya).

The decline in global commodity prices between 2012 and 2016 induced the first wave of decelerations in Uganda and Rwanda during 2012–2013 (from declining tea and coffee prices). It also led to a second pulse of decelerations in Nigeria, Kenya, Tanzania and Togo during 2014–2016 and crises in Ghana, South Africa, Botswana and Benin as oil, gold, platinum and diamond prices plummeted. In contrast, Senegal and Mali were unaffected by these export commodity declines but shocked into crisis by imported food price inflation in 2011. Endogenous climate shocks independently triggered crises in Kenya and Tanzania in 2012 while contributing to economic decelerations or crises in six countries. Governance shocks were pertinent in Uganda and Rwanda (budget aid cuts), as well as Mali, Benin and Togo (conflict).

The fourth global exogenous shock to Africa was the COVID pandemic and its associated trade and travel restrictions, which induced economic crisis across the globe in 2019–2020. Ten of the 12 countries were plunged into crisis with declining real per capita incomes. In Nigeria, this had been preceded by four years of recession in recovery from the oil price slump. Crisis was avoided in Tanzania and Benin, where governments forsook domestic quarantining lockdowns in addition to unavoidable international trade shutdowns. Climate shocks independently induced crises of

agricultural production in Uganda and Rwanda in 2017 while contributing to the COVID shock in all four WAEMU countries.

The most recent exogenous commodity price and supply chain shocks of 2022–2023 have provoked a socio-economic recession in South Africa and, coincident with a coup d'état, in Mali, while inducing deceleration in Ghana and Botswana. By contrast, the 2021–2022 rise in food and agricultural commodity prices induced an imported food crisis in the four WAEMU countries.[19]

The following general observations are pertinent. Firstly, countries on a low and decelerating structural growth path are more prone to be shocked into actual crisis (South Africa, Botswana, Kenya and the four WAEMU countries) than those on moderate or accelerating growth paths. Secondly, export commodity price declines are more important in inducing volatility in countries with dominant export commodities while imported fuel and food price increases provoke crises in nations prone to import concentration of these commodities.[20] Thirdly, endogenous climatic and governance shocks are more likely to provoke socio-economic crisis in agriculture-based, low-income economies.[21]

Transmission mechanisms

As indicated above, the most common trigger for socio-economic crises or GDP growth decelerations in countries with dominant export commodity profiles are export commodity price declines. During the short to medium term, the first-stage transmission mechanism consists of disinvestment, declining export values and balance of payments deficit pressures. These, in turn, prompt currency devaluations to cheapen exports in foreign markets and boost local production. The counter-effect is rising import prices and the triggering of a domestic cost-push inflationary surge, especially for food and fuel with relatively inelastic demand. The third stage of transmission is through the loss of fiscal revenue and capacity with which to counter-spend. Employment losses characterise the first stage, declining household incomes and consumption the second stage, and declining social spending the third stage over the short to medium term.

Export losses trigger production decelerations in countries with fixed currency pegs, but exogenous rises in imported food and fuel prices appear more likely to provoke crisis directly through declining real incomes and consumption in the short term. Such direct transmission into economic loss, without an inflationary shock absorber, may be implicated in the pegged regimes' lower-than-average investment and GDP growth performances.

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19 For country developments in 2021–2023, see The World Bank, "Where We Work", https://www.worldbank.org/en/where-we-work.

20 For commodity prices, see the historical data charts at Trading Economics, "Commodities", https://tradingeconomics.com/commodities/.

21 For climatic shocks, see World Bank, Climate Change Knowledge Portal, Risk – Historical hazards, 2023, https://climateknowledgeportal.worldbank.org/general-resources.

Endogenous climatic shocks transmit directly into a loss of agricultural production, rural household incomes and export volumes, and may necessitate food importation. Food scarcity in turn induces domestic food price inflation, declining real wages and food insecurity. Endogenous health epidemics may reduce the labour supply and human capital, but in labour-surplus economies this is unlikely to translate into GDP recession. Additional health-spending demands may prompt fiscal deficit-inducing pressures, as would be the case with additional security spending during social unrest and border conflicts. The main impact of governance crises is on investor or donor confidence and, where there is violent conflict, the destruction of infrastructure. The importance of governance in building or sustaining macroeconomic resilience is discussed further in the next two sections.

Policy responses

National governments' authority to manage both the structural growth path and the volatility of the business cycle gives them some potential to use the tools of monetary policy and of fiscal policy to impact the external debt, trade and investment positions of their national accounts. Monetary policy tools consist of base money supply, policy rate and reserve adequacy requirements, while those of fiscal policy are revenue collection and spending prioritisation. Their capacity to do so depends on inherited income status and the proportion of GDP facilitated by the broad money supply and generated by the public sector.

The ability to manage volatility such that it contributes to structural growth (and lower poverty), and hence to absorb and recover from shocks, depends crucially on how the upcycle is harnessed to build resilience through asset and reserve accumulation or liability reduction. At their most capable, national authorities can dampen both the up- and downcycles through countercyclical monetary and fiscal policy instruments.

The findings show that the two SACU members are the most capacitated to influence their growth and inflation cycles. However, most of the cohort are of lower-income status with smaller financial markets and public sectors relative to GDP. This means that their capacity to manage production, inflation or political cycles is correspondingly disabled. Despite using the policy tools available, they are more likely to be unable to counter the exogenous shifts in aggregate demand or supply. Alternatively, leads and lags in policy impulses may yield perverse (or fortuitous) results that counter the intended result of policy in the short term. Under the most adverse conditions, monetary and fiscal policy are incapable of being other than a victim of the production or inflation cycles or to even accentuate their volatility. Greater indebtedness and redirection of spending towards debt servicing is an important accumulated feature of deteriorating resilience.

A breakdown of possible monetary and fiscal policy responses to down- and upcycles is presented in Table 3. Where the impact counters/compounds the production or price cycle it is labelled countercyclical/procyclical, whether by intention or default. Passive responses are those that allow the money supply or revenue to respond endogenously to fluctuations in aggregate demand but use nominal interest rates and spending to (ineffectively) counter the cycle over the short term. Active responses are those that use their power to exogenously adjust money supply growth and revenue collection to counter (or perversely compound) the inflation or output cycles.

Table 3 Procyclical versus countercyclical monetary and fiscal policy options

Monetary policy responses	Downcycle (Trough)	Upcycle (Peak)
Passively procyclical	Broad money growth decelerates, nominal interest rate declines	Broad money growth accelerates, nominal interest rate rises
Actively procyclical	Broad money growth decelerates, nominal interest rate rises	Broad money growth accelerates, nominal interest rate declines
Passively countercyclical	Broad money growth accelerates, nominal interest rate rises	Broad money growth decelerates, nominal interest rate declines
Actively countercyclical	Broad money growth accelerates, nominal interest rate declines	Broad money growth decelerates, nominal interest rate rises
Fiscal policy responses	**Downcycle (Trough)**	**Upcycle (Peak)**
Passively procyclical	Revenue and spending growth decelerating	Revenue and spending growth accelerating
Actively procyclical	Revenue growth accelerating, spending growth decelerating	Revenue growth decelerating, spending growth accelerating
Passively countercyclical	Revenue and spending growth accelerating	Revenue and spending growth decelerating
Actively countercyclical	Revenue growth decelerating, spending growth accelerating	Revenue growth accelerating, spending growth decelerating

Source: Compiled by author

It should be noted that, although the expected outcome of these monetary and fiscal policy responses may be procyclical or countercyclical, they do not necessarily lead to fiscal, internal or external balance. Assessing this would require extended studies on the potential for and sequencing of the coordination of exchange rate, monetary and fiscal policies under different inherited structural and institutional environments.

There is some asymmetry in expectations of monetary versus fiscal policy. Monetary policy is generally focussed on stabilising the price inflation cycle but is often expected to manage the production cycle too, despite no necessary short-run coincidence between the two cycles. Fiscal policy is intended and expected to manage the production cycle, despite the possible impacts on the inflationary cycle (through, for example, the external or domestic debt position).

Table B1 in Annexure B sets out a review of the de facto and short-term monetary policy responses to both production and inflation cycles, and fiscal policy responses to the production cycle across the cohort for 2000–2021. Of contextual significance is that, based on historical evidence, output and inflation cycles do not coincide over the short term. This is true both across the cohort and for each country. Rather, the cycles appear to lead or lag each other over the medium term. This challenges the assumptions behind equilibrating towards internal balance and complicates the (sequencing of) policy measures designed to achieve it. If production and inflation cycles are asynchronous, and the relative emphases of the fiscal and monetary authorities are asymmetric, the parties are incentivised to pursue different objectives (which may/not be discordant with each other). The most likely explanations for these asynchronous cycles are supply disturbances and cost-push inflationary events, possibly transmitted through external imbalances.

The most common outcomes of monetary policy are what is dubbed 'actively procyclical' or 'passively countercyclical', meaning that the relevant authorities lack either the capacity (a structural issue) or the willingness (a policy operational issue) to resist the weight of external and domestic market forces or use the tools available to them. Success in achieving countercyclical results is more apparent with the inflation than the output cycle, but only marginally so. This finding is corroborated by the proportion of observation years in which countercyclical instruments were used (61% vs 48%). South Africa, Kenya and Uganda were the only countries more successful in countering their production than their price cycles through monetary policy. The four WAEMU countries exhibit the most consistent emphasis on the inflation rather than the output cycle.

With respect to fiscal policy, 'actively procyclical' and 'passively countercyclical' outcomes are the most likely. This means that, intentionally or otherwise, the fiscal authorities do not or cannot use both revenue and spending tools to counter the business cycle. The country most consistently using fiscal policy countercyclically is Uganda, while the country least able or willing to do so is Tanzania with its non-interventionist stance. The country most likely to achieve procyclical outcomes is Kenya.

It is possible that countries that more consistently attempt to counter troughs rather than peaks weaken their structural resilience and capacity to use monetary and fiscal policy instruments to do so (and vice versa). However, it is not possible to test this hypothesis with the evidence available, since our analysis shows little deviation from a cross-country norm of alternating between pro- and countercyclicality across both business peaks and troughs.

Inasmuch as policy uncertainty correlates with lags in information flows, data availability becomes relevant in improving policy responsiveness in the short run. Table B1 indicates the proportion of years between 2000 and 2021 for which there is no finalised and standardised data available per country from global financial institutions. On average, 23% and 31% of the basic

data needed to assess monetary and fiscal policy respectively is missing, reaching as high as 45% and 73% in the WAEMU countries. This points to the importance of domestic institutional capacity building to collect, compile and project the data necessary to analyse macroeconomic resilience.

The most comprehensive dataset is captured by the South African authorities. It is sufficient to enable a principal components regression of macroeconomic resilience with GDP growth, and a monetary and fiscal policy impulse-response function for that country in the companion paper to this policy synthesis.[22]

Policy capacity and effectiveness

Cross-country analysis

Table 4 Correlation analysis between primary macroeconomic indicators (2000–2021)

	Real GDP growth		Real GDP growth		Inflation			Real GDP growth		Export growth	
	Inflation	Broad money growth	Exchange rate appreciation	Export growth	Broad money growth	Real interest rate	Exchange rate appreciation	Fiscal revenue growth	Fiscal spending growth	Exchange rate appreciation	Export commodity dominance
Nigeria	0,35	0,30	0,40	0,08	-0,22	-0,90	0,32	-0,07	-0,03	0,24	single
Ghana	0,02	-0,02	0,29	0,29	-0,83	0,38	-0,03	0,22	0,19	-0,49	dual
South Africa	0,19	0,41	0,22	0,65	0,57	-0,10	-0,32	0,84	0,21	-0,29	dual
Botswana	-0,22	0,25	-0,05	0,81	-0,63	-0,72	-0,05	0,81	0,03	0,14	single
Tanzania	-0,06	0,26	-0,17	0,25	-0,09	-0,92	-0,05	-0,06	0,35	-0,21	slowly concentrating
Kenya	-0,02	0,27	0,26	0,17	0,34	-0,92	-0,20	0,17	0,08	0,04	diverse
Uganda	0,08	0,12	0,10	0,23	-0,83	-0,98	-0,32	-0,34	-0,02	0,38	rapidly concentrating
Rwanda	-0,38	0,44	0,20	-0,06	0,12	0,47	0,10	0,15	0,06	-0,27	slowly concentrating
Senegal	-0,29	0,29	-0,13	0,32	-0,52	-0,98	0,07	-0,56	-0,58	0,00	diverse
Mali	-0,05	-0,15	0,08	0,21	-0,44	-0,95	-0,12	0,05	0,18	-0,36	single
Benin	-0,32	0,14	0,19	0,58	-0,08	-0,94	-0,08	-0,01	0,69	0,23	slowly concentrating
Togo	-0,03	0,11	-0,04	-0,16	-0,72	-0,99	-0,13	0,23	0,08	0,28	rapidly concentrating

Source: Compiled by author from World Bank, "World Development Indicators", https://databank.worldbank.org/source/world-development-indicators

22 Ndou, "The Information Content of Macroeconomic".

There is no consistent co-movement between exchange rates and export performance, both across the cohort and within the pegged, managed or free-floating exchange rate regimes. The direction of causality is likely to vary from country to country, where export acceleration/deceleration can generate currency appreciation/depreciation, or currency movements stimulate/depress trade. Export growth is generally (eight of the 12 countries) weakly associated with GDP growth but quite strongly correlated therewith in the two SACU economies. Weakly moderate co-movement between currency appreciation and GDP growth is exhibited across most of the cohort.

More economies (eight of the 12) exhibit negative co-movements between GDP growth and inflation, indicating non-coincidence between production and price cycles over the short term. However, the correlations are weak to moderate. This is true for all the WAEMU pegged currency regimes. The remainder find a positive co-movement of growth and inflation (or coincidence of cycles) of similarly weak to moderate correlation magnitude.

Weak to moderate co-movement is witnessed in most (10 of the 12) countries between GDP and broad money growth, suggesting monetary accommodation and a deepening of financial markets. Where the opposite negative relationship is observed, the correlations are weak or insignificant. In most countries (nine of the 12), monetary deceleration is the response to mainly imported inflationary surges (or vice versa) and most of these co-movements are quite strongly correlated in the short term. This suggests that a countercyclical monetary policy to the inflationary cycle is the norm. That said, monetary management through raising/lowering the policy or repo rates is rarely sufficient to prevent a decline/increase in the real interest rate during an inflationary acceleration/deceleration. South Africa and Kenya, which have the deepest money and financial markets, are the prominent exceptions to the negative relationship between money growth and inflation, suggesting some monetary accommodation of inflation.

As a generalisation, more countries (eight of the 12) display a positive, albeit weak to moderate, fiscal procyclicality owing to the impact of GDP and export growth on fiscal revenues. While countercyclical spending may be attempted (as indicated in the rather weaker positive correlations between GDP and spending growth), it is rarely sufficient to overcome any loss of revenue or to moderate any gain. Specific countercyclical exceptions to this generalisation are weakly related (Nigeria) to moderately so (Senegal).

Box 1 Country-specific analyses

Nigeria – weakly moderate correlations

Nigeria displays a relatively unusual characteristic (within the cohort) of weakly moderate positive correlations between exchange rate depreciation, export growth acceleration, disinflation and GDP growth acceleration (and vice versa). Nigeria also shows the highest coincidence of growth and inflationary cycles within the cohort. As is common across the cohort, however, procyclical monetary and fiscal outcomes are the norm, where efforts to counter the output cycle are insufficient to temper volatility induced by (oil) commodity price movements. As in most of the cohort, greater effort goes into managing the inflation than the output cycle, with a weak negative correlation between inflation and broad money growth. The relationship between fiscal revenue or spending with GDP growth is negligible.

Ghana – mostly weak correlations

In sharpest contrast to Nigeria, Ghana exhibits a moderately negative relationship between exchange rate movements and export growth. Export growth is weakly positively correlated to GDP growth, and currency devaluations are more closely related to output growth than currency appreciations are. Unlike Nigeria, there is negligible correspondence between currency movements and either inflation or GDP growth. While procyclical monetary and fiscal outcomes reflect the average condition, Ghana's monetary policy is the most consistently and effectively counter-inflationary of the cohort, displaying a strong negative correlation between inflation and money growth and a moderately positive relationship with the interest rate. This emphasis is consistent with controlling the highest average inflation rate of the cohort. Fiscal revenue and spending are weakly positively related to GDP growth, reaffirming the procyclical outcome of fiscal policy.

South Africa – moderate correlations

South Africa also exhibits a weak likelihood of currency depreciations stimulating export growth, and a stronger probability that this will generate output growth. Growth and inflation cycles are weakly coincident and enabled by currency devaluations through imported cost-push inflation. Broad money growth is moderately accommodative of both output growth and, in sharpest contrast to the rest of the sample, even more so for inflation. This reflects and enables the deepening of money and credit markets. Monetary and fiscal policy is effectively procyclical despite South Africa's greatest capacity to enact countercyclicality. This is consistent with a low-growth or stagnant domestic economy relying on marginal stimulation through positive exogenous shocks.

Botswana – mostly weak but with some strong correlations on monetary and fiscal indicators

Like Nigeria, Botswana's exports are dominated by a single export, thus the relationship between currency appreciation and export growth is positive but weak. Export growth is (the most) strongly correlated with GDP growth, implying that socio-economic prospects are highly dependent on diamond price movements which, like other commodities, were on a downcycle between 2012 and 2021. Monetary policy is very consistently directed at controlling imported inflation from South Africa through deceleration of money growth but fails to curb procyclicality by adjusting interest rates. Inflation and growth cycles are weakly likely to be discordant, with little expectation that the output cycle can be managed. As with its larger neighbour, revenue collection is strongly correlated with GDP growth and spending negligibly, suggesting that countercyclical fiscal policy action is incapable of preventing procyclical outcomes. This is despite Botswana being one of the few countries to consistently generate budget surpluses, keeping its debt burdens the lowest of the cohort.

Tanzania – weak correlations

Tanzania's trade-generated fortunes are increasingly dependent on movements in the gold price. Exports and GDP growth are weakly associated with currency depreciations. There is negligible co-movement between exchange rate movements, GDP growth and inflation. Broad money growth is weakly associated with GDP growth accommodation, but there appears to be negligible monetary management of the output or inflation cycles other than a more consistent application of inflation peak targeting. Revenue collection is unrelated to GDP growth and spending policy is moderately procyclical. Despite minimal monetary and fiscal countercyclical intervention, the Tanzanian economy has sustained one of the highest rates of per capita GDP growth in the cohort.

Kenya – weak to negligible correlations

Kenya's export profile is relatively diverse and diffuse (wide-ranging and changes frequently), such that the impacts of dominant commodity price changes are less noticeable. Currency appreciation is weakly positively related to GDP and export growth, but negatively so with imported inflation. Consequently, there is undetectable coincidence or discordance between growth and inflation cycles. As in South Africa, monetary accommodation of both output and inflation cycles is the de facto norm despite countercyclical policy attempts to both target inflation and stabilise the business cycle. GDP growth weakly enables fiscal expansion with declining deficits (and vice versa). Monetary and fiscal policy is effectively weakly procyclical.

Uganda – weak to moderate correlations

Traditionally, agricultural goods (primarily coffee) have been Uganda's exporting mainstay. Since 2016 gold has been the country's dominant foreign exchange earner, and with it comes the challenges of single commodity dependence on financial, monetary and fiscal management. As export volumes rise, the exchange rate tends to appreciate moderately. GDP growth is weakly synched into export growth (and vice versa with commodity price declines). For example, a currency depreciation is moderately likely to import cost-push inflation (and vice versa), such that there is negligible coincidence between GDP growth and inflation. Broad money growth is weakly accommodating GDP growth, but there is a strong negative relationship with inflation, suggesting that monetary policy is strongly countercyclical. Fiscal revenue accumulation appears to be weakly countercyclical and there is no evidence of countercyclical government spending capacity.

Rwanda – weak to moderate correlations

Rwanda has a relatively diverse export portfolio of mineral and agricultural products, the composition of which has changed several times (with gold becoming primary over the past decade). Currency depreciations are weakly associated with export stimulation (and vice versa), but the accompanying import contraction weakly suppresses GDP growth. Inflation is moderately negatively correlated with GDP growth. Active monetary policy is practised by setting the policy or repo rates to rise faster (fall slower) than inflation but fails to choke off broad money supply accommodation of inflationary growth. Fiscal policy is consistently countercyclical over both output troughs and peaks but fails to avoid a weakly procyclical outcome.

Senegal – weak to moderate correlations

Despite a currency peg to the euro, which has been structurally appreciating against the dollar, coupled with limited monetary policy autonomy, each of the WAEMU countries responds to currency fluctuations and exogenous shocks uniquely. Export composition is diverse and export performance in Senegal is unrelated to exchange rate movements, but appreciations have a weak probability of decelerating GDP growth through financial investment, domestic employment and consumption channels. Output and inflation cycles tend to be discordant. Broad money growth is weakly accommodative of GDP growth and moderately counter-inflationary, but no consistent use of countercyclical tools is made across successive stages of either the inflation or output cycles, such that the outcome of monetary policy is procyclical. This may reflect discordance between European and domestic cycles and policy priorities. GDP growth is moderately and negatively correlated with both fiscal revenue and spending, implying that fiscal policy is moderately countercyclical but unable to avoid procyclical outcomes.

Mali – weak to moderate correlations

Mali is a single export commodity-dependent economy. Externalised exchange rate depreciations are moderately likely to stimulate exports (mainly gold), which weakly stimulates GDP growth (and vice versa), such that there is insignificant correlation between currency movements and GDP growth. Currency depreciation is very weakly correlated with inflation (and vice versa). GDP growth and inflationary events are, respectively, weakly and moderately negatively associated with money growth. This suggests that countercyclical monetary responses are moderately likely to coincide with inflationary events but unable to avoid a procyclical outcome. There are very weak indications that fiscal policy is procyclical.

Benin – mostly weak correlations

As the pegged exchange rate appreciates, exports and GDP are weakly stimulated. Benin's exports are relatively diverse and diffuse, with cotton as a constant component, but with intermittent production for export of gold and refined petroleum. The WAEMU countries' externalised monetary responses are more coincident with countering imported cost-push inflation than enabling monetary accommodation to GDP growth, but the correlation is negligible. Fiscal spending is strongly procyclical despite negligible correlation between fiscal revenue and GDP growth.

Togo – mostly weak correlations

Togo's relatively diversified and volatile export base has been morphing into single-commodity dependence based on refined petroleum since 2016. Export growth is weakly stimulated by an exchange rate appreciation, but there is a weak indication that this does not translate into GDP growth. There is insignificant evidence that exchange rate movements are correlated with either growth or inflation. Growth and inflation cycles are equally likely to be coincident or discordant over the short term. Monetary contraction is strongly correlated with inflation surges and weakly associated with monetary accommodation of GDP growth. There is very weak indication that fiscal responses are procyclical.

Macroeconomic resilience and real GDP growth relationships

After reviewing the theoretical literature on macroeconomic resilience (and vulnerability), the seven component sub-indices and their constituent indicators that make up our proposed macroeconomic resilience index (CoMPRA-MERI) are defined. This follows through to a preliminary analysis of the relationships with real GDP growth based on dynamic correlation analysis. It should be noted that the results presented are preliminary for the 12-country cohort, since no principal component analysis of the otherwise equally weighted indicators/sub-indices has been undertaken to reweigh the components according to the extent of co-correlation between them.[23] Further, no inference on the direction of causality or dominance of contextual and policy variables on GDP growth can be made without vector autoregression and forecast error variance decomposition.

Defining macroeconomic resilience

As developed by Briguglio and others, the extant literature on developing macroeconomic resilience indices generally makes a distinction between inherent vulnerability and nurtured resilience, with the latter assumed to be under some form of policy direction. Factors generally considered indicative of structural macroeconomic vulnerability include the degree of trade

23 Principal component analysis reduces the number of useful dimensions and signifies which components are independent of each other. Generally, it can only serve its purpose if correlations are at least moderate (above 0.4).

openness, export concentration and dependence on strategic imports (notably fuel and food).[24] Together with the nature of currency exchange regimes (pegged to floating), these three primary indicators of vulnerability have been used to analyse the structural context within which the macroeconomic performance and resilience of the 12-country cohort are enabled. In their application of this methodological approach to the COVID-19 pandemic shock in sub-Saharan Africa, Diop, Asongu and Nnanna expand the concept. This is done by including net foreign investment, net personal remittances, official development assistance (ODA), natural resource rents and sectoral concentration as indicators of vulnerability, owing to their volatile and procyclical characteristics.[25]

Briguglio et al. illustrate their independently contrasting concept of nurtured resilience as being inclusive of:[26]

- macroeconomic stability (including fiscal and external balance, inflation and unemployment);
- microeconomic efficiency (a proposed index of anti-competitive regulation of the financial, labour and product markets); which is in turn likely to be influenced by
- measures of good governance (and social cohesion); with
- a proposed sub-index of environmental management of water, energy and waste.

Diop et al. use the available indicators of macroeconomic stability and good governance in their Africa-focussed study of the COVID shock, include the Human Development Index and use the agricultural share of output as indicative of independence from food importation.[27]

Our specific adaptation of this approach is threefold. Firstly, it allows a deepening of the resilience (side of the) index in terms of its applicability to monetary, fiscal and, to a lesser extent, exchange rate policy. Secondly, it allows a substitution of the inherited vulnerability concept with one of structural features and trends that can be incrementally improved/impaired by government over the medium to longer term, and of the nurtured resilience concept with that of capacity to manage the business cycle over the short term. In this formulation, both vulnerability and resilience can be nurtured through policy action, but with variable structural constraints

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24 Lino Briguglio, "Economic Vulnerability and Resilience: Concepts and Measurements", in L Briguglio and EJ Kisanga (eds), *Economic Vulnerability and Resilience of Small States* (Malta and London: Islands and Small States Institute and Commonwealth Secretariat, 2004).

25 Samba Diop, Simplice A Asongu and Joseph Nnanna, "COVID-19 Economic Vulnerability and Resilience Indexes: Global Evidence", *International Social Science Journal* 71, no. S1 (2021): 37–50.

26 Lino Briguglio et al., "Economic Vulnerability and Resilience Concepts and Measurements" (WIDER Research Paper 2008/55, Helsinki, UN University, World Institute for Development Economics Research, 2008).

27 Diop, Asongu and Nnanna, "COVID-19 Economic Vulnerability".

on what is feasible. Finally, this, in turn, informs the decision to treat vulnerability as part of a continuum from lesser to greater resilience.

As indicated previously, CoMPRA-MERI comprises seven sub-indices corresponding broadly with the component indicators indicated in the base literature. These are fiscal balance, external debt position, external trade and investment balances and governance scores. Following Rojas-Suarez, we include monetary variables into an additional sub-index[28] and adapt the human capital components to reflect progress in employment, social spending and dependency ratios. The index comprises 50 indicators that can be drawn from the WDI and the IMF, among other global data sources. Annexure D lists all indicators per sub-index and their data sources and hypothesises the expected relationship of that variable (positive or negative) to resilience and GDP growth. It also provides the rationale for its inclusion as a short-term cyclical indicator, a possible counter-rationale for a longer-term structural indicator and theoretic references (with hyperlinks). Indicators without a theoretic reference are added to elicit the relevance of variables of (monetary and fiscal) policy that governments can influence.

Resilience trends and policy implications: Cross-country analysis

Table 5 compares the co-movement between real GDP growth and (the seven components of) the macroeconomic resilience index with two measures. First (and with reference to Figures 2–13), the long-term trend lines are compared for the sign of their relationships. Second, the equivalent correlation coefficients are calculated from the underlying data for each country and for the duration of its available time series. Where both trendline and correlation analysis coincide, the relationship is shaded in blue for positive and green for negative coefficients. Where the long- and short-term measures are discordant, they are shaded in beige.

As is immediately apparent from Table 5, there is great diversity in the direction and magnitudes of relationships both across countries and sub-indices of macroeconomic resilience. Correspondingly, the evidence of generalisable relationships across the cohort is relatively limited. Within and between countries, there are multiple interacting variables affecting movement towards greater resilience or balance and it should not be surprising that correlations are negligible, weak or ambiguous. In the absence of reliable benchmarks or counterfactuals, it is only really feasible to compare against each other's performance than against an unquantifiable ideal. Even these cross-country comparisons may be deemed spurious by the different number of annual observations for each country indicator.

28 Liliana Rojas-Suarez, "Identifying Macroeconomic Resilience to External Shocks in Emerging and Developing Countries: Lessons from the Global Shocks of 2020–2022" (Working Paper, Centre for Global Development, Washington DC, October 2023).

Table 5 Long-term trendline relationships versus correlation coefficients – GDP growth against components of macroeconomic resilience (2000–2021)

Regional Economic Community	Country	GDP growth path	Macro-economic resilience	Fiscal	Monetary	External debt	Trade	Investment	Governance	Human capital
ECOWAS	Nigeria	moderate, decelerating	improving, negatively correlated -0.43	deteriorating, positively correlated 0.06	improving, negatively correlated -0.29	***improving, negatively correlated 0.03***	deteriorating, positively correlated 0.04	deteriorating, positively correlated 0.40	improving, negatively correlated -0.73	improving, negatively correlated -0.58
ECOWAS	Ghana	moderate, decelerating slightly	improving, negatively correlated 0.36	***improving, negatively correlated -0.10***	improving, negatively correlatedd -0.09	deteriorating, positively correlated 0.31	improving, negatively correlated -0.18	***improving, negatively correlated 0.28***	***improving, negatively correlated 0.40***	***improving, negatively correlated 0.09***
SACU	South Africa	low, decelerating	deteriorating, positively correlated 0.78	deteriorating, positively correlated 0.70	constant, positively correlated 0.35	deteriorating, positively correlated 0.67	improving, negatively correlated -0.14	***improving, negatively correlated 0.14***	deteriorating, positively correlated 0.68	improving, negatively correlated -0.41
SACU	Botswana	low, constant	deteriorating, positively correlated 0.36	***improving, negatively correlated 0.37***	***improving, negatively correlated 0.28***	deteriorating sharply, positively correlated 0.05	***improving, negatively correlated 0.38***	deteriorating sharply, positively correlated 0.08	deteriorating, positively correlated 0.03	***improving, negatively correlated 0.01***
EAC	Tanzania	moderate, decelerating slightly	deteriorating, positively correlated 0.32	improving, negatively correlated -0.12	deteriorating, positively correlated 0.22	deteriorating, positively correlated 0.31	***deteriorating slightly, positively correlated -0.07***	deteriorating, positively correlated 0.37	deteriorating, positively correlated 0.12	***improving, negatively correlated 0.35***
EAC	Kenya	low, accelerating	improving, positively correlated 0.75	deteriorating, negatively correlated 0.00	improving, positively correlated 0.33	deteriorating, negatively correlated 0.04	***deteriorating slightly, negatively correlated 0.21***	deteriorating sharply, negatively correlated 0.00	improving sharply, positively correlated 0.52	improving sharply, positively correlated 0.27
EAC	Uganda	moderate, decelerating	improving, negatively correlated 0.14	***deteriorating, positively correlated -0.38***	deteriorating, positively correlated 0.64	deteriorating, positively correlated 0.44	deteriorating, positively correlated 0.37	deteriorating, positively correlated 0.32	***improving, negatively correlated 0.46***	improving sharply, negatively correlated -0.42

Regional Economic Community	Country	GDP growth path	Macro-economic resilience	Fiscal	Monetary	External debt	Trade	Investment	Governance	Human capital
EAC	Rwanda	high, decelerating	improving, negatively correlated -0.08	deteriorating, positively correlated 0.03	***improving, negatively correlated 0.32***	deteriorating, positively correlated 0.39	improving, negatively correlated -0.20	deteriorating sharply, positively correlated 0.38	improving sharply, negatively correlated -0.36	improving sharply, negatively correlated -0.30
ECOWAS-WAEMU	Senegal	low, accelerating	improving, positively correlated 0.57	deteriorating, negatively correlated -0.05	***deteriorating, negatively correlated 0.27***	deteriorating, negatively correlated -0.10	***deteriorating slightly, negatively correlated 0.16***	deteriorating, negatively correlated -0.27	improving sharply, positively correlated 0.31	improving sharply, positively correlated 0.36
ECOWAS-WAEMU	Mali	low, decelerating	deteriorating, positively correlated 0.11	improving, negatively correlated -0.08	slightly improving, negatively correlated -0.15	improving, negatively correlated -0.12	***deteriorating slightly, positively correlated -0.23***	deteriorating, positively correlated 0.28	deteriorating sharply, positively correlated 0.24	improving, negatively correlated 0.06
ECOWAS-WAEMU	Benin	low, accelerating	improving, positively correlated 0.14	***deteriorating, negatively correlated 0.04***	improving, positively correlated 0.00	deteriorating, negatively correlated -0.37	improving, positively correlated 0.17	***deteriorating, negatively correlated 0.11***	***deteriorating, negatively correlated 0.33***	improving, positively correlated 0.23
ECOWAS-WAEMU	Togo	low, accelerating	improving, positively correlated 0.47	***deteriorating, negatively correlated 0.18***	deteriorating slightly, negatively correlated -0.01	improving slightly, positively correlated 0.18	deteriorating, negatively correlated -0.31	improving, positively correlated 0.08	improving, positively correlated 0.31	improving, positively correlated 0.57

KEY	GDP growth decelerating, resilience deteriorating, positive correlation	GDP growth accelerating, resilience improving, positive correlation	GDP growth decelerating, resilience improving, negative correlation	GDP growth accelerating, resilience deteriorating, negative correlation	***Long term trend co-movements contradict short-term correlation analysis***

Source: Compiled by author from World Bank, "World Development Indicators", https://databank.worldbank.org/source/world-development-indicators

For both the short and long term, composite macroeconomic resilience is positively correlated with GDP growth trends in 10 of the 12 countries. Associations are strong for South Africa (both declining) and Kenya (both improving); moderately so for Ghana (during downcycles only), Botswana and Tanzania (declining), and Senegal and Benin (improving); and weakly so for Uganda (during downcycles only), Mali (decreasing) and Togo (increasing). In two countries the association is negative over both the long and short term – in Nigeria moderately so (showing improved resilience but decelerating growth) and in Rwanda negligibly so. In Ghana and Uganda, the upcycles also tend to be accompanied by declining resilience.

Governance is one of the more important driving forces constituting resilience through its impact on investor confidence, fiscal balance and monetary policy consistency. Governance indicators are improving in seven of the 12 countries and deteriorating in five. Correlation with GDP growth is positive in 10 of the 12 countries in the short term (and in seven of the 12 over the long term). The positive correlation is strong for South Africa, moderate in Uganda and weak to insignificant in the remainder. The two outliers with negative co-movements are Nigeria (with a strong correlation between improving governance and decelerating growth) and Rwanda (with a moderate one). This unexpected finding might be attributed to the dominance of the oil price in Nigeria's growth performance and as a statistical artifice for Rwanda's deceleration from an unsustainably high GDP growth rate (averaging 4.9% in per capita terms between 2000 and 2021).

As a structural trend, all countries in the cohort are building generational resilience through human capital formation (defined as improved employability through educational achievement and extension of life expectancy). In four countries where GDP growth is decelerating (Nigeria, South Africa, Uganda and Rwanda), the correlations are unambiguously negative. This suggests that increased (public) employment rates and social spending from the fiscus may be contributing to fiscal drag on growth through rising debt accumulation and servicing. In the remaining countries where growth is decelerating (Ghana, Botswana, Mali and Tanzania), the associations are undetectable. For Tanzania, however, the correlation becomes moderately positive over the short term, implying that social spending is procyclical and that this directly impacts public sector employment, life expectancy and educational achievement in the short term. Since Tanzania is a high-growth (albeit decelerating) economy, rising state expenditure on personnel and transfers and hence human capital improvement is the norm. Weak to moderately positive co-movement is indicated for Kenya, Senegal, Benin and Togo, where GDP growth is accelerating and raising (both public and private) employment-to-population ratios and human capital outcomes.

The investment position is positively correlated (but weak to moderately) with governance rankings in eight of the 12 countries, probably owing to the impact of policy uncertainty on investor confidence. In two countries, the relationship is negligible or ambiguous and only in

Nigeria and Senegal does the investment position move contrary to governance trends to a weakly moderate degree. The dominance of oil price trends in influencing investment positions can explain this contrary result for Nigeria. However, as indicated earlier, the disengagement between Senegal's growth acceleration and declining investment performance is difficult to interpret.

While shifts in the terms of trade are useful in predicting crises, decelerations and accelerations in growth, evidence on the relationship between trade resilience and GDP growth is undetectable (two of the 12 cases), weak (seven) or discordant between long- and short-term relationships (five). Approximately half the sample exhibits improving/deteriorating trade resilience while a different half indicates positive/negative relationships. The strongest (weakly moderate) correlations between trade resilience and GDP growth are for Uganda (where declining long- and short-term trends coincide) and Botswana (where the relationship is only positive over the business cycle). The strongest negative relationship (weakly moderate) is for Togo, where accelerating growth and a deteriorating trade position coincide both structurally and cyclically. In general, however, the direction, magnitude and causality of relationships of trade with other sectors of the economy are largely indeterminate in the absence of more complex principal components and multiple regression analysis.

The external debt position is improving only in Nigeria (through active debt management) and Mali (through market exclusion). Elsewhere, debt has been accumulated since the application of the Heavily Indebted Poor Countries Initiative between 2006 and 2008, such that servicing burdens have been rising steadily since the mid-2010s. There is a positive correlation between external debt resilience and GDP growth in eight countries (strong in South Africa, moderate in four countries and weak in three). Where there are negative relationships between resilience from external debt and GDP growth, the co-movement is negligible or weak. It can hence generally be stated that external debt accumulation is a net drag on GDP growth even though that debt can be used for productive investment.

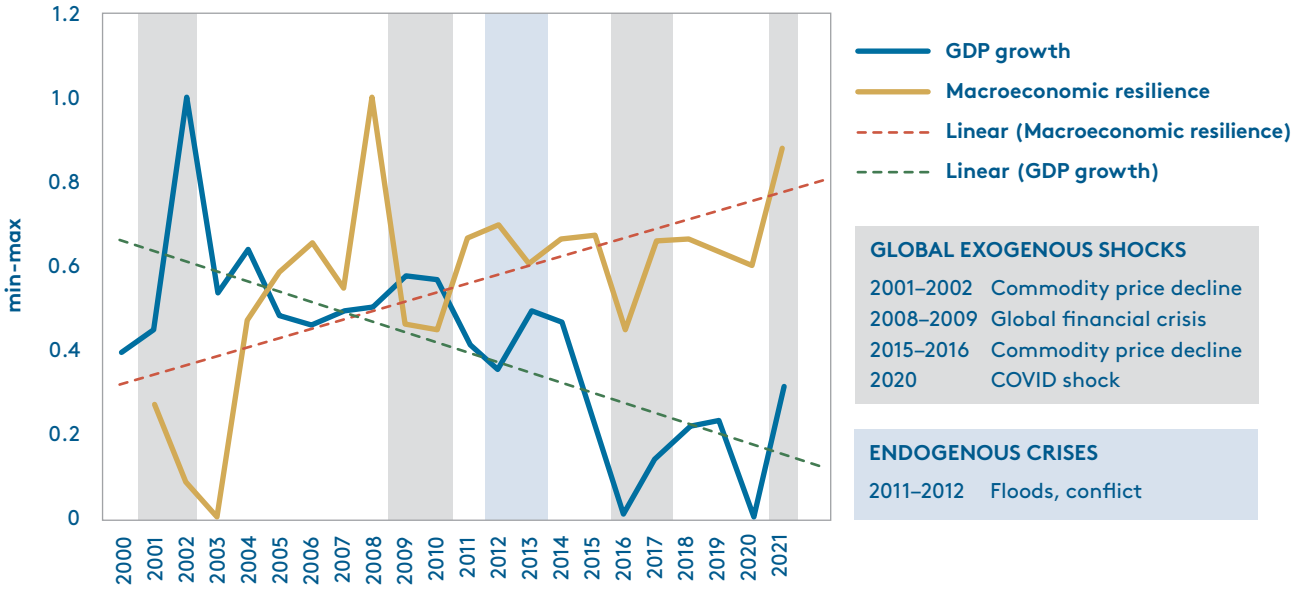
Over the long term, half the cohort indicated a positive relationship between GDP growth and the monetary resilience secured through a combination of monetary accommodation to growth and counter-inflationary monetary management. Seven countries exhibited a positive relationship on a year-by-year basis, but most of the correlations were weak to moderate, with the remainder negligible. The rest of the cohort exhibited a negative correlation, implying that inflationary surges accompany growth accelerations, such that counter-inflationary monetary management chokes off these upcycles (and vice versa). This is also weak to moderately evident in the two West African countries that operate managed currency floats, namely Nigeria and Ghana. The evidence for a negative relationship is weak to negligible (and often ambiguous) in the WAEMU countries where monetary capacity and policy is externalised.

Only three countries show long-term net fiscal revenue over expenditure (deficit-reducing/surplus-enhancing) trends, all of them WAEMU members – Mali, Benin and Togo. This is likely to reflect a lack of institutional capacity to spend and/or diversify from mainly export trade-based revenue sources. As a structural trend, eight of the 12 countries reflect a deficit-raising relationship with growth, while four use growth to reduce fiscal deficits. Over the course of the medium-term business cycle, however, the year-on-year correlations show that four countries flipped from a negative to a positive co-movement with growth accelerations/decelerations. This implies that eight countries are able to engage in countercyclical fiscal responses, while four are not able to avoid procyclical outcomes (Mali, Senegal, Uganda and Tanzania). South Africa is strongly and Botswana moderately capable of exercising countercyclical fiscal policy, the remainder weakly and mostly negligibly so.

Cross-country analysis

Nigeria

Figure 2 Nigeria: GDP growth vs macroeconomic resilience



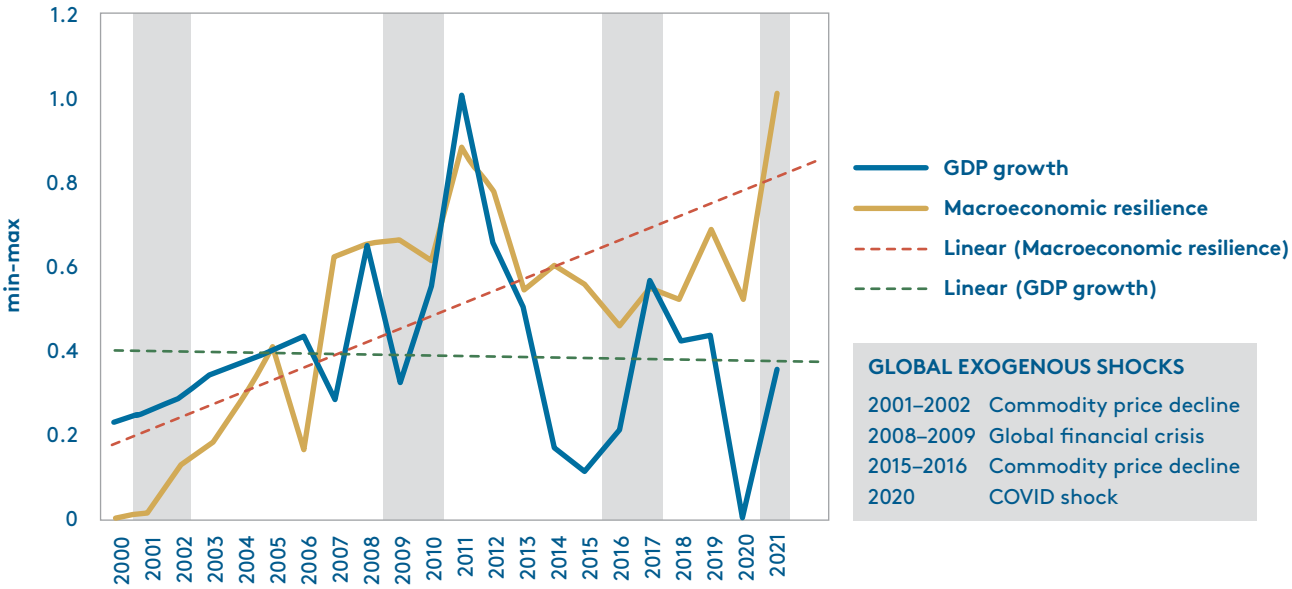
Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

Nigeria exhibited a moderate, but decelerating, growth path between 2000 and 2021. This deceleration followed a structural reversal of global oil prices since 2010–2012. However, the composite macroeconomic resilience index improved over this period with a moderate negative correlation to GDP growth. Improvements in governance appear to be the main driver of this

structural resilience, exerting a counterinfluence against vulnerability associated with export commodity dominance. Improvements in human capital are moderately likely to contribute to this resilience, while those in monetary management are weakly correlated. The adverse effects of commodity dominance are moderately reflected in the deteriorating investment position. However, there are insignificant relationships (positive correlations) between declining fiscal and trade resilience and GDP deceleration, suggesting that these two reflections of primary commodity dependence have been sterilised through better governance. The evidence on the importance of external debt to resilience and GDP growth is ambiguous, with long-term trend lines implying an improving debt position and a negative correlation with GDP growth, with the short-term, year-on-year correlation yielding an insignificant positive correlation.

Ghana

Figure 3 Ghana: GDP growth vs macroeconomic resilience



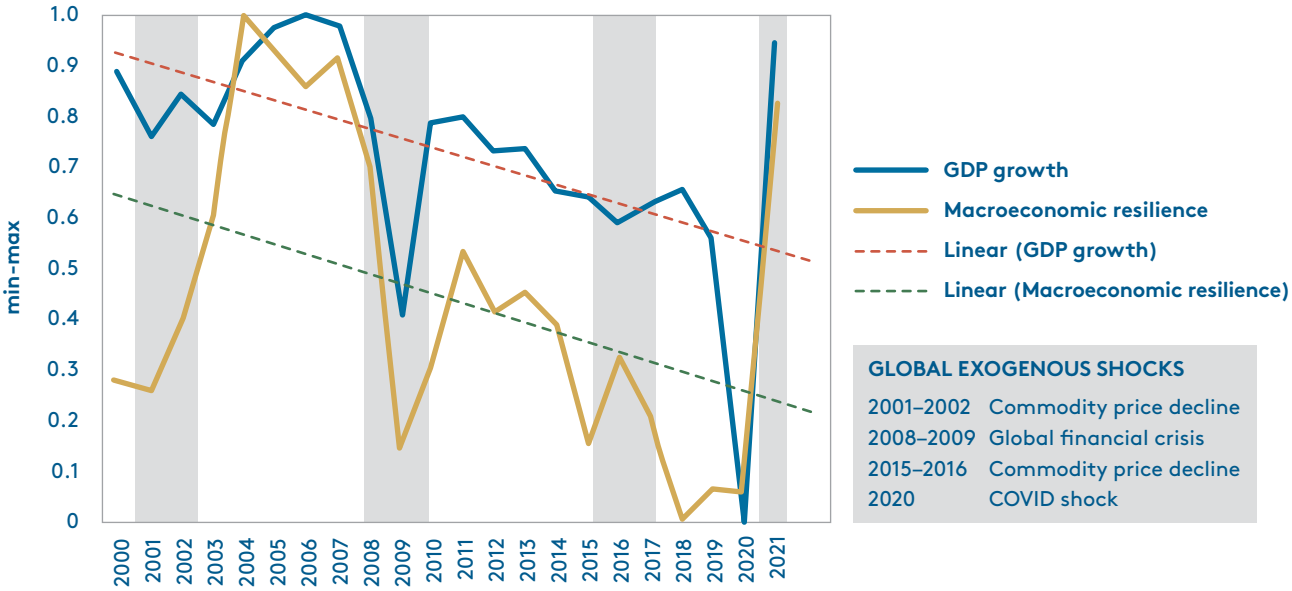
Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

Like Nigeria, **Ghana's** growth path has been moderate and decelerating, with a structurally negative correlation to improving macroeconomic resilience. Year-on-year, however, the short-term relationship between overall macroeconomic resilience and GDP growth is weakly positive. This same ambiguity between long-term trends and year-by-year economic management can be found with the governance, investment, fiscal and human capital sub-indices. These are moderately to weakly correlated positively with GDP growth over the medium-term political or business cycles despite long-term trends, suggesting improvement in these sub-indices

against growth deceleration. Ghana's monetary and trade positions are improving, and this is in weak countermovement with the decelerating GDP growth rate. The external debt position deteriorates both in concert with the business cycle and with structural deceleration.

South Africa

Figure 4 South Africa: GDP growth vs macroeconomic resilience

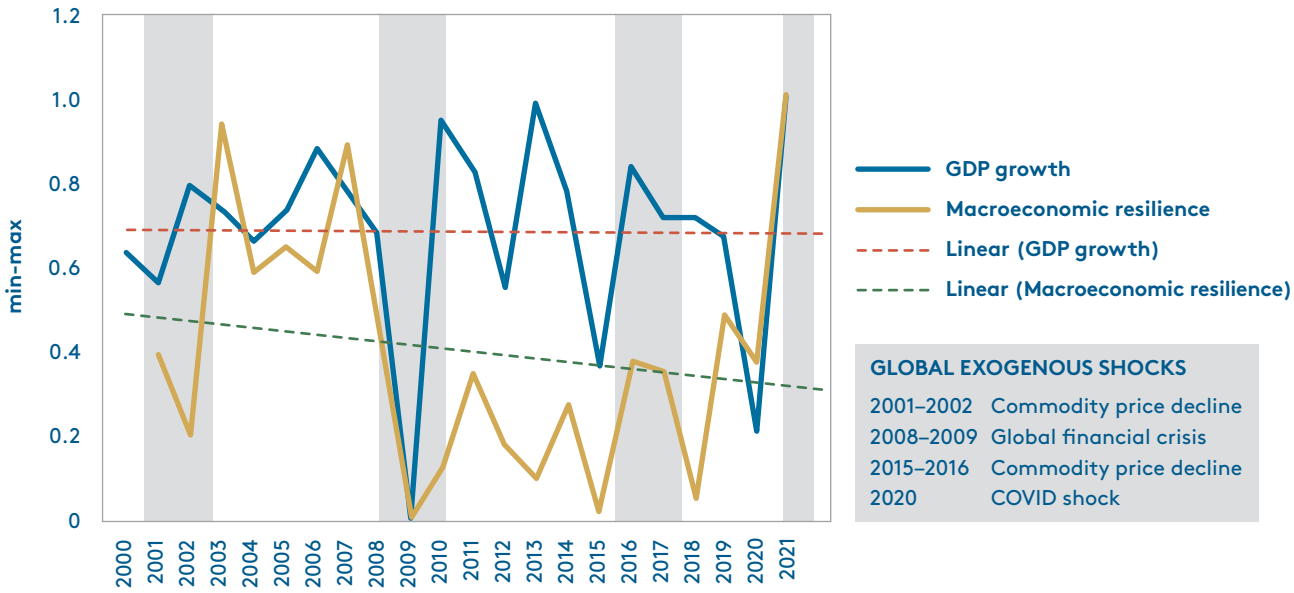


Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

South Africa's growth path has been low and decelerating, which is strongly and positively correlated with a decline in its overall macroeconomic resilience. Indicators of resilience in governance, the external debt position, and fiscal and monetary management are all deteriorating and are moderately to strongly correlated with the GDP deceleration. Least resilience lost is to the management of monetary resilience, with a weakly moderate correlation to GDP deceleration. Ironically, growth deceleration is associated with long-term improvements in trade and investment positions as export growth exceeds that of imports, net investment outflows diminish and reserves accumulate. There is some ambiguity in the relationship with the investment position, with the short-term, year-on-year correlations suggesting a co- rather than a counter-movement of investment with GDP growth. However, the positive correlation is weak. Resilience through human capital formation runs counter to the trends in GDP growth (with a moderate, negative correlation), providing some longer-run optimism that this can turn around the decline in governance.

Botswana

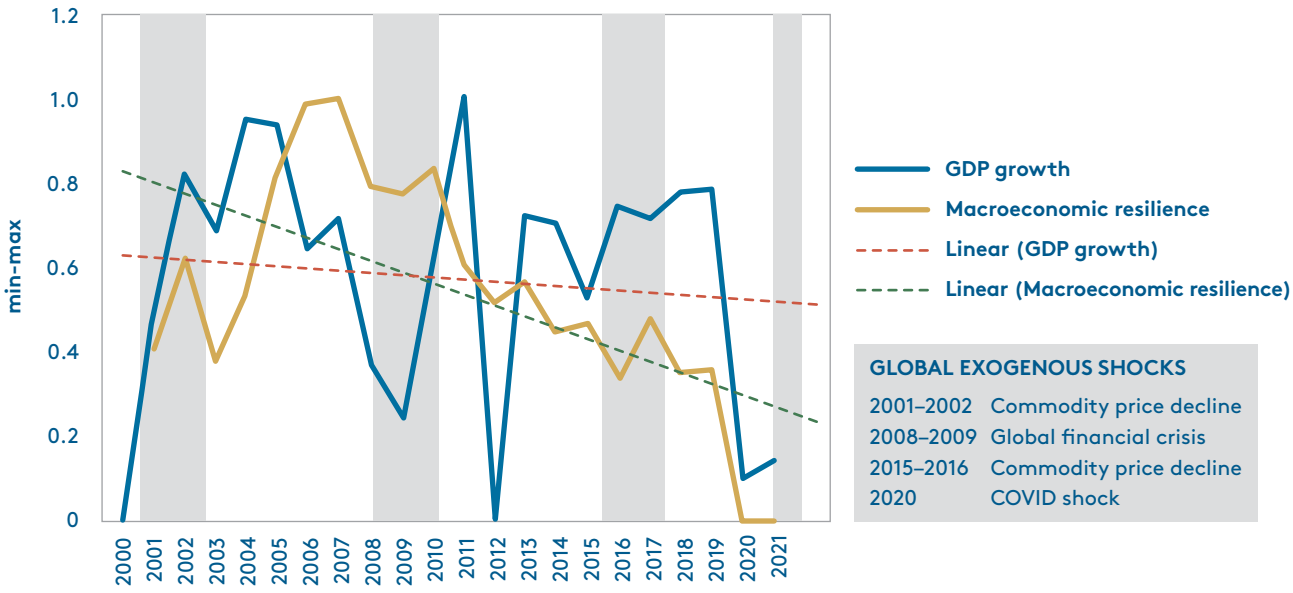
Figure 5 Botswana: GDP growth vs macroeconomic resilience



Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

Like Ghana, **Botswana's** GDP growth trendline is near-constant (or slightly decelerating) over the 2000–2021 period but, as in its neighbour South Africa, composite macroeconomic resilience is declining with a weakly moderate positive correlation against growth. Despite the structural deterioration of trade, fiscal and monetary resilience, these sub-indices display weakly moderate positive (or procyclical) correlations over the course of the medium-term business cycle. Botswana's long-term external debt and investment positions as well as governance sub-indices are worsening, but there is negligible positive correlation with GDP growth over the short to medium term.

Figure 6 Tanzania: GDP growth vs macroeconomic resilience

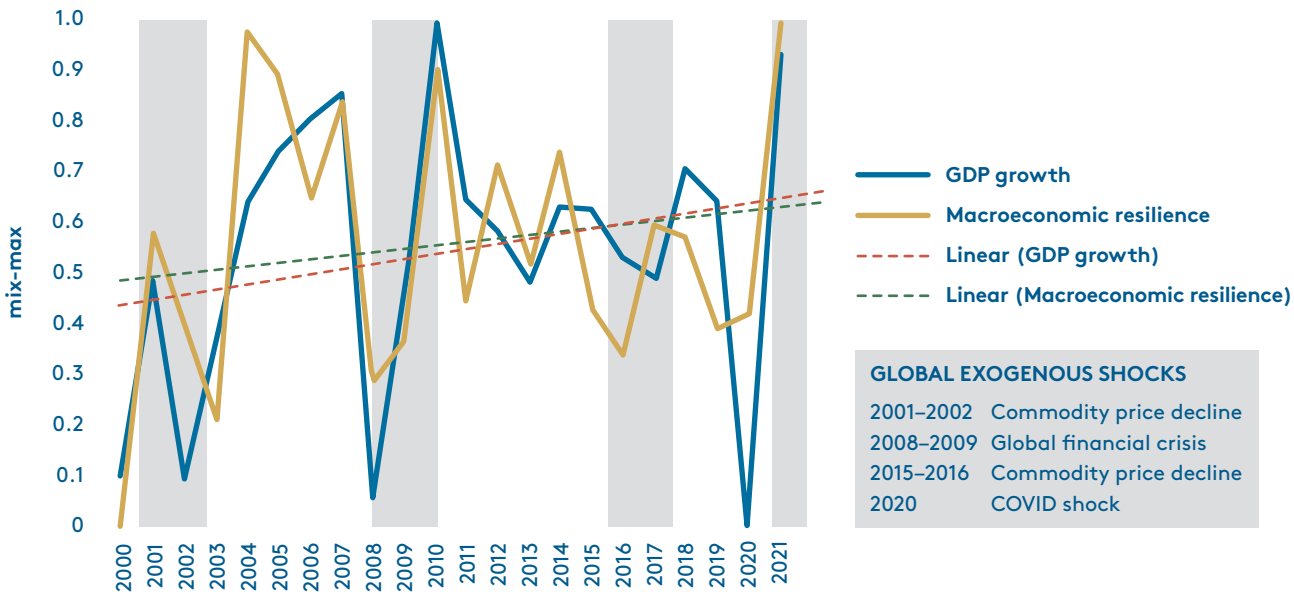


Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

Over the study period, **Tanzania's** moderate growth trend has been decelerating in line with deteriorating macroeconomic resilience. This lessened resilience is weakly indicated for governance and monetary sub-indices and moderately so for external debt and investment. The trade position has negligible correlation with GDP growth and is worsening slightly over time. Tanzania's fiscal resilience is improving, but with a weak likelihood of influencing or being influenced by GDP growth movements. Tanzania's governance scores have been deteriorating over the long term, but the positive correlation with decelerating growth is weak. As across the cohort, human capital formation is improving structurally; however, the year-on-year correlation is weak moderately positive owing to employment losses during successive decelerations between 2006 and 2015, as well as the COVID crisis of 2020.

Kenya

Figure 7 Kenya: GDP growth vs macroeconomic resilience

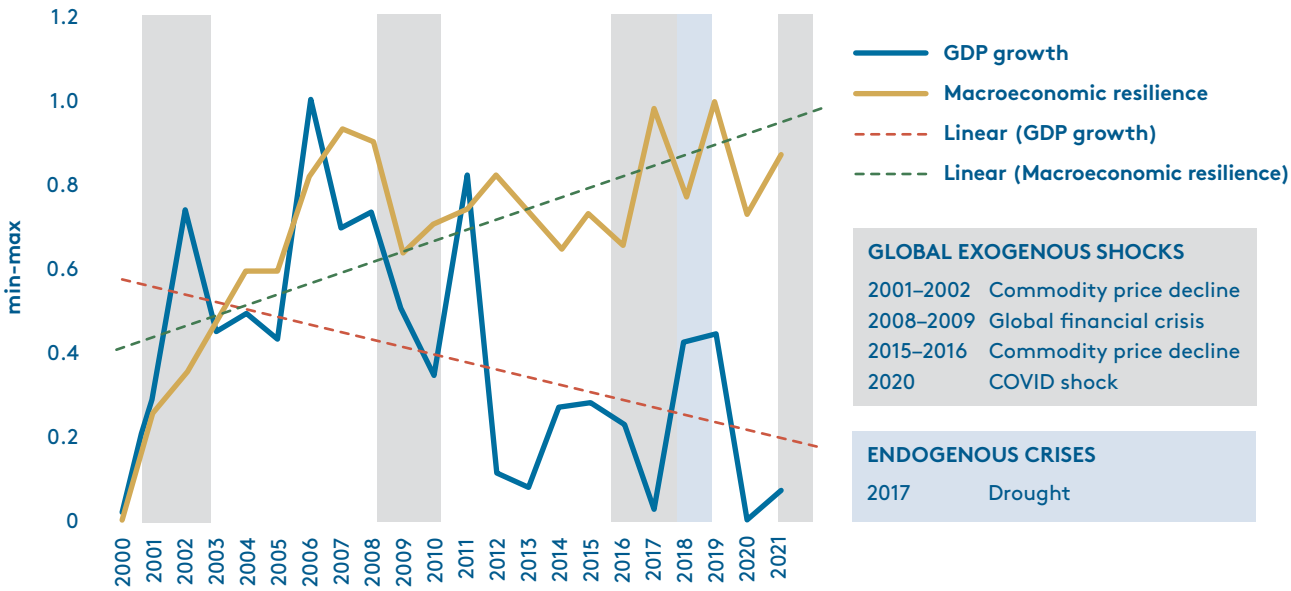


Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

Although low, **Kenya's** GDP growth rate is accelerating and is strongly positively correlated with improving macroeconomic resilience. Contributing to this enhanced resilience are governance and human capital (moderately correlated) and monetary management (weakly correlated). Long-term trends suggest a deterioration in the external debt, investment, fiscal and trade positions, but all of these relationships are inconsequentially (and non-negatively) correlated to GDP growth in the short term (ie, within that year).

Uganda

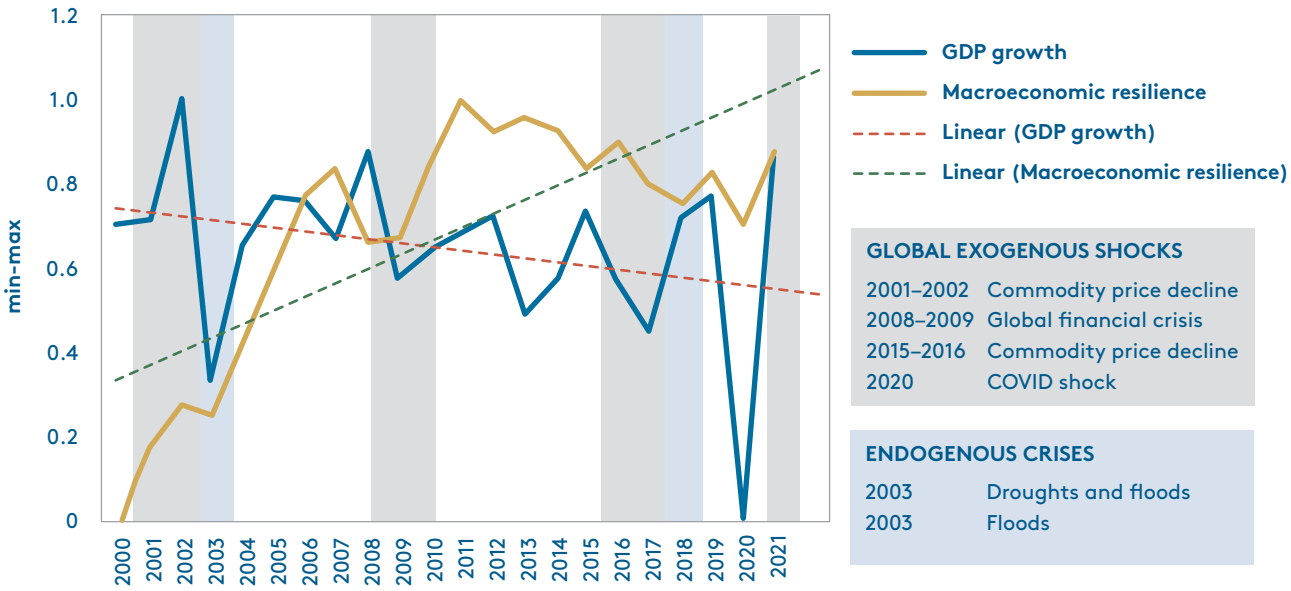
Figure 8 Uganda: GDP growth vs macroeconomic resilience



Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

As with Ghana, **Uganda** is observed to indicate different co-relationships between long-term trends/trend lines and year-on-year correlations. Its moderate structural growth path is decelerating, while composite macroeconomic resilience is trending up, yet over the short term there is a weak positive correlation between stages of the business cycle and macroeconomic resilience. In descending moderate likelihood of co-movement with growth decelerations are counter(-inflationary) monetary policies, debt accumulation, trade deficits and net investment outflows (and vice versa). There is moderate evidence of countercyclical fiscal policy, but this may be contributing towards a long-term loss of fiscal resilience through mounting debt-servicing obligations. While governance has shown increasing resilience from 2000–2021, it has been declining since the GFC and indicates moderate co-movement with the business cycle. Human capital resilience has been on a steady upward trend over the study period and the correlation with GDP growth is moderately negative, with no signs of pro- or countercyclicality.

Figure 9 Rwanda: GDP growth vs macroeconomic resilience

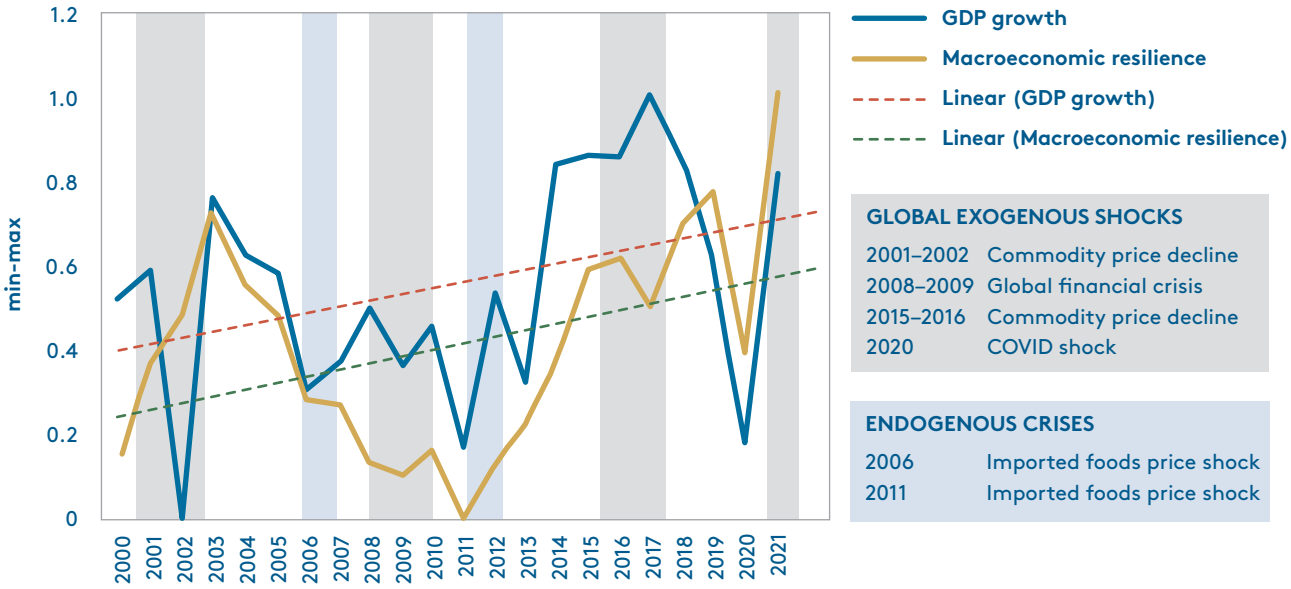


Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

Rwanda's high growth could be attributed to sharp improvements in governance and human capital over the study period. As is to be expected, high growth rates are generally unsustainable, such that GDP growth is decelerating. Governance and human capital are weak moderately and negatively correlated with structural deceleration, as is the strengthening trade position arising from slow concentration from a diverse export base. Eroding growth prospects are a sharp deterioration of the investment position and external debt accumulation, both of which are moderately and positively correlated with GDP growth. The long-run fiscal position has been worsening, short-run correlations with GDP growth are negligible and the fiscal response appears to lag behind the business cycle by a year or two. While there is structural deepening of money and financial markets through monetary accommodation of GDP growth, active countercyclical monetary management cannot overcome the positive and moderate co-movement of monetary resilience with the economic cycle. Overall, the influence of enhanced trade positions, governance reforms and human capital formation suggests that macroeconomic resilience is improving and the negative correlation with growth deceleration is undetectable.

Senegal

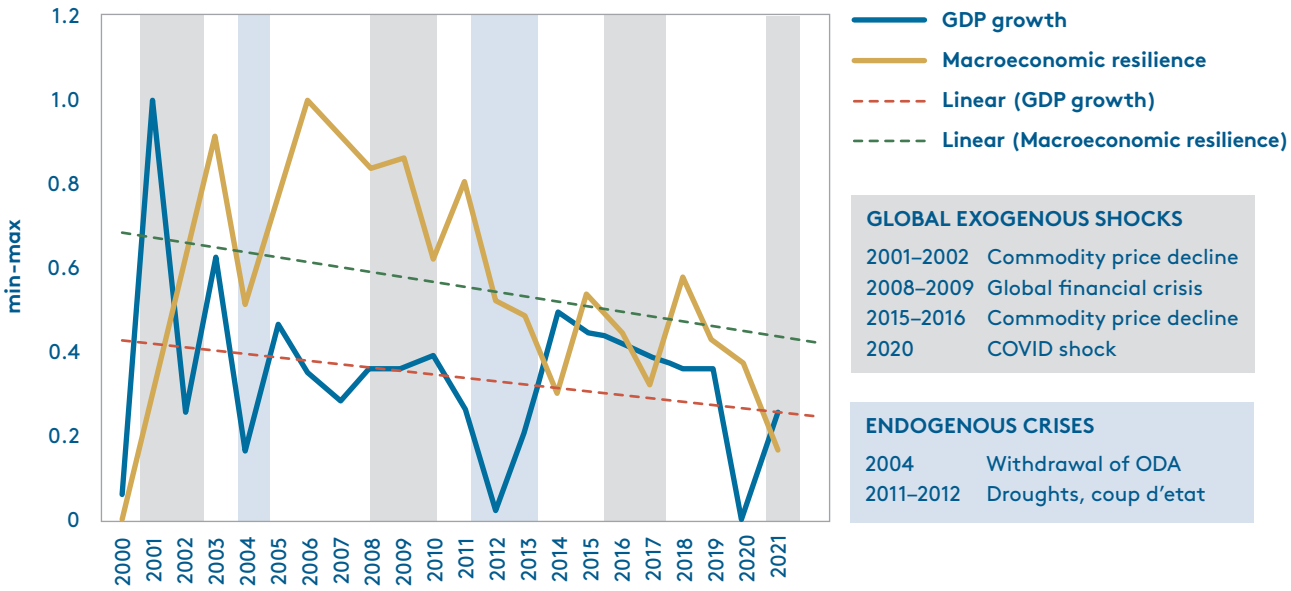
Figure 10 Senegal: GDP growth vs macroeconomic resilience



Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

There is a moderate correlation between **Senegal's** low but accelerating growth path and its strengthening composite macroeconomic resilience index. As with Nigeria and Kenya, improvements in governance and human capital appear to be driving this positive association (but sub-index correlations with GDP growth are both weak and weaker than that of the composite). Structural trends in trade, investment, external debt, and monetary and fiscal resilience all appear to be deteriorating over this period (with weak negative correlations). However, the short-term correlations for monetary and trade management are weakly positive. This may imply that within-year growth accelerations/decelerations are accompanied by monetary accommodation and trade balancing. Overall, the evidence is rather ambiguous as to the dominant source of this positive resilience to GDP growth relationship.

Figure 11 Mali: GDP growth vs macroeconomic resilience

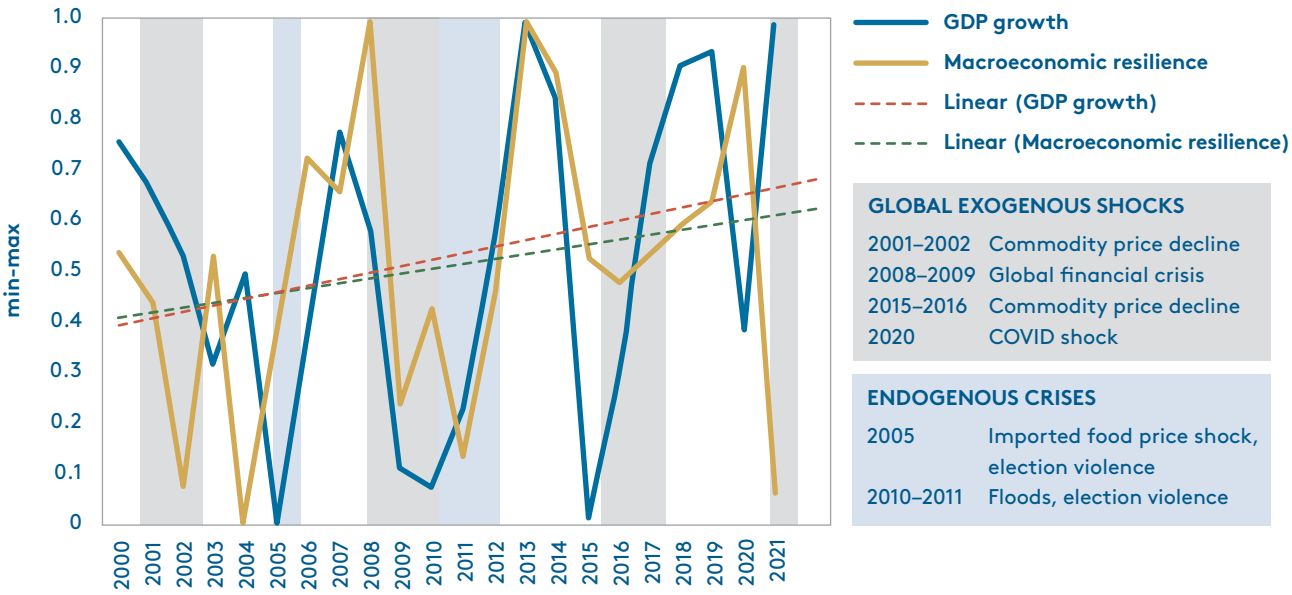


Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

Mali's composite macroeconomic resilience score is deteriorating, driven by a sharp descent of governance into civil and border conflicts, coups d'état and disinvestment. The negative correlations with a low and decelerating growth trend are, however, weak. Converse to disinvestment is an improvement in the external debt and fiscal positions since the government is largely blocked from financial markets; however, the negative correlations with GDP growth are weak. Despite the long-term trendline of trade resilience remaining constant, the trade cycle is highly volatile, contracyclical to GDP growth in the short term, but with the impact on growth lagging into the medium term. Monetary affairs and management are delinked from the fortunes of the domestic economy but display a weak negative correlation between monetary resilience and GDP growth cycles.

Benin

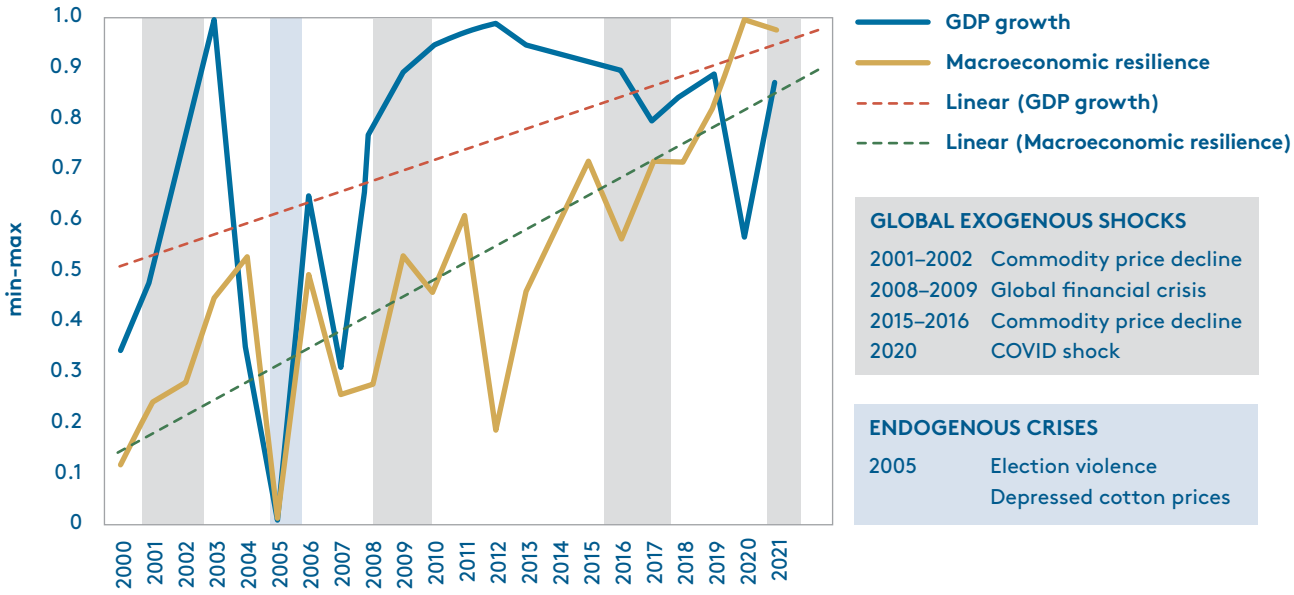
Figure 12 Benin: GDP growth vs macroeconomic resilience



Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

As with Senegal, the evidence from correlation analysis of the relationships between a low and accelerating growth path and improving macroeconomic resilience in **Benin** is ambiguous. The positive correlation is weak, which could be attributed to worsening governance as a structural trend. Short-term improvements in governance, such as the resolution of or stalemate following a violently contested election, do appear to have a weak growth-stimulating effect. Resilience through investment inflows is similarly on a downward long-term trajectory but responds in line with dips and troughs in the political cycle. The external debt position has been worsening over the long term but the relationship to GDP growth is weakly negative. This also worsens the likelihood of fiscal deficit, although the correlation between fiscal resilience and growth is undetectable. While a long-term improvement in monetary resilience is evident, the short-term relationship between monetary management and GDP growth is non-existent. Benin's improving macroeconomic resilience seems to be attributable to weak correlations with trade resilience (owing to a relatively diverse export profile) and human capital formation.

Figure 13 Togo: GDP growth vs macroeconomic resilience



Source: SAIIA compilation from the sources listed in Table C.4 in Annexure C

Togo's low but accelerating growth path is complemented by rising macroeconomic resilience through human capital formation (moderate positive correlation), government stability and reform (weakly moderate), debt restructuring and forgiveness (weak) and net investment flows (weak). Togo's transition into a single commodity-dependent exporter (of refined petroleum) is worsening the trade position but also stimulating growth, such that there is a weakly moderate negative correlation. Fiscal responses to the business cycle have become more countercyclical over time, with a weak positive correlation between fiscal resilience and growth on a year-by-year basis. However, fiscal resilience is deteriorating as a structural trend. As with Benin and Mali, the relationship between externalised monetary management and GDP growth is negligible to non-existent.

Policy recommendations

General

Fixed exchange rate pegs to a dominant global currency appear to straitjacket their members into being unable to benefit from autonomous national learning on the monetary and fiscal management of countering the business (production and inflation) cycle. Despite the volatility of exchange rate movements and the intensity of inflationary cycles that freer exchange rate regimes engender, they are also better able to absorb shocks, learn how to benefit from upcycles and sustain GDP above population growth. In view of the multi-generational objectives of the AU to move progressively and consecutively towards a customs, monetary and fiscal union, countries with currency pegs may wish to consider floating their currencies within the limits of other REC members' and a global currency (such as the US dollar, the euro or the trade-weighted XDR).

Trade diversification is the generational goal of the African Continental Free Trade Area through (a) the liberalisation of tariffs and standardisation of non-tariff barriers, thereby promoting intra-African trade via domestic import substitution; and (b) the development of regional components of global supply chains that add value through processing or beneficiating primary products. Such diversification through trade and industrial policy can ameliorate though not eradicate the impact of exogenous commodity price shocks.

Within a context of managed floats, the incentive is created, and the capacity developed, to deepen money and credit markets, thereby effectuating monetary policy, and to build the public sector (albeit through debt accumulation), thereby strengthening fiscal policy ability. Consistently countering (inflation and) growth peaks with (a) reserve accumulation, money supply deceleration and/or rising policy rates, or (b) revenue enhancement, debt-servicing acceleration, other state-spending deceleration and debt decumulation will build resilience. Such resilience is needed during crises to counter the downcycle through (c) reserve depletion, money supply acceleration and/or declining policy rates and (d) revenue sustenance, debt restructuring to reduce or stretch out servicing schedules, spending stimuli and debt accumulation. Fiscal and any potential monetary rules and limits should be directed at maximising the use of countercyclical policy, particularly during output peaks and inflation troughs, to build longer-term resilience. Coincidence of cycles eases the coordination of monetary and fiscal policy while discordance requires more careful negotiation.

The institutional capacity to effectuate countercyclical monetary and fiscal policy is influenced by the quality of governance (particularly regulatory quality, political stability, and voice and accountability) and of human capital formation. While improved employability through education, health and welfare enables institutional capacity building in the long run or

generational term, it competes for limited fiscal resources in the short to medium term. This happens even if infrastructure and social services are prioritised for countercyclical spending stimuli and protection from spending deceleration (using fiscal rules). Infrastructure spending consistent with enabling structural growth can nevertheless disrupt short-term fiscal, trade and investment balances, especially if undertaken on a scale disproportionate to fiscal and financial resources. Smaller-scale sequentially programmed public works projects using labour-intensive technologies provide the most simultaneously inclusive and growth-enhancing combination of fiscal resources for prioritisation and protection. In respect of the revenue side of the fiscal equation, a more equitable sourcing of revenue could be generated through greater use of corporate and personal income taxes and the differentiation of sales tax rates by a continuum of basic to luxury and sin products.

Analysing the potential for spending and revenue source prioritisation is difficult to undertake given the paucity of data on fiscal and domestic debt indicators. The consolidation of siloed data from national ministerial sources yields contradictory or implausible results and can take years to finalise. Consequently, there are both time-series and cross-sectional gaps in the composition and aggregation of fiscal data downloaded from global financial institutions. Improving the coverage, depth, speed of collation and reliability of macroeconomic (but especially fiscal) data is vital in unclogging the flow of information needed to enhance government effectiveness, and voice and accountability.

Country-specific

The following country-specific recommendations reflect on adapting the general suggestions above according to their unique structural features or position along the relevant continuum. Table 6 indicates some of these structural constraints/opportunities in/capacitating monetary and fiscal policy.

Table 6 Structural features of monetary and fiscal policy capacity (2000–2022)

Average 2000-22	Trade % of GDP	Broad money as % of GDP	Revenue as % of GDP (1)	Government consumption as % of GDP (2)	Education and health spending as % of GDP	Education & health spending as % of government consumption	External debt servicing as % of GNI (3)	External debt as % of GNI
Nigeria	35,9%	20,0%	*	5,8%	*	*	1,0%	17,2%
Ghana	77,3%	28,0%	16,7%	9,4%	6,6%	70%	2,5%	53,4%
South Africa	53,9%	63,2%	26,6%	18,1%	8,9%	49%	1,8%	31,8%
Botswana	94,7%	43,8%	36,8%	28,3%	12,5%	44%	0,8%	11,1%
Tanzania	38,4%	20,0%	11,9%	9,8%	5,4%	55%	0,8%	37,8%
Kenya	46,9%	37,7%	19,2%	13,9%	6,6%	47%	1,9%	32,7%
Uganda	39,3%	18,8%	12,6%	11,0%	3,4%	31%	0,7%	36,4%
Rwanda	41,8%	17,1%	19,9%	15,0%	5,9%	39%	0,9%	47,3%
Senegal	58,1%	29,3%	20,4%	13,6%	5,8%	43%	2,1%	52,2%
Mali	60,1%	25,6%	14,3%	15,7%	4,6%	29%	1,1%	39,8%
Benin	50,5%	23,8%	*	10,0%	3,7%	36%	1,0%	23,2%
Togo	63,0%	29,9%	13,0%	11,6%	4,0%	34%	0,9%	49,9%
AVERAGE	**55,0%**	**29,8%**	**19,1%**	**13,5%**	**6,1%**	**43,6%**	**1,3%**	**36,1%**

Key Below average Above average

Caveats
1 Revenue excludes foreign grants
2 Government expenditure includes consumption, investment and trade
3 External debt servicing and stock only ie. excludes domestic debt

Source: Compiled by author from World Bank, "World Development Indicators", https://databank.worldbank.org/source/world-development-indicators

Nigeria

Nigeria is the least trade-dependent of the cohort and export growth is insignificantly related to GDP growth. Domestic growth is more import-dependent than the average, leading to the strongest correlation between exchange rate movements and both production growth and inflation. A freer-floating currency dissipating the parallel un/official spreads may help to diversify and raise the trade profile.

Nigeria has one of the cohorts' shallowest money and credit markets, as indicated by the low broad-money-to-GDP ratio. This maximises constraints on the transmission of monetary policy and may account for the generally procyclical outcomes of counter-inflationary policy. Lighter regulation of the currency should dampen the volatility of the inflationary cycle and enable the monetary authorities to be more accommodative of output growth, thereby deepening financial markets.

The availability of fiscal data for Nigeria is poor. Multiple sources seem to imply that tax and non-tax revenue sources are of rough equivalence, and that public investment and trading activities are as important as government consumption. With these caveats in mind, Nigeria seemingly exhibits the lowest tax and spending ratios to GDP of the cohort. Improving its data flow, widening and deepening the domestic tax base and measuring/prioritising social and infrastructure spending should enable greater debt accumulation by lowering the risk premium. Nigeria's external debt burdens are comparatively low, which may reflect increasing reliance on domestic debt.

Ghana

In contrast to Nigeria, Ghana is highly trade-dependent (with dual export concentration towards both oil and gold) and a stronger relationship between currency devaluations with export growth than currency appreciations. Ghana's currency has shown the sharpest devaluation among the cohort over the study period and, like Nigeria, may benefit from a freer-floating currency regime that dampens its excessive devaluation–inflation spirals.

Ghana's inflation rate is also the highest of the sample, with strong to moderate evidence of counter-inflationary monetary deceleration and use of interest rate policy. Although typical of the cohort, shallow money markets inhibit the capacity of the monetary authorities to de facto counter the inflation cycle. At the same time, their strong policy emphasis on reacting to inflation neglects the countercyclical use of upcycles to build reserves or decumulate debt. Ghana is the most consistently indebted country in the sample and is currently negotiating its path out of designated debt distress. This bias in the utilisation of countercyclical policy contributes to the uncommon disparity between short-run procyclical relationships of (the fiscal, investment, governance and human capital components of) macroeconomic resilience with GDP growth, and their longer-term and negatively correlated trends.

The small though cohort-average size of the public sector inhibits the effective use of countercyclical fiscal policy. However, social spending exceeds external debt-servicing burdens and shows the highest proportion of government consumption in the cohort. Using production upcycles to deepen the revenue base and reduce the government deficit can help to translate improving macroeconomic resilience into a stronger structural growth path.

South Africa

South Africa exhibits a sample-average trade dependence. It has one of the most free-floating currency regimes of the cohort. Currency depreciation is weakly likely to induce export growth, which is a moderately important driver of production growth (and vice versa). This reflects a decelerating and low-growth domestic economy marginally dependent on exogenous stimulation or contraction to determine its growth prospects.

South Africa has the deepest money and credit markets on the continent. By enabling the velocity of circulation to equilibrate the financial markets, the volatility of the inflation rate can be maintained within targeting limits despite the procyclical accommodation of money demand.

Deteriorating governance, external debt and fiscal deficit positions are strongly correlated with decelerating growth and declining macroeconomic resilience. Despite the relative size of the public sector, countercyclical spending is losing its effectiveness as a fiscal multiplier against the weight of procyclical revenue generation. While the external debt burden is below the sample average, South Africa lacks access to or does not use concessional finance to ameliorate relatively high servicing burdens. South African redistributive spending on social services is above the cohort average, but the burden of monopoly rent extraction through public infrastructure enterprises is immobilising the domestic economy.

Botswana

Botswana is the most trade-dependent economy of the sample and its growth prospects are heavily dependent on movements in the diamond price. These movements have been unfavourable over most of the past decade, contributing to currency devaluation, growth deceleration and greater exposure to crisis. Botswana operates an adjustable fixed peg against the devaluing South African currency, allowing it to appreciate against the South African rand, which suppresses imported inflation from its dominant trading partner.

Botswana holds substantial reserves to sustain its currency. Unlike its dominant neighbour, its monetary policy focus is to counter the inflation rather than the output cycle, where it would seem to have the option to allow accommodation of fluctuations in money demand given that money markets are relatively deep by sub-Saharan African standards.

Like South Africa, Botswana does not fully utilise its fiscal policy potential to counter output cycles. It is one of the few countries to consistently generate fiscal surpluses and has the lowest debt stock and servicing burden of the cohort. However, fiscal spending fails to prevent procyclical outcomes to overall welfare, despite Botswana's indicating the greatest proportion of government consumption to education and health spending.

Tanzania

Tanzania is one of the least trade-dependent economies in the sample and there are negligible relationships between currency movements, GDP growth or inflation. Broad money supply as a proportion of GDP is also one of the lowest in the sample, indicating little leeway to exercise inflation-targeting policies, let alone counter either the output or the inflation cycle. Fiscal capacity is similarly constrained, with the lowest revenue-to-GDP ratio in the sample. Fiscal spending has an above-average bias towards social spending but is procyclical in nature. Tanzania's debt stock is one of the more burdensome among the sample. However, its strong structural growth performance may be testament to its minimally interventionist policy stance.

Kenya

Kenya indicates somewhat below-average trade openness within the cohort but is rather more diverse in its export composition and can spread the risks of disruptions from global commodity price cycles. Currency movements are positively but weakly correlated with export and GDP growth and are enabled by a relatively free-floating currency within the EAC's emerging monetary union. Kenya's per capita growth performance has been low but is accelerating in concordance with improving governance, human capital and monetary resilience.

As with most of the cohort, monetary (and fiscal) policy is effectively procyclical despite efforts to at least counter inflationary surges. Kenya has one of the deeper and more diverse financial markets in sub-Saharan Africa and can afford to accommodate both output- and inflation-driven shifts in demand while smoothing the business cycle at the margins. The cost of this relatively lax position on inflation targeting is a higher-than-average inflation rate.

Kenya exhibits above-average revenue, general government and social spending proportions of GDP and below-average debt burdens but, as across the income spectrum, fiscal policy can rarely be sufficiently countercyclical to reverse the inherent procyclicality of outcomes.

Uganda

Uganda challenges the hypothesis that the capacity for countercyclical monetary and fiscal policy depends on the depth of financial markets and the size of the public sector, both of which are below average for the cohort. By consistently applying countercyclical monetary policy on both output troughs and inflation peaks, and fiscal policy on output troughs, Uganda is the only country to use its policy tools successfully. Uganda spends below-average proportions of its public consumption on health and education and uses the upcycle to accelerate revenue collection.

Given that Uganda is also one of the least trade-open or -dependent economies in the cohort, it could be argued that it is relatively protected from the vicissitudes of the global commodity cycle and relies on the domestic agriculture-based economy to generate its internal resilience. As trade dependence and concentration deepen, though, exposure to the volatility and the challenges in resisting procyclical outcomes may intensify.

As a low-income country, Uganda is also eligible for more ODA and concessional IMF lending than the higher-income members of the cohort. This is likely to enable and incentivise countercyclical fiscal and monetary responses.

Rwanda

Rwanda exhibits below-average trade openness, but the trade position is improving with its export concentration trend towards gold. Exchange rate movements are weakly and negatively associated with export growth but weakly and positively associated with GDP growth, confirming that growth is primarily domestic rather than externally driven.

Rwanda's money and credit markets are the shallowest of the cohort. The monetary authorities are one of two that effectively use the interest rate as a tool of countercyclical policy. However, procyclical accommodation of output and inflation cycles is the norm and serves to develop financial markets from a low base.

By contrast, Rwanda has a sizable public sector for its low-income status and consistently uses its fiscal spending tool to counter the output cycle but, as with the other sample countries, it fails to prevent a procyclical outcome. Similarly, it uses concessional debt to increase public sector capacity but, unlike Uganda, the composition of its spending is less focussed on education and health.

Senegal

Senegal exhibits above-average trade openness and there is no evidence of a relationship between (exogenous) currency movements and export growth, and weak evidence of a negative relationship with GDP growth. If the WAEMU countries were to follow Botswana's example and float an independent currency within progressively permissive limits of dominant trading partner currencies, there could be opportunities (and challenges) to use devaluations and inflationary surges to absorb and dissipate shocks and enable further acceleration of the GDP growth rate.

A more autonomous currency regime would also empower national authorities to use the tools of monetary policy to manage the inflation cycle more consistently and effectively. Senegal's broad money supply as a proportion of GDP is below the cohort average, implying that, even with more consistent use of counter-inflationary instruments, a procyclical outcome remains likely. However, monetary accommodation of the output and inflation cycles should help deepen money and credit markets over the long run.

Senegal's public sector is slightly larger proportionately to the sample average, but there is moderate probability that fiscal policies are countercyclical even if the weight of government revenue and spending is insufficient to avoid procyclical outcomes. Senegal spends a lower-than-average proportion of its government budget on education and health.

Mali

Mali is highly trade dependent with exports dominated by gold, and with export and GDP growth weakly and negatively correlated to coincident currency movements. The exogenously referenced monetary policy has inconsistent or lagged counter reactions to inflationary events. As with Senegal, a freer-floating exchange rate regime may enable more effective countercyclical use of monetary instruments to control more volatile inflationary reactions. Mali's public sector as a proportion of GDP is average for the cohort, but it spends below the cohort average on education and health. This may be the result of crowding out from security expenditures prompted by the civil and border conflicts and election violence associated with Mali's long-term deteriorating governance, investment and overall macroeconomic resilience position. Its external debt and fiscal position is improving, but for perverse reasons of risk exclusion from financial markets.

Benin

Benin has a diverse but slowly concentrating export profile. Structural appreciation of the West African franc's value has been weakly correspondent with export and GDP growth acceleration. Production and inflation cycles are more likely to be discordant; nevertheless, externalised monetary policy responses tend to react countercyclically to both output and price cycles over both peaks and troughs. The outcome remains procyclical because Benin has shallow money and credit markets. Similarly, its low revenue- and spending-to-GDP ratios imply that there is insufficient fiscal space to effect countercyclical outcomes. Still, there is evidence that consistent attempts are made to use fiscal policy to ameliorate the production cycle. Benin makes the case for applying countercyclical monetary and fiscal policy consistently despite the external constraints imposed by an exchange rate peg and lack of policy autonomy.

Togo

Togo is highly trade dependent and currency appreciation is weakly likely to stimulate exports. However, Togo is unusual within the cohort in exhibiting a weak but negative relationship between export and GDP growth. If Togo were to adopt a freer-floating currency regime it could be able to induce the devaluation and inflationary surge with lagged growth response of its neighbours.

Externalised monetary management is such that it tends to asymmetrically counter inflationary surges and output troughs but not disinflation and production peaks. Coupled with lagged transmission and non-necessary coincidence of price and output cycles, monetary policy responses are inconsistent and unable to break free of procyclical outcomes. Greater monetary autonomy would allow for both better or worse coordination than an externalised regime.

Asymmetric countercyclical fiscal responses to production troughs rather than peaks weaken the overall effectiveness of fiscal policy, despite limited capacity to reverse a cycle, as indicated by the below-average revenue- and spending-to-GDP ratios. Social spending makes up a lower-than-average proportion of government consumption. Debt stock burdens are comparatively high but debt-servicing burdens relatively low, suggesting that a higher-than-average proportion of debt is concessional.

Conclusion

Caveats

As indicated earlier, the correlation analysis of sub-indices of macroeconomic resilience to real GDP growth does not consider the relative weighting of component indicators (for which principal component analysis is required). It also does not presume causality or dominance (for which vector autoregression and forecast error variance are required) or indicate the magnitude and duration of fiscal and monetary impulse reactions. Where there is missing data, indicators and sub-indices are progressively eliminated and for most of the cohort (save for South Africa and Kenya) insufficient observations are available for results to be significant. The companion paper to this policy synthesis offers such an analysis for South Africa.[29]

The approach of CoMPRA-MERI is to use or convert all measures on a scale of lesser to greater resilience, on the assumption that vulnerability measures are highly correlated with resilience indicators. Two companion indices (socio-economic and climatic) have been developed using a smaller number of indicators roughly equally distributed between measures of vulnerability and resilience as is the norm.[30] Possible complementary structural vulnerability (versus cyclical resilience) indicators with their references and data sources are listed in Annexure 4.

29 Ndou, "The Information Content of Macroeconomic".

30 Joseph Matola, "Socio-Economic Vulnerability Index for the COVID-19 Shock" (Policy Insight, SAIIA, Johannesburg, forthcoming); Joseph Matola, "Climate Vulnerability Index" (Policy Insight, SAIIA, forthcoming).

Future research directions

A spatial broadening of the cohort countries to cover entire RECs or the African continent may help elucidate the steps required to align exchange rate, monetary and fiscal policies within the free trade associations and customs, incipient and established monetary unions that constitute the second tier of African economic governance.

Greater conceptual depth and statistical significance of results can be secured by focusing the choice of indicators to key trade, investment, financial and monetary policy tools that can be collected on a quarterly basis to increase the number of observations. This should enable closer assessment of the more ambiguous relationships between exchange rate policies, trade concentration, real GDP growth, inflation and the use of (countercyclical) policy instruments. Given current data availability, however, early 21st century observations and most fiscal indicators will not be able to be analysed for most African countries.

Correlation or regression analysis using leads and lags may help to elucidate the extent to which discordance between monetary (and fiscal) policy interventions and inflation (and production) cycles is the result of information flow blockages, inherent capacity to resist the cycle or uncontrollable (and exogenous) trends.

Inasmuch as significant relationships between the growth and component aspects of resilience and the effectiveness of countercyclical policy can be ascertained, it becomes more feasible to identify and deduce realistic monetary and fiscal rules for limiting and regulating the inflation and output cycles. Fiscal rules can also be developed to protect public spending streams for infrastructure public works and maintenance from procyclical volatility and to prevent basic welfare grants and primary healthcare from being crowded out. They can also be developed to minimise fluctuations in the flow of educational outcomes. The corollary of such rules of inclusive growth is that the burden of budget adjustments will be felt in other lines of state expenditure. Monetary and fiscal rules gearing towards countercyclicality, and inclusive growth will need to be differentiated by income status. This is because income status is well correlated with the depth of money markets and the relative weights of fiscal revenue and spending to GDP, and of infrastructure and SDG spending to public consumption.

Annexure A
Crisis description and identification by country

Table A1 Crisis identification and description 2000–2023: Nigeria and Ghana

		Nigeria	Ghana
2000 to 2005	Date & Intensity	2002–03 - deceleration	*
	Proximate cause	Declining oil price in 2001	*
	Type	Exogeneous, economic, domestic/ regional	*
	Transmission	Decline in export value, currency depreciation, rising import costs and inflation, loss of government revenue and fiscal capacity	*
	Policy response	Procyclical government spending fluctuations moderated, countercyclical monetary expansion resisted through interest rate hikes	*
2006 to 2010	Date & Intensity	2010–12 - sharp deceleration	2009 - deceleration
	Proximate cause	GFC induced decline in oil price in 2008, floods, border and internal conflict	GFC induced decline in gold and oil prices in 2008-09
	Type	Exogeneous, economic + Endogeneous, environmental & governance, domestic/ regional	Exogeneous, economic, domestic/ regional
	Transmission	Trade deceleration from supply chain and labour disruptions, infrastructure destruction	Sharp currency depreciation
	Policy response	Limited countercyclical spending growth, sharp currency depreciation, monetary easing	Procyclical fiscal contraction and monetary deceleration in 2009 followed by capital spending stimulus
2011 to 2015	Date & Intensity	2015 - deceleration	2014–5 - crisis
	Proximate cause	Declining oil price in 2014-16	Decline in gold 2012–16 and oil prices 2014–16, floods in 2015
	Type	Exogeneous, economic, domestic/ regional	Exogeneous, economic + environmental, domestic/regional
	Transmission	Decline in export value, currency depreciation, rising import costs and inflation, loss of government revenue and fiscal capacity	Declining exports and fiscal revenue to 2014, sharp currency depreciation decelerates inflation, electricity shortages
	Policy response	Limited countercyclical spending growth, sharp currency depreciation, monetary easing	Procyclical fiscal contraction, monetary accommodation
2016 to 2023	Date & Intensity	2016–19, 2020 - crisis	2020 - crisis
	Proximate cause	Declining oil price 2014–16, Covid trade restrictions	Covid trade restrictions

		Nigeria	Ghana
2016 to 2020	Type	Exogeneous, economic + environmental, global	Exogeneous, environmental, global
	Transmission	Ongoing inflationary surge, disruption of supply chains and labour markets, loss of revenue amd employment	Disruption of supply chains and international trade, loss of revenue and employment
	Policy response	Limited countercyclical spending growth, sharp currency depreciation, monetary tightening to 2019 then easing, IMF concessional loan	Strong countercyclical fiscal stimulus, rapid increase in debt servicing, monetary accommodation, IMF negotiations
	Date & Intensity	*	2022–23 - sharp deceleration
	Proximate cause	*	Russo-Ukraine war, rising fuel & food and declining gold price 2021–23
2021 to 2025	Type	*	Exogeneous, governance, global
	Transmission	*	Disruption of food and fuel supply chains, inflationary surge and sharp currency depreciation
	Policy response	*	Debt restructuring negotiations, monetary tightening

Source: Chukwuka Onyekwena and Oluwatosin Deborah Edafe, "Enhancing Macroeconomic Resilience: A Comparative Analysis of Nigeria and Ghana" (Policy Insight 25, SAIIA, Johannesburg

Table A2 Crisis identification and description 2000–2023: South Africa and Botswana

		South Africa	Botswana
	Date & Intensity	2001 - deceleration	2000–01 - crisis
	Proximate cause	Temporary decline in platimum and gold prices, HIV-AIDS epidemic 2000–04	Decline in diamond price, HIV-AIDS epidemic
2000 to 2005	Type	Exogenous, economic + Endogenous, environmental, domestic/regional	Exogenous, economic + Endogenous, environmental, domestic/regional
	Transmission	Sharp currency depreciation kept exports growing	Currency depreciation, decline in trade, loss of fiscal revenue
	Policy response	Countercyclical fiscal policy, debt accumulation, monetary deceleration	Countercyclical fiscal and monetary expansion
	Date & Intensity	2009 - crisis	2009 - crisis
	Proximate cause	Decline in platimum and gold prices 2008–09	Short-term decline in diamond price
2006 to 2010	Type	Exogeneous, economic, domestic/ regional	Exogeneous, economic, domestic
	Transmission	Sharp decline in trade and investment, loss of fiscal capacity	Severe decline in trade, investment, fiscal capacity and with inflationary surge
	Policy response	Countercyclical fiscal spending, contractionary monetary policy to counter inflationary uptick	Procyclical fiscal and monetary contraction with spending decline for following 2 years
	Date & Intensity	2014-16 - crisis	2012 and 2015 - crises
	Proximate cause	Decline in platinum and gold prices 2012-16, energy shortages, drought 2015	Short-term declines in diamond price
2011 to 2015	Type	Exogenous, economic + governance, domestic	Exogeneous, economic, domestic
	Transmission	Sharp and volatile deceleration of trade and investment	Currency depreciation, deceleration of trade & investment in 2012, decline in trade and loss of government revenue in 2015
	Policy response	Short-term countercyclical fiscal response unable to be sustained by 2016, monetary acceleration against rising interest rates	Balanced budgets maintained in 2012, countercyclical spending growth and debt accumulation in 2015
	Date & Intensity	2020 - crisis	2020 - crisis
	Proximate cause	Covid trade restrictions and lockdowns, energy shortages	Decline in diamond price, Covid trade restrictions
2016 to 2020	Type	Exogeneous, environmental, global + domestic	Exogeneous, environmental, global
	Transmission	Disruption of supply chains and labour markets, sharp decline in trade and investment, currency depreciation, loss of fiscal capacity	Disruption of supply chains and labour markets, sharp decline in trade and investment, currency depreciation

		South Africa	Botswana
	Policy response	Welfare oriented stimulus package unable to counter revenue loss, large but concessional debt accumulation, monetary accommodation	Net fiscal expansion without significant debt accumulation, monetary accommodation
	Date & Intensity	2022–23 - crisis	2022–23 - sharp deceleration
	Proximate cause	Russo–Ukraine war, rising fuel & food and declining platinum and gold prices 2021-23, energy shortages	Russo–Ukraine war, rising fuel & food and declining diamond prices
2021 to 2025	Type	Exogeneous, governance, global + domestic	Exogeneous, governance, global
	Transmission	Currency depreciation, food and consumer price inflationary surge, decline in exports and household consumption	Currency depreciation, food and consumer price inflationary surge, decline in exports and household consumption
	Policy response	Countercyclical fiscal stimulus (both capital and operational spend), monetary growth but rising interest rates	Rising government deficit, monetary growth but rising interest rates

Source: Santos Bila, Neuma Grobbelaar & Conrad van Gass, "Evaluating Macroeconomic Resilience: The Case of South Africa and Botswana" (Policy Insight, SAIIA, Johannesburg, forthcoming)

Table A3 Crisis identification and description 2000–2023: Tanzania and Kenya

		Tanzania	Kenya
	Date & Intensity	2001 - deceleration	2000–01 - crisis
	Proximate cause	Temporary decline in platimum and gold prices, HIV-AIDS epidemic 2000–04	Decline in diamond price, HIV-AIDS epidemic
2000 to 2005	Type	Exogenous, economic + Endogenous, environmental, domestic/regional	Exogenous, economic + Endogenous, environmental, domestic/regional
	Transmission	Sharp currency depreciation kept exports growing	Currency depreciation, decline in trade, loss of fiscal revenue
	Policy response	Countercyclical fiscal policy, debt accumulation, monetary deceleration	Countercyclical fiscal and monetary expansion
	Date & Intensity	2009 - crisis	2009 - crisis
	Proximate cause	Decline in platimum and gold prices 2008–09	Short-term decline in diamond price
2006 to 2010	Type	Exogeneous, economic, domestic/ regional	Exogeneous, economic, domestic
	Transmission	Sharp decline in trade and investment, loss of fiscal capacity	Severe decline in trade, investment, fiscal capacity and with inflationary surge
	Policy response	Countercyclical fiscal spending, contractionary monetary policy to counter inflationary uptick	Procyclical fiscal and monetary contraction with spending decline for following 2 years
	Date & Intensity	2014–16 - crisis	2012 and 2015 - crises
	Proximate cause	Decline in platinum and gold prices 2012–16, energy shortages, drought 2015	Short-term declines in diamond price
2011 to 2015	Type	Exogenous, economic + governance, domestic	Exogeneous, economic, domestic
	Transmission	Sharp and volatile deceleration of trade and investment	Currency depreciation, deceleration of trade & investment in 2012, decline in trade and loss of government revenue in 2015
	Policy response	Short-term countercyclical fiscal response unable to be sustained by 2016, monetary acceleration against rising interest rates	Balanced budgets maintained in 2012, countercyclical spending growth and debt accumulation in 2015
	Date & Intensity	2020 - crisis	2020 - crisis
	Proximate cause	Covid trade restrictions and lockdowns, energy shortages	Decline in diamond price, Covid trade restrictions
2016 to 2020	Type	Exogeneous, environmental, global + domestic	Exogeneous, environmental, global
	Transmission	Disruption of supply chains and labour markets, sharp decline in trade and investment, currency depreciation, loss of fiscal capacity	Disruption of supply chains and labour markets, sharp decline in trade and investment, currency depreciation

		Tanzania	Kenya
	Policy response	Welfare oriented stimulus package unable to counter revenue loss, large but concessional debt accumulation, monetary accommodation	Net fiscal expansion without significant debt accumulation, monetary accommodation
	Date & Intensity	2022–23 - crisis	2022–23 - sharp deceleration
	Proximate cause	Russo–Ukraine war, rising fuel & food and declining platinum and gold prices 2021-23, energy shortages	Russo–Ukraine war, rising fuel & food and declining diamond prices
2021 to 2025	Type	Exogeneous, governance, global + domestic	Exogeneous, governance, global
	Transmission	Currency depreciation, food and consumer price inflationary surge, decline in exports and household consumption	Currency depreciation, food and consumer price inflationary surge, decline in exports and household consumption
	Policy response	Countercyclical fiscal stimulus (both capital and operational spend), monetary growth but rising interest rates	Rising government deficit, monetary growth but rising interest rates

Source: Daniel Yohane Kamene Ngowi, Abel Lawrence Songole, Agatha David Kiama & Abeid Mzee, "Macroeconomic Resilience: Kenya and Tanzania" (Policy Brief 21, SAIIA, Johannesburg, forthcoming)

Table A4 Crisis identification and description 2000–2023: Uganda and Rwanda

		Uganda	Rwanda
	Date & Intensity	2000 - crisis	2003 - crisis
	Proximate cause	Decline in coffee price, first Ebola outbreak	Droughts and floods 2003
2000 to 2005	Type	Exogeneous, economic & environmental, domestic/regional	Endogeneous, enviromental, domestic/ regional
	Transmission	Worsening terms of trade, currency depreciation, inflation	Decline in food production, food inflation and currency depreciation
	Policy response	Fiscal stimulation	Sharp rise in interest rates
	Date & Intensity	2009-2010 - deceleration	2009 - sharp deceleration
	Proximate cause	GFC induced decline in commodity prices	GFC induced decline in commodity prices
2006 to 2010	Type	Exogeneous, economic, domestic/regional	Exogeneous, economic, domestic/ regional
	Transmission	Decline in international trade, currency depreciation, inflation	Deceleration of investment, decline in international trade, currency depreciation
	Policy response	Sharp fiscal and monetary contraction to counter inflationary surge	Sharp fiscal contraction and monetary deceleration reduced inflation
	Date & Intensity	2012–13 - sharp deceleration	2013 - deceleration
	Proximate cause	Sharp drop in coffee price, Budget aid cuts, Ebola outbreak	Coffee, tea and mineral commodity price drops
2011 to 2015	Type	Exogeneous, economic + governance, domestic/regional	Exogeneous, economic, domestic/ regional
	Transmission	Decline in public consumption and investment	Currency depreciation, temporary hold on aid
	Policy response	Monetary tightening, governance reforms, unavoidable procyclical fiscal response	Fiscal and monetary deceleration, Diversification of mineral exports
	Date & Intensity	2017, 2020 - crises	2017 - deceleration; 2020 - crisis
	Proximate cause	Severe drought; Covid trade restrictions and lockdowns	Floods; Covid trade restrictions and lockdowns
2016 to 2020	Type	Endogenous + Exogeneous, environmental, domestic/regional + global	Endogenous + Exogeneous, environmental, domestic/regional + global
	Transmission	Decline in food production; Disruption of supply chains and labour markets, declining international trade and tax revenue	Decline in food production; Disruption of supply chains and labour markets, declining international trade and tax revenue
	Policy response	Countercyclical government spending and rising debt, IMF concessional loans	Increase in fiscal spending unable to counter revenue loss, monetary accommodation
	Date & Intensity	*	*
	Proximate cause	*	*
2021 to 2025	Type	*	*
	Transmission	*	*
	Policy response	*	*

Source: Emmanuel Kisaame & Susan Kavuma, "Macroeconomic Resilience of Uganda and Rwanda" (Policy Insight, SAIIA, Johannesburg, forthcoming)

Table A5 Crisis identification and description 2000–2023: Senegal and Mali

		Senegal	Mali
	Date & Intensity	2002 - crisis	2000, 2002, 2004 - crises
	Proximate cause	Severe drought, energy shortages	Rising imported food prices, reduction in ODA 2002 and 2004, floods in 2002, declining cotton prices 2001 and 2004
2000 to 2005	Type	Endogeneous, environmental, domestic	Exogenous,economic + Endogenous, environmental; domestic
	Transmission	Drastic decline in agricultural production and food insecurity	Decline in food production; and agricultural exports, rise in imported food prices
	Policy response	Aid and concessional loans, fiscal effort and stimulus, expansionary monetary policy	Increased tax effort, procyclical monetary response
	Date & Intensity	2006 - crisis	2007 - deceleration
	Proximate cause	Sharp increase in imported food prices	Sharp increase in imported food prices; floods and drought, reduction in ODA from conflict
2006 to 2010	Type	Exogenous, economic, domestic/ regional	Endogenous, environmental+ Exogenous, economic; domestic/ regional
	Transmission	Imported food inflation, declining household income and consumption	Imported food inflation, decline in agricultural exports, loss of government revenue
	Policy response	Procyclical fiscal policy, debt restucturing, countercyclical monetary policy	Inability to effect countercyclical spending policies
	Date & Intensity	2011, 2013 - crises	2011–13 - crisis
	Proximate cause	Sharp increase in imported food prices, drought 2011, floods 2013, energy shortages	Decline in gold price, sharp increase in imported food prices, drought 2011, coup d'etat 2012, floods 2013
2011 to 2015	Type	Exogenous, economic + Endogeneous, environmental; domestic/regional	Exogenous, economic + Endogeneous, environmental + governance, domestic/ regional
	Transmission	Imported food inflation from, decline in agricultural production	Decline in agricultural production and mining exports, imported food inflation, internal conflict
	Policy response	Countercyclical spending growth and deficit financing, monetary accommodation	Procyclical fiscal policies, significant aid inflows, monetary restriction, governance crisis
	Date & Intensity	2020 - crisis	2020 - crisis
	Proximate cause	Covid trade restrictions and lockdowns, floods	Covid trade restrictions and lockdowns, drought
2016 to 2020	Type	Exogeneous, environmental, global + Endogenous, environmental, domestic	Exogeneous, environmental, global + Endogenous, environmental, domestic

		Senegal	Mali
	Transmission	Disruption of supply chains and labour markets, deceleration of trade, decline in exports and investment	Disruption of supply chains and labour markets, imported food price inflation, deceleration of investment
	Policy response	Countercyclical fiscal policy, debt restructuring, accommodative monetary policy	Countercyclical fiscal policy, debt restructuring, accommodative monetary policy, governance crisis
	Date & Intensity	*	2021–22 - crisis
	Proximate cause	*	Russo-Ukraine war, coup d'etat
2021 to 2025	Type	*	Exogenous + Endogeneous, governance, global and domestic
	Transmission	*	Imported food inflation; withdrawal of ODA
	Policy response	*	Ongoing countercyclical fiscal and monetary accommodation, increasing debt

Source: Daouda Ndiaye & Djibril Diallo, "Senegal's Macroeconomic Resilience 2000 to 2022: A Comparative Study with Mali" (Policy Insight, SAIIA, Johannesburg, forthcoming)

Table A6 Crisis identification and description 2000–2023: Benin and Togo

		Benin	Togo
	Date & Intensity	2005 - crisis	2000–01 - crisis
	Proximate cause	Background of rising global food prices, election of former dictator, trade dispute with Nigeria	Floods 1998–99
2000 to 2005	Type	Exogenous, economic + Endogenous, governance, domestic/regional	Endogenous, environmental, domestic
	Transmission	Decline in investment and food production, imported food inflation	Decline in food production, concurrent currency depreciation
	Policy response	Countercyclical fiscal and monetary expansion	Data unavailable
	Date & Intensity	2009–11 - crisis	2004–07 - crises
	Proximate cause	Floods, Political instability around elections	Depressed cotton price, election violence 2005, floods in 2007
2006 to 2010	Type	Endogenous, environmental + governance, domestic	Exogenous, economic, regional + endogenous, governance + environmental, domestic
	Transmission	Decline in exports and agricultural production, substantial accumulation of debt	Decline in cotton production and export earnings concurrent with pegged currency appreciation
	Policy response	Concurrent currency depreciation, countercyclical fiscal stimulus, debt accumulation, monetary deceleration	Concurrent currency appreciation, fiscal and monetary expansion, but investment inflows, major trade diversification
	Date & Intensity	2015 - crisis	2016–17 - deceleration
	Proximate cause	Gold, cotton and food prices declined, Political instability around elections	Gold and oil price decline, Election violence in 2015
2011 to 2015	Type	Exogenous, economic, regional + Endogenous, governance, domestic	Exogenous, economic, regional + endogenous, governance, domestic
	Transmission	Decline in food production and agricultural exports	Decline in trade, investment, food production and fiscal capacity
	Policy response	Debt accumulation through countercyclical fiscal spend, monetary deceleration, concurrent currency depreciation	Procyclical fiscal and monetary policy responses
	Date & Intensity	2020 - sharp deceleration	2020 - crisis
	Proximate cause	Covid lockdowns, floods	Covid lockdowns
2016 to 2020	Type	Exogeneous, environmental, global + domestic	Exogeneous, environmental, global
	Transmission	Disruption of supply chains, decline in trade + decline in food production	Disruption of supply chains, decline in trade
	Policy response	Concessionary IMF loans and ODA grants, countercyclical fiscal stimulation, debt accumulation, monetary accommodation	Debt forgiveness and restructuring, fiscal response indeterminate, monetary accommodation

		Senegal	Mali
	Date & Intensity	2022 - crisis	2022 - crisis
	Proximate cause	Russo-Ukraine war	Russo-Ukraine war
2021 to 2025	Type	Exogeneous, governance, global	Exogeneous, governance, global
	Transmission	Disruption of supply chains, rising food and fuel prices, imported inflation, concurrent currency depreciation	Disruption of supply chains, rising food and fuel prices, imported inflation, concurrent currency depreciation
	Policy response	Revenue enhancement and deficit reduction plans, monetary contraction	Data unavailable or evidence ambiguous

Source: Fabrice Salavi and Ian Heffernan, "Macroeconomic Resilience in Benin and Togo" (Policy Insight 23, SAIIA, Johannesburg, February 2024)

Annexure B
Frequency analysis of countercyclical policy responses

Table B1 Monetary and fiscal policy responses to the production and inflation cycles (2000–2021)

Policy options	Indicator	AVERAGE	Nigeria	Ghana	South Africa	Botswana	Tanzania	Kenya	Uganda	Rwanda	Senegal	Mali	Benin	Togo
MONETARY POLICY														
Data gaps	% of years missing data	23%	18%	14%	5%	18%	18%	5%	27%	18%	45%	23%	45%	45%
GDP output cycle														
1 = passively procyclical 2 = actively procyclical 3 = passively countercyclical 4 = actively countercyclical	average score	2,4	2,6	2,6	2,6	2,3	2,6	2,8	2,6	2,3	2,5	2,2	2,1	2,0
% countercyclical	% of observation years	48%	50%	58%	52%	39%	56%	67%	63%	33%	50%	29%	42%	33%
GDP inflation cycle														
1 = passively procyclical 2 = actively procyclical 3 = passively countercyclical 4 = actively countercyclical	average score	2,6	2,5	2,5	2,2	2,9	2,8	2,6	2,4	2,6	2,6	2,5	3,0	2,9
% countercyclical	% of observation years	61%	56%	58%	48%	78%	61%	67%	56%	61%	58%	53%	67%	75%
Coincidence of GDP output and inflation cycles	1 = coincident troughs 2 = GDP trough, inflation peak 3 = GDP peak, inflation trough 4 = coincident peaks	2,6	2,4	2,6	2,5	2,7	2,9	2,8	2,1	2,5	2,7	2,9	2,5	2,9

Policy options	Indicator	AVERAGE	Nigeria	Ghana	South Africa	Botswana	Tanzania	Kenya	Uganda	Rwanda	Senegal	Mali	Benin	Togo
FISCAL POLICY														
Data gaps	% of years missing data	31%	18%	18%	5%	41%	68%	14%	5%	41%	41%	9%	73%	36%
GDP output cycle														
1 = passively procyclical 2 = actively procyclical 3 = passively countercyclical 4 = actively countercyclical	average score	2,4	2,4	2,7	2,1	2,5	2,0	1,7	2,8	2,7	2,3	2,4	2,8	2,2
% countercyclical	% of observation years	49%	50%	61%	38%	46%	29%	32%	67%	54%	62%	50%	50%	50%

Key Below average Above average

Note: This frequency analysis and the average scores are based on the percentage of available observations (which varies by country). No attempt has been made to impute for missing data

Source: Compiled by author from World Bank, "World Development Indicators", https://databank.worldbank.org/source/world-development-indicators and various IMF databases

Annexure C
Methodological notes for constructing CoMPRA-MERI

Table C1 Rationale and references for inclusion of indicators per sub-index of CoMPRA-MERI

Indicators per sub-index (1)	Source (2)	Increase in indicator/ sub-index value indicates	Rationale for the short-term (one year) (3)	Contrary rationale for the medium- to long-term	Reference
Generic	**WDI**	**Higher resilience**	**Dependent variable, most important component of resilience**	*	**Various**
Real GDP growth	WDI	Higher resilience	Higher GDP growth enables higher savings & investment, reserves & contingencies	Growth acceleration can not be continuously sustained especially with accumulating debt and inflation	Cortina (2004)
Monetary	**Various**	**Higher resilience, ambiguous relationship with GDP growth**	**Monetary growth accommodates GDP growth, deepens financial markets, enables counter inflationary monetary policy**	**Counter inflation policy is central bank priority, rather than management of business cycle**	**Various**
Inflation (GDP deflator)	WDI	Lower resilience	Higher inflation reduces purchasing power	*	Briguglio (2004); Diop, Asangu & Nnanna (2021) use the Consumer Price Index
Base money supply growth	IMF-IFS	Higher resilience	Direct monetary accommodation of GDP growth	Central bank can directly reduce base money growth as a counter inflation tool	*
Broad money supply growth	IMF-MFS	Higher resilience	Indirect monetary accommodation of GDP growth	Central bank can raise reserve requirements of commercial banks	Rojas-Suarez - CGD (2015)
Real interest rate	WDI	Lower resilience	Higher interest rates reduce money demand, GDP growth and inflation	Central banks can raise policy rate as a counter inflation tool	Rojas-Suarez, CGD, 2015, 2023)
Risk premium (lending - bill rate)	WDI	Lower resilience	Higher the gap between lending and borrowing rates, greater the risk of default	*	*
Bank non-performing loans	WDI	Lower resilience	Higher lending rates increase NPL ratios and lower GDP growth potential	*	IMF (2016)

Indicators per sub-index (1)	Source (2)	Increase in indicator/ sub-index value indicates	Rationale for the short-term (one year) (3)	Contrary rationale for the medium- to long-term	Reference
Fiscal	**IMF-GFS**	**Higher resilience, positive relationship with GDP growth**	**Rising revenue relative to spending growth enables countercyclical fiscal policy, public investment, poverty reduction and lower reliance on debt**	**Counter cyclical fiscal policies can not be indefinitely sustained if GDP growth decelerating or declining**	**Various**
Gross operating balance - % of GDP	IMF-GFS	Higher resilience	Lower deficits (or higher surpluses) provide greater leeway for counter shock spending	As above	Briguglio (2004); Rojas-Saurez - CGD (2015); Diop, Asangu & Nnanna (2021)
Revenue growth	IMF-GFS	Higher resilience	Greater revenue growth enables deficit reduction	As above	IMF (2016)
Grant revenue growth	IMF-GFS	Higher resilience	Revenue from external grants is supplementary to tax	External grants are an insecure and volatile source of revenue	Diop, Asangu & Nnanna (2021) use % of GDP to indicate vulnerability
Expenditure growth	IMF-GFS	Lower resilience	Greater spending growth counters deficit reduction	Public spending can boost investment and consumption	IMF (2016)
Interest payment growth	IMF-GFS	Lower resilience	Higher debt interest servicing crowds out productive spending	*	IMF (2016)
Social grant spending growth	IMF-GFS	Higher resilience	Greater spending on social welfare enables poverty reduction	Greater spending on social welfare can contribute to deficit and debt accumulation for consumption purposes	IMF (2016)
Fixed capital consum-ption growth	IMF-GFS	Higher resilience	Higher consumption of fixed capital means depreciation of capital assets, which may not be matched by gross fixed capital formation (for which data is unavailable)	Net fixed capital formation may more than compensate for depreciation of stock	IMF (2016)
External debt	**WDI/IMF-IDS**	**Lower resilience, negative relationship with GDP growth**	**Increase in debt stock leads to increased servicing and crowds out investment and consumption**	**Debt accumulation may be focused on productive investment which generate GDP growth**	**Various**
External, long-term, private debt stock (% of GDP)	WDI	Lower resilience	As above for private companies	As above for private companies	Diop, Asangu & Nnanna (2021), Rojas-Suarez - CGD (2015, 2023)

Indicators per sub-index (1)	Source (2)	Increase in indicator/ sub-index value indicates	Rationale for the short-term (one year) (3)	Contrary rationale for the medium- to long-term	Reference
External, long-term, public debt stock (% of GDP)	WDI	Lower resilience	As above for public sector	As above for public sector	Diop, Asangu & Nnanna (2021), Rojas-Suarez - CGD (2015, 2023)
External, short-term debt stock (% of GDP)	WDI	Lower resilience	As above but insufficient time for debt restucturing	*	Diop, Asangu & Nnanna (2021), Rojas-Suarez - CGD (2015, 2023)
IMF Credit and SDR allocations (% of GDP)	WDI	Higher resilience	Can alleviate short-term position	However concessional debt still needs to be repaid	IMF (2016)
Debt forgiveness (% of GDP)	IMF-IDS	Higher resilience	This lowers debt servicing burdens in short- and longer-term	*	IMF (2016)
External, long-term, private debt servicing (% of GDP)	WDI	Lower resilience	Crowds out private investment and consumption	*	IMF (2016)
External, long-term, public debt servicing (% of GDP)	WDI	Lower resilience	Crowds out public investment and consumption	*	IMF (2016)
External, total debt servicing (% of GDP)	WDI	Lower resilience	Includes short-term obligations not able to be restructured or forgiven (some double counting here)	*	Rojas-Suarez - CGD (2015, 2023)

Source: Compiled by author

Table C2 Rationale and references for inclusion of indicators per sub-index of CoMPRA-MERI

Indicators per sub-index (1)	Source (2)	Increase in indicator/ sub-index value indicates	Rationale for the short-term (one year) (3)	Contrary rationale for the medium- to long-term	Reference
Trade	**Various**	**Higher resilience, ambiguous relationship with GDP growth**	**Reduction of trade deficits and greater diversification /lesser concentration thereof help build the reserves and spread the risk to counter terms of trade shocks**	**Sustained surpluses can deprive domestic production, generate cost inflation and lead to currency appreciation**	**Various**
Current account (% of GDP)	IMF-IFS	Higher resilience	Lower deficits (or higher surplusses) mean less borrowing from the financial account or withdrawal from reserves, and less chance of financial outflows and currency depreciation	Higher deficits may reflect an excess of investment over savings and if channeled productively (not consumptively) can enable necessary restructuring and generate GDP growth	Briguglio (2004), Rojas-Suarez - CGD (2015)
Personal remit-tances (% of GDP)	WDI	Higher resilience	Higher net remittances reduce current account deficits through inflows into the secondary income component	Higher remittances may reflect economic weakness as excess labour emigrates	Diop, Asangu & Nnanna (2021)
Reserves excluding gold (% of GDP)	IMF-IFS	Higher resilience	Greater accumulation of reserves on the balance of payments enables central banks to sustain a currency	Excess reserve holdings may incentivise wasteful importation or disinvestment	IMF (2016)
Import growth	IMF-IFS	Lower resilience	Excess import over export growth widens current account deficits	Excess imports may be of capital goods and services which generate longer term GDP growth	Diop, Asangu & Nnanna (2021) use % of GDP to indicate vulnerability
Import Concen-tration Index - national	UNCTAD	Lower resilience	Greater import product concentration makes the economy more vulnerable to supply chain disruptions	*	*
Import Diversi-fication Index - global	UNCTAD	Higher resilience	Greater import product (and source) diversification facilitates burden shifting after a terms of trade shock, currency depreciation or supply chain disruption	*	*
Export growth	IMF-IFS	Higher resilience	Excess export over import growth narrows current account deficits or enables a surplus	Trade surpluses, if sustained, may generate inflation and currency depreciation	*

Indicators per sub-index (1)	Source (2)	Increase in indicator/ sub-index value indicates	Rationale for the short-term (one year) (3)	Contrary rationale for the medium- to long-term	Reference
Export Concentration Index - national	UNCTAD	Lower resilience	Greater export product concentration implies more dependence on specific commodity price movements and exposure to terms of trade shocks	*	Briguglio (2004) uses as indicator of vulnerability
Export Diversification Index - global	UNCTAD	Higher resilience	Greater export product (and destination) diversification enables burden shifting between different commodities	*	*
Investment	**WDI**	**Higher resilience, ambiguous relationship with GDP growth**	**Net foreign (and domestic) direct (and other) investment should build productive capacity and enable currency appreciation**	**Currency depreciation can incentivise foreign and domestic investment**	**Various**
Exchange rate appreciation	WDI	Higher resilience	Currency appreciation reflects strong export performance which usually corresponds with GDP growth, and can lead to import disinflation	Although inflationary, currency depreciations can boost domestic investment and (and vice versa)	Briguglio (2004)
Food production growth rate	WDI	Higher resilience	Domestic food production growth enables food security for the more vulnerable sectors of society	*	Briguglio (2004) citing UN ECOSOC
Gross Fixed Capital Formation	IMF-IFS	Higher resilience	Investment in infrastructure and equipment enables GDP growth in short and longer terms	*	Cortina (2004)
Net foreign direct investment (% of GDP)	IMF-IFS	Higher resilience	Net foreign direct investment enhances domestic production, employment, innovation and GDP growth	Foreign direct investment can crowd out domestic investment or create dual economies	Diop, Asangu & Nnanna (2021) use this to indicate vulnerability
Net foreign portfolio investment (% of GDP)	IMF-IFS	Higher resilience	Net foreign portfolio investment reflects short-term investor confidence	Foreign portfolio investment is procyclical and aggravates volatility	*
Net foreign other investment (% of GDP)	IMF-IFS	Higher resilience	Net foreign trade credit facilitates trade growth	*	Rojas-Suarez - CGD (2015)

Indicators per sub-index (1)	Source (2)	Increase in indicator/ sub-index value indicates	Rationale for the short-term (one year) (3)	Contrary rationale for the medium- to long-term	Reference
Reserves including gold (% of GDP)	IMF-IFS	Higher resilience	Greater reserves enables the central bank to stabilise currencies, temper exogenous shocks and manage countercyclical monetary and fiscal policy	*	IMF (2016), Rojas-Suarez - CGD (2015)
Govern-ance	**WGI**	**Higher resilience, positive relationship with GDP growth**	**Improved governance incentivises investment, reduces waste and loss, facilitates redistribution to the poor and enables competition**	*	**Various**
Control of Corruption	WGI	Higher resilience	Bribery, monopoly rent extraction, state capture disincentivise investment, reduce competition and waste resources	*	Diop, Asangu & Nnanna (2021); Rojas-Suarez - CGD (2023)
Govern-ment Effect-iveness	WGI	Higher resilience	Improving coverage and reliability of government services enables inclusiveness of growth opportunities	*	Briguglio (2004); Diop, Asangu & Nnanna (2021); Rojas-Suarez - CGD (2023)
Political Stability and Absence of Violence/ Terrorism	WGI	Higher resilience	Armed conflict, social unrest and government instability disincentivise direct investment and destroy infrastructure and property	*	Briguglio (2004)
Regulatory Quality	WGI	Higher resilience	Domestic protectionist barriers to [foreign] trade, investment and employment raise costs and prevent competition	*	Briguglio (2004); Diop, Asangu & Nnanna (2021); Rojas-Suarez - CGD (2023)
Rule of Law	WGI	Higher resilience	Enforcement of contracts and protection of property from theft through an independent judicial system encourages investor confidence	*	Briguglio (2004)
Voice and Account-ability	WGI	Higher resilience	Free association and media, and reliable information on public finances; enable democratic debate, negotiation and decision-making; and for more balanced policy and macroeconomic stability	*	Briguglio (2004)

Source: Compiled by author

Table C3 Rationale and references for inclusion of indicators per sub-index of CoMPRA-MERI

Indicators per sub-index (1)	Source (2)	Increase in indicator / sub-index value indicates	Rationale for the short-term (one year) (3)	Contrary rationale for the medium- to long-term	Reference
Human Capital	**Various**	**Higher resilience, positive relationship with GDP growth**	**Increased private consumption and improved public services should increase employment demand**	**Improved public provision of education, health and social security might be funded through fiscal deficits and debt accumulation**	**Diop, Asangu & Nnanna (2021) use HDI for the collective sub-index**
GDP per capita (constant 2015 USD)	WDI	Higher resilience	Since population growth is a more stable time-series, volatility in GDP growth will determine most of the co-movement with GDP per capita growth	*	Included within HDI
Econom-ically active (15–65)	WDI	Higher resilience	Higher proportions of the population of working age enable reduction in dependency ratios	A greater supply of labour may exceed demand for employment	*
Employ-ment to population ratio	WDI	Higher resilience	Higher employment ratios reduce dependency burdens	*	Diop, Asangu & Nnanna (2021) use unemployment
Life expectancy	WDI	Higher resilience	Longer life expectancy may mean working life is extended	Longer life expectancy can worsen the dependency burden from pension and related provisions	Included within HDI
Human capital index	PWT	Higher resilience	This is a measure of the quality of educational and health services, the improvement of which increase skills and employability	Public spending on education and health might be deficit financed	IMF (2016)

Note 1 All growth rates are real (i.e. measuring output growth only, price inflation stripped out)

2 All data downloaded during the first quarter of 2023

3 All assumptions on indicator's relevance to macroeconomic resilience are made on the basis of other relevant variables remaining unchanged (ceteris paribus)

Source: Compiled by author

Table C4 Data sources for compiling the CoMPRA-MERI

Institutional database source	Sub-Index	Data source hyperlink
World Development Indicators (WDI)	All	https://databank.worldbank.org/source/world-development-indicators
International Monetary Fund - Government Finance Statistics (IMF-GFI)	Fiscal	https://data.imf.org/regular.aspx?key=60991462
International Monetary Fund - Monetary and Financial Statistics (IMF-MFS)	Monetary	https://data.imf.org/regular.aspx?key=63243613
International Monetary Fund - International Financial Statistics (IMF-IFS)	Monetary	https://data.imf.org/regular.aspx?key=62808823
World Bank - International Debt Statistics (WB-IDS)	Debt	https://databank.worldbank.org/source/international-debt-statistics
United Nations Conference on Trade and Development (UNCTAD)	Trade	https://unctadstat.unctad.org/datacentre/
World Bank, World Governance Indicators (WGI)	Governance	https://www.worldbank.org/en/publication/worldwide-governance-indicators
Penn World Tables (PWT)	Human capital	https://www.rug.nl/ggdc/productivity/pwt/?lang=en

Table C5 Theoretic references used in compiling the CoMPRA-MERI

Institutional database source	Sub-Index
Samba Diop, Simplice A Asongu and Joseph Nnanna, "COVID-19 Economic Vulnerability and Resilience Indexes: Global Evidence", International Social Science Journal 71, S1 (2001): 37–50.	
Lino Briguglio, "Economic Vulnerability and Resilience: Concepts and Measurements", in L Briguglio and EJ Kisanga (eds), Economic Vulnerability and Resilience of Small States (Malta and London: Islands and Small States Institute and Commonwealth Secretariat, 2004).	
Lino Briguglio et al., "Economic Vulnerability and Resilience Concepts and Measurements" (WIDER Research Paper 2008/55, UNU-WIDER, Helsinki, 2008).	
Gordon Cordina, "Economic Vulnerability, Resilience and Capital Formation", in L Briguglio and EJ Kisanga (eds), Economic Vulnerability and Resilience of Small States (Malta and London: Islands and Small States Institute and Commonwealth Secretariat, 2004).	
IMF, "A Macroeconomic Perspective on Resilience" (Policy Paper for G20, IMF, Washington DC, November 2016).	http://www.g20.utoronto.ca/2017/2017-Germany-IMF-a-macroeconomic-perspective-on-resilience.pdf
Liliana Rojas-Suarez, "Emerging Market Macroeconomic Resilience to External Shocks: Today versus Pre-Global Crisis" (Essay, Centre for Global Development, Washington DC, February 2015).	https://www.cgdev.org/sites/default/files/CGD-Essay-Rojas-Suarez-Emerging-Market-Macroeconomic-Stability_0.pdf
Liliana Rojas-Suarez, "Identifying Macroeconomic Resilience to External Shocks in Emerging and Developing Countries: Lessons from the Global Shocks of 2020–2022" (Essay, Centre for Global Development, Washington DC, October 2023).	https://www.cgdev.org/sites/default/files/identifying-macroeconomic-resilience-external-shocks-emerging-and-developing-countries.pdf

Annexure D
Future research directions

Table D1 Possible indicators for structural vulnerability index

Indicator	Data source	Assigned as	By reference
Foreign investment - % of GDP	WDI	Vulnerability	Diop, Asongu and Nnanna, "COVID-19 Economic Vulnerability"
Personal remittances - % of GDP	WDI	Vulnerability	Diop, Asongu and Nnanna, "COVID-19 Economic Vulnerability"
Official development assistance - % of GDP	WDI	Vulnerability	Diop, Asongu and Nnanna, "COVID-19 Economic Vulnerability"
Natural resource rents - % of GDP	WDI	Vulnerability	Diop, Asongu and Nnanna, "COVID-19 Economic Vulnerability"
Sectoral diversification index	Not known	Resilience	
Agriculture - % of GDP	WDI	Resilience	Diop, Asongu and Nnanna, "COVID-19 Economic Vulnerability"
Frequency of natural disasters	WB?	Vulnerability	
Trade openness - % of GDP	WDI	Vulnerability	Briguglio, "Economic Vulnerability and Resilience"
Ratio of fuel and food to total imports	UNCTAD?	Vulnerability	Briguglio, "Economic Vulnerability and Resilience"
Population size, economy size	WDI	Resilience	Briguglio, "Economic Vulnerability and Resilience"
Labour productivity		Resilience	Briguglio, "Economic Vulnerability and Resilience"
Income distribution – Gini	WDI - infrequent	Vulnerability?	Briguglio, "Economic Vulnerability and Resilience"
Environmental management index including coverage and enforcement of legislation, energy efficiency, waste management, use of water and biodiversity	Not known	Resilience	Briguglio, "Economic Vulnerability and Resilience"

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