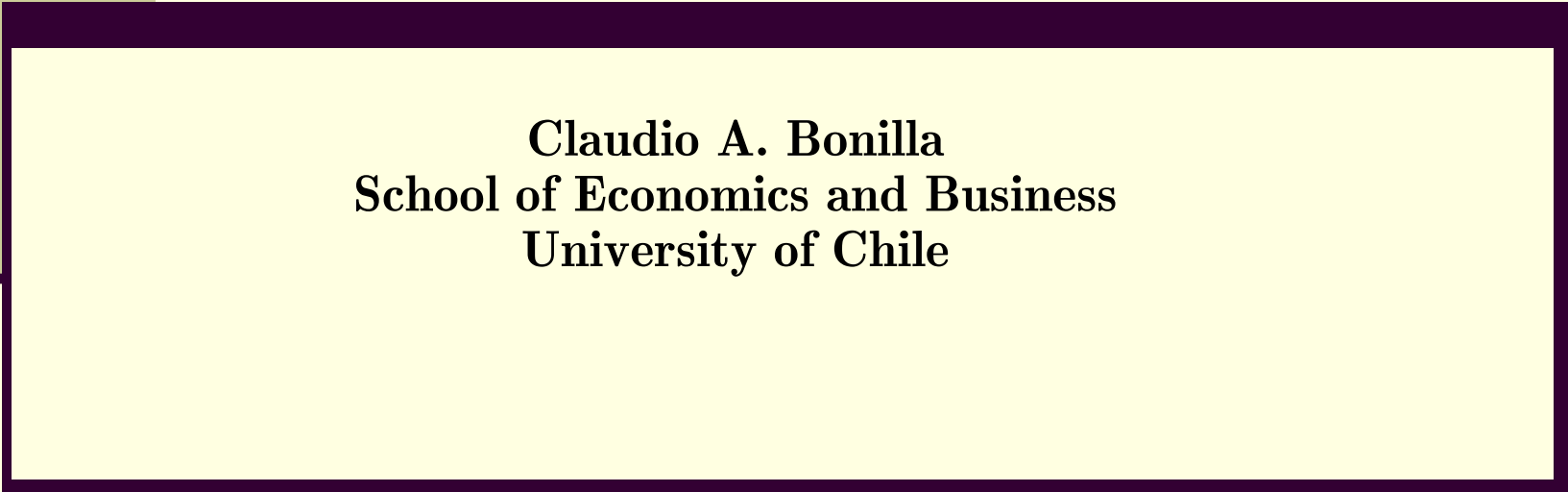






**Social Choice and Time Consistency with Low-
Probability Events**



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Motivation

- “Rules rather than policy discretion are what policy makers should follow to avoid the inconsistency of optimal short-run temptation” (Kydland and Prescott (1977), Nobel Prize)
- Examples: central bank MP, tax FI, fiscal structural balance
- But central bank policy decision are a social choice problem
- To what extent can such a theoretical idea (KP, 1977) be effective under a social choice setting?
- Answer: Social choice can destroy the applicability of the “rules rather than discretion” idea when low-probability events are in place.

How we model determines our results

- KP (1977) paper uses the Representative agent model (Dynamic)
- RA (Cass, 1965; Koopman, 1965) model has lots of problems (Kirman, 1992)
- KP (1977) introduces game theory into the RA model
- Incentives do not imply that things necessarily happen that way
- Incentives indicate the forces behind a situation
- It is novel to introduce a social choice approach into a classical macro problem

Group Choice in Theory

- Suppose that a Bayesian central bank committee has to decide on the level of inflation rate
- The decision depends on the committee members' personal assessment of the future (prior distribution)
- The committee receives new information (the exact same information for everyone) about the economic conditions
- This new information is processed by committee members, generating an updated belief about the probability distribution of the future state of the world
- If this procedure repeats many times, the posterior distribution of beliefs converge to the same unique updated distribution, which is the idea behind the representative agent model and also the basis of an important branch of the literature on game theory based on the idea of common knowledge (Aumann 1976).

Group Choice in Practice

- Let us suppose that the arrival of new data happens each hour
- So we update our posterior distribution of beliefs 8.760 times a year.
- If there exists a low probability event k_0 , let us say with probability of occurrence $p(k_0)=10^{-5}$, then this event will occur, on average, every 11.42 years based on the hourly influx of new information.
- Therefore, nine occurrences of state K_0 occur in a 100-year period
- The sample proportion estimate of $p(k_0)$ is $9/876.000$
- The 95% approximate CI is $(0.36 \times 10^{-5}, 1.7 \times 10^{-5})$
- This interval contains the true value of $p(k_0)$ but with a 67% plus or minus spread.

Group Choice in Practice

- It will take approximately 100 years for committee members to observe sufficient outcomes of this low probability state to estimate the probability to an accuracy of an order of magnitude
- The problem with this time is that nobody stays on a central bank board for 100 years.
- Therefore, in practice, committee members cannot converge to the same belief about the assessments of future states of the world, and in consequence, it is highly likely that they will not always agree
- Which means that discretion rather than rule may again be the only way to make decisions in this social choice setting, and therefore, changes in policy rules should be expected (Baxa et. al., 2014).