

# Growth and Development

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Lecture location and times: Wed 3pm-6pm, Seminar Room

## I Course Description

This graduate course covers advanced topics in development economics. We will integrate microeconomic tools and quantitative macro theory to understand development and evaluate policy.

**PART I:** First, we will discuss development facts from cross-sectional and panel household-level data from developing countries. Our unit of observation will be individuals and households. We will look at the behavior of consumption and income, and whenever possible of wealth and land. We will focus on household-level data from Sub-Saharan African countries and China. We will also review some macro development facts from standard aggregate data (e.g. PWT, WDI, etc.) and discuss their relation to our micro facts.

**PART II:** Second, we will introduce consumption theory (intertemporal choice and PILCH models with borrowing and savings constraints) and discuss its applications to development. Then, we will use theory to study consumption risk and insurance in village economies formalizing tests of market (in)completeness; this will include state-of-the-art estimations of the degree of partial insurance. Further, we will study models where incomplete markets arise endogenously (e.g. imperfect information and imperfect enforceability) and for which we can derive additional insurance tests that we will also take to the data. Here, we will pay particular attention to Sub-Saharan African countries and China. Finally, we will move beyond villages and discuss potential routes to link individual risk and insurance to aggregate development. This course is very much engineered to get this aggregation right. To do so, we will present quantitative macro models with heterogeneous agents and discuss their solution under individual/aggregate risk in non-stationary development processes. Specifically, we will analyze how to embed heterogeneity into aggregate models of structural transformation.

Finally, time permitting, we will study a set of advanced topics in development: (a) health behavior and risk to understand the effects of disease (e.g. HIV, malaria) and assess the role of prevention strategies and palliative policies; (b) data and theory behind the relationship between fertility and income/land in developing countries; (c) missallocation issues arising from regulations on firms, land policies and gender-biased social norms; (d) models that explain low rates of new technology adoption (e.g. use of fertilizers) in some developing countries; and (e) measurement and use of subjective expectations on returns to schooling (and aspirations) in developing countries. We will also discuss how to conduct field experiments. Here, our goal is to find useful ways in which we can integrate field experiments and structural modeling to exploit their complementarities when conducting policy evaluations.

Starting the first week of classes, students should check the course website regularly at:

<http://r-santaeulalia.net/Growth-Development-Economics-SP17.html>.

There I will post announcements and a class diary that keeps track of what we are doing.

## II Grades and Requirements

This course is demanding and I expect you to be engaged continuously. I will ask you to present papers from the reference list and occasionally ask you to do some additional homework exercises. The grade will be largely based on one project to be chosen out of the the following options:

- Your own project.
- Explore the relationship between fertility and income/land/productivity in rural and urban areas using household survey data. Find the mechanisms that explain it. Is family planning a good or bad policy?
- Explore the relationship between insurance and missallocation in the agricultural sector using household survey data.
- Explore default risk in developing countries using household survey data (remember that in a limited commitment economy sustainable contracts imply that there is no default in equilibrium). Find who borrowed, who defaulted, who tried to borrow and could not, etc. Find the mechanisms that rationalize your facts. Do policy.
- Solve an Aigayari-Bewley-Hugget economy for a developing country matching the variance of logged consumption over the life cycle and the covariance of logged consumption and income over the life cycle given an exogenous income process. Bonus: Introduce endogenous labor supply (**Note: This project comes with bonus**).
- Or others specified in class.

The project will be chosen the fourth week of class and due by the last week of classes. You are expected to update me on your projects in the development workshop that we will hold 2 Fridays per month. This update will take the form of a 5-slides presentation. You are encouraged to work in groups (of not more than 2) but grades are individual.

## III Computer Skills

It helps if you have had previous programming experience but it is not a pre-requisite. The programming language you use is at your discretion.

- To do serious data work when you are 'fishing for facts' or doing your homework, I suggest you to use STATA which is a good application that allows you to upload and manipulate many large data sets at once. **Most (if not all) homework exercises that you will do in this course can be managed with STATA.**

- Further, if you are planning to do serious computational work in your research, I encourage you to learn FORTRAN (good alternatives are C or C++). This requires an initial fixed cost but I think it pays off. MATLAB is more user-friendly than Fortran and very popular in economics. It is particularly useful if you are used to think in vector-matrix operations. FORTRAN and MATLAB are both good alternatives to solve Aiyagari-Bewley-Hugget economies.

You have all these packages in the graduate lab.

## IV Textbooks

Our readings will consist of published articles, working papers, etc. I will provide some lecture notes/slides for some specific topics and that will be completed by the set of references. Two interesting references to have in your bookshelf, are the consumption/development book [Deaton \(2000\)](#) and the recent Handbooks of Economic Growth. Though a bit outdated, Debraj Ray's book on Development Economics is also interesting, Princeton University Press (January 12, 1998). A good set of current debates on economic development can also be found in the "Poor Economics" book by Banarjee and Duflo. For historical/macro perspective, Lucas' essay on "The Industrial Revolution: Past and Future" (2003) is an excellent reading.

## V Course Outline

While we will cover all topics, we will not go through all the references listed here but a selection of them to be decided as we move along.

### 1. [Weeks 1-2] Development Facts: Cross-sectional and Panel Data from Developing Countries

(a) Macro:

- Some classics: [Barro \(1991\)](#), [Kremer \(1993\)](#), [Young \(1995\)](#), [Klenow and Rodriguez-Clare \(1997\)](#), [Prichett \(1997\)](#), [Hall and Jones \(1999\)](#), and [Hsieh \(2002\)](#).
- Level (aka development) accounting: [Caselli \(2005\)](#) and [Hsieh and Klenow \(2010\)](#).
- Mobility: [Quah \(1993\)](#), [Chari et al. \(1996\)](#), and [Jones \(1997\)](#).
- Home-production: [Parente et al. \(2000\)](#);
- Human capital: [Lucas \(1988\)](#), [Bils and Klenow \(2000\)](#), [Duflo \(2001\)](#), and [Manuelli and Seshadri \(2005\)](#).
- Relative investment prices: [Hsieh and Klenow \(2007\)](#)
- Multiple equilibria: [Graham and Temple \(2006\)](#).
- Big Push: [Murphy et al. \(1989\)](#)
- Historians: [Sahlins \(1972\)](#), [Jones \(1988\)](#), [Mokyr \(1992\)](#), [Landes \(1998\)](#) and [Polanyi \(2001\)](#).

(b) Micro: Cross-sectional facts of household-level consumption, income and wealth inequality are well-known in the U.S. and Europe, [Krueger et al. \(2010\)](#). What about

developing countries? A study using some Sub-Saharan countries: [deMagalhaes and Santaaulàlia-Llopis \(2013b\)](#).

## 2. [Weeks 3-4] Consumption: Intertemporal Choice, PILCH, Credit Constraints and Saving Constraints

- (a) Estimating income processes: standard tools in [Guvenen and Smith \(2010\)](#) and [Meghir and Pistaferri \(2010\)](#). Estimating income process in very poor countries: see [Carli and Santaaulàlia-Llopis \(2013\)](#) for Malawi and [Santaaulàlia-Llopis and Zheng \(2013\)](#) for China.
- (b) The transmission from income to consumption: Theory and data: [Deaton \(1992\)](#), [Attanasio \(1999\)](#) and Dirk Krueger's graduate notes.
- (c) Solving and using Aiyari-Bewley-Hugget Economies: [Aiyagari \(1994\)](#), [Hugget \(1996\)](#), and [Storesletten et al. \(2004\)](#).

## 3. [Weeks 5-8] Risk and Insurance in Village Economies

- (a) The basics: Testing the complete market models in [Townsend \(1994\)](#) and [Udry \(1994\)](#). The BPP exercise: An alternative empirical strategy applied to the U.S. [Blundell et al. \(2008\)](#) and to China [Santaaulàlia-Llopis and Zheng \(2013\)](#). BPP in Bewley economies: [Kaplan and Violante \(2010\)](#).
- (b) Credit constraints [Deaton \(1991\)](#), [Zeldes \(1989\)](#) and [Jappelli et al. \(1998\)](#); savings constraints [Dupas and Robinson \(2012\)](#); the life-cycle [Deaton and Paxson \(1994a\)](#) and [Deaton and Paxson \(1994b\)](#); [Rosenzweig and Wolpin \(1993\)](#), and [Behrman et al. \(1997a\)](#); lifetime credit and savings constraints in Sub-Saharan Africa [deMagalhaes and Santaaulàlia-Llopis \(2013a\)](#).
- (c) Endogenous incomplete markets models: Models with imperfect enforceability (lack of commitment) ([Kocherlakota, 1996](#); [Kehoe and Levine, 2001](#); [Alvarez and Jermann, 2000](#); [Ligon et al., 2000](#); [Krueger and Perri, 2006](#))<sup>1</sup> and models with imperfect/private information ([Atkeson and Lucas, 1992](#); [Golosov and Tsyvinski, 2006](#); [Golosov et al., 2009](#); [Attanasio and Pavoni, 2011](#); [Ligon, 1998](#)).
- (d) Intrahousehold resource allocation: [Behrman and Deolalikar \(1993\)](#), [Foster and Rosenzweig \(2002\)](#), [Duflo and Udry \(2004a\)](#), and [Dubois and Ligon \(2011\)](#).<sup>2</sup>
- (e) The role of social networks: [Udry and Conley \(2004\)](#), [Ligon and Schechter \(2011\)](#). [Ligon \(2012\)](#) shows further reasons on reciprocity/altruism for the appearance of risk-sharing contracts. [Angelucci et al. \(2010\)](#) show differential coping strategies from within family versus out-of-family networks.<sup>3</sup> More on self-insurance vs. mutual insurance: [Coate and Ravallion \(1993\)](#) and [Ligon et al. \(2002\)](#).

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<sup>1</sup>See [Prescott and Townsend \(1984\)](#) for a discussion on decentralizations of economies with both adverse selection and moral hazard.

<sup>2</sup>See also, [Mazzocco et al. \(2007\)](#), [Blundell et al. \(2007\)](#) [Blundell et al. \(2005\)](#) for collective models in static frameworks in non-development settings. Further, dynamic extensions of noncooperative decision making—such as the spheres model proposed in [Lundberg and Pollak \(1993\)](#)—are also an alternative avenue to explore.

<sup>3</sup>An earlier reference using U.S. data [Altonji et al. \(1992\)](#).

- (f) Formal insurance: [Burgess and Pande \(2005\)](#), [Kaboski and Townsend \(2011\)](#), and [Gine and Townsend \(2004\)](#). Formal vs. informal insurance [Mobarak and Rosenzweig \(2012\)](#).
- (g) Other aspects of insurance: Migration-marriage [Rosenzweig and Stark \(1989\)](#), [Morten \(2013\)](#), [Dinkelman \(2013\)](#); the tradeoff between private vs. public insurance [Attanasio and Ríos-Rull \(2000\)](#); insurance and advance information [Jappelli et al. \(2008\)](#); illness and insurance [Gertler and Gruber \(2002\)](#); heterogeneous preferences and risk sharing [Mazzocco and Shiv \(2012\)](#) and [Chiappori et al. \(2011\)](#); risk preferences and risky choices can bias conventional insurance tests, see [Schulhofer-Wohl \(2011\)](#).
- (h) Nutrition: [Behrman and Deolalikar \(1990\)](#), [Lee et al. \(1997\)](#), and [Behrman et al. \(1997b\)](#), and [Iannotti et al. \(2012\)](#).

4. **[Week 9-10] Beyond Villages: Insurance and Growth** Macroeconomic models with heterogeneous agents explicitly derive aggregate implications from heterogeneous household behavior; see a classic discussion in [Ríos-Rull \(1995\)](#) and, more recently, in [Heathcote et al. \(2009\)](#). While these models are an industry standard in quantitative macroeconomics, their use in development economics is practically nonexistent. A fundamental reason for the so far limited use of these models to study development is that in order to map them to the data comprehensive knowledge of the properties of household-level economic inequality of consumption, income, and wealth from representative surveys is required, see a discussion in [deMagalhaes and Santaeulàlia-Llopis \(2013b\)](#). Pioneering Micro-Macro exercises in development: [Jeong and Townsend \(2005\)](#) and [Townsend and Ueda \(2006\)](#). In this section we will incorporate consumption insurance in model of structural transformation to assess the effects of insurance on aggregate development following [Koh and Santaeulàlia-Llopis \(2013\)](#).<sup>4</sup>

#### (a) Macro Models with Heterogeneous Agents

##### i. Complete Markets

- A. When heterogeneous agents economies behave as representative agent economies.
  - The Negishi method: [Chatterjee \(1994\)](#), [Caselli and Ventura \(2000\)](#), [Maliar and Maliar \(2001\)](#), [Maliar and Maliar \(2003\)](#) and [Koulovatianos \(2005\)](#)
- B. When heterogeneous agents economies do NOT behave as representative agent economies.
- C. The case of Hybrid OLGs Economies: [Santaeulàlia-Llopis \(2011\)](#)

ii. **Incomplete Markets** : [Ríos-Rull \(1996\)](#), [Castañeda et al. \(1998\)](#), [Storesletten et al. \(2004\)](#), [Heathcote et al. \(2009\)](#), [Hugget et al. \(2011\)](#).

iii. **Incomplete Markets and Aggregate Risk**: [Krusell and Smith \(1998\)](#) and [Krusell et al. \(2009\)](#).

#### (b) Models of Structural Transformation

- i. Malthus to Solow: One-good economy, 2 production functions (one with DRS) [Hansen and Prescott \(2002\)](#)
- ii. [Parente and Prescott \(2005\)](#).

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<sup>4</sup>At the aggregate level: [Heathcote and Perri \(2013\)](#). An interesting reading here is also [Banarjee and Duflo \(2005\)](#).

- iii. Non-homothetic preferences with 2 goods: [Kongsamut et al. \(2001\)](#) and [Gollin et al. \(2002\)](#), and with capital [Gollin et al. \(2007\)](#).
- iv. Clubs and catching up: [Lucas \(2005\)](#)

## 5. [Week 11] Specific Topic I: Health Behavior and Risk

- (a) Basics: [Pitt et al. \(1990\)](#), [Strauss and Thomas \(2007\)](#), [Curtler and Lleras-Muney \(2011\)](#), [Dupas \(2011\)](#).
- (b) HIV/AIDS:
  - Macro: Agregate Effects: [Young \(2005\)](#), [Santaeuàlia-Llopis \(2011\)](#); HIV-Education gradient [Fortson \(2008\)](#), HIV-Education Gradient, Risky Sexual Behavior and Stages of the HIV Epidemic: [Iorio and Santaeuàlia-Llopis \(2011\)](#); Endogenous sexual behavior models: [Greenwood et al. \(2010\)](#), [Manuelli and Santaeuàlia-Llopis \(2011\)](#).
  - Micro: [Duflo et al. \(2012\)](#), [Helleringer and Kohler \(2007\)](#), [Levinsohn et al. \(2011\)](#), [Levinsohn et al. \(2006\)](#), [Thornton \(2008\)](#), [Habyarimana et al. \(2010\)](#), [Baranov et al. \(2012\)](#) and [Carli and Santaeuàlia-Llopis \(2013\)](#).<sup>5</sup>

## 6. [Week 12.1] Specific Topic II: Fertility and Investment in Children

- (a) Macro: Fertility, income and schooling across countries, [Manuelli and Seshadri \(2007\)](#)
- (b) Micro: Historical fertility and income from U.S. cohorts, [Jones et al. \(2010\)](#); experimental evidence on fertility and contraceptive choices, [Ashraf et al. \(2010\)](#); fertility, income and schooling within Sub-Saharan Africa countries, [deMagalhaes et al. \(2013\)](#).

## 7. [Week 12.2] Specific Topic III: Missallocation: Firms, Land and Gender-Biased Social Norms

- (a) The Basics: [Lucas \(1990\)](#), [Caselli and Feyrer \(2007\)](#) with cross-country data and [Restuccia and Rogerson \(2008\)](#) with firm-plant level data.
- (b) Plants in China and India: [Hsieh and Klenow \(2009\)](#); Labor dynamics: [Klein and Ventura \(2012\)](#)
- (c) Land Missallocation (bad policy) and Productivity: [Restuccia and Santaeuàlia-Llopis \(2013\)](#)
- (d) Gender-Biased Social Norms: Do they prevent growth? [Udry \(1996\)](#), [Foster and Rosenzweig \(2002\)](#), [Duflo and Udry \(2004b\)](#), [Tertilt \(2005\)](#), [Gneezy et al. \(2009\)](#), [Doepke and Tertilt \(2010\)](#) and [Pitt et al. \(2012\)](#).

## 8. [Week 13.1] Specific Topic IV: Technology Adoption

- (a) Why so low new tech. adoption rates in developing countries? and [Udry and Anagol \(2006\)](#), [Suri \(2011\)](#) and [Duflo et al. \(2011\)](#)

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<sup>5</sup>An additional good reading in [Behrman and Kohler \(2012\)](#).

- (b) Models of span of control and technology adoption: Lucas (1978) and Greenwood and Yorukoglu (1997)
- (c) Contextualized aspects of tech. adoption: weather risk Rosenzweig and Binswanger (1993); labor supply Goldberg (2010); credit constraints Gine and Klonner (2006); financial knowledge.

9. **[Week 13.2] Specific Topic V: Aspirations**

- (a) The socialization of preferences: Clausen (1968), and the capacity to aspire: Appadurai (2004) and Ray (2006).
- (b) Measuring subjective expectations in developing countries: Delavande et al. (2009)
- (c) Measuring subjective expectations on returns to schooling in developing countries: Attanasio and Kaufmann (2009) and the Congo Project.
- (d) Andersen et al. (2008) on the joint elicitation of risk and time preferences

10. **[Week 14] Integrating Field Experiments and Structural Modeling to Evaluate Policy**

We will go over how to set up a randomized experiment. We will discuss to lower potential randomization bias, contamination bias, and attrition bias (see Behrman and Todd (1999) and King and Behrman (2009)). In this final section we will focus on how we can use dynamic structural models of social insurance identified and validated by the experimental evidence to evaluate policy. Todd and Wolpin (2006) and Attanasio et al. (2011) are pioneers in this methodology that exploits complementarities between experimental evidence and structural modelizations. Both studies evaluate the impact of a school subsidy program in Mexico, PROGRESA. While Todd and Wolpin (2006) use the experiment for out-of-sample validation of their structural model, Attanasio et al. (2011) use the experimental outcomes to further identify specific structural model parameters. In that sense, our exercise is closest to Attanasio et al. (2011). See also Banerjee et al. (2012) and Rosenzweig and Wolpin (2000).

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