Inequality, Leverage and Crises, by M.Kumhof and R.Ranciere (Nov. 2010)

Economics of Inequalities Class - C. Lebarz

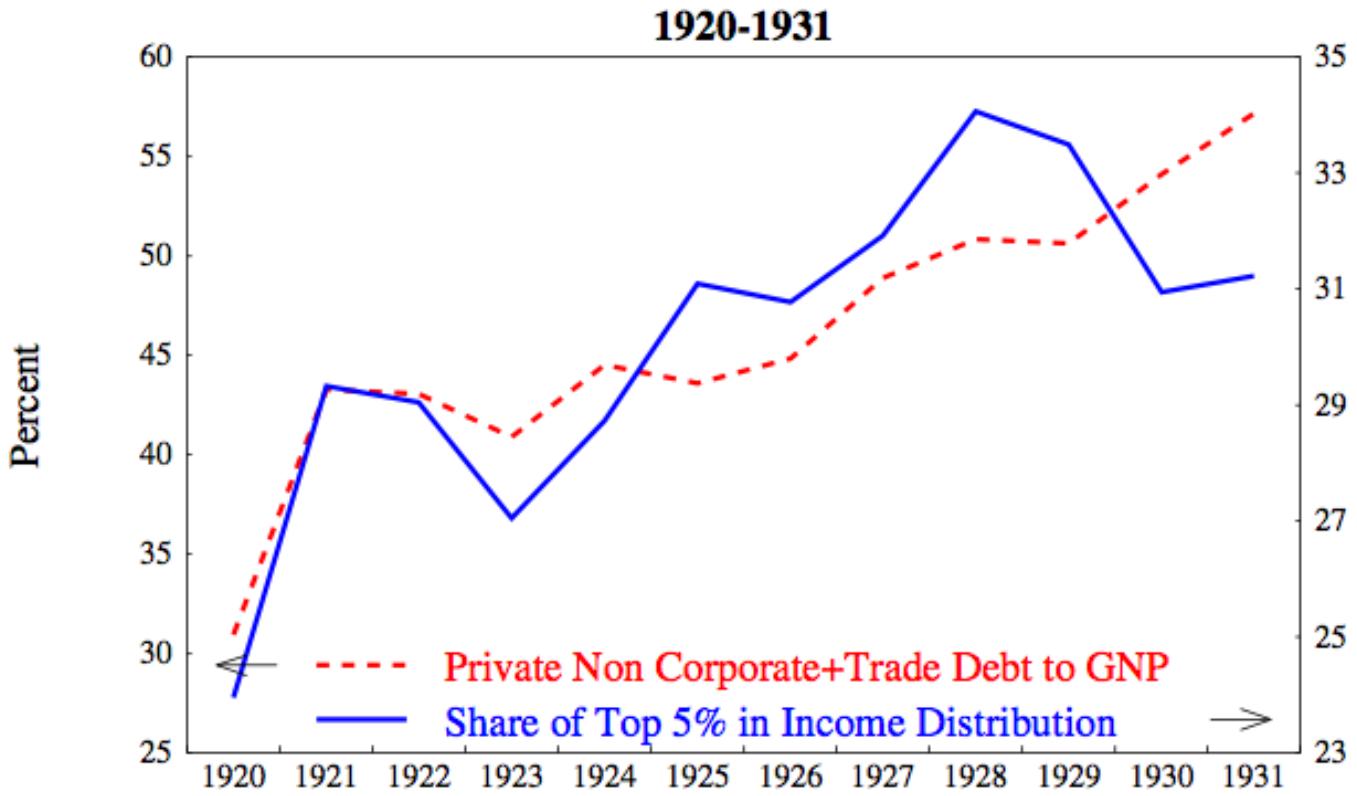
4 January 2011

Overview

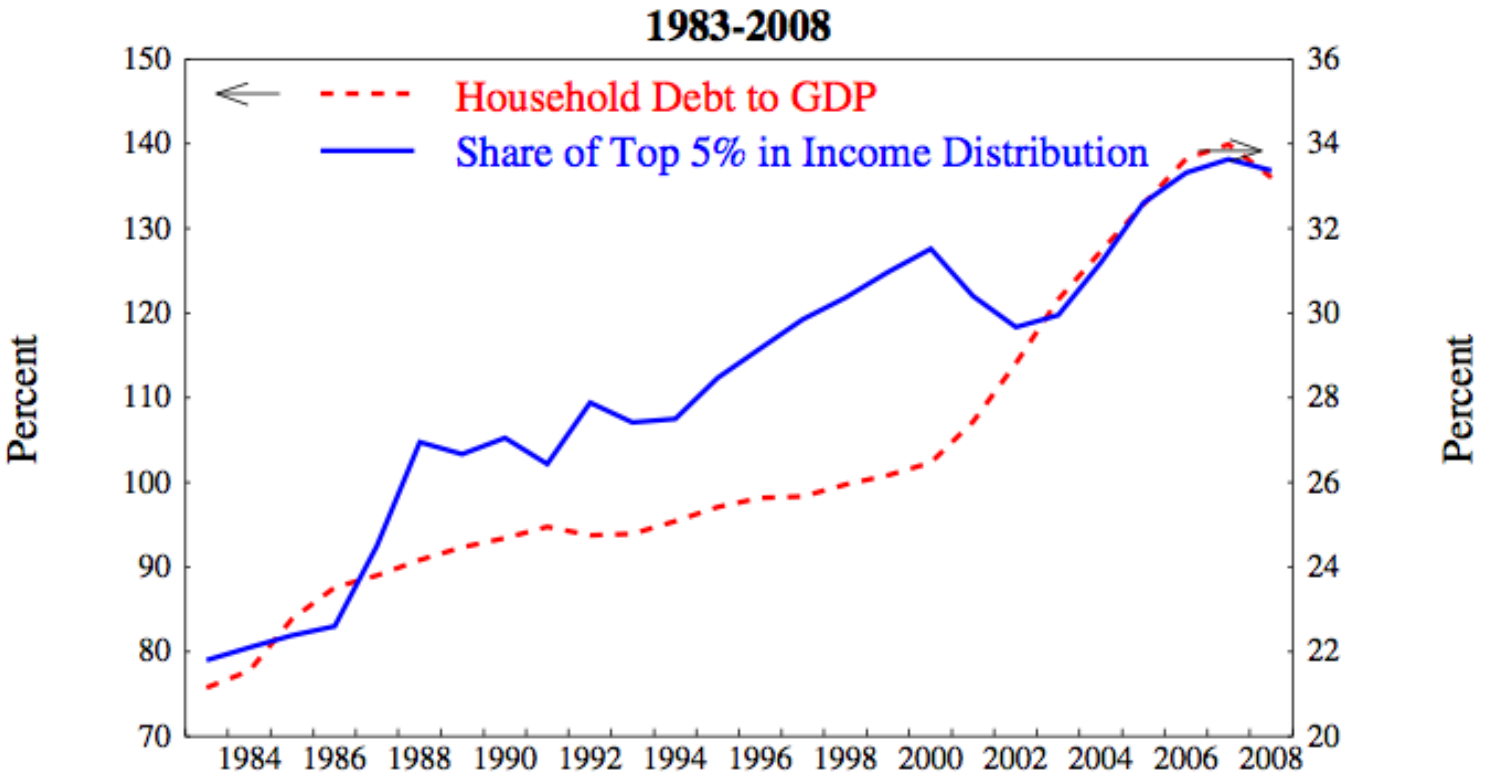
- How high leverage and crises can arise as a result of changes in the income distribution.
- Theoretical model where a large increase in the income share of the rich and in the leverage of the remainder arise endogeneously as a result of a shift in the bargaining power over incomes

Stylized Facts

Figure 1. Income Inequality and Household Leverage

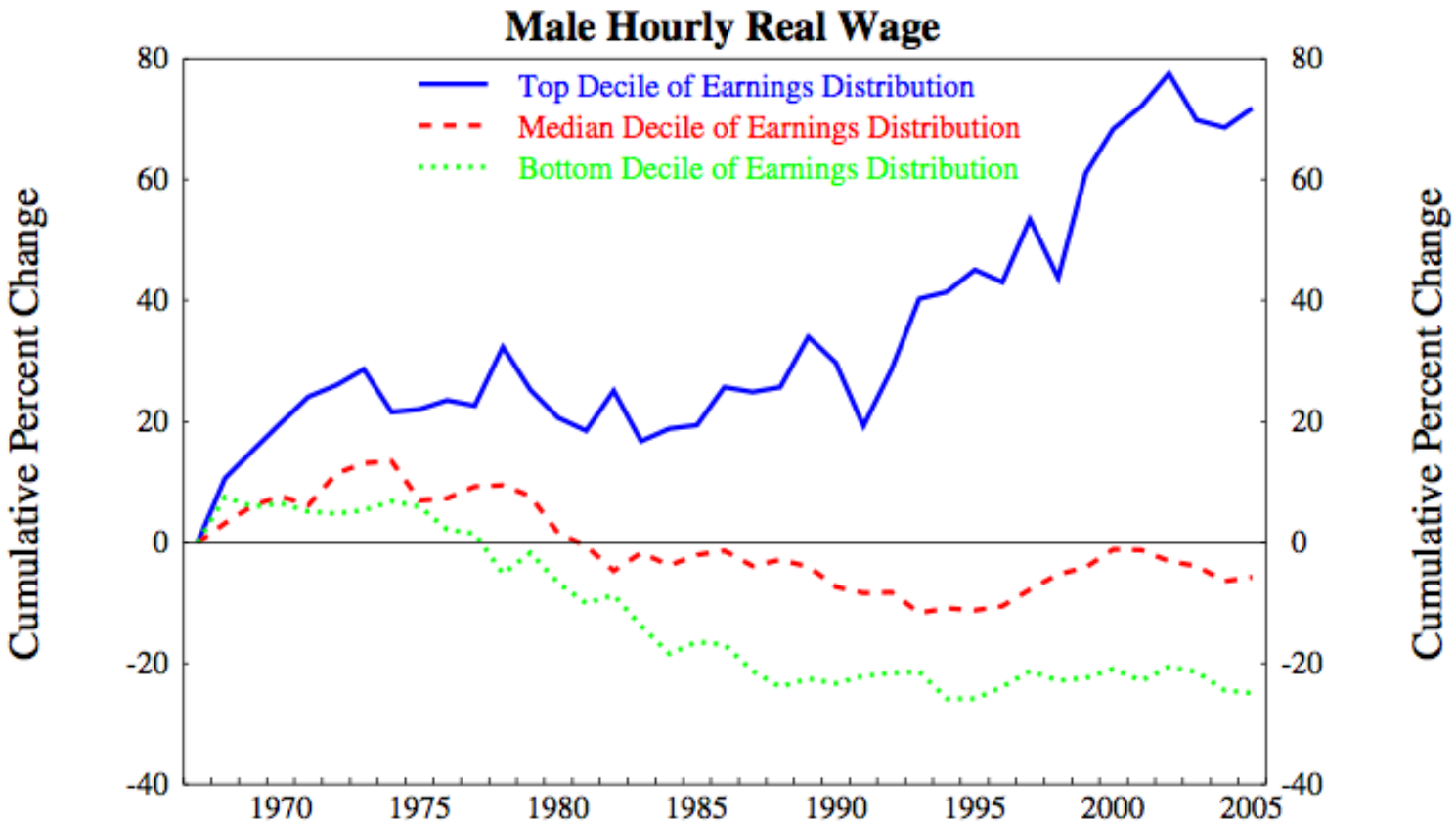


Stylized Facts

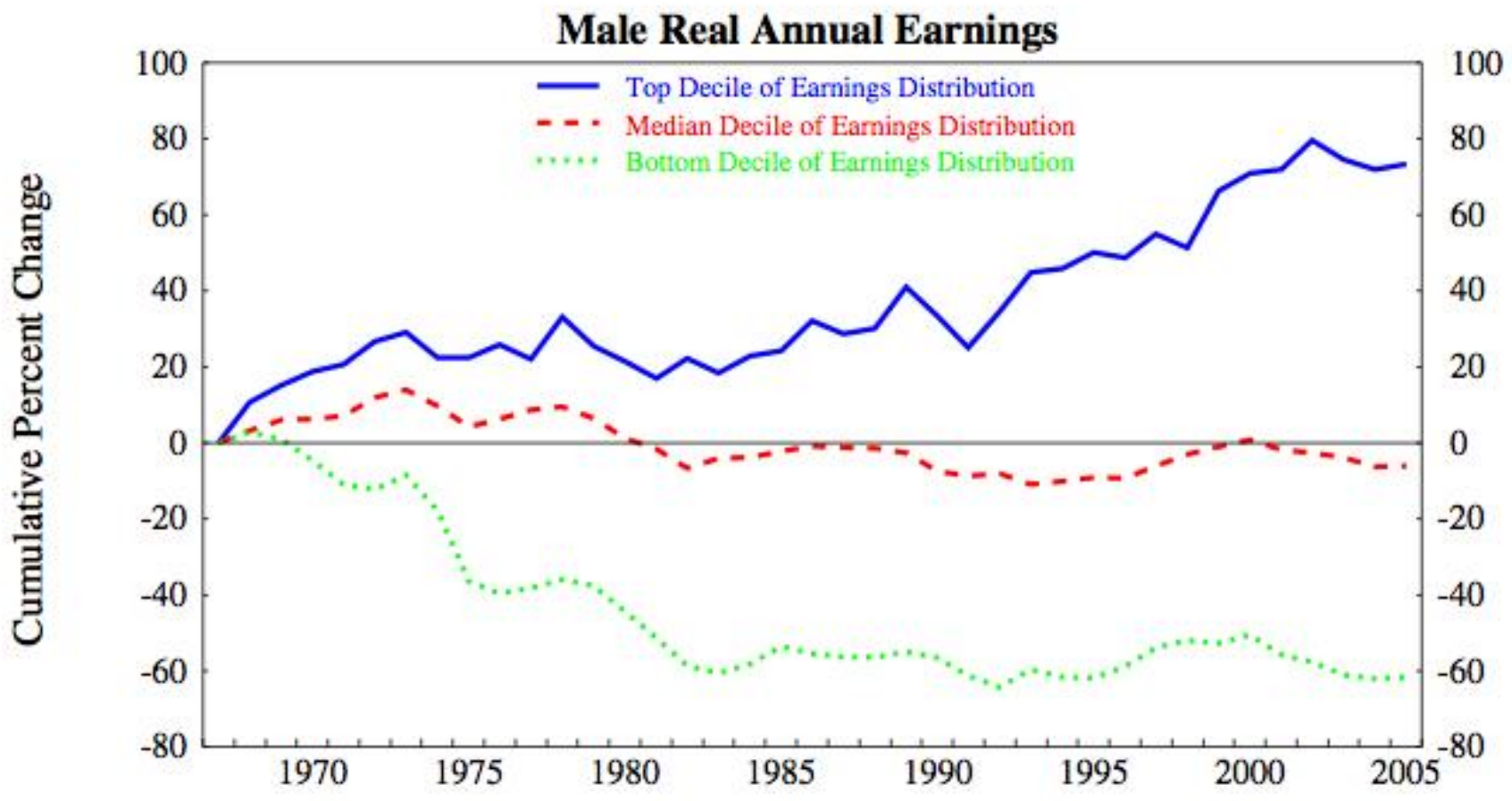


Stylized Facts

Figure 2. Real Income Inequality

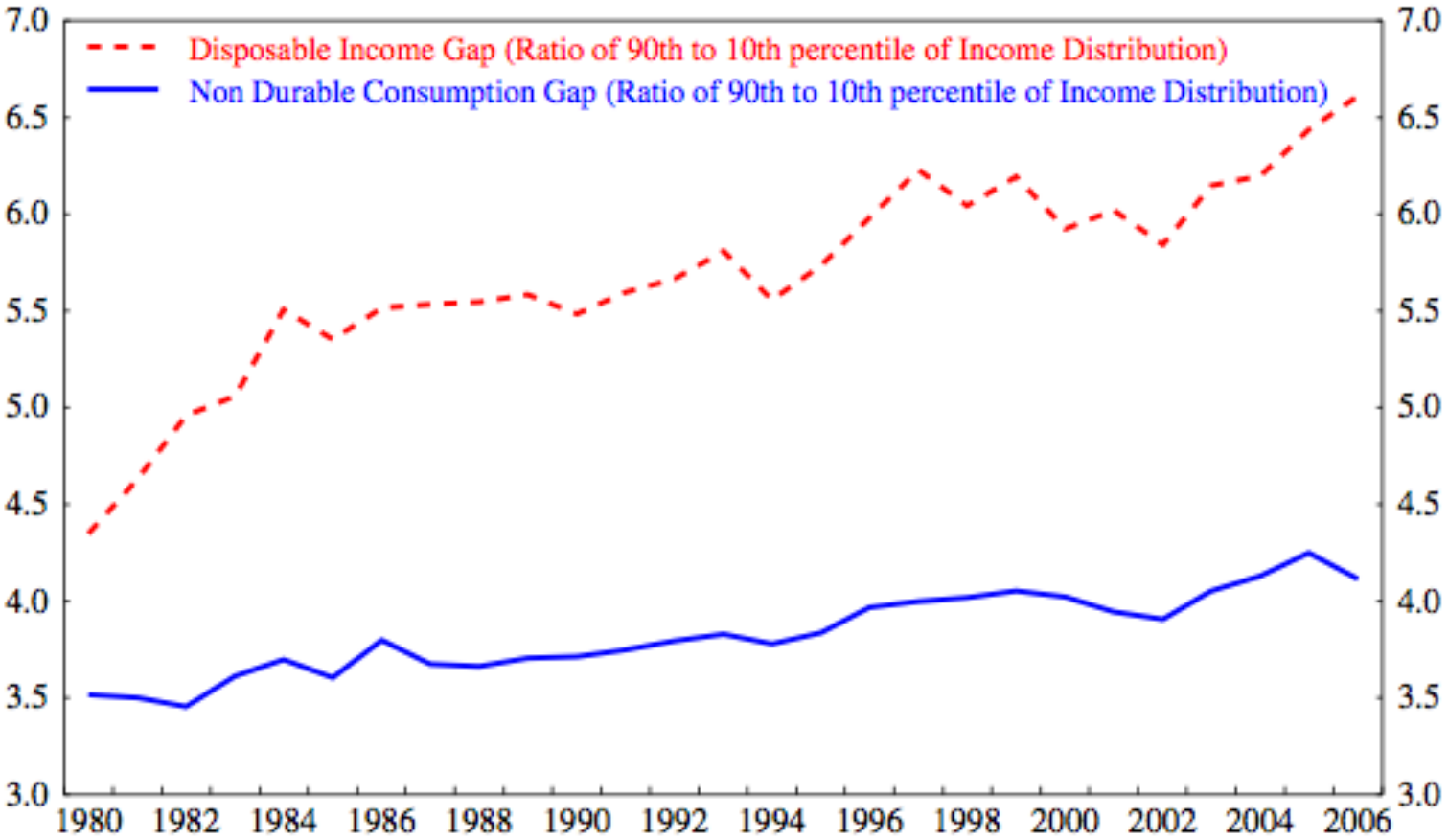


Stylized Facts



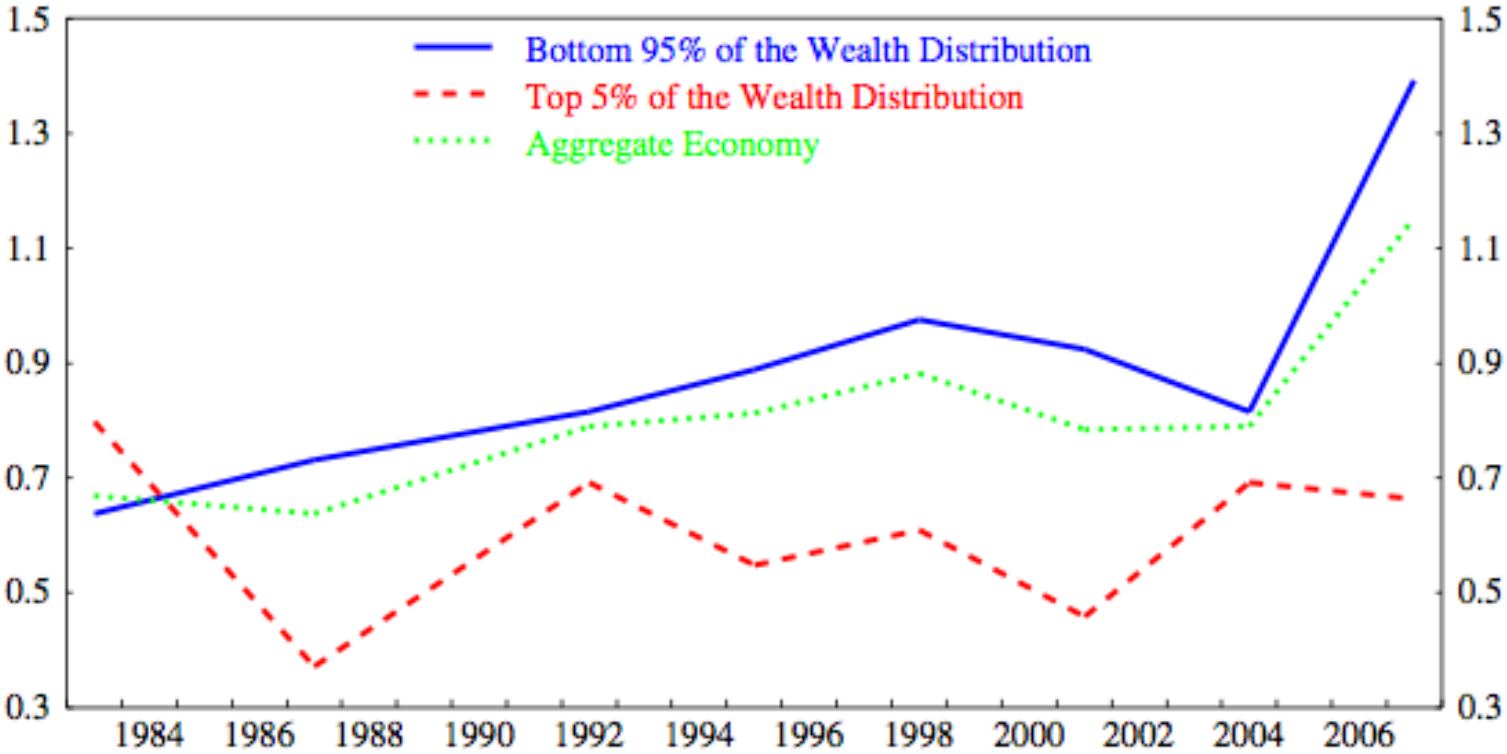
Stylized Facts

Figure 3. Income Inequality and Consumption Inequality



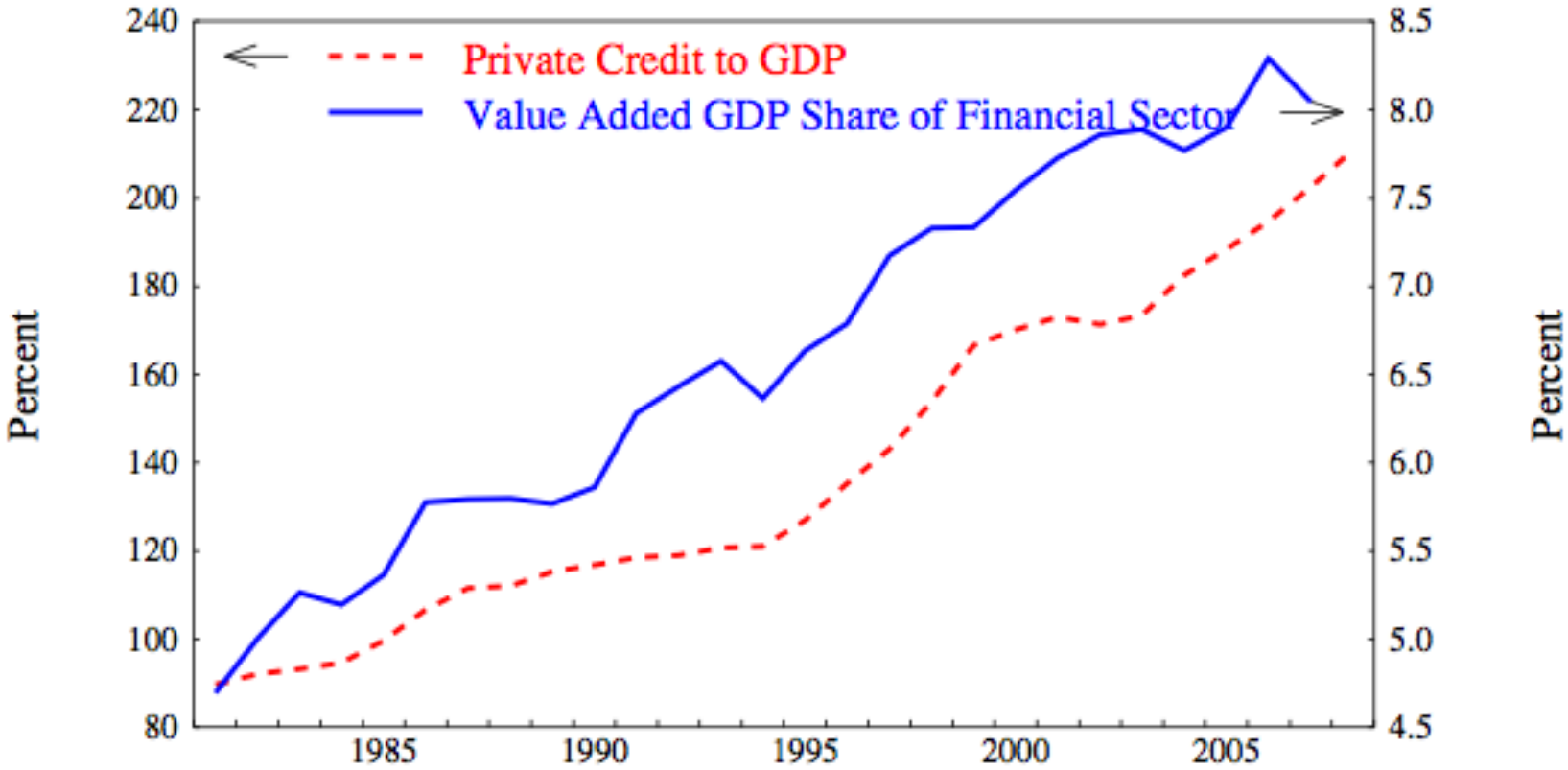
Stylized Facts

Figure 5. Debt to Income Ratios



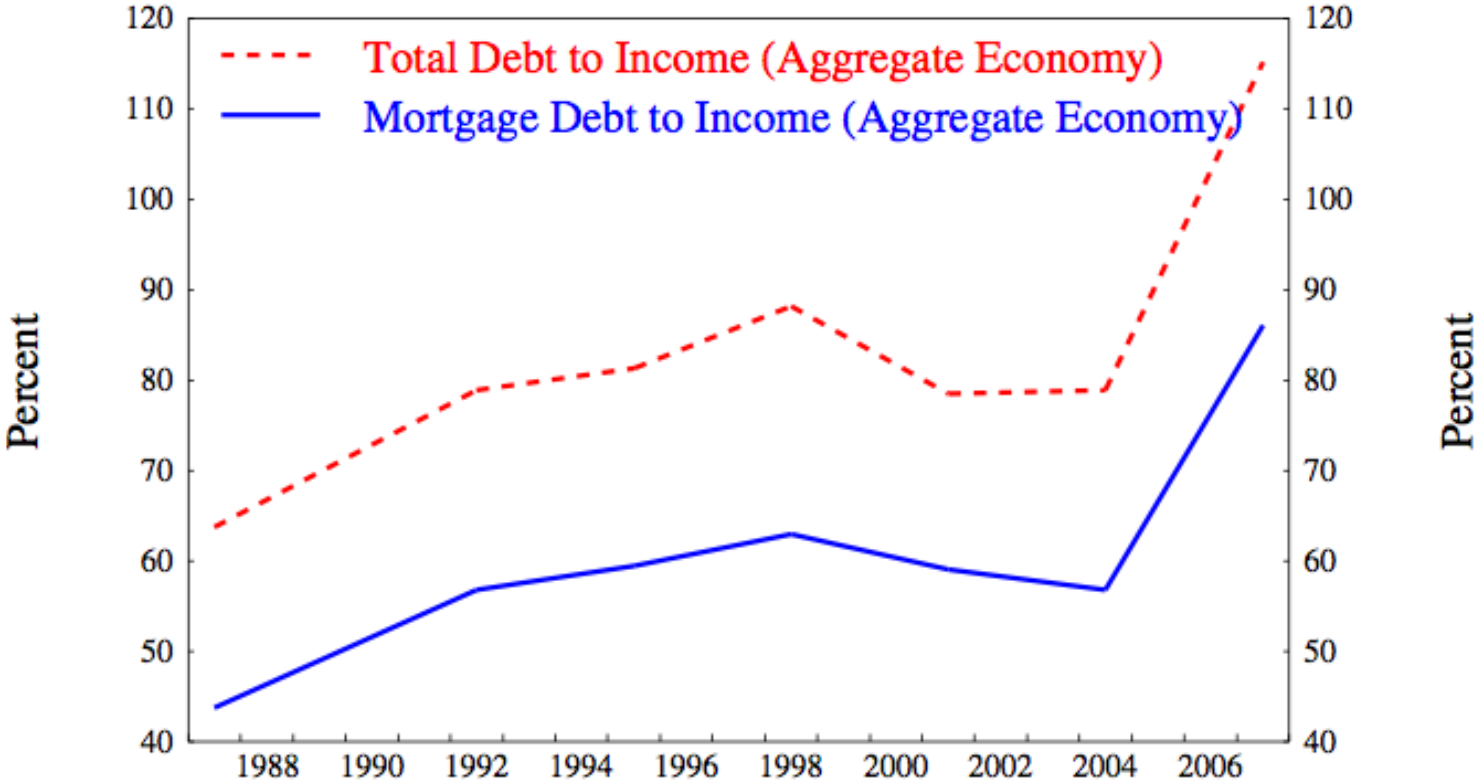
Stylized Facts

Figure 6. The Size of the U.S. Financial Sector



Stylized Facts

Figure 7. Mortgage Debt and Subprime Borrowing



Source: Survey of Consumer Finance. Mortgage Debt corresponds to the amount outstanding

Stylized Facts

- Income Inequality and Household Leverage
- Income Inequality and Consumption Inequality
- Wealth Inequality and Household Debt-to-Income Ratios
- Size of the US Financial Sector

The Model

- Investors
- Workers
- Technology

Conclusion

Investors

- A share χ of the population (5%)
- Utility from consumption (*standard CRRA*) and wealth
- Wealth can take 2 forms
  - Physical capital k_t (*Stone Geary form*)
  - Financial investment d_t (*Log form adjusted for expected losses*)

Investors

- Losses from a crisis depend on Π_t (proba of a crisis) and on the percentage of loan or capital stocks destroyed $(1-\gamma_l)$ and $(1-\gamma_k)$
  - Expected loan: $d_t(1-(1-\gamma_l)\Pi_t)$
  - Expected capital: $k_t(1-(1-\gamma_k)\Pi_t)$
- Lifetime Utility

$$U_0^i = E_0 \sum_0^\infty \beta_i^t [\frac{(c_t^i - \bar{c}_{min}^i)^{1-\frac{1}{\sigma_i}}}{1-\frac{1}{\sigma_i}} + \zeta_d log(d_t(1-(1-\gamma_l)\Pi_t)) + \zeta_k log(\bar{k} + k_t(1-(1-\gamma_k)\Pi_t))]$$

Investors

- Investors are the owners of the economy's entire stock of physical capital whose law of motion is

$$k_t = (1 - \delta)\Delta_{k_t} k_{t-1} + I_t$$

($\Delta_{k_t} = \gamma_k < 1$ if crisis, $=1$ otherwise)

- q_t: price of a deposit that pays off 1 unit of output at t+1
- Investors budget constraint

$$d_t q_t + I_t + c_t^i = \Delta_{I_t} d_{t-1} + r_t^k \Delta_{k_t} k_{t-1}$$

Workers

- A share $1-\chi$ of the population (95%)
- Utility from consumption (*same standard CRRA with subsistence level*)

$$U_0^k = E_0 \sum_0^\infty \beta_k^t [\frac{(c_t^k - \bar{c}_{min}^k)^{1-\frac{1}{\sigma_k}}}{1-\frac{1}{\sigma_k}}]$$

- They supply inelastically one unit of labor per capita

$$\text{(BC) } w_t + l_t q_t = \Delta_{l_t} l_{t-1} + c_t^w$$

- They default on their loan obligation with proba Π_t (Increasing in their debt to income ratio according to a logistic function)

Technology

- Aggregate production function

$$y_t = A(\chi \Delta_t^k k_{t-1})^{\alpha}(1-\chi)^{1-\alpha}$$

- Factors returns are determined by the outcome of a Nash Bargaining over the real wage (η_t bargaining power)

$$Max_{w_t}(\text{Workers surplus})^{\eta_t}(\text{Investors surplus})^{1-\eta_t}$$

$$\text{(FOC) } w_t = \eta_t * \text{marginal product of labor}$$

- η_t follows an autoregressive stochastic process given by

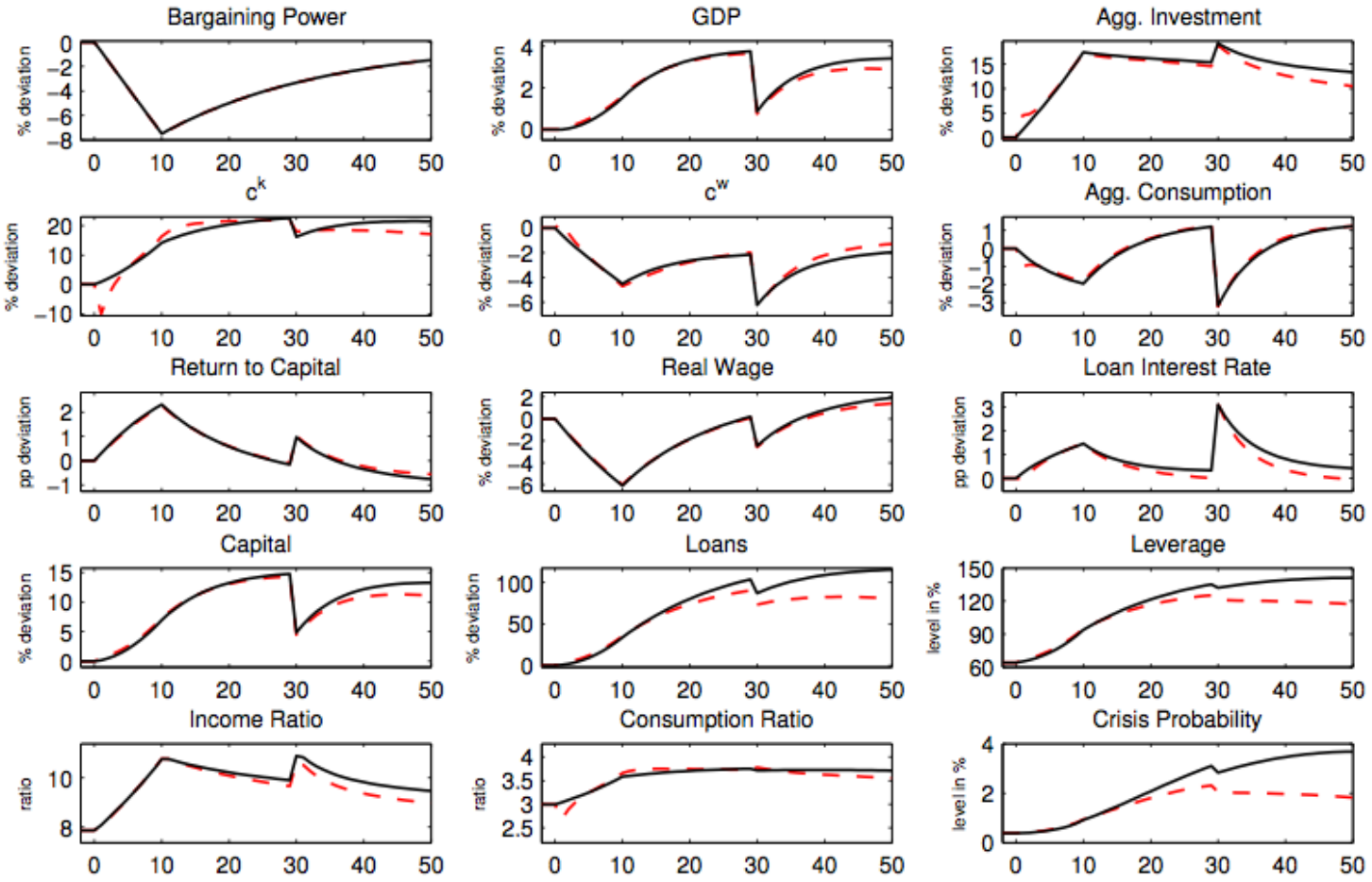
$$\eta_t = (1-\rho)\bar{\eta} + \rho\eta_{t-1} + e_t^n$$

Equilibrium

- Maximization of investors and consumers utilities
- Market clearing conditions
  - for goods
$$y_t = \chi(c_t^i + I_t) + (1-\chi)c_t^w$$
  - for financial claims
$$(1-\chi)I_t = \chi d_t$$

Simulation

Figure 10. Baseline Scenario



Conclusions

- The crisis barely improve workers situation (while their loan drop by 10% due to default, their wage also drops significantly and the real interest rate on remaining debt shoots up to raise debt servicing)
- By contrast, restoration of poor and middle income households' bargaining power can be very effective (sustained reduction in leverage that should reduce the probability of a further crisis)
- Link between crisis and leverage: the specification of the crisis probability
- Extend this to open economy (same mechanism) and explain current account imbalances triggered by income inequality in surplus countries