

# Topics in Macroeconomics

## Programa de Maestria. Universidad Di Tella

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### 1 Basic Information About The Course

**Instructors:** Rody Manuelli, (email: manuelli@wustl.edu)

**Time and Location:** To be Determined

**Office Hours:** Stop by my office (in Alcorta) anytime or call ahead.

**Organization:** The course discusses some results on investment decisions, asset pricing and the provision of incentives in the presence of asymmetric information in continuous time. The strategy is to develop the basic tools in the first two/three lectures and then to use them in a variety of applications. I have listed several topics and I know that it is not possible to cover them all. Once we get started, and depending on the class' interest, we will choose.

Given the emphasis on applications, I will not go into the derivations of the basic math results, and I will state them without proof. I will follow a set of notes that extract the most useful results from several sources. Additional references are:

*Investment Under Uncertainty (IUU)* by Avinash Dixit and Robert Pyndick, Princeton, 1994

*Brownian Motion and Stochastic Flow Systems (BMSF)* , J. Michael Harrison, Krieger 1990

*Stochastic Optimization in Continuous Time (SCT)*, Fwu-Ranq Chang, Cambridge U. Press, 2004.

*Brownian Motion and Stochastic Calculus (BMSC)*, Ioannis Karatzas and Steven Shreve, Springer, 1991.

*Security Markets (SM)*, Darrell Duffie, Academic Press, 1988.

*Stochastic Methods in Economics and Finance (SMEF)*, A. G. Malliaris (with W. Brock), North-Holland, 1982.

*The Economics of Inaction (EI)*, Nancy Stokey, Princeton University Press 2008.

**Grading:** There will be some (probably a couple) of required homework assignments and a take-home final. The date of the final will be chosen by the students to minimize

conflicts with other courses.

## 2 Topics

1. *Background Material.* IUU, chapters 1 and 2. (I will not cover this material. It is your responsibility to read the relevant chapters)
2. *Stochastic Processes and Ito's Lemma.* Class Notes.
  - *Stochastic Processes and Brownian Motion: Basic Results.*
  - *Stochastic Integration and Ito's Lemma: Definitions and Results.*
  - *Stochastic Differential Equations and the Feynman-Kac Theorem.*
  - *Notes on Optimal Stopping and Smooth Pasting.*
  - In addition, the material is covered in IUU. chapter 3, SCT (several chapters), as well as the other references. (Almost every book listed covers this topic. See, in particular, the appendix in BMSF.).
3. *Options: Real and Financial.* IUU (chapters, 5, 6, and 7), Stokey (chapters 4 and 5). Additional readings:
  - McDonald, R. and Siegel, (1986), "The Value of Waiting to Invest," **The Quarterly Journal of Economics**, Vol. 101, No. 4. (Nov., 1986), pp. 707-728.
  - S. Agarwal, J. Driscoll and D. Laibson, (2002), "When Should Borrowers Refinance Their Mortgages?" working paper, Brown University.
4. *Options: Strategic Exercise.*
  - Grenadier, S, (1996), "The Strategic Exercise of Options: Development Cascades and Overbuilding in Real Estate Markets," **The Journal of Finance**, Vol. 51, No. 5, pp: 1653-1679.
  - Mella-Barral, P. and W. Perraudin, (1997), "Strategic Debt Service," **The Journal of Finance**, Vol. 52, No. 2, pp: 531-556.
  - Grenadier, S, (1999), "Information revelation Through Option Exercise," **Review of Financial Studies**, Vol. 12, No. 1, pp: 95-129.
  - Leland, H. E. (1994), "Corporate Debt Value, Bond Covenants and Optimal Capital Structure," **The Journal of Finance**, Vol. 49, Issue 4, pp: 1213-1252.
  - Sundaresan, S. and N. Wang, (2006), "Dynamic Investment, Capital Structure and Debt Overhang," working paper.

- Lyandres, E. and A. Zhdanov, (2009), “Convertible Debt and Investment Timing,” working paper.

#### 5. *Asset Pricing:*

- Arbitrage Pricing: Market Price of Risk. Class Notes: *Asset Pricing I*.
- General Equilibrium: Lucas’ Tree Model. Class Notes: *Asset Pricing II*.
- General Equilibrium: Non-standard Preferences:
  - Constantinides, (1990), “Habit Formation: A Resolution of the Equity Premium Puzzle, **Journal of Political Economy**,” Vol. 98, No. 3, pp: 519-543.
  - Campbell, John Y., and John H. Cochrane (1999) “By Force of Habit: A Consumption-based Explanation of Aggregate Stock Market Behavior,” **Journal of Political Economy**, 107(2), 205
- Fixed Income Pricing:
  - Dai, Q and K. Singleton (2002), “Fixed Income Pricing,” chapter 20 in **Handbook of the Economics of Finance**. [Google for a free pdf version of the paper]

#### 6. *Principal Agent Models*

- Sannikov, Yuliy, (2008), “A Continuous-Time Version of the Principal Agent Problem,” **Review of Economic Studies**, Vol. 75, pp: 957-984.
- DeMarzo, P. and Y. Sannikov, 2006, “Optimal Security Design and Dynamic Capital Structure in a Continuous-Time Agency Model,” **The Journal of Finance**, Vol. LXI, No. 6, pp: 2681-2724.
- Philippon, T. and Y. Sannikov, 2007, “Real Options in a Dynamic Agency Model, with Applications to Financial Development, IPOs, and Business Risk,” NBER working paper No 13584.
- Grenadier, S. and N. Wang, 2005, “Investment Timing, Agency and Information,” **Journal of Financial Economics**, Vol. 75, pp: 493-533.
- He, Z. (2010), “A Model of Dynamic Compensation and Capital Structure,” **Journal of Financial Economics** (forthcoming).

#### 7. *Optimal Consumption and Saving.*

- Merton, R, (1973), “An Intertemporal Asset Pricing Model,” **Econometrica**, Vol. 41, No. 5. (Sep., 1973), pp. 867-887.
- Cox, J, J. Ingersoll, and S. Ross, (1985a), “A Theory of the Term Structure of Interest Rates,” **Econometrica**, Vol. 53, pp: 363-384.

- Cox, J, J. Ingersoll, and S. Ross, (1985a), “An Intertemporal General Equilibrium Model of Asset Prices,” **Econometrica**, Vol. 53, pp: 385-408.
- Duffie, D., (2002), “Intertemporal Asset Pricing Theory,” working paper, Stanford University.
- Cochrane, J, F Longstaff and P. Santa-Clara, (2003), “Two Trees: Asset Pricing Dynamics Induced by Market Clearing,” working paper.
- Pavlova, A. and R. Rigobon, (2003), “Asset Prices and Exchange Rates,” working paper

#### 8. *Capital Structure and Industry Equilibrium*

- Miao, J. (2005), “Optimal Capital Structure and Industry Dynamics,” **The Journal of Finance**, Vol. LX, No. 6, pp: 2621-2259.
- Hackbarth, D., Miao, J. and E. Morellec, (2006), “Capital Structure, Credit Risk, and Macroeconomic Conditions,” **Journal of Financial Economics**, 82 (2006), pp: 519-550.

#### 9. *Aggregate Equilibrium*

- Brunnermeier, M. and Y. Sannikov, “A Macroeconomic Model with Financial Frictions,” working paper.