DISCUSSION OF "DEBT AND INCOMPLETE FINANCIAL MARKETS," BY KEVIN SHEEDY

James Bullard
President and CEO
Federal Reserve Bank of St. Louis

Brookings Institution
Washington, D.C.
21 March 2014

Any opinions expressed here are mine and do not necessarily reflect those of others on the Federal Open Market Committee.

MONETARY POLICY RATIONALES

- Leading rationale: "Sticky price friction prevents the market solution from being fully optimal."
- Associated policy advice: "Keep prices stable along a price level path."

AN ALTERNATIVE MONETARY POLICY RATIONALE

- An alternative rationale: "Non-state contingent nominal contracting friction keeps the market solution from being fully optimal."
- Associated policy advice: "Move the price level counter-cyclically in response to aggegate income shocks."
- *This advice is quite different in nature!*

NICE PAPER

- This is a very nice paper that lays out considerable intuition for the alternative rationale.
- *Prof. Sheedy has set the standard for future analyses in this area.*
- The paper includes commentary on an extensive related literature.
- The paper also includes a tug-of-war between sticky prices and non-state contingent nominal contracting.
  - In a calibrated model with both frictions present, the non-state contingent nominal contracting friction is the more salient for policymakers.

THREE QUESTIONS

- I will organize my discussion around three questions.
  - The model seems "special." Would these results hold in a general equilibrium life-cycle model with many heterogeneous participants in a large private credit market?
    - *Tentatively, yes.*
  - What are some of the key questions on which future research in this area should focus?
  - Whither nominal GDP targeting?
    - *The paper has much to say in framing the debate on the wisdom of nominal income targeting.*

A More Realistic Version

IS THE MODEL SPECIAL?

- The Sheedy model has two types of households, relatively impatient and relatively patient.
- Since there are just two types of agents, there is only one set of marginal conditions that requires "repair."
- The policymaker has just one tool, the price level, which neatly fixes the marginal conditions.
- Question: Would the results carry over to a more realistic environment with more heterogeneity in the private credit market?

Life-cycle version

- To investigate: Consider a stripped-down, endowment general equilibrium life-cycle economy.
- I will describe a "quarterly" specification, with households living 241 periods.
  - The odd number of periods provides a "middle" period at which life-cycle income peaks.
- Interpretation: Cohorts begin participation in the economy at age 20, die at age 80, and are most productive in the middle period, age 50.
  - See Sheedy (2013) for an analysis of a three-period model.

KEY FRICTION

- Sheedy: *Loans are dispersed and repaid in the unit of account—that is, in nominal terms—and are not contingent on income realizations.*
  - Other assumptions I am making: Within-cohort agents are identical, no population growth, inelastic labor supply, time-separable log preferences, no discounting, no capital, no default, flexible prices, no borrowing constraints, no government other than the central bank.

LIFE-CYCLE PRODUCTIVITY

- All agents are endowed with an identical productivity profile over their lifetime.
- The profile begins at zero, rises to a peak at the middle period of life, and then declines to zero.
- Agents can sell productivity units in the labor market at the competitive wage.
- The productivity profile is symmetric.

LIFE-CYCLE INCOME PROFILE

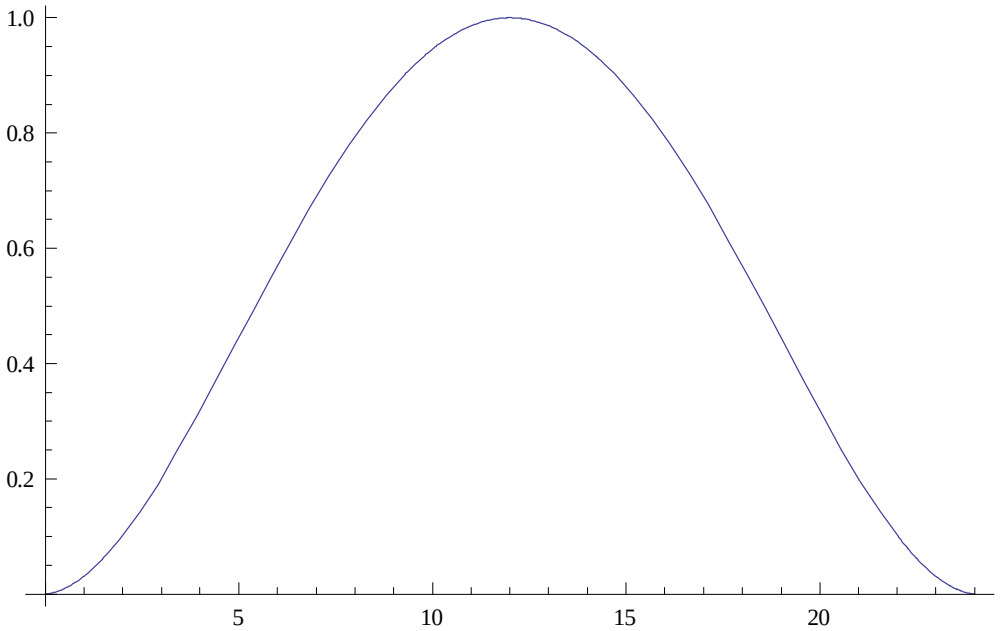

FIGURE: A schematic life-cycle income profile of a typical household. About 50 percent of the households earn 75 percent of the income.

AGGREGATE SHOCKS

- Sheedy: *The only source of uncertainty is an aggregate shock.*
- Accordingly, assume the real wage is exogenous and grows at gross rate $\lambda(t)$, where we think of $\lambda(t)$ as near unity and

$$\lambda(t) = \begin{cases} \lambda^H & w.p. \quad 1/3 \\ \lambda & w.p. \quad 1/3 \\ \lambda^L & w.p. \quad 1/3 \end{cases}$$

  and $\lambda^H \geq \lambda \geq \lambda^L$ and where $\lambda = \left(\lambda^H + \lambda^L\right)/2$.
- Thus, the mean growth rate of national income is λ.
- If $\lambda^H = \lambda = \lambda^L$, there is no uncertainty.

THE POLICYMAKER

- The policymaker completely controls the price level, which is a unit of account in this model.
- To see a two-period example along this line, see Evan Koenig (2013, *IJCB*).
- The within-period timing protocol is as follows: (1) nature chooses the growth rate, (2) policymaker chooses a price level, and (3) households make decisions to consume and save.
- For now, let's think of the policymaker choosing $P(t) = 1 \; \forall t$, "price stability."

NATURE OF THIS ECONOMY

- The economy I have described has 241 different households, each with its own level of asset holding.
- To calculate the full stochastic equilibrium, in principle, one has to keep track of the evolution of the distribution of asset holdings over time.
- If there was no uncertainty, a non-stochastic steady state has interesting properties that fit well with the intuition offered by Prof. Sheedy.

Steady State

NON-STOCHASTIC STEADY STATE NET ASSET HOLDING

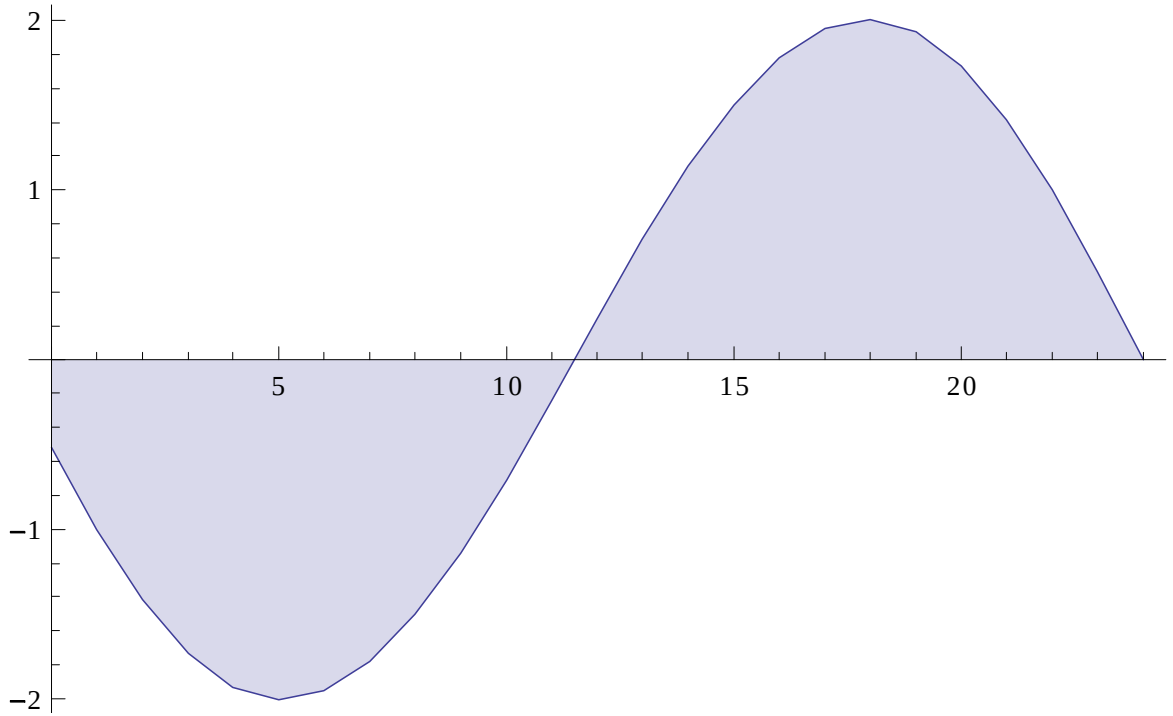

FIGURE: Schematic asset holding by cohort when the system is in a non-stochastic steady state. About 25 percent of the population holds about 75 percent of the assets.

HOW LARGE ARE THESE MARKETS?

- According to Mian and Sufi (*AER*, 2011), the ratio of household debt to GDP was about 1.15 before the increase during the 2000s when it ballooned to 1.65.
- In today's dollars, that would be about $19.5 trillion to about $28 trillion, comprised mostly of mortgage debt.
- Messing up these markets might be quite costly for the economy, so this friction could be quite important.

NON-STOCHASTIC STEADY STATE CONSUMPTION

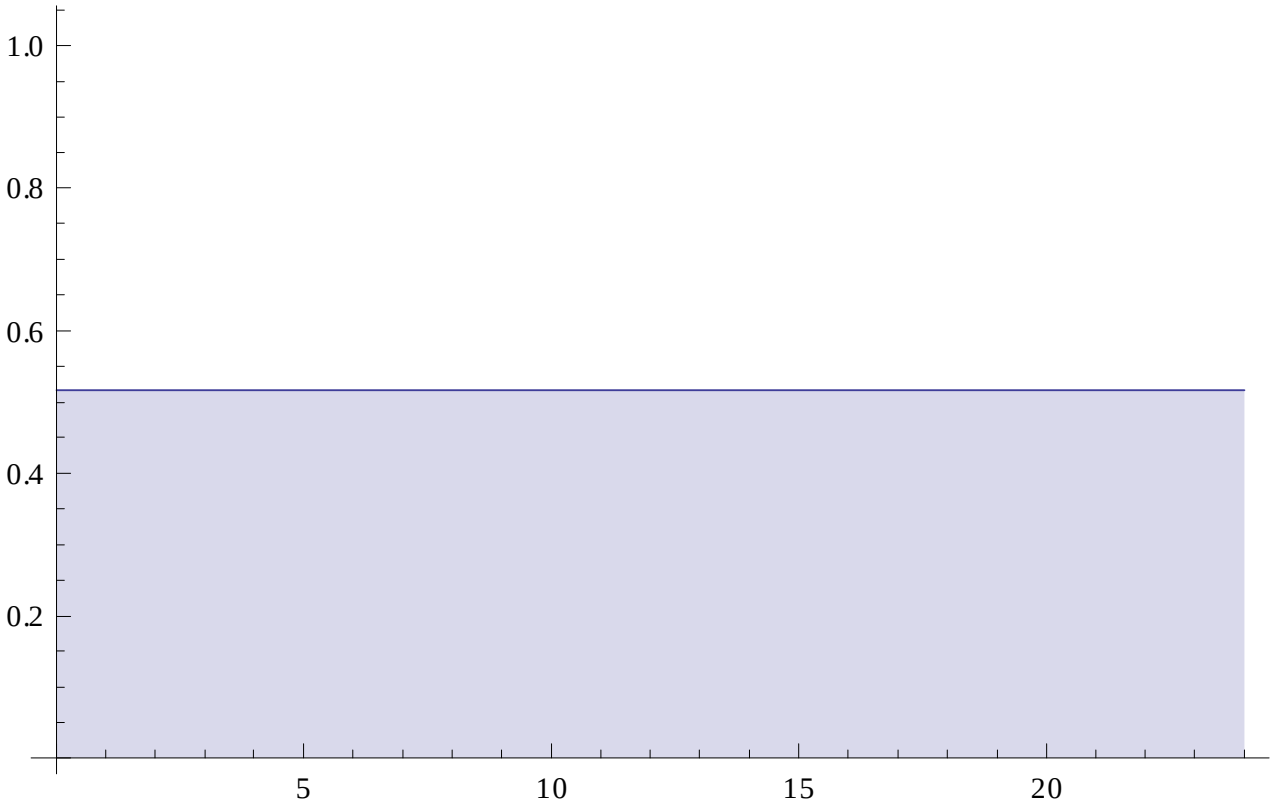

FIGURE: Non-stochastic steady state consumption by cohort. The private credit market completely solves the point-in-time income inequality problem.

KEY FEATURE OF THE NON-STOCHASTIC STEADY STATE

- By careful choice of assumptions, the general equilibrium gross one-period real interest rate is equal to the gross real output growth rate in the steady state; that is,

$$R = \lambda.$$

- This value for the real interest rate effectively means that all income earned within a period is divided equally among all participants alive in the economy at that time.
  - *Prof. Sheedy's excellent intuition: This means all households have an "equity share" in the economy.*

Main Finding

THE STOCHASTIC CASE

- Now allow aggregate shocks, maintaining the price stability policy $P(t) = 1 \; \forall t$.
- State-contingent loan contracts are ruled out by assumption.
- When there is a shock, consumption will now be allocated unevenly across households alive at date t.
- To bear risk appropriately across the economy's participants, the price level policy should produce something like an "equity share" of any surprise movements in income.

COUNTER-CYCLICAL PRICE LEVEL POLICY

- In the three-period version, the gross real interest rate R that prevails between dates t and $t+1$ is:

$$R = \frac{P(t+1)}{P(t)} \frac{w(t+1)}{w(t)}. \tag{1}$$

- Take $P(t) = 1$ and $w(t) = 1$ as given, allow nature to choose a rate of growth of real wages (and hence national income), and then let the policymaker choose $P(t+1)$ to make $R = \lambda$, the average growth rate in the economy.
- If growth is high, $P(t+1) < 1$, which is a decrease in the price level—hence policy is "counter-cyclical."
  - *This policy is "real interest rate smoothing," as R never moves in response to shocks.*

EQUITY SHARES

- This (perfectly credible) policy will again cause all consumption available in the economy at date t to be split evenly between living households.
- If there is more income than expected, all get more to consume, or if there is less income than expected, all get less.
  - *Everyone bears the risk of real income shocks equally—the "equity share" contract.*
- Because shocks have a simple structure in this example, this policy also works for the 241-period model.

BOTTOM LINE

- The bottom line: *Versions of the key result presented in this paper may also hold in a wide class of general equilibrium life-cycle economies with many different participants in the private credit market.*
- This is encouraging for this line of research.
- Still, there are many questions ...

Some Directions for Future Research

CHANGES IN THE LONG-RUN GROWTH RATE

- To implement the policy suggested here, the policymaker has to know the long-run growth rate of the economy.
- An incorrect estimate of that growth rate would cause the policymaker to inadvertently, but persistently, distort the private credit market.
- This might cause considerable damage relative to simply ignoring the non-state contingent nominal contracting friction.
- A better handle on this issue would be a helpful addition to this literature.

GOOD-BYE TO POSITIVE INFLATION TARGETS?

- The simple formula above suggests that positive inflation targets are ill-advised in this class of models, as they permanently distort the real interest rate away from the real output growth rate.
- In models like the one presented here, average inflation should be zero.
  - *Messing with the price level is serious business in this economy and must be done only in response to a shock.*
- I think it would be interesting to get a better handle on this aspect of the suggested monetary policy.

DEFAULT

- Many have argued that the presence of default in actual economies indicates that a type of state contingency does exist after all, albeit perhaps in more extreme cases.
- Understanding the role of default arrangements, especially endogenous debt constraints, is the subject of a large literature.
  - In life-cycle economies, for instance, see Azariadis and Lambertini (2003, *RES*).
- Future research should try to integrate that literature more fully with the arguments for a counter-cyclical price level policy.

HARMING CASH USERS?

- This model has no money demand.
- In the U.S. economy, perhaps 15 percent of households are unbanked and perhaps another 15 percent are nearly unbanked.
- These intensive cash users tend to be poor and may not appreciate a policy aimed solely at credit markets.
- A fully satisfactory model would have this segment of the population included.

Whither NGDP Targeting?

WHITHER NOMINAL GDP TARGETING?

- This paper describes the optimal policy in the non-state contingent nominal contracting world as "nominal GDP targeting."
- This policy is the *polar opposite* of what one would obtain from a purely sticky price framework.
- Yet many today argue *from a sticky price perspective* that nominal GDP targeting may provide a good policy benchmark.
  - See, for instance, Woodford (2012, Jackson Hole Symposium).
- We need to sharpen up this debate—NGDP targeting cannot be all things to all people.

SHARPENING THE NGDP TARGETING DEBATE

- My unsolicited advice:
  - Those advocating NGDP targeting have long needed a model.
    - Advocates of NGDP targeting should embrace the Sheedy class of models.
    - Variations in inflation would be deliberate and systematic.
  - Those wishing to remain with the sticky price rationale should argue for stable prices.
    - Variations in inflation would be limited, as they have been in the U.S. since 1995.