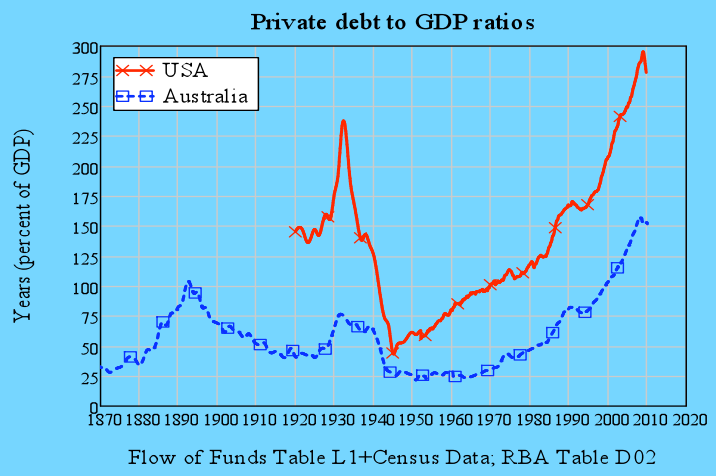
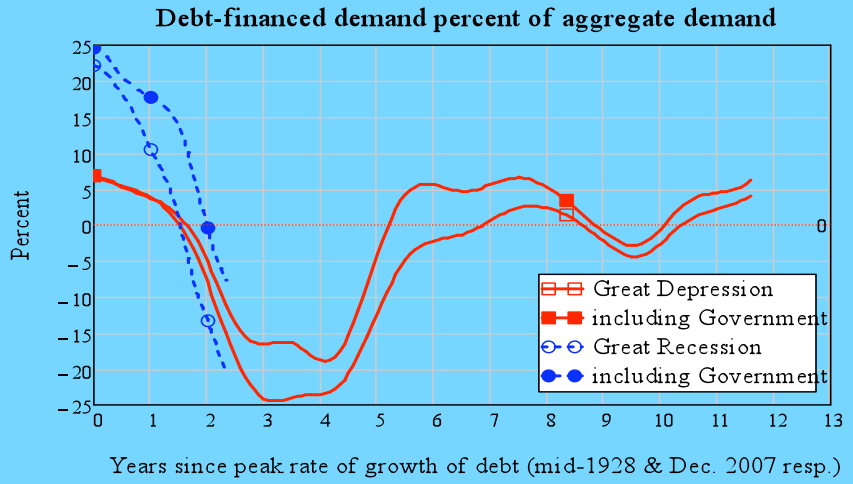


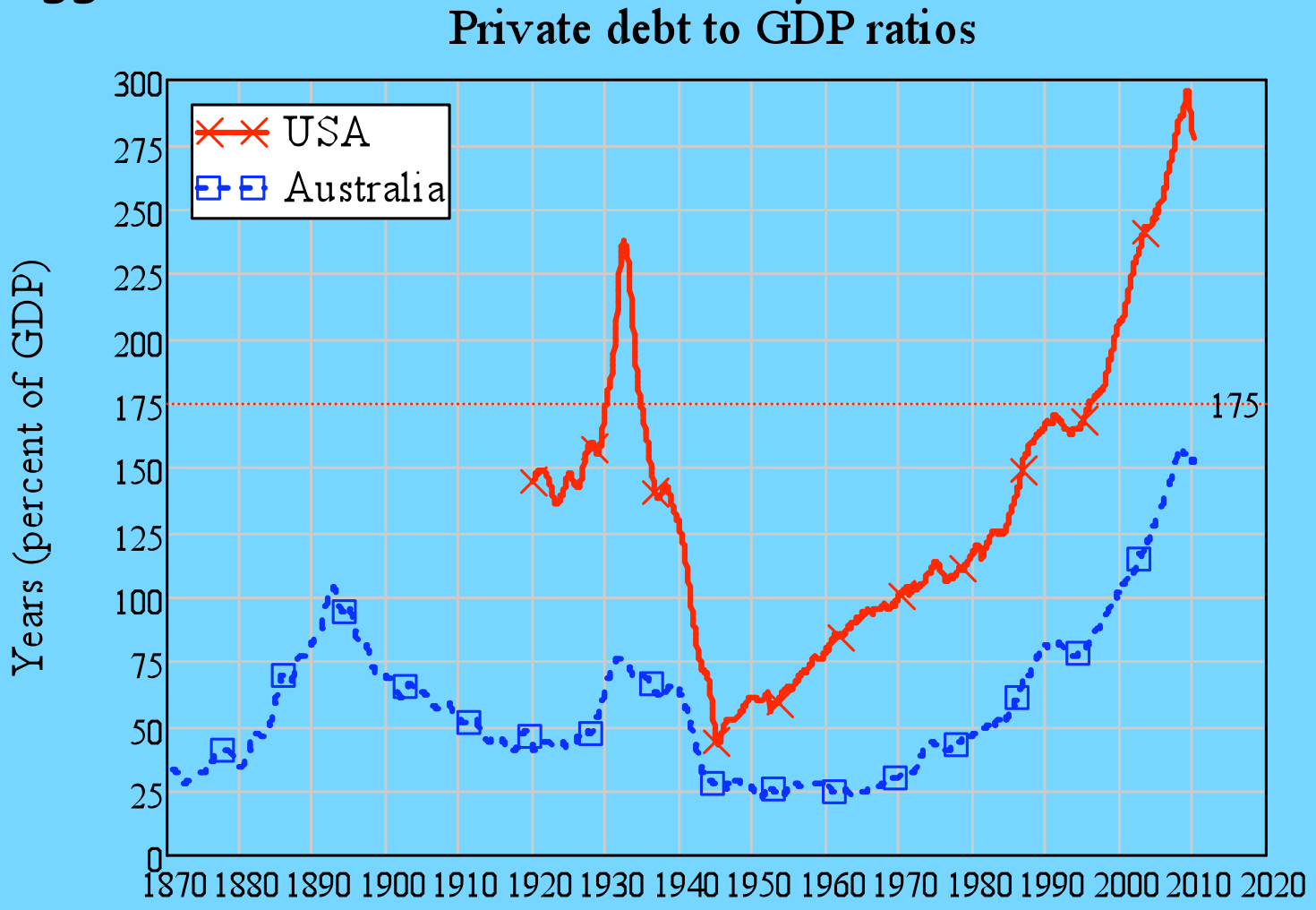


Are We "It" Yet?

Steve Keen
University of Western Sydney
Debunking Economics
www.debtdeflation.com/blogs
www.debunkingeconomics.com

Are We "It" Yet?

- Biggest debt bubbles in history...



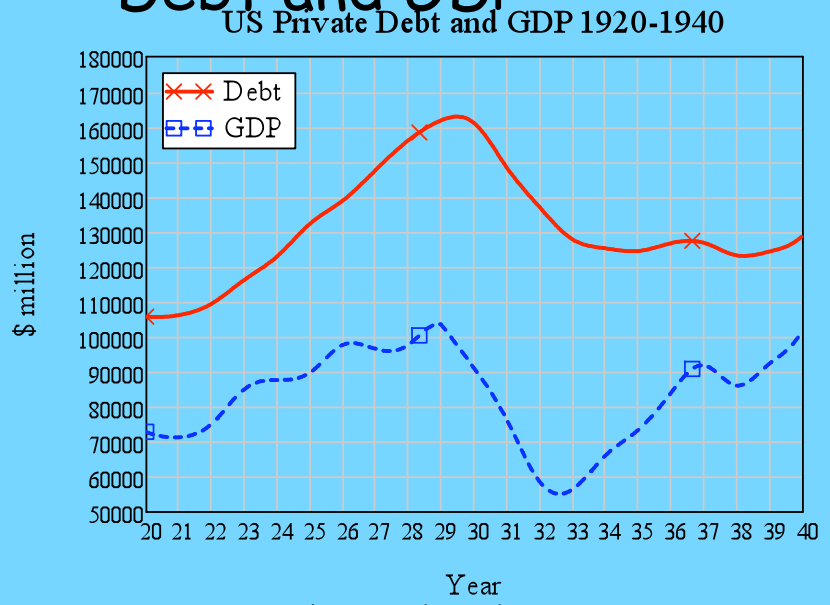
Flow of Funds Table L1+Census Data; RBA Table D02

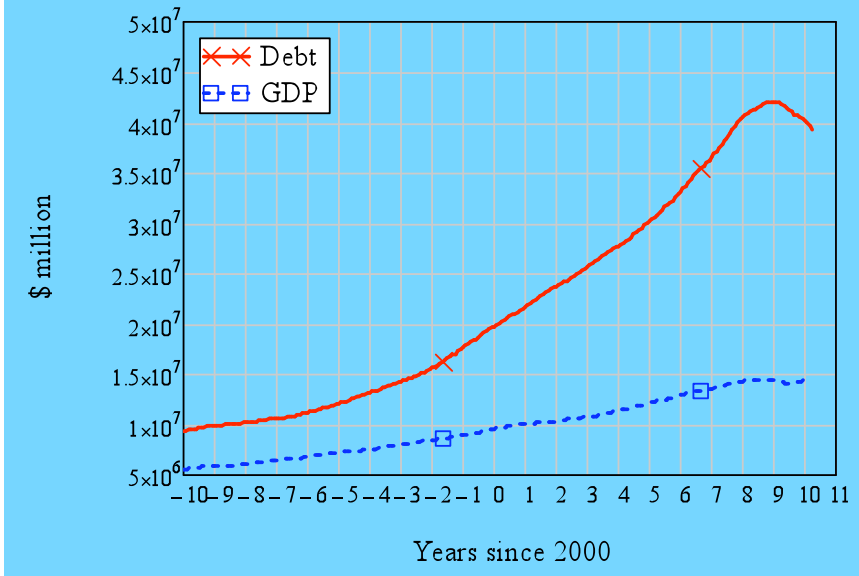
Are We "It" Yet?

- "If income is to grow, the financial markets … must generate an aggregate demand that, aside from brief intervals, is ever rising.
- For real aggregate demand to be increasing, … it is necessary that current spending plans, summed over all sectors, be greater than current received income
- and that some market technique exist by which aggregate spending in excess of aggregate anticipated income can be financed.
- *It follows that over a period during which economic growth takes place, at least some sectors finance a part of their spending by emitting debt or selling assets.*" (Minsky 1982, p. 6; emphasis added)

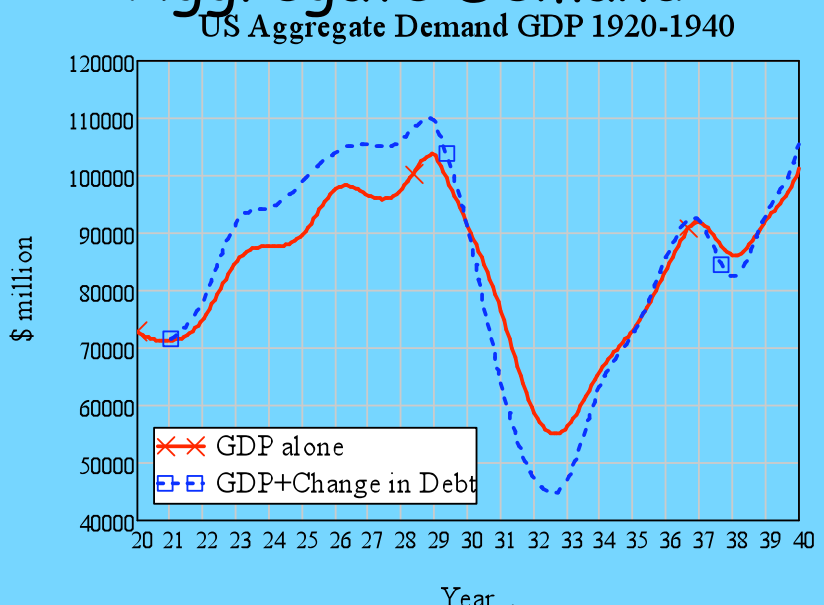
Are We "It" Yet?

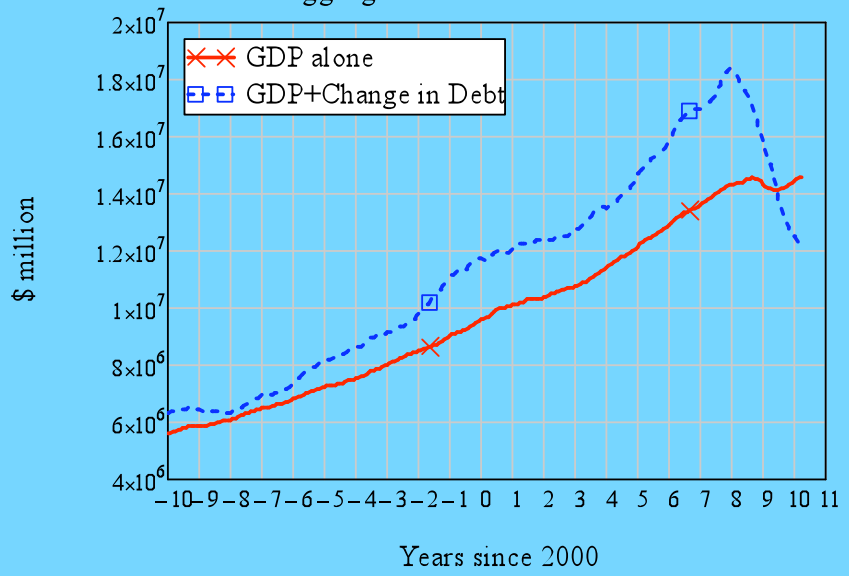
- Debt and GDP





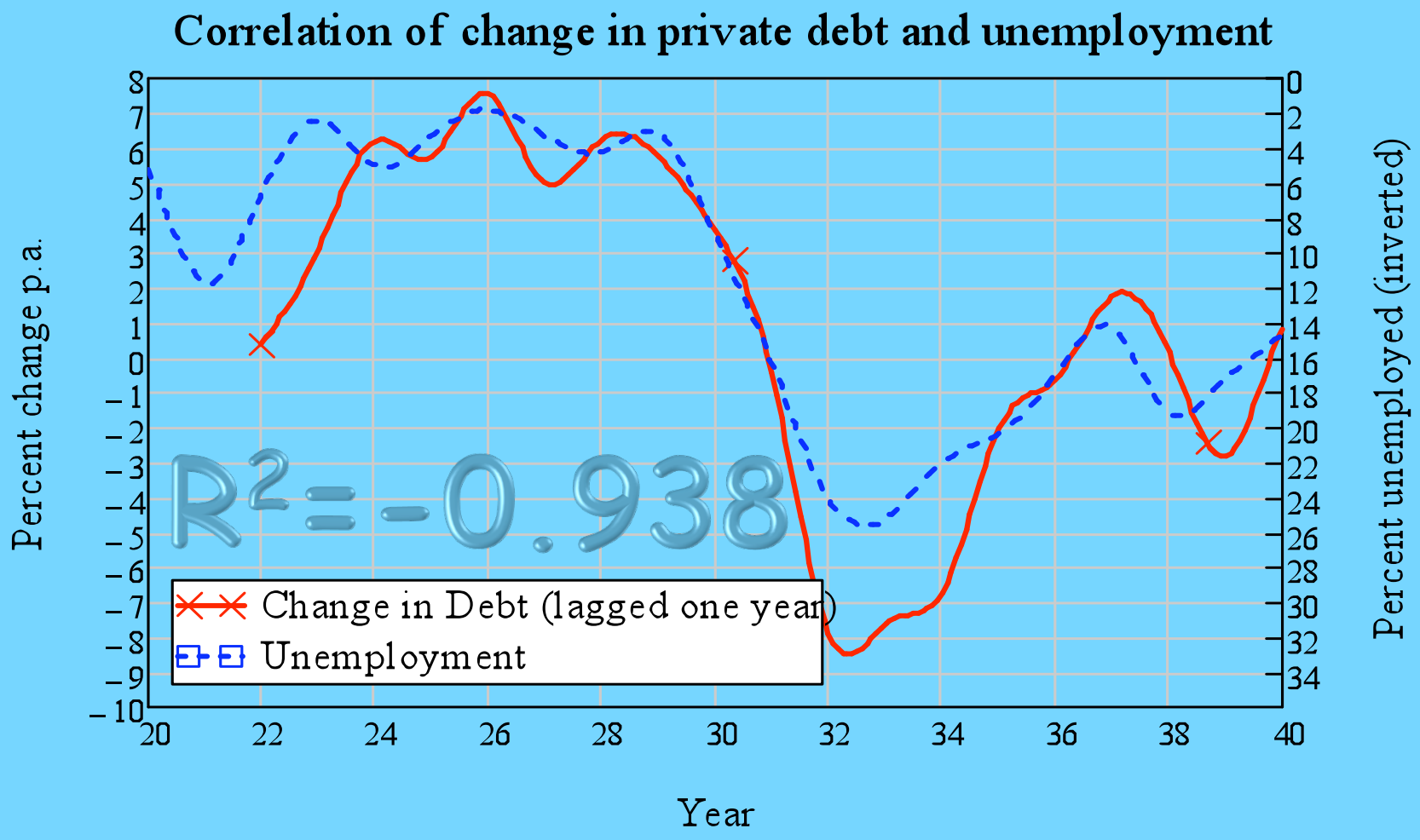
- Aggregate Demand





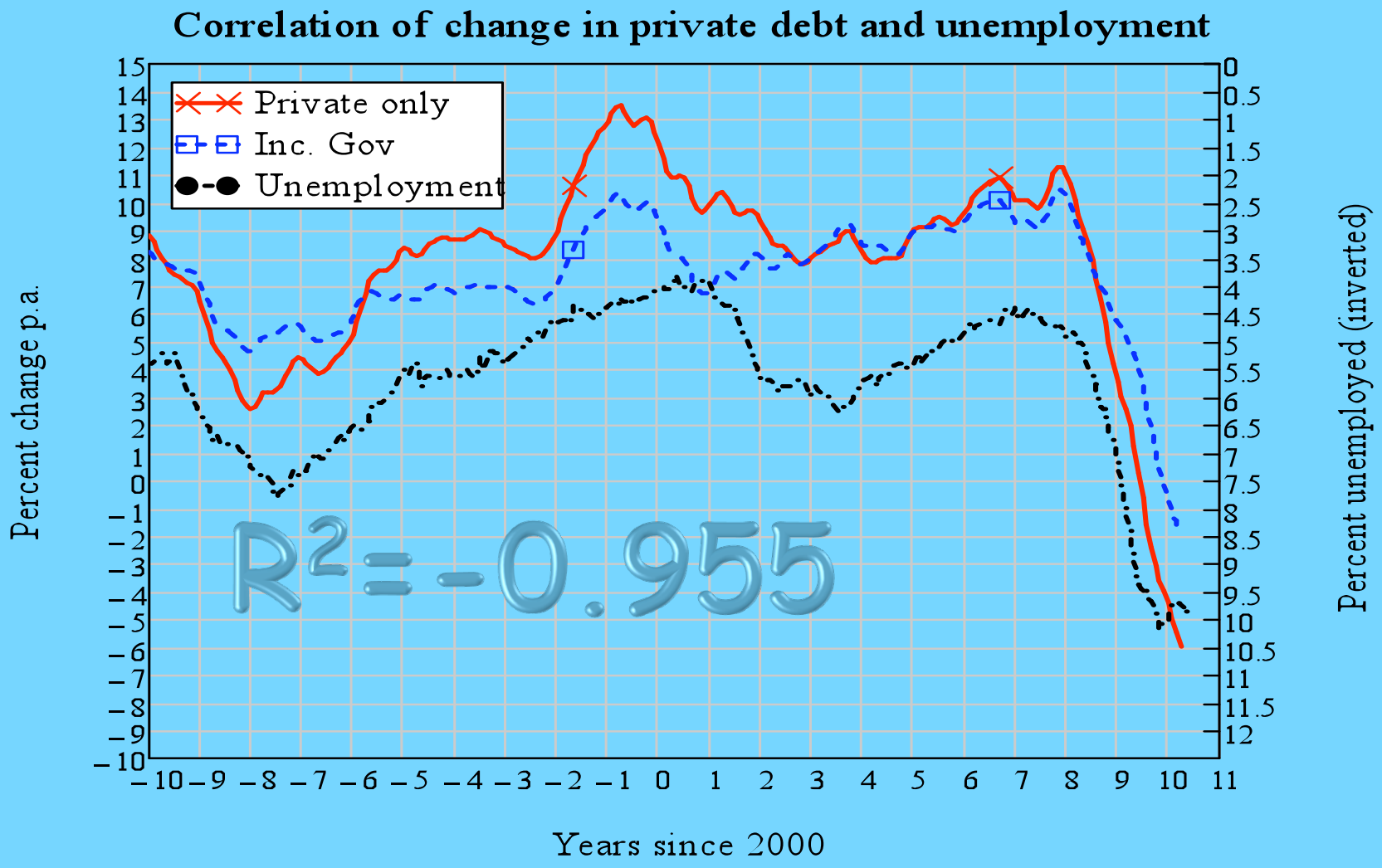
Are We "It" Yet?

- Aggregate demand & unemployment 1920-1940



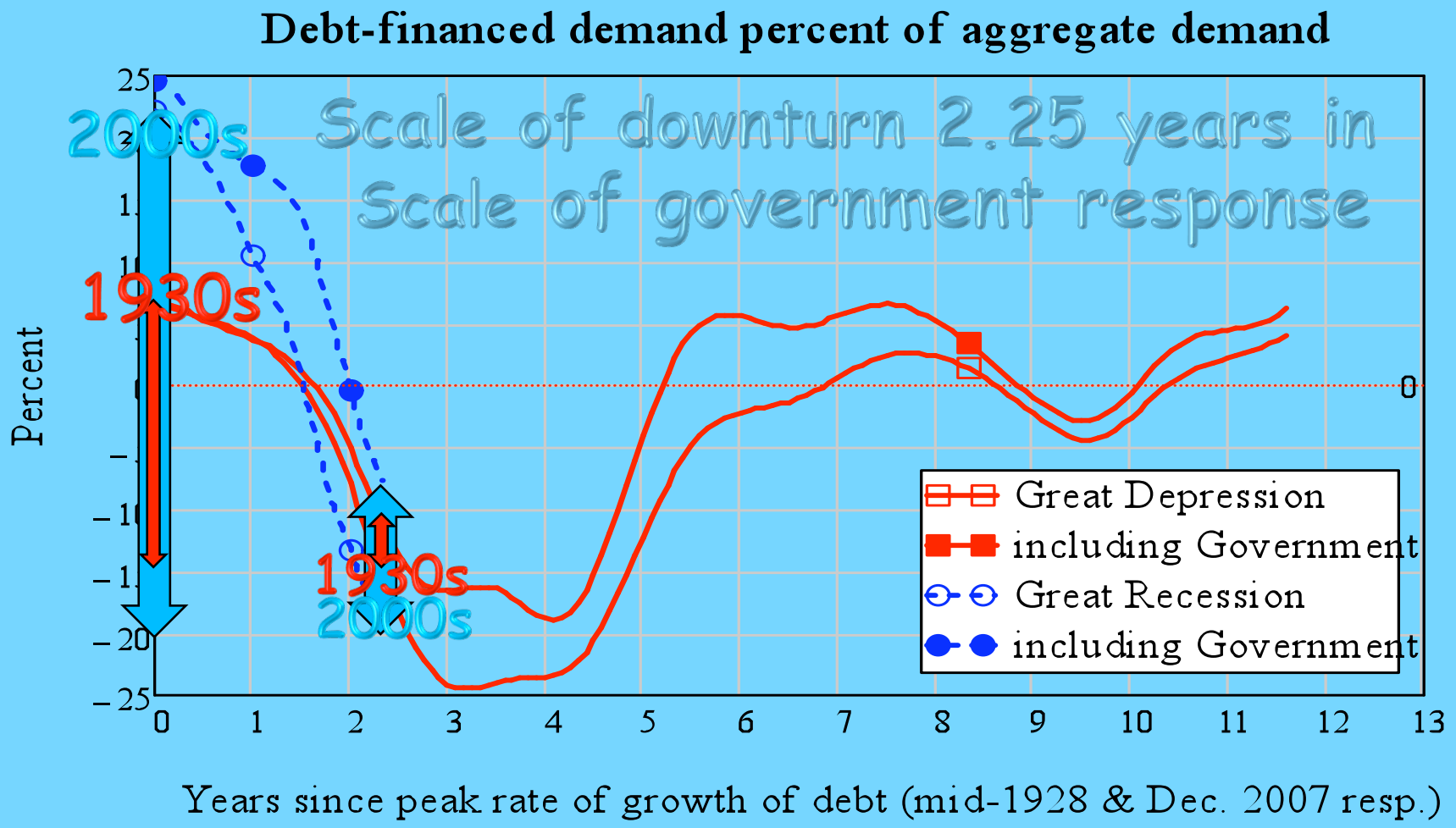
Are We "It" Yet?

- Aggregate demand & unemployment 1990-2010



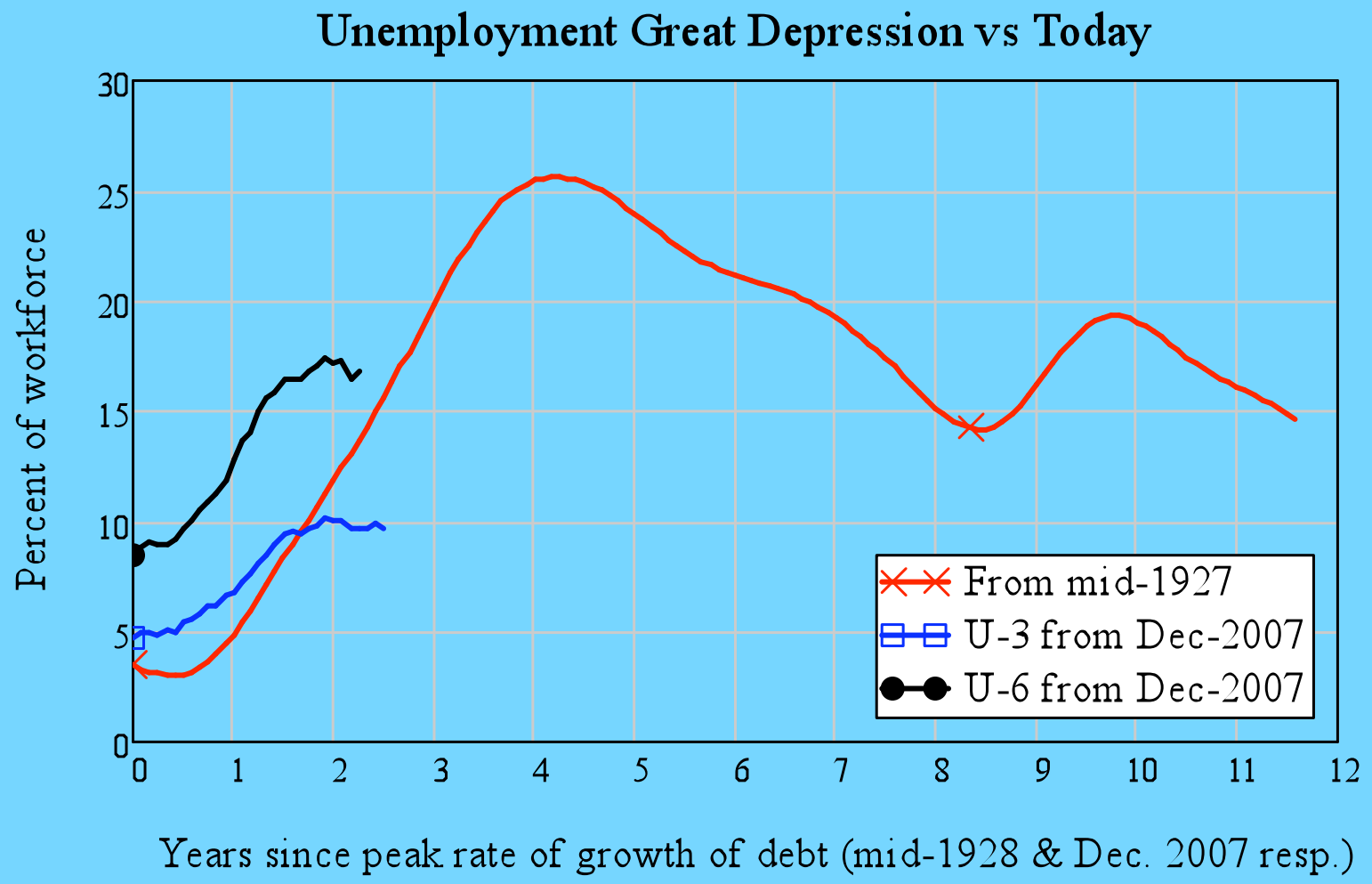
Are We "It" Yet?

- Debt-financed proportion of aggregate demand: $\frac{\Delta Debt}{GDP + \Delta Debt}$



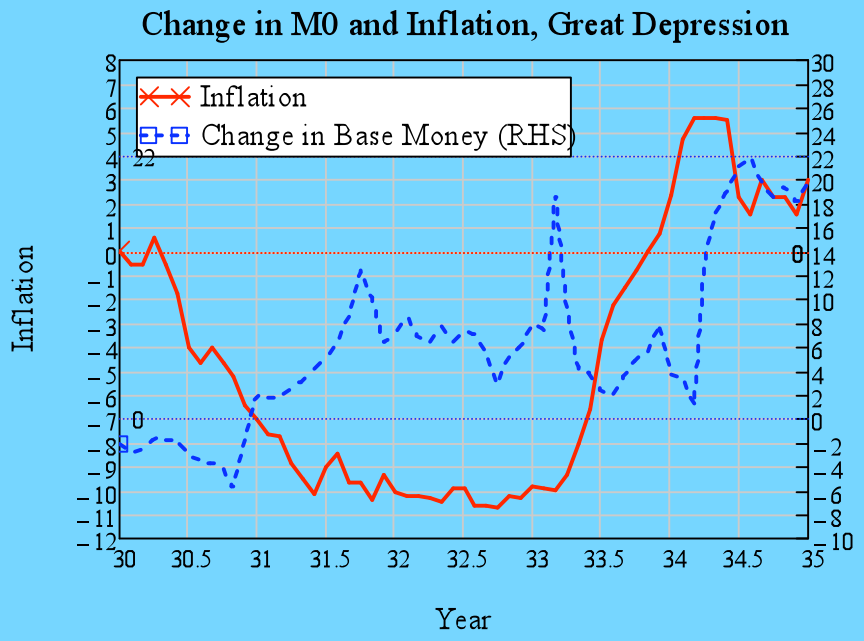
Are We "It" Yet?

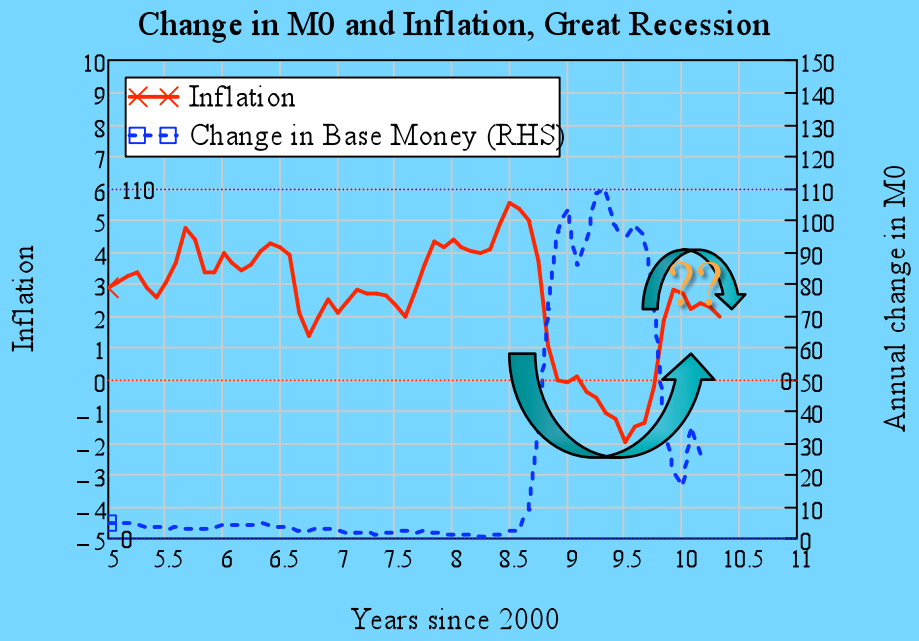
- Unemployment: end of the storm or just a lull?



Are We "It" Yet?

- Far larger Fed response: quantitative easing then & now





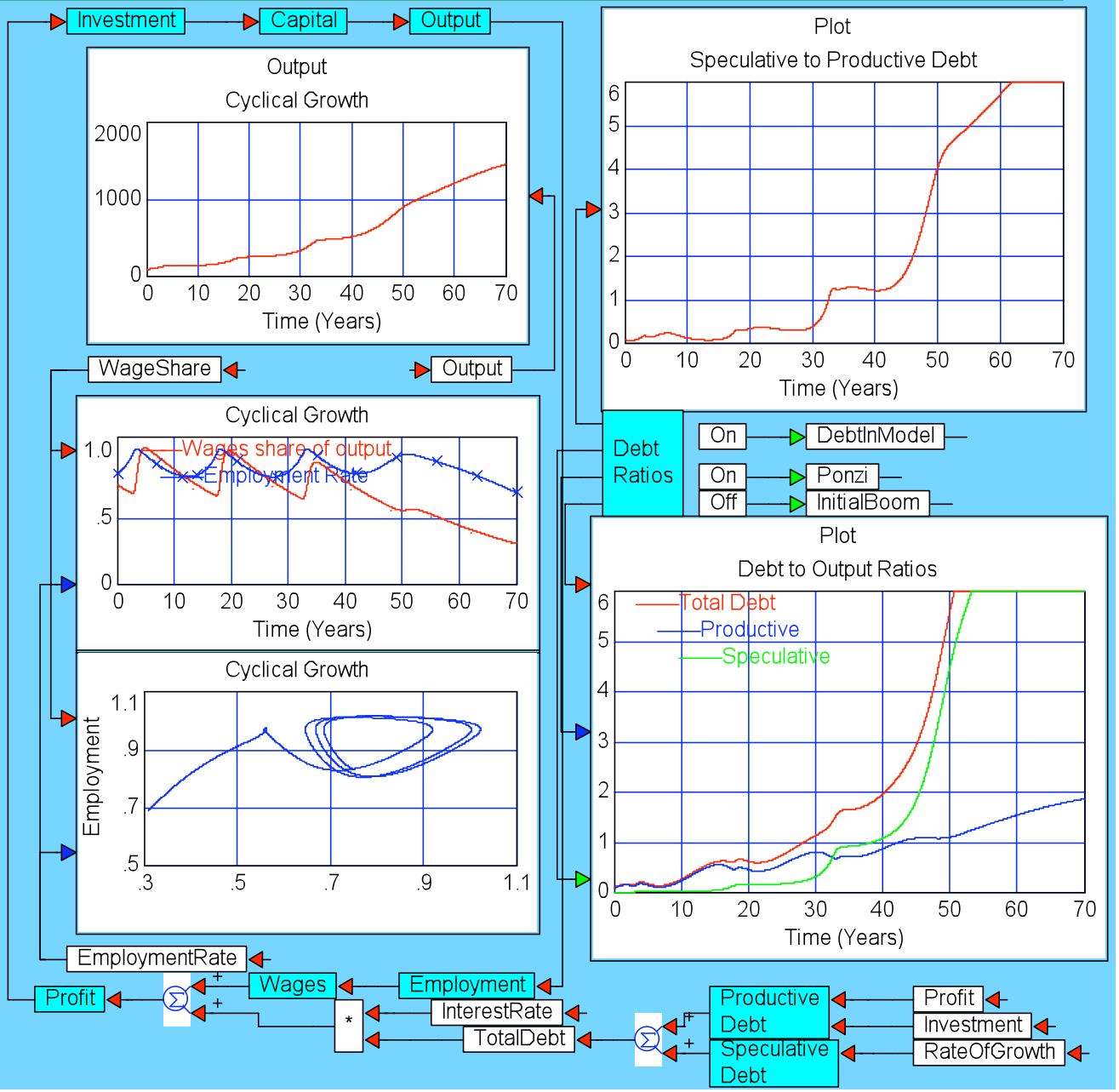
- "Printing press" may have stopped nascent deflation
- But will it be sustained?
- Over to modelling…

Are We "It" Yet?

- Minsky: Ponzi finance extension to Keen 1995

Click here to download Vissim viewer program

- Click on icon to run simulation after installing Vissim Viewer



MinskyFlowchart.vsm

Are We "It" Yet?

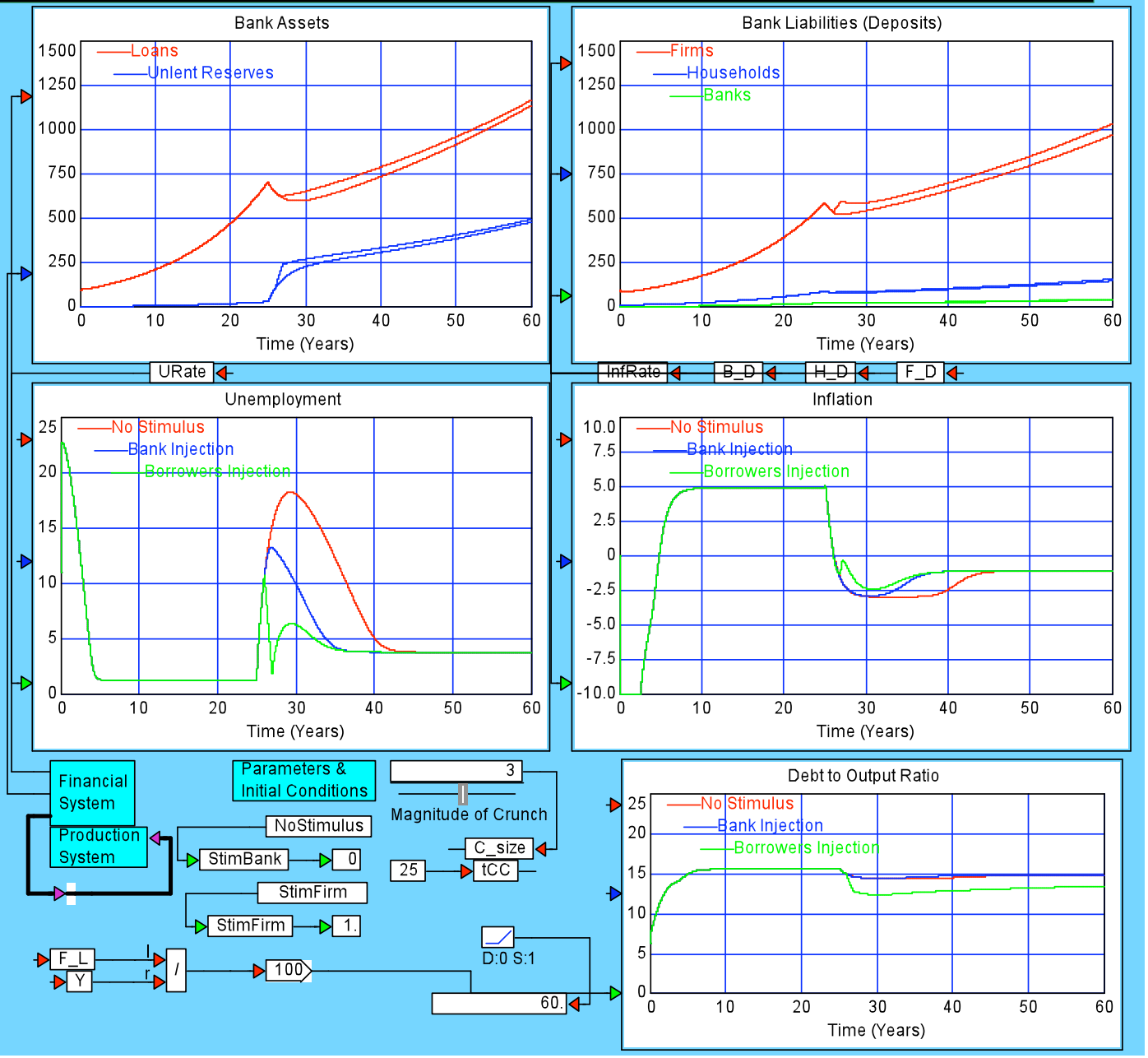
- Circuit:
  Which gives more "bang for buck" —rescuing bankers or debtors?

- Click on icons to run

CreditCrunchGovRescue.vsm

CreditCrunchGovRescue.vsm

CreditCrunchGovRescue.vsm



Are We "It" Yet?

- Integrating Minsky & the Circuit

Financial Sector

$$\frac{d}{dt}B_C(t) = \frac{F_L(t)}{\tau_{RL}(g(t))} - \frac{B_C(t)}{\tau_{LC}(g(t))}$$

$$\frac{d}{dt}B_{PL}(t) = r_L \cdot F_L(t) - r_D \cdot F_D(t) - r_D \cdot W_D(t) - \frac{B_{PL}(t)}{\tau_B}$$

$$\frac{d}{dt}F_L(t) = \frac{B_C(t)}{\tau_{LC}(g(t))} - \frac{F_L(t)}{\tau_{RL}(g(t))} + P_C(t) \cdot Y_r(t) \cdot Inv(\pi_r(t))$$

$$\frac{d}{dt}F_D(t) = r_D \cdot F_D(t) - r_L \cdot F_L(t) + \frac{B_C(t)}{\tau_{LC}(g(t))} - \frac{F_L(t)}{\tau_{RL}(g(t))} + \frac{B_{PL}(t)}{\tau_B} + \frac{W_D(t)}{\tau_W} - \frac{Y_r(t) \cdot W(t)}{a(t)} + P_C(t) \cdot Y_r(t) \cdot Inv(\pi_r(t))$$

$$\frac{d}{dt}W_D(t) = r_D \cdot W_D(t) - \frac{W_D(t)}{\tau_W} + \frac{Y_r(t) \cdot W(t)}{a(t)}$$

System states and algebraic relations

Level of output $$Y_r(t) = \frac{K_r(t)}{v}$$

Rate of Profit $$\pi_r(t) = \frac{P_C(t) \cdot Y_r(t) - W(t) \cdot \frac{Y_r(t)}{a(t)} - r_L \cdot F_L(t)}{v \cdot P_C(t) \cdot Y_r(t)}$$

Rate of employment $$\lambda(t) = \frac{Y_r(t)}{a(t) \cdot N(t)}$$

Rate of real economic growth $$g(t) = \frac{Inv(\pi_r(t))}{v} - \delta$$

Rate of change of wages $$\frac{d}{dt}W(t) = W((t)) \cdot \left[Ph(\lambda(t)) + \left[\frac{-1}{\tau_{Pc}} \cdot \left[1 - \frac{W(t)}{a(t) \cdot (1 - s) \cdot P_C(t)} \right] \right] \right]$$

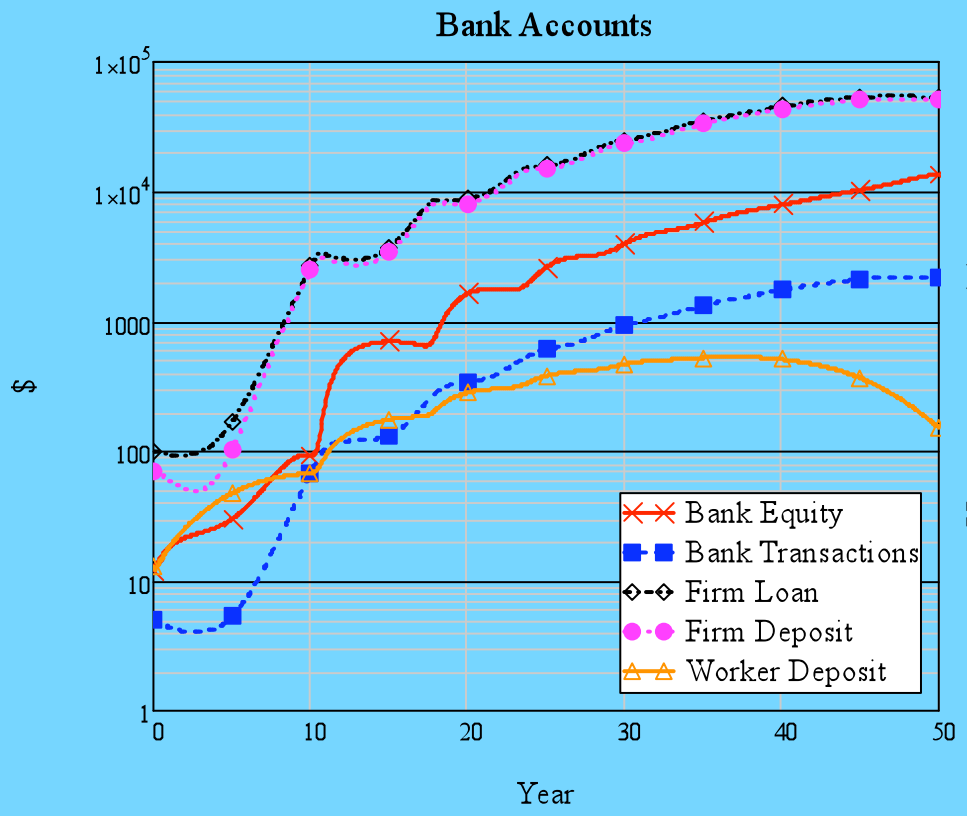
Rate of change of prices $$\frac{d}{dt}P_C(t) = \frac{-1}{\tau_{Pc}} \cdot \left[P_C(t) - \frac{W(t)}{a(t) \cdot (1 - s)} \right]$$

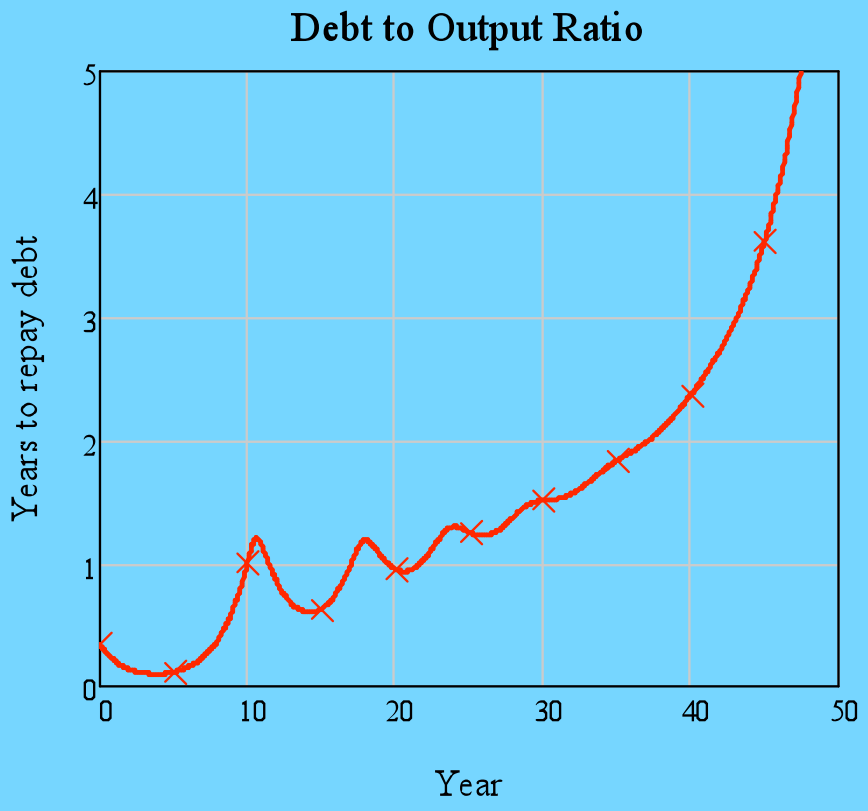
Rate of change of capital stock $$\frac{d}{dt}K_r(t) = K_r(t) \cdot g(t)$$

Rates of growth of population and productivity $$\frac{d}{dt}a(t) = \alpha \cdot a(t) \qquad \frac{d}{dt}N(t) = \beta \cdot N(t)$$

Are We "It" Yet?

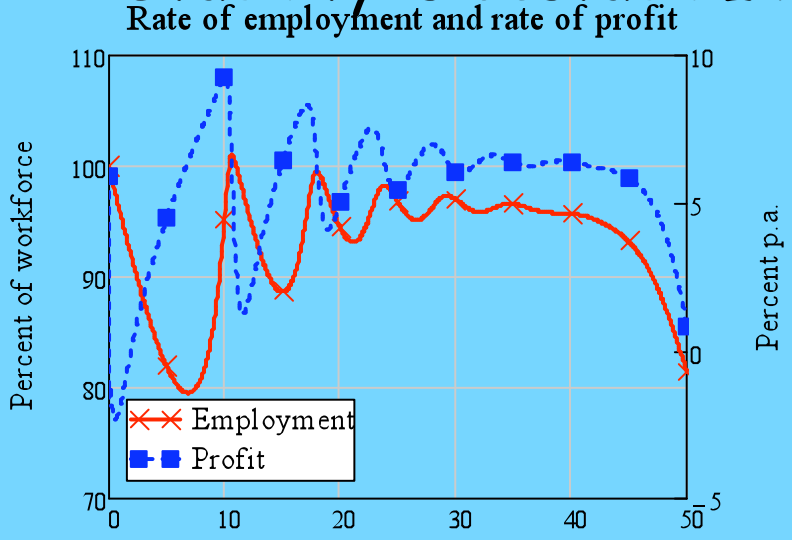
- Debt-deflationary dynamics in strictly monetary Minsky -Circuit model
- "The Great Moderation", then "The Great Crash"

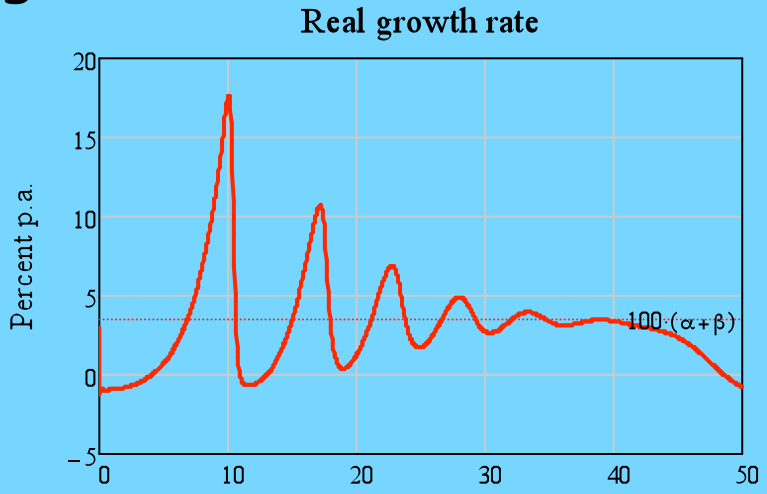


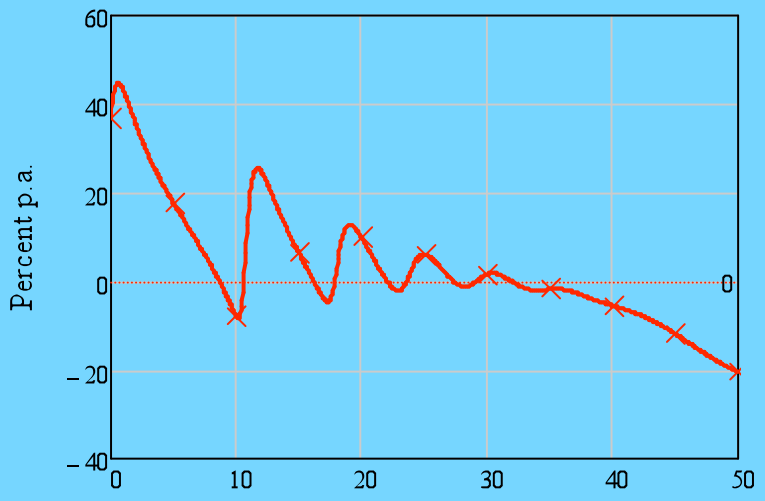


Are We "It" Yet?

- Stability is destabilizing…

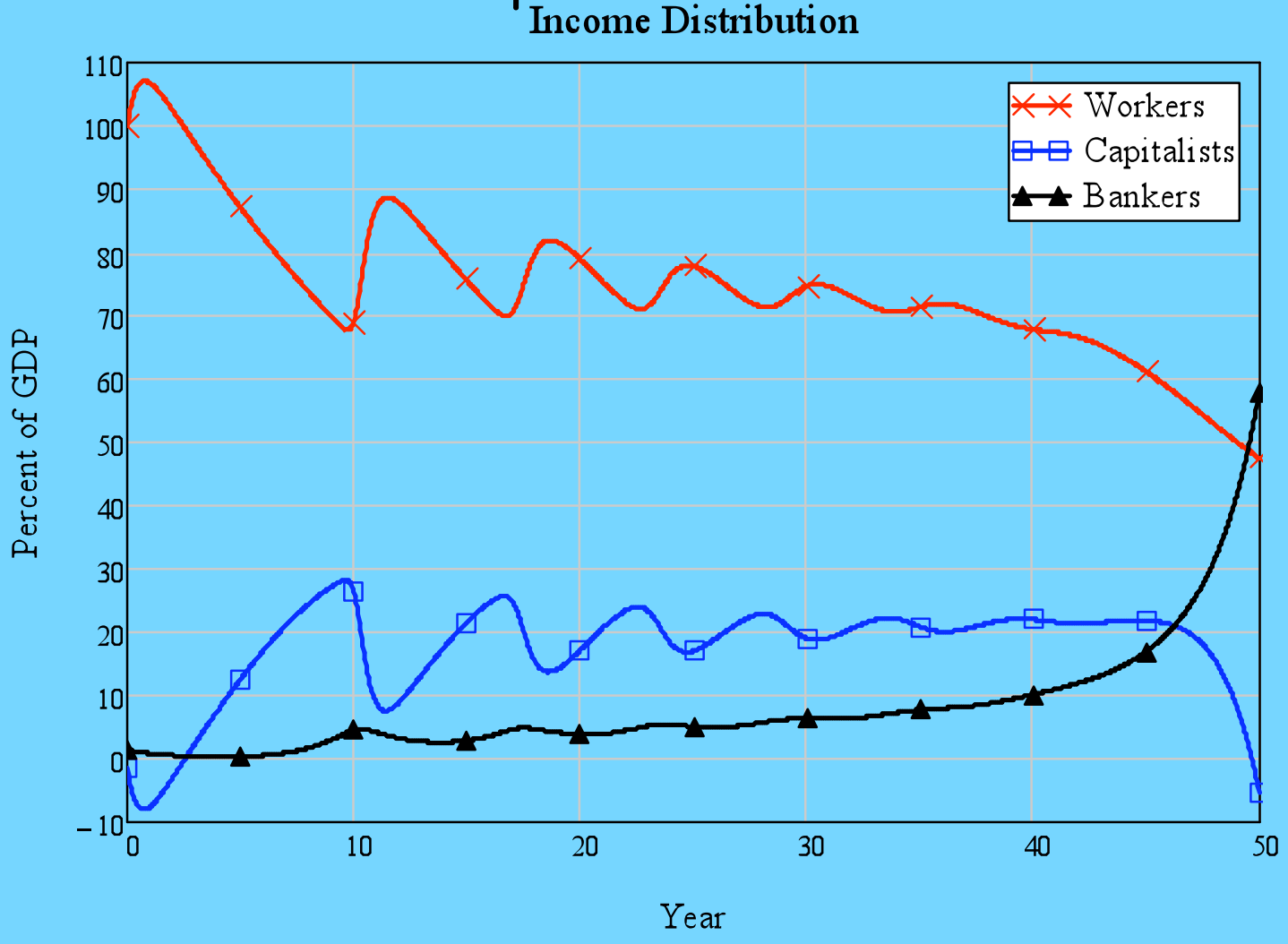






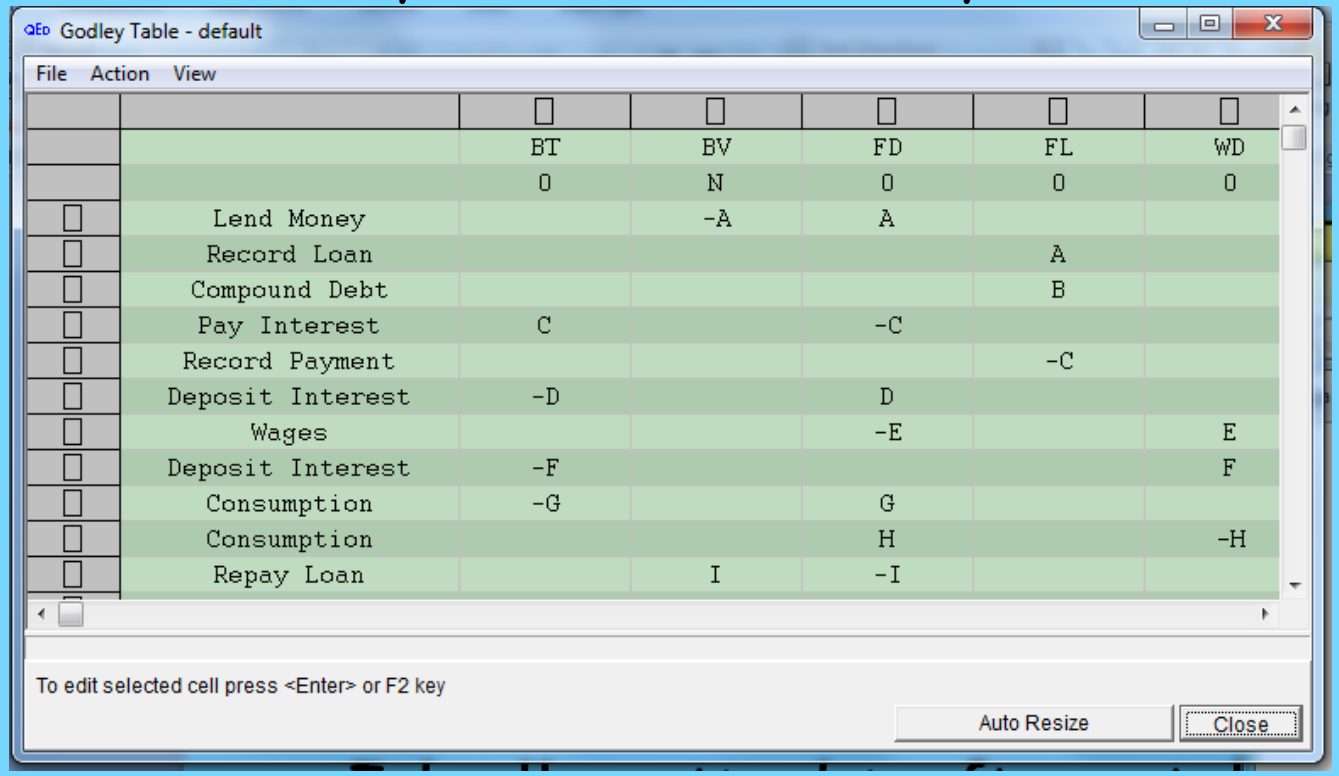
Are We "It" Yet?

- Income inequality
  - Not worker vs capitalist but worker vs banker



Are We "It" Yet?

- QED: a new approach to dynamic modelling
- Inspired by Godley SAM approach
  - Extended to continuous time
- Ideally suited to financial flows
  - Model dynamics via a GodleyTable:



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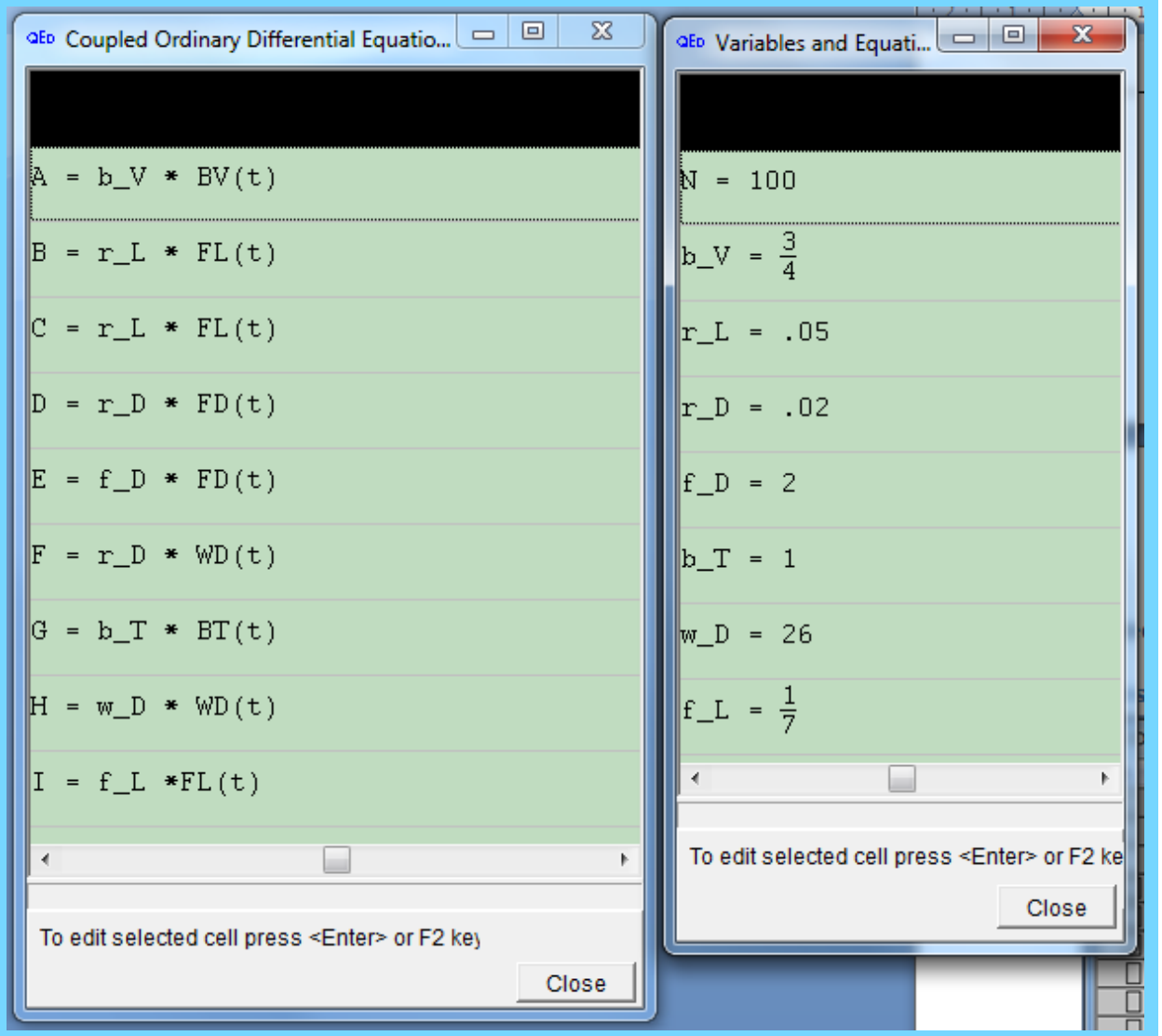
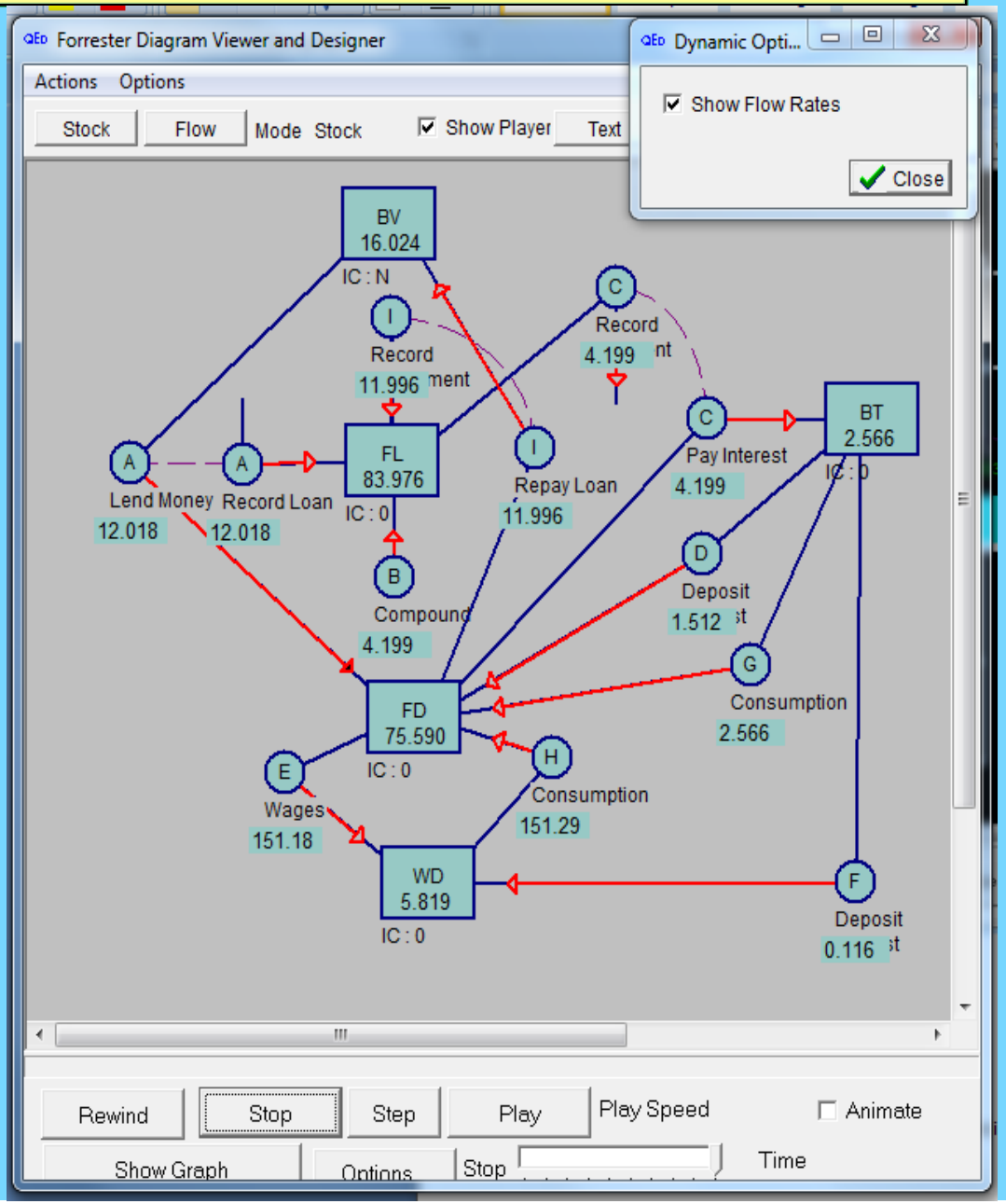
- Equation entry:



Are We "It" Yet?

- Automatically generate "Forrester Diagram"
- Similar to standard systems engineering
  - Simulink, Vissim, Ithink, Stella, Vensim
- And also "Phillips Diagram"...



Are We "It" Yet?

- Tribute to Bill Phillips…
- Freely available at

  www.debtdeflation.com/blogs/qed
- Updates will be posted there