

Program Guide to Market 8.1

Ralph Abraham

September 23, 2006

This is the PDF of market083.05guide.tex. It is a program guide for market083.05.nlogo, a NetLogo model for a market of portfolio managers. It is an extension of our basic market model 8.0. We are going to make two extensions to 8.2, as described in *Bubbles and Crashes* (B+C) of September 2006: *gravity* and *death-rebirth*.

The changes from 8.2 to 8.3 are: add slider "gravity", and change the procedure "update-managers-z" to the following.

```
;;; update-managers-z is called by step
to update-managers-z ;;; update turtle variable z and move its ycor, includes clipping
ask managers [
  let annual-gross ( u * ( R1 - R0 ) + R0 ) ;;; this is gross return
  let annual-gross-jiggled annual-gross + u * jiggle
  let annual-gross-jiggled-weighted annual-gross-jiggled - gravity * z * z * u * u ;;;
  let pay cut annual-gross-jiggled-weighted
  ;;; this is the annual yield reduced to interval of stepsize
  ;;;; update z ;;; REV 082
  let z-now z ;;; hold for later
  let z-temp1 z-now * ( 1 + pay ) ;;; add payoff for this step
  let fickle d * stepsize * Lhat ;;; portion to defect
  let z-temp2 ( 1 - fickle ) * z-temp1 ;;; let defectors go
  let RelRhat z-now * ( exp ( lambda * Rhat ) ) / sum-zRhat ;;; new local in REV 083.04
  let recruits rate * stepsize * z-pool * RelRhat ;;; REV 083.04
  if recruits < 0 [ set recruits 0 ] ;;; clip
  set z ( z-temp2 + recruits ) ;;; include recruits ;;; REV 082.02b
  if ( z < 0 ) [ set z 0 ] ;;; clipping to zero REV 083 (formerly, clip to zlim)
  if ( z > zcap ) [ ;;; large bound
    set z zcap
    show "Z-CAP"
  ]
  ;;; vertical move
  let ytemp ( z - zmin ) * ( width-y - 1 ) / ( 2 * width-z ) ;;; its a float
```

```

    if ( ytemp > ymax ) [ set ytemp ymax ] ;;; clip for display only ;;; REV 083.01
    set ycor ytemp ;;; convert z to ycor, keep as float
    ;;; update z-pool ;;; REV 082b
    set z-pool ( z-pool + fickle * z-now - recruits ) ;;; REV 082.02b
    if z-pool < 0 [ set z-pool 0 ] ;;; clip
  ]
end

to bury-the-dead
  ask managers [
    if ( z < zlim ) [
      set z-pool ( z-pool + z ) ;;; increment z-pool
      set deaths ( deaths + 1 ) ;;; increment bench count
      set totalpop ( totalpop - 1 ) ;;; decrement totalpop
      die ;;; vanish for good
    ]
  ]
end

to give-birth
  ;;; show "giving birth" ;;; DEBUG
  let yellow-u u-of turtle 2
  ;;; show yellow-u ;;; DEBUG
  ;;; save all 5 puff slider values
  let pop-temp population
  let center-temp center
  let width-temp width
  let height-temp height
  let alt-temp altitude
  ;;; now puff
  if deaths > 0 [ ;;; warning this will reset all puff sliders
    ;;; show "puffing" ;;; DEBUG
    set population deaths ;;; number to puff
    set center 100 * yellow-u / ( umax - umin ) ;;; this is a percentage
    set width center / 2 ;;; ok if yellow king in left half of graphics window
    set height 10
    set altitude 25
    puff ;;; this creates, and resets totalpop
    set deaths 0
    ;;; now restore puff sliders
    set population pop-temp
  ]
end

```

```
set center center-temp
set width width-temp
set height height-temp
set altitude alt-temp
]
end
```