

Foreign Reserves Adequacy In S.S.A.

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ESSA – South Africa.

Motivation

- Policy makers in S.S.A., as in elsewhere, need to find an operational way of assessing reserve adequacy.
- Recent studies have attempted to assess reserve adequacy by weighing the consumption smoothing benefits of holding reserves against their cost (Aizenman and lee, 2005, Garcia and Soto, 2004, and Jeanne and Ranciere*, 2006).
- S.S.A. Countries, however, are routinely faced with substantially different shocks than industrial and emerging market economies.

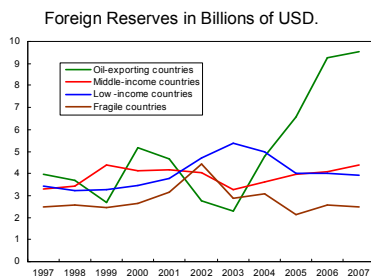
Objective

- Developing a framework for assessing reserve adequacy in low-income African countries with special focus on the key shocks faced by them.

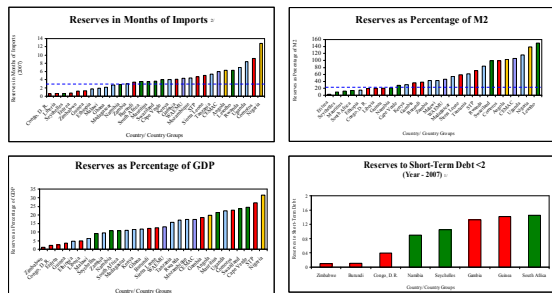
Plan Of The Talk

- State of Play in Reserve Adequacy.
- Shocks in S.S.A. and Their Impact.
- Two Good Model.
- Parameterization and Simulation Results.
- Conclusion.

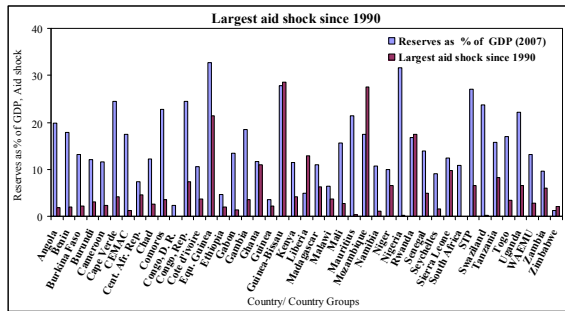
Foreign Reserves In S.S.A.



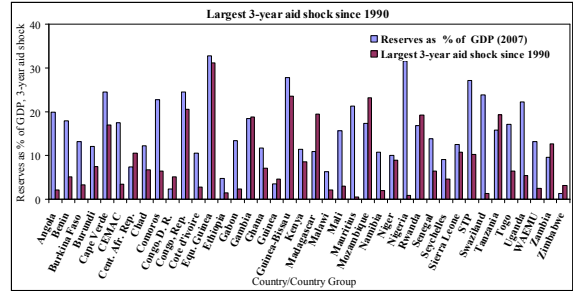
Foreign Reserves In S.S.A. – Standard Indicators.



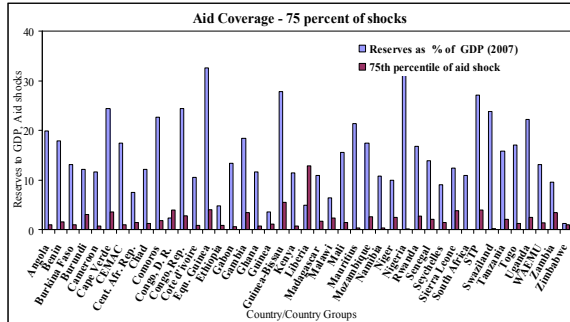
Shocks Facing S.S.A. – Aid Shock.



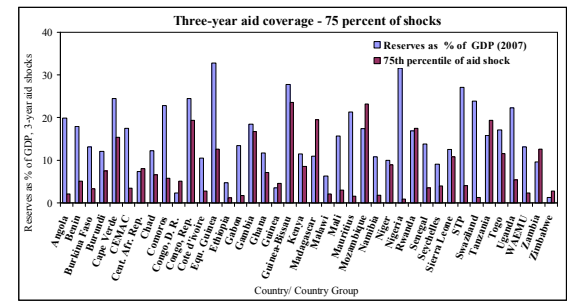
Shocks Facing S.S.A. – Three Year Aid Shock.



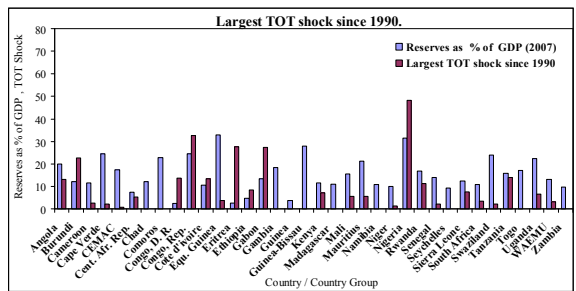
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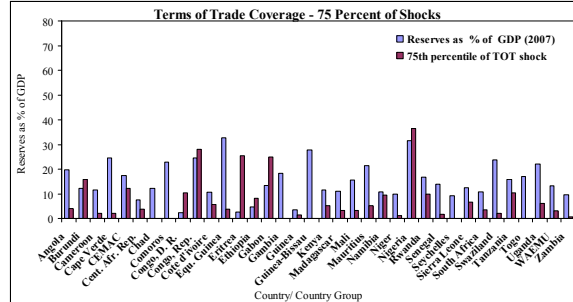
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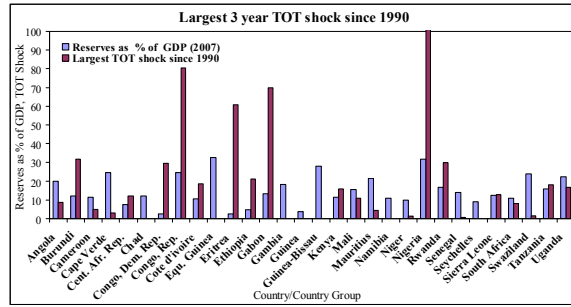
Shocks Facing S.S.A. – Terms Of Trade Shock.



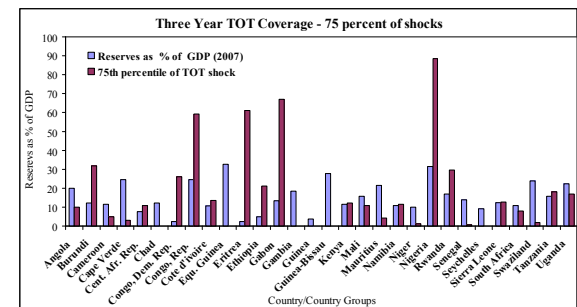
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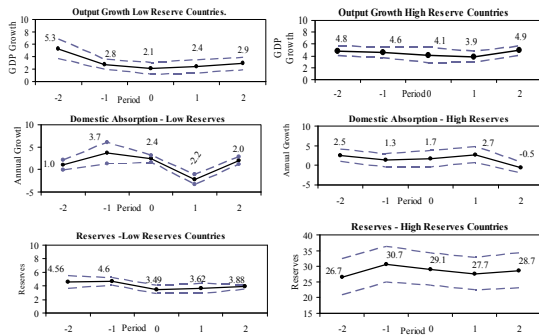
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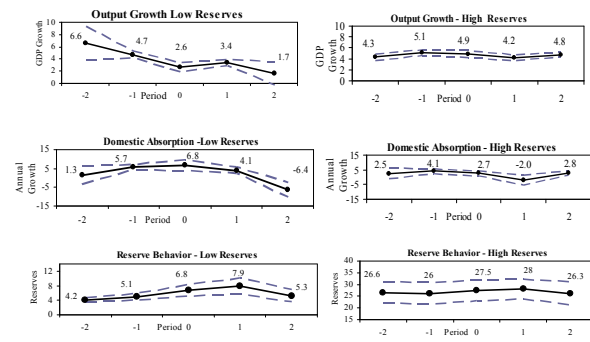


Response Of Key Variables - TOT Shocks



Source: Authors' computations based on I.M.F., International Financial Statistics and World Bank, World Development Indicators.

Response Of Key Variables - Aid Shocks



Source: Authors' computations based on I.M.F., International Financial Statistics and World Bank, World Development Indicators.

Small Open Economy With Two Goods

- Two Goods – One tradable another non-tradable.
- Two Sectors – Households & Government.
- Exogenous stochastic transfer of tradable good – Aid.
- Two Shocks – Terms of Trade and Aid.

Two-good Model - Household

- Maximization Problem of The Representative Household:

$$\max U_t = \sum_{s=0}^{\infty} E_0 \left[(1+r)^{-s} u(C_{t+s}) \right],$$

$$\text{s.t. } C_t^T = T \times Y_t^T + L_t - (1-r)L_{t-1} + Z_t + A_t$$

$$C_t^N = Y_t^N$$

Where

$$u(C) = \frac{C^{1-\sigma} - 1}{1-\sigma} \quad \text{and} \quad C = (C^T)^\alpha (C^N)^{1-\alpha}$$

Shock And Sudden Stop.

- Shock occurs with probability π_s every period

Where:

$$\pi_s = \pi_{TOT} + \pi_{Aid} - \pi_{TOT} \times \pi_{Aid}$$

- No Debt Roll-Over When Shock Occurs.

Two-good Model - Government

- Government can issue a long-term security which is used to finance reserves.

$$R_t = PN_t$$

- Price of the security is give by:

$$P = \frac{1}{r + \delta + \pi_s}$$

- Government's budget constraint is given by:

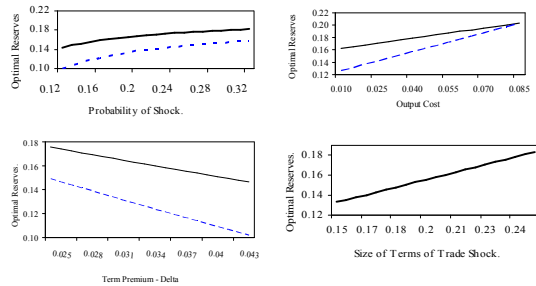
$$Z_t + R_t + N_{t-1} = P(N_t - N_{t-1}) + (1+r)R_{t-1}$$

Parameterization

Benchmark Parameters	Values
Size of the T.O.T Shock, γ_{TOT}	0.219
Output loss due to the TOT shock, γ_1	0.015
Coefficient of Risk Aversion, σ	2
Share of Tradable Good in Consumption, α	0.5
Probability of T.O.T Shock, π_{TOT}	0.209
Term Premium, δ	0.03
Potential Output Growth, g	0.05
Risk free Rate of Return, r	0.05
Short Term Debt as a Share of Output, λ	0.204
Aid as a share of GDP	0.04
Size of Aid Shock, γ_{Aid}	1.81
Output loss due to Aid shock, γ_2	0.015
Probability of Aid Shock, π_{Aid}	0.10

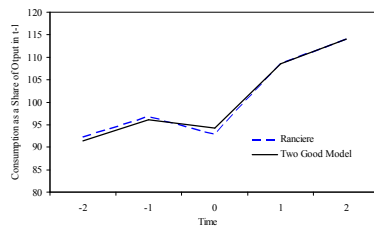
Simulation Results.

Ranciere Vs. Two-good Model.



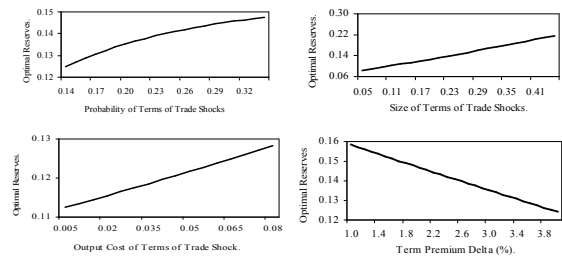
Simulation Results.

Path of Consumption under Optimal Reserves:



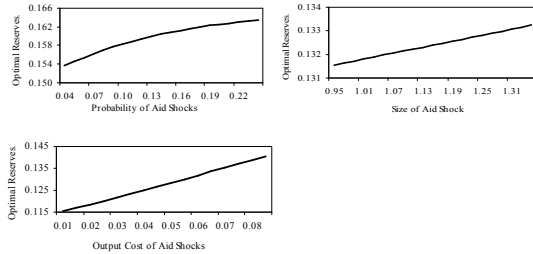
Simulation Results.

Two-Good Model with Terms Of Trade & Aid Shock.



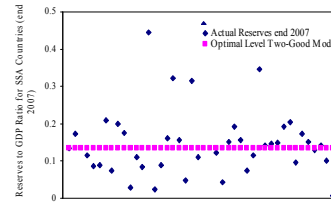
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Two-Good Model with Terms Of Trade and Aid Shock.



Simulation Results.

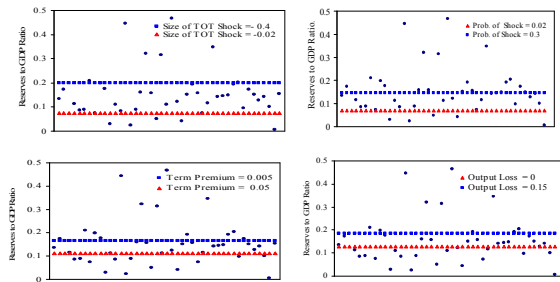
Reserves Across S.S.A.



Source: W.E.O and A.F.R Database and Author's Computations.

Sensitivity Analysis.

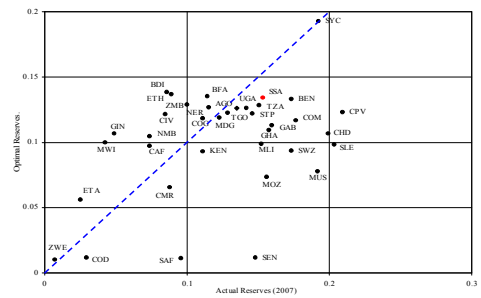
Sensitivity to Key Parameters.



Source: W.E.O and A.F.R Database and Author's Computations.

Country-specific Simulations.

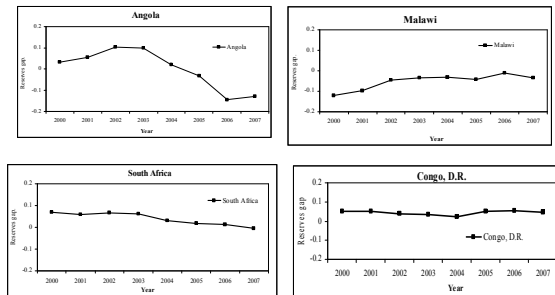
Reserve Adequacy for S.S.A. Countries.



Source: W.E.O and A.F.R Database and Author's Computations.

Country-specific Application.

Application of Two-Good Model to a set of 4 S.S.A. Countries.



Source: W.E.O February, 2008.)

Conclusions.

- Consumption smoothing role of reserves is particularly important in S.S.A.
- The Two-Good model provides a benchmark against which we can compare the actual reserve holdings of a country.
- The actual choice of reserve levels to hold depends on a number of factors and should therefore be studied within the context of overall macroeconomic policy framework in a country.

Future Research.

- Extending the Two-Good Model to include production and investment.
 - Allowing for persistent shocks.
 - Looking at the transition path of the economy towards the optimal reserve level.
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