

THE UNIVERSITY of EDINBURGH
School of Economics

Consumption and Saving

Where Micro Behaviour Meets Macroeconomic Policy

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Why do some households spend a tax rebate immediately while others save it? How should fiscal policy be designed when households differ in their wealth, income risk, and the goods they consume? And what can large-scale stimulus programs reveal about the structure of modern macroeconomies?

This Honours course addresses these questions by building, step by step, from canonical intertemporal theory to the research frontier. We begin with the representative-agent paradigm: the two-period consumption–saving model, the Permanent Income Hypothesis, and the empirically testable restrictions implied by rational expectations. We then extend this benchmark in two directions. First, we introduce overlapping generations to analyse intergenerational interactions, dynamic inefficiency, and the economic logic of public pension systems as mechanisms for longevity insurance. Second, we progressively relax the representative-agent assumption by introducing heterogeneous households that face uninsurable income risk, liquidity constraints, and incomplete markets. The course shows how macroeconomic conclusions change as microeconomic structure becomes richer.

With this framework in place, we turn to real-world policy evaluation. The U.S. Economic Stimulus Payments of 2001 and 2008 are treated as quasi-natural experiments that generate plausibly exogenous income variation, allowing economists to identify marginal propensities to consume—a parameter central to the design and evaluation of fiscal policy. The final part of the course extends heterogeneity from households to goods, drawing on recent research that explicitly models price dispersion, consumption baskets, and differential exposure to trade shocks.

Throughout, the course integrates theory, identification, and computation. In tutorials, students use R—the free, open-source programming language for statistical computing—to simulate theoretical models, implement Monte Carlo simulations, replicate published empirical evidence, and estimate heterogeneous consumption responses using regression and quantile regression techniques. By the end of the course, students will understand not only how consumption theory works, but how it is extended to intergenerational settings, tested in the data, and used to inform policy in practice. No prior programming experience is assumed.

Learning Outcomes

By the end of the course, students will be able to:

1. Identify the theoretical limitations of the Keynesian consumption function and explain how the Permanent Income Hypothesis addresses them.
2. Implement simulations of intertemporal consumption models using R.
3. Apply regression and quantile regression techniques to estimate heterogeneous consumption responses and interpret distributional policy effects.
4. Explain how quasi-natural experiments can be used to identify causal consumption responses to income shocks.
5. Interpret Hall's random walk implication as empirically testable restrictions.
6. Analyse lifecycle and overlapping-generations models, including dynamic inefficiency.
7. Explain the role of public pensions as longevity insurance and compare PAYG and funded financing mechanisms.
8. Evaluate the effects of income risk and liquidity constraints on saving behaviour.
9. Critically assess the design, implementation, and effectiveness of fiscal stimulus programs and articulate their implications for public policy debate.
10. Assess fiscal policy in the presence of household and goods-level heterogeneity.

Assessment

Course mark is determined by:

- **Examination** (80%): written exam.
- **Coding project in R** (20%): practical assignment.

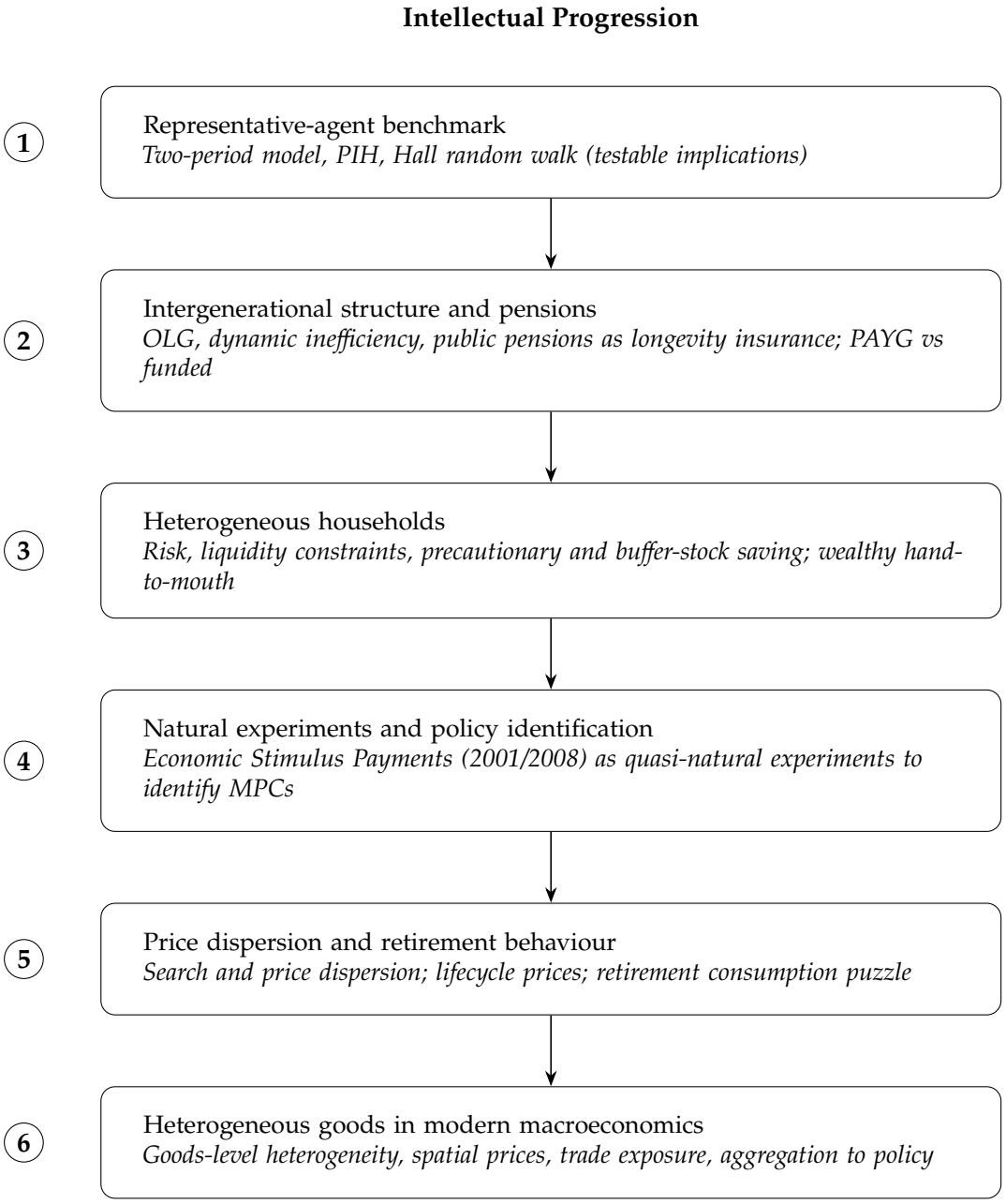


Figure 1: Course map: the syllabus progresses from representative-agent benchmarks to heterogeneous households and, finally, heterogeneous goods with macro policy implications.

1. Indicative Lecture Structure (20 Hours)

Part I — The Representative-Agent Benchmark

We begin with the representative-agent paradigm to establish the theoretical benchmark against which richer models will be evaluated.

1. *The Two-Period Consumption–Saving Model*

This lecture introduces intertemporal optimisation as the foundational tool for analysing consumption decisions.

2. *The Permanent Income Hypothesis*

We develop the PIH as a forward-looking alternative to the Keynesian consumption function.
Reading: Friedman (1957).

3. *Rational Expectations and Testable Implications*

We show how the PIH generates empirically testable restrictions when embedded in a stochastic rational expectations framework. We interpret Hall's model through Sargent's conception of an economic model as a stochastic process.
Readings: Hall (1978); Sargent (1987).

4. *The Lifecycle Model*

We extend the benchmark to finite horizons to analyse retirement and wealth decumulation.
Reading: Modigliani and Brumberg (1954).

Part II — Intergenerational Structure and Pension Systems

We move beyond a single representative household to analyse intergenerational interactions and the economic logic of pension systems.

5. *The Overlapping Generations Model*

This lecture introduces an economy with multiple cohorts coexisting in time.
Readings: Diamond (1965); Shell (1971).

6. *Dynamic Inefficiency and Double Infinities*

We examine how OLG models can generate inefficient equilibria and intergenerational welfare trade-offs.

7. *Public Pensions and Longevity Insurance*

We interpret public pensions as longevity insurance and compare PAYG and funded systems as alternative financing mechanisms.

Part III — From Representative Agent to Heterogeneous Households

We relax the representative-agent assumption and introduce idiosyncratic income risk, liquidity constraints, and heterogeneity in marginal propensities to consume.

8. *Income Risk and Certainty Equivalence*

We analyse consumption behaviour under uncertainty when precautionary motives are absent.
Reading: Jappelli and Pistaferri (2017), Ch. 4.

9. *Liquidity Constraints*

We introduce borrowing limits and show how they generate excess sensitivity to income shocks.
Reading: Jappelli and Pistaferri (2017), Ch. 5.

10. *Precautionary Saving*

We demonstrate how convex marginal utility generates precautionary motives and wealth accumulation.
Reading: Jappelli and Pistaferri (2017), Ch. 6.

11. *Buffer-Stock Behaviour and Incomplete Markets*

We study target-wealth behaviour and wealth dispersion in incomplete-markets economies.
Readings: Huggett (1993); Carroll (1997).

12. *Wealthy Hand-to-Mouth Households*

We reconcile high wealth with high marginal propensities to consume in heterogeneous-agent models.
Reading: Kaplan, Violante, and Weidner (2014).

Part IV — Household Heterogeneity and Economic Stimulus

We examine how real-world fiscal stimulus programs interact with household heterogeneity and how quasi-natural experiments allow us to identify marginal propensities to consume.

13. *Institutional Design of Economic Stimulus Payments*

We analyse the structure and timing of the 2001 and 2008 stimulus programs and how policy implementation generates plausibly exogenous income variation.

14. *Natural Experiments and the Measurement of MPCs*

We use stimulus payments as quasi-natural experiments to identify heterogeneous marginal propensities to consume. Econometric implementation is

conducted in tutorials.
Reading: Parker, Souleles, Johnson, and McClelland (2013).

Part V — Prices, Lifecycle Behaviour, and the Retirement Puzzle

We enrich the framework by incorporating price dispersion, shopping behaviour, and retirement dynamics.

15. *Lifecycle Prices*

We show how shopping intensity and price dispersion vary systematically over the lifecycle.
Reading: Aguiar and Hurst (2007).

16. *The Retirement Consumption Puzzle*

We examine the decline in expenditure at retirement and its interpretation through home production.
Reading: Aguiar and Hurst (2005).

17. *Price Dispersion and Search*

We introduce search frictions as a source of equilibrium price dispersion.
Reading: Burdett and Judd (1983).

Part VI — Heterogeneous Goods in Modern Macroeconomics

We conclude by examining recent macroeconomic research that explicitly models heterogeneous consumption goods and differential exposure to price changes.

18. *Spatial Price Dispersion and Consumption Baskets*

We analyse how local price variation shapes household welfare and inequality.
Reading: Handbury (2021).

19. *Trade, Relative Prices, and Household Exposure*

We study how international trade shocks affect households differently through their consumption baskets.
Reading: Neiman and Vavra (2023).

20. *From Heterogeneous Households to Heterogeneous Goods*

We integrate household heterogeneity and goods-level heterogeneity to evaluate macroeconomic policy design.
Discussion of Pytka ⓡ Runge (2025).

2. Tutorials (6 × 1 Hour)

Tutorials operationalise the theoretical material through programming, simulation, replication, and causal inference. All computation uses R, a free, open-source programming language for statistical computing. No prior programming knowledge is assumed.

Primary programming reference: Grolemund (2014).

Tutorial 1. *R and Intertemporal Simulation*

We simulate the two-period model and build foundational programming skills.

Tutorial 2. *Monte Carlo Simulation and Income Risk*

We simulate stochastic income processes and evaluate estimation uncertainty.

Tutorial 3. *Economic Stimulus Payments as Natural Experiments*

We replicate the identification logic of the 2008 ESPs to estimate average MPCs.

Tutorial 4. *Heterogeneous MPCs and Quantile Regression*

We estimate distributional responses and interpret quantile treatment effects.

Tutorial 5. *Simulating Buffer-Stock Behaviour*

We simulate precautionary saving and target-wealth dynamics in incomplete-markets settings.

Tutorial 6. *Simulation of Heterogeneous Goods*

We simulate goods-level heterogeneity and study aggregation to macro outcomes.

Pre-requisites

Students must have passed ECNM08013 Economics 2 and a course equivalent to ECNM08016 Statistical Methods in Economics.

ECNM10052 Essentials of Econometrics is listed as a co-requisite, as familiarity with regression analysis will be beneficial for the empirical components of the course.

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