

A Theory of Rollover Risk, Sudden Stops, and Foreign Reserves

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1 FORTRAN Blocks

1.1 Toolkit

- **SUBROUTINE** BISECTION(min,max,function) \Rightarrow zero, functionc value, error code
- **FUNCTION** TRAPZ
- **FUNCTION** Linspace
- **FUNCTION** PRODFEC
- **FUNCTION** INTERP1, INTERP2, INTERP3

1.2 Feasibility

- **FUNCTION** RSRV_INI(R_0, K)
- **FUNCTION** YIELD_CRISIS(R_0, K, r_H)
uses RSRV_INI
- **FUNCTION** LIQ_CRISIS(R_0, K, r_H)
uses RSRV_INI, YIELD_CRISIS
- **FUNCTION** PHI_LIQ(R_0, K, r_H)
uses RSRV_INI
- **FUNCTION** LIQ_MAX(R_0, K, r_H, φ)
- **FUNCTION** PHI_LO(R_0, K, r_H)
uses RSRV_INI, LIQ_MAX + PHIGRID
- **FUNCTION** PHI_UP(R_0, K, r_H)
uses RSRV_INI, LIQ_MAX + PHIGRID

- **FUNCTION** PHI_MIN($\varphi_{liq}, \varphi_{lo}, \varphi_{up}$)
- **FUNCTION** PHI_MAX($\varphi_{liq}, \varphi_{lo}, \varphi_{up}$)
- **FUNCTION** PHINODEFAULT(R_0, K, r_H)
See formula for φ_N + uses RSRV_INI, YIELD_CRISIS, LIQ_CRISIS
- **FUNCTION** PHIDEFAULT(R_0, K, r_H)
See formula for φ_S + uses RSRV_INI, YIELD_CRISIS, LIQ_CRISIS
- **FUNCTION** PHILB(R_0, K, r_H)
See formula for $\underline{\varphi}$ + uses PHI_MIN, PHILLIQ, PHILLO, PHINODEFAULT
- **FUNCTION** PHIUB(R_0, K, r_H)
See formula for $\overline{\varphi}$ + uses PHI_MAX, PHI_UP, PHIDEFAULT
- **SUBROUTINE** SOLVECONTRACT(ρ, R_0, K) $\Rightarrow r_H, \text{feasible}$
Uses BISECTION¹ + contains
 - **FUNCTION** PC(r_H)
See formula + derives from PARTICIPATION
- **FUNCTION** PARTICIPATION(ρ, R_0, K, r_H)
See formula + uses PHIUB, PHILB + cdf and anti-cdf of $h_\rho^1(\varphi)$
- **SUBROUTINE** BUILDFEASIBLE $\Rightarrow r_H, \text{feasible}$
Uses SOLVECONTRACT, RHOGRID, RGRID, KGRID + populates FSBLMAP, FSBLRH, FSBLRSRV, FSBLRLL, FSBLPHILB, FSBLPHIUB, FSBLYSS

1.3 Value Function Iteration

- **FUNCTION** NET_OUTPUT_CRISIS(R_0, K, r_H)
- **FUNCTION** CONS_CRISIS(R_0, K, r_H, R')
- **FUNCTION** NET_OUTPUT(R_0, K, r_H, φ)
- **FUNCTION** CONS_FIN(R_0, K, r_H, φ, R')

¹Generically, the PC holds for two values of r_H , if any. Just finding ‘a’ zero is problematic since the lowest zero strictly dominates the other (more consumption + fewer crises).