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Theory and Application of Dynamic Programming: Household Finance

A. Description

These lectures study decision problems of households in a dynamic stochastic setting. To do so, the course will develop a number of tools and then apply them to the agents' choice problems and equilibrium. A primary tool is dynamic programming. Another tool is the use of simulated method of moments to estimate economic models. The course will start with a brief review of these tools.

After developing these two tools, the course turns to applications. Household dynamic choices will include intertemporal consumption, labor supply, portfolio adjustment and durable expenditures. The role of borrowing constraints will be explored. A theme will be the interaction of discrete and continuous choices.

B. Course Plan

This is a preliminary schedule. It will surely be modified as the term progresses. Key articles are indicated by a *.

Week 1: **Overview of Dynamic Programming**

- Asset Pricing
- Value Function Iteration
- Simulated Method of Moments

Read:

1. *Adda-Cooper, Chpts. 2-5
2. *Cooper, R. “Overview of Dynamic Programming,” August 2018

Weeks 2-4: **Household Finance: Portfolio Choice and Borrowing Constraints**

- Household Consumption/ Saving: the Euler Equation

- Household Portfolio Adjustment:
- Borrowing Constraints

Read:

1. *Adda-Cooper, Chapt. 6.
2. Alan, Sule. "Entry costs and stock market participation over the life cycle." *Review of Economic Dynamics* 9, no. 4 (2006): 588-611.
3. Alvarez, Fernando, and Urban J. Jermann. "Quantitative asset pricing implications of endogenous solvency constraints." *The Review of Financial Studies* 14, no. 4 (2001): 1117-1151.
4. Ampudia, M. and R. Cooper and J. LeBlanc and G. Zhu, "MPC Heterogeneity in Europe: Sources and Consequences", mimeo September 2018.
5. Bonaparte, Yosef, Russell Cooper, and Guozhong Zhu. "Consumption smoothing and portfolio rebalancing: The effects of adjustment costs." *Journal of Monetary Economics* 59, no. 8 (2012): 751-768.
6. Carroll, Christopher D. "Buffer-stock saving and the life cycle/permanent income hypothesis." *The Quarterly journal of economics* 112, no. 1 (1997): 1-55.
7. Carroll, Christopher D., and Miles S. Kimball. "On the concavity of the consumption function." *Econometrica: Journal of the Econometric Society* (1996): 981-992.
8. *Cooper, R. and G. Zhu, "Household finance over the life-cycle: What does education contribute?" *Review of Economic Dynamics*, 20 (2016), 63-89.
9. *Deaton, A. "Savings and Liquidity Constraints," *Econometrica*, 59 (1991), 1121-42.
10. Eichenbaum, M., Hansen, L. and K. Singleton, " A Time Series Analysis of Representative Agent Models of Consumption and Leisure Choice under Uncertainty," *Quarterly Journal of Economics*, 103 (1988), 51-78.
11. Gourinchas, P. and J. Parker, "Consumption over the Life Cycle", *Econometrica*, 70 (2002), 47-89.
12. Guiso, Luigi, Michael Haliassos, and Tullio Jappelli. "Household stockholding in Europe: where do we stand and where do we go?." *Economic Policy* 18, no. 36 (2003): 123-170.
13. Haliassos, Michael, and Carol C. Bertaut. "Why do so few hold stocks?." *The Economic Journal* (1995): 1110-1129.

14. * Hall, R. "Stochastic Implications of the Life Cycle-Permanent Income Hypothesis: Theory and Evidence," *Journal of Political Economy*, 86 (1978), 971-87.

15. * Hansen, L. and K. Singleton, "Generalized Instrumental Variables Estimation of Nonlinear Rational Expectations Models," *Econometrica*, 50 (1982), 1269-86.

16. *Krusell, Per, and Anthony A. Smith, Jr. "Income and wealth heterogeneity in the macroeconomy." *Journal of political Economy* 106, no. 5 (1998): 867-896.

17. Zeldes, S. "Consumption and Liquidity Constraints: An Empirical Investigation," *Journal of Political Economy*, 97 (1989), 305-46.

Weeks 5-6: **Household Durable Expenditures**

- Continuous Expenditures
- Lumpy Investment
- Borrowing Constraints

Read:

1. Adda-Cooper, Chapt. 7

2. *Adda, J. and R. Cooper, "Balladurette and Juppette: A Discrete Approach," *Journal of Political Economy*, August, 2000.

3. Caballero, Ricardo J. "Expenditure on durable goods: a case for slow adjustment." *The Quarterly Journal of Economics* 105, no. 3 (1990): 727-743.

4. Cocco, Joao F. "Portfolio choice in the presence of housing." *The Review of Financial Studies* 18, no. 2 (2004): 535-567.

5. Esteban, Susanna, and Matthew Shum. "Durable−goods oligopoly with secondary markets: the case of automobiles." *The RAND Journal of Economics* 38, no. 2 (2007): 332-354.

6. Gavazza, Alessandro. "Leasing and secondary markets: Theory and evidence from commercial aircraft." *Journal of Political Economy* 119, no. 2 (2011): 325-377.

7. House, Christopher L., and John V. Leahy. "An sS model with adverse selection." *Journal of Political Economy* 112, no. 3 (2004): 581-614.

8. * Mankiw, N.G. "Hall's Consumption Hypothesis and Durable Goods," Journal of Monetary Economics, 10 (1982), 417-25.

9. * Fernandez-Villaverde, Jesus, and Dirk Krueger. "Consumption and saving over the life cycle: How important are consumer durables?." *Macroeconomic dynamics* 15.05 (2011): 725-770.

Week 7: **Policy Implications**

Read:

1. *Greg Kaplan and Benjamin Moll and Giovanni L. Violante, 2018. "Monetary Policy According to HANK," American Economic Review, vol 108(3), pages 697-743.
2. *Kaplan, G. "Violante G. Weidner J.,(2014)'The Wealthy Hand to Mouth'." *Brookings Papers On Economic Activity*.