Uncertainty in Macroeconomics and Intertemporal Coordination

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Uncertainty in macro and intertemporal coordination

- Discussion based on Guzman-Stiglitz, "Towards a Dynamic Disequilibrium Theory with Randomness", *Oxford Review of Economic Policy*, 2021, 36(3), 621-674

Uncertainty and perfect intertemporal coordination

- **Case I**: well-defined full space of states (shocks)

  - Even in Arrow-Debreu, there is uncertainty

$$Z_t = \{z_1, \dots, z_N\}$$

  - Z_t represents the full space of states

  - In the Arrow-Debreu environment, by design every contract is fulfilled
    - Meaning that by design, there is a **perfect coordination of intertemporal plans** (plans that involve debt/credit)
      - (Leave aside the issue of what guarantees enforcement of contracts.)

  - While DSGE models do not assume a complete set of Arrow-Debreu securities, they assume that transversality conditions hold in every possible state

Uncertainty and defaults under known full space of states

- **Case II**: the full space of states Z_t is known but there are no Arrow-Debreu securities
  - Note that if incentives are endogenous, we may not even want to have contracts indexed to every possible contingency
    - For instance, getting life insurance on someone else's life may affect incentives to "preserve" that person's life (like naked-sovereign credit default swaps)

  - Incomplete contracts give rise to the possibility of defaults

  - But this is expected ex-ante and reflected in risk-premia in contracts

  - If the distribution of "losses" in bad states is also well-defined, then the difference with respect to the Arrow-Debreu case is that seemingly non-contingent contracts will in fact be contingent contracts, with an equity segment below the threshold shock that triggers default and a fixed-income segment above that threshold

Uncertainty and intertemporal coordination failures

- Case III: the full space of states Z_t is known but each state has sub-states, and there are (some) states for which the full space of sub-states is not known
  - Could be modeled as an environment in which "learning" each sub-state is costly and for low-probability states is not worth meeting the cost of learning its sub-states
  - Those states are simply ignored
  - Implying no Arrow-Debreu securities

- Realization of states for which sub-states are not known increased perceived uncertainty

- Realizations of certain states lead to inconsistency between *promises* (contracts) and budget constraints

- When there are *too many / too large* inconsistencies, we have a situation of **macroeconomic inconsistency**
  - Like a financial crisis, a debt crisis, or an inflation crisis

- This is what we call **intertemporal coordination failure**

Uncertainty and intertemporal coordination failures

- Case IV: not well-defined full space of states

  - Either because the space of states is non-stationary

  - Or because it is simply impossible to envision every state that can ever be realized

  - By definition, contracts will *always* be incomplete

  - Not possible to ever converge to the complete markets benchmark

  - Macroeconomic inconsistencies may arise (and in an infinite time span, they *will* arise)

Intertemporal coordination failures and endogenous uncertainty

- Intertemporal coordination failures may endogenously increase uncertainty

  - Not clear how the inconsistencies will be resolved, creating additional uncertainty about budget constraints (e.g. debt restructurings)
    - Another way of saying this: it's not clear how (and if) debt sustainability will be restored
  - And **power** may play a role in how they will be resolved
    - Power: another feature of the market economy that is absent from the Arrow-Debreu benchmark

  - In turn, this aggravates the intertemporal coordination failure

  - That is, there is a **dynamic disequilibrium**

Today's sessions are about "Radical Uncertainty" in Macroeconomics

- In today's sessions, we will discuss the following themes :

1. How is uncertainty modeled in macroeconomics?

2. What is the interplay between uncertainty, learning, economic behavior, and macroeconomic dynamics?

3. How does the economic system adjust to large (and possibly unpredicted) shocks or structural transformations?

4. What are the frameworks that can guide policymaking (and policymakers) in the presence of "radical uncertainty"?