



**Course:** Development Economics  
**Faculty:** Raül Santaeuilàlia-Llopis  
**Term:** Spring term  
**E-mail:** rauls@wustl.edu  
**Office Hours:** Upon request by email.

## 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-santaaulalia.net/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. The grade will be largely based on one project to be chosen out of the the following options:

- Your own project that involves using micro-data from developing countries.
- 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 counts for two**).
- Or others specified in class.

The two projects will be chosen the second 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 short presentation. You are encouraged to work in groups (of not more than 2) but grades are individual. I may occasionally ask you to do some additional homework exercise and/or present a paper from the reference list.

## 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. \(2002\)](#).

---

<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 \(2005\)](#).

---

<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. \(2011\)](#)

---

<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).

## References

- Aiyagari, S. R. (1994). Uninsured idiosyncratic risk, and aggregate saving. *Quarterly Journal of Economics*, 109:659–684.
- Altonji, J. G., Hayashi, F., and Kotlikoff, L. J. (1992). Is the extended family altruistically linked? direct tests using micro data. *American Economic Review*, pages 1177–1198.
- Alvarez, F. and Jermann, U. J. (2000). Efficiency, equilibrium, and asset pricing with risk of default. *Econometrica*, 68(4):775–798.
- Andersen, S., Harrison, G., Lau, M., and Rutström, E. (2008). Eliciting risk and time preferences. *Econometrica*, 76(3):583–618.
- Angelucci, M., de Giorgi, G., Rasul, I., and Rangel, M. A. (2010). Insurance and investment within family networks. Working Papers id:2649, eSocialSciences.

- Appadurai, A. (2004). Capacity to aspire. In Rao, V. and Walton, M., editors, *Culture and Public Action*. Stanford Social Sciences.
- Ashraf, N., Field, E., and Lee, J. (2010). Household bargaining and excess fertility: An experimental study in zambia. Mimeo, Harvard University and Duke University.
- Atkeson, A. and Lucas, R. E. (1992). On efficient distribution with private information. *Review of Economic Studies*, 59:427–453.
- Attanasio, O. (1999). Consumption. In Woodford, J. B. T. . M., editor, *Handbook of Macroeconomics*, volume 1, chapter 11, pages 741–812. Amsterdam, North-Holland.
- Attanasio, O. and Kaufmann, K. (2009). Educational choices, subjective expectations, and credit constraints. Working Paper 15087, National Bureau of Economic Research.
- Attanasio, O., Meghir, C., and Santiago, A. (2011). Education choices in mexico: Using a structural model and a randomized experiment to evaluate progressa. *Review of Economic Studies*, pages 1–30.
- Attanasio, O. and Ríos-Rull, J.-V. (2000). Consumption smoothing in island economies: can public insurance reduce welfare ? *European Economic Review*, 44:1225–1258.
- Attanasio, O. P. and Pavoni, N. (2011). Risk sharing in private information models with asset accumulation: Explaining the excess smoothness of consumption. *Econometrica*, 79(4):1027–1068.
- Banarjee and Duflo, E. (2005). Growth theory through the lens of development economics. In Aghion, P. and Durlauf, S., editors, *Handbook of Economic Growth*. Elsevier.
- Banerjee, A., Chandrasekhar, A. G., Duflo, E., and Jackson, M. O. (2012). The diffusion of microfinance. NBER Working Papers 17743, National Bureau of Economic Research, Inc.
- Baranov, V., Bennett, D., and Kohler, H.-P. (2012). The aids epidemic, antiretroviral therapy, and subjective mortality risk. Unpublished working paper, University of Chicago and University of Pennsylvania.
- Barro, R. (1991). Economic growth in a cross-section of countries. *Quarterly Journal of Economics*, pages 407–443.
- Behrman, J., Foster, A. D., and Rosenzweig, M. R. (1997a). Dynamic savings decisions in agricultural environments with incomplete markets. *Journal of Business and Economic Statistics*, 15(2):282–292.
- Behrman, J., Foster, A. D., and Rosenzweig, M. R. (1997b). The dynamics of agricultural production and the calorie-income relationship: Evidence from pakistan. *Journal of Econometrics*, 77(1):187–207.
- Behrman, J. and Kohler, H.-P. (2012). Sexual transmission of hiv. Unpublished working paper, University of Pennsylvania.
- Behrman, J. R. and Deolalikar, A. B. (1990). The intrahousehold demand for nutrients in rural south india: Individual estimates, fixed effects, and permanent income. *Journal of Human Resources*, 25(4):665–696.



- Behrman, J. R. and Deolalikar, A. B. (1993). The intrahousehold distribution of market labour supply in rural south india. *Oxford Bulletin of Economics and Statistics*, 55(4):409–20.
- Behrman, J. R. and Todd, P. E. (1999). Randomness in the experimental samples of progesa (education, health, and nutrition program). Unpublished working paper, IFPRI.
- Bils, M. and Klenow, P. (2000). Does schooling cause growth? *American Economic Review*, pages 1160–1183.
- Blundell, R., Chiappori, P.-A., Magnac, T., and Meghir, C. (2007). Collective labour supply: Heterogeneity and non-participation. *Review of Economic Studies*, 74(2):417–445.
- Blundell, R., Chiappori, P.-A., and Meghir, C. (2005). Collective labor supply with children. *Journal of Political Economy*, 113(6):1277–1306.
- Blundell, R., Pistaferri, L., and Preston, I. (2008). Consumption inequality and partial insurance. *American Economic Review*, 98(5):1887–1927.
- Burgess, R. and Pande, R. (2005). Do rural banks matter? evidence from the indian social banking experiment. *American Economic Review*, 95(3):780–795.
- Carli, F. and Santaeuàlia-Llopis, R. (2013). Consumption insurance in times of hiv. Mimeo, WUSTL.
- Caselli, F. (2005). Accounting for cross-country income differences. In Aghion, P. and Durlauf, S., editors, *Handbook of Economic Growth*, pages 679–74. Elsevier.
- Caselli, F. and Feyrer, J. (2007). The marginal product of capital. *Quarterly Journal of Economics*, 122(2):535–568.
- Caselli, F. and Ventura, J. (2000). A representative consumer theory of distribution. *American Economic Review*, 90(4):909–926.
- Castañeda, A., Díaz-Giménez, J., and Ríos-Rull, J.-V. (1998). Exploring the income distribution business cycle dynamics. *Journal of Monetary Economics*, 42(1).
- Chari, V., Kehoe, P. J., and McGrattan, E. R. (1996). The poverty of nations: A quantitative exploration. Working Paper 5414, National Bureau of Economic Research.
- Chatterjee, S. (1994). Transitional dynamics and the distribution of wealth in a neoclassical growth model. *Journal of Public Economics*, 54(1):97–119.
- Chiappori, P.-A., Samphantharak, K., Schulhofer-Wohl, S., and Townsend, R. M. (2011). Heterogeneity and risk sharing in village economies. NBER Working Papers 16696, National Bureau of Economic Research, Inc.
- Clausen, J. A. (1968). *Socialization and Society*. Boston, Little Brown and Company.
- Coate, S. and Ravallion, M. (1993). Reciprocity without commitment: Characterization and performance of informal insurance arrangements. *Journal of development Economics*, 40(1):1–24.
- Curtler, D. and Lleras-Muney, A. (2011). Education and health: Insights from international comparisons. Mimeo, UCLA.

- Deaton, A. (1991). Saving and liquidity constraints. *Econometrica*, 59:1221–1248.
- Deaton, A. (1992). *Understanding Consumption*. Oxford University Press.
- Deaton, A. (2000). *The Analysis of Household Surveys. A Microeconomic Approach to Development Policy*. The Johns Hopkins University Press.
- Deaton, A. and Paxson, C. (1994a). Intertemporal choice and inequality. *Journal of Political Economy*, 102(3):437–67.
- Deaton, A. and Paxson, C. (1994b). Saving, growth, and aging in taiwan. In Wise, D. A., editor, *Studies in the Economics of Ageing*, pages 331–357. University of Chicago Press. Studies in the economics of aging. National Bureau of Economic Research Project Report series.
- Delavande, A., Gine, X., and D., . M. (2009). Measuring subjective expectations in developing countries. Policy Research Working Paper 4824.
- deMagalhaes, L. and Santaaulàlia-Llopis, R. (2013a). Consumption and income inequality in sub-saharan africa: A lifetime with no humps and low partial insurance. mimeo WUSTL.
- deMagalhaes, L. and Santaaulàlia-Llopis, R. (2013b). Consumption, income and wealth of the very poor: Cross-sectional facts from household isa data for ethiopia, malawi, niger, uganda and tanzania. mimeo WUSTL.
- deMagalhaes, L., Santaaulàlia-Llopis, R., and Zheng, Y. (2013). Optimal fertility in sub-saharan africa: Why and when is more children better for income? mimeo WUSTL.
- Dinkelman, T. (2013). Can spatial mobility insure families against long-term impacts of economic shocks? evidence from drought and disability in south africa. Mimeo, Dartmouth.
- Doepke, M. and Tertilt, M. (2010). Does female empowerment promote economic development? Working Papers id:3189, eSocialSciences.
- Dubois, P. and Ligon, E. A. (2011). Incentives and nutrition for rotten kids: intrahousehold food allocation in the philippines. CUDARE Working Paper Series 1114, University of California at Berkeley, Department of Agricultural and Resource Economics and Policy.
- Duflo, E. (2001). Schooling and labor market consequences of school construction in indonesia: Evidence from an unusual policy experiment. *American Economic Review*, 91(4):795–813.
- Duflo, E., Dupas, P., and Kremer, M. (2012). Education, hiv, and early fertility: Experimental evidence from kenya? mimeo Stanford.
- Duflo, E., Kremer, M., and Robinson, J. (2011). Nudging farmers to use fertilizer: Theory and experimental evidence from kenya. *American Economic Review*, (101):2350–2390.
- Duflo, E. and Udry, C. (2004a). Intrahousehold resource allocation in cote d’ivoire: Social norms, separate accounts and consumption choices. NBER Working Papers 10498, National Bureau of Economic Research, Inc.
- Duflo, E. and Udry, C. (2004b). Intrahousehold resource allocation in cote d’ivoire: Social norms, separate accounts and consumption choices. Working Paper 10498, National Bureau of Economic Research.

- Dupas, P. (2011). Health behavior in developing countries. *Annual Review of Economics*, 3.
- Dupas, P. and Robinson, J. (2012). Savings constraints and microenterprise development: Evidence from a field experiment in Kenya. mimeo Stanford.
- Fortson, J. G. (2008). The gradient in sub-Saharan Africa: Socioeconomic status and HIV/AIDS. *Demography*, 45(2):303–322.
- Foster, A. D. and Rosenzweig, M. R. (2002). Household division and rural economic growth. *Review of Economic Studies*, 69(4):839–869.
- Gertler, P. and Gruber, J. (2002). Insuring consumption against illness. *American Economic Review*, 92(1):51–70.
- Gine, X. and Klonner, S. (2006). Credit constraints as a barrier to technology adoption by the poor: Lessons from South Indian small-scale fishery. Working Papers RP2006/104, World Institute for Development Economic Research (UNU-WIDER).
- Gine, X. and Townsend, R. (2004). Evaluation of financial liberalization: A general equilibrium model with constrained occupational choice. *Journal of Economic Development*, 74:269–307.
- Gneezy, U., Leonard, K. L., and List, J. A. (2009). Gender differences in competition: Evidence from a matrilineal and a patriarchal society. *Econometrica*, 77(5):1637–1664.
- Goldberg, J. (2010). Kwacha gonna do? experimental evidence about labor supply in rural Malawi. Working paper.
- Gollin, D., Parente, S. L., and Rogerson, R. (2002). The role of agriculture in development. *American Economic Review*, 92(2):160–164.
- Gollin, D., Parente, S. L., and Rogerson, R. (2007). The food problem and the evolution of international income levels. *Journal of Monetary Economics*, 54(4):1230–1255.
- Golosov, M., Lorenzoni, G., and Tsyvinski, A. (2009). Decentralized trading with private information. NBER Working Papers 15513, National Bureau of Economic Research, Inc.
- Golosov, M. and Tsyvinski, A. (2006). Designing optimal disability insurance: A case for asset testing. *Journal of Political Economy*, 114(2):257–279.
- Graham, B. and Temple, J. (2006). Rich nations, poor nations: How much can multiple equilibria explain? *Journal of Economic Growth*, 11(1):5–41.
- Greenwood, J., Kircher, P., and Tertilt, M. (2010). An equilibrium model of the African HIV/AIDS epidemic. Mimeo, UPENN.
- Greenwood, J. and Yorukoglu, M. (1997). 1974. *Carnegie-Rochester Conference Series on Public Policy*, 46(1):49–95.
- Guvenen, F. and Smith, A. (2010). Inferring labor income risk from economic choices: An indirect inference approach. Mimeo, University of Minnesota.
- Habyarimana, J., Mbakile, B., and Pop-Eleches, C. (2010). The impact of HIV/AIDS and ARV treatment on worker absenteeism. *Journal of Human Resources*, 45(4):809–839.

- Hall, R. E. and Jones, C. I. (1999). Why do some countries produce so much more output per worker than others? *Quarterly Journal of Economics*, pages 83–116.
- Hansen, G. D. and Prescott, E. C. (2002). Malthus to solow. *The American Economic Review*, 92(4):1205–1217.
- Heathcote, J. and Perri, F. (2013). Assessing international efficiency. Working Paper.
- Heathcote, J., Storesletten, K., and Violante, G. L. (2009). Quantitative macroeconomic with heterogeneous households. NBER Working Paper No. 14678.
- Helleringer, S. and Kohler, H. (2007). Sexual network structure and the spread of hiv in africa: evidence from likoma island, malawi. *AIDS*, 21(17):2323–32.
- Hsieh, C.-T. (2002). What explains the industrial revolution in east asia? *American Economic Review*, 92(3):502–526.
- Hsieh, C.-T. and Klenow, P. J. (2007). Relative prices and relative prosperity. *American Economic Review*, 97(3):562–585.
- Hsieh, C.-T. and Klenow, P. J. (2009). Misallocation and manufacturing tfp in china and india. *Quarterly Journal of Economics*, 124(4):1403–1448.
- Hsieh, C.-T. and Klenow, P. J. (2010). Development accounting. *American Economic Journal: Macroeconomics*, 2(1):207–223.
- Hugget, M. (1996). Wealth distribution in life-cycle economies. *Journal of Monetary Economics*, 38(3):469–494.
- Hugget, M., Ventura, G., and Yaron, A. (2011). Sources of lifetime inequality. Forthcoming in *American Economic Review*.
- Iannotti, L. L., Robles, M., Pachon, H., and Chiarella, C. (2012). Food prices and poverty negatively affect micronutrient intakes in guatemala. *The Journal of Nutrition*, 142(8):1568–1576.
- Iorio, D. and Santaaulàlia-Llopis, R. (2011). Education, hiv status and risky sexual behavior: How much does the stage to the hiv epidemic matter? Mimeo, Washington University in St. Louis.
- Jappelli, T., Padula, M., and Pistaferri, L. (2008). A direct test of the buffer-stock model of saving. *Journal of European Economic Association*, 6(6):1186–1210.
- Jappelli, T., Pischke, J.-S., and Souleles, N. S. (1998). Testing for liquidity constraints in euler equations with complementary data sources. *Review of Economics and Statistics*, pages 251–262.
- Jeong, H. and Townsend, R. (2005). Sources of tfp growth: occupational choice and financial deepening. *Economic Theory*, 32(1):179–221.
- Jones, C. (1997). On the evolution of the world income distribution. *Journal of Economic Perspectives*.
- Jones, E. (1988). *Growth Recurring: Economic Change in World History*. Oxford University Press.
- Jones, L. E., Schoonbroodt, A., and Tertilt, M. (2010). Fertility theories: Can they explain the negative fertility-income relationship? In *NBER Chapters, in: Demography and the Economy*, pages 43–100.

- Kaboski, J. and Townsend, R. (2011). A structural evaluation of a large-scale quasi-experimental microfinance initiative. *Econometrica*, 79(5):1357–1406.
- Kaplan, G. and Violante, G. L. (2010). How much consumption insurance beyond self-insurance? *American Economic Journal: Macroeconomics*, 2(4):53–87.
- Kehoe, T. J. and Levine, D. (2001). Liquidity constrained vs. debt constrained markets. *Econometrica*, 69(3):749–65.
- King, E. M. and Behrman, J. R. (2009). Timing and duration of exposure in evaluations of social programs. *World Bank Research Observer*, 24(1):55–82.
- Klein, P. and Ventura, G. (2012). Productivity differences and the dynamic effects of labor movements. Working Paper.
- Klenow, P. J. and Rodriguez-Clare, A. (1997). The neoclassical revival in growth economics: Has it gone too far? In Bernanke, B. S. and Rotemberg, J. J., editors, *NBER Macroeconomics Annual 2006*, pages 73–103.
- Kocherlakota, N. R. (1996). The equity premium: It's still a puzzle. *Journal of Economic Literature*, 34(1):42–71.
- Koh, D. and Santaaulàlia-Llopi (2013). Partial insurance and economic growth. mimeo WUSTL.
- Kongsamut, P., Rebelo, S., and Xie, D. (2001). Beyond balanced growth. *Review of Economic Studies*, 68:869–882.
- Koulovatianos, C. (2005). Preferences and the dynamic representative consumer. Vienna Economics Papers 0505, University of Vienna, Department of Economics.
- Kremer, M. (1993). Population growth and technological change: One million b.c. to 1990. *The Quarterly Journal of Economics*, 107:681–716.
- Krueger, D. and Perri, F. (2006). Does income inequality lead to consumption inequality? evidence and theory. *Review of Economic Studies*, pages 163–193.
- Krueger, D., Perri, F., Pistaferri, L., and Violante, G. L. (2010). Cross sectional facts for macroeconomists. *Review of Economic Dynamics*, 13(1). Special Issue, January 2010.
- Krusell, P., Mukoyama, T., Sahin, A., and Smith, A.-A. (2009). Revisiting the welfare effects of eliminating business cycles. *Review of Economic Dynamics*, 12(3):393–402.
- Krusell, P. and Smith, A. (1998). Income and wealth heterogeneity in the macroeconomy. *Journal of Political Economy*, 106:867–896.
- Landes, D. (1998). *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor*. W. W. Norton and Company.
- Lee, L. F., Rosenzweig, M. R., and Pitt, M. M. (1997). The effects of improved nutrition, sanitation, and water quality on child health in high-mortality populations. *Journal of Econometrics*, 77(1):209–235.
- Levinsohn, J. A., Dinkelman, T., and Majelantle, R. (2006). When knowledge is not enough: Hiv/aids information and risky behavior in botswana. NBER Working Papers 12418, National Bureau of Economic Research, Inc.

- Levinsohn, J. A., McLaren, Z., Shisana, O., and Zuma, K. (2011). Hiv status and labor market participation in south africa. NBER Working Papers 16901, National Bureau of Economic Research, Inc.
- Ligon, E. (1998). Risk sharing and information in village economics. *Review of Economic Studies*, 65(4):847–64.
- Ligon, E. (2012). Cooperation, reciprocity and altruism in developing countries: Discussion. *American Journal of Agricultural Economics*, 94(2):419–421.
- Ligon, E., Thomas, J., and Worrall, T. (2002). Informal insurance arrangements with limited commitment: Theory and evidence from village economies. *The Review of Economic Studies*, 69(1):209–244.
- Ligon, E., Thomas, J. P., and Worrall, T. (2000). Mutual insurance, individual savings and limited commitment. *Review of Economic Dynamics*, 3(3):1–47.
- Ligon, E. A. and Schechter, L. (2011). The value of social networks in rural paraguay. CUDARE Working Paper Series 1116, University of California at Berkeley, Department of Agricultural and Resource Economics and Policy.
- Lucas, R. E. (1978). On the size distribution of business firms. *The Bell Journal of Economics*, pages 508–523.
- Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22:3–42.
- Lucas, R. E. (1990). Why doesnt capital flow from rich to poor countries? *American Economic Review*, pages 92–96.
- Lucas, R.-E. (2005). The industrial revolution: Past and future. *Region, Federal Reserve Bank of Minneapolis*.
- Lundberg, S. and Pollak, R. A. (1993). Separate spheres bargaining and the marriage market. *Journal of Political Economy*, 101(6):988–1010.
- Maliar, L. and Maliar, S. (2001). Heterogeneity in capital and skills in a neoclassical stochastic growth model. *Journal of Economic Dynamics and Control*, 25(9):1367–1397.
- Maliar, L. and Maliar, S. (2003). The representative consumer in the neoclassical growth model with idiosyncratic shocks. *Review of Economic Dynamics*, 6(2):368–380.
- Manuelli, R. and Santaeulàlia-Llopis, R. (2011). A quantitative model of hiv diffusion. Mimeo, Washington University in St. Louis.
- Manuelli, R. and Seshadri, A. (2005). Human capital and the wealth of nations. Working Paper.
- Manuelli, R. and Seshadri, A. (2007). Explaining international fertility differences. Working Paper.
- Mazzocco, M., Ruiz, C., and Yamaguchi, S. (2007). Labor supply, wealth dynamics, and marriage decisions. Unpublished working paper, UCLA.
- Mazzocco, M. and Shiv, S. (2012). Testing efficient risk sharing with heterogeneous risk preferences. *The American Economic Review*, 102(1):428–468.

- Meghir, C. and Pistaferri, L. (2010). Earnings, consumption and lifecycle choices. NBER Working Paper No. 15914.
- Mobarak, A. M. and Rosenzweig, M. (2012). Selling formal insurance to the informally insured. Working Paper.
- Mokyr, J. (1992). *The Lever of Riches: Technological Creativity and Economic Progress*. Oxford University Press.
- Morten, M. (2013). Temporary migration and endogenous risk sharing in village india. Mimeo, Stanford.
- Murphy, K., Shleifer, A., and Vishny, R. (1989). Industrialization and the big push. *Journal of Political Economy*, 97:1003–1026.
- Parente, S. L. and Prescott, E. C. (2005). A unified theory of the evolution of international income levels. In Aghion, P. and Durlauf, S., editors, *Handbook of Economic Growth*, volume 1, chapter 21, pages 1371–1416. Elsevier.
- Parente, S. L., Rogerson, R., and Wright, R. (2000). Homework in development economics: Household production and the wealth of nations. *Journal of Political Economy*, 108(4):pp. 680–687.
- Pitt, M. M., Rosenzweig, M. R., and Hassan, M. N. (1990). Productivity, health, and inequality in the intrahousehold distribution of food in low-income countries. *American Economic Review*, 80(3):1139–1156.
- Pitt, M. M., Rosenzweig, M. R., and Hassan, M. N. (2012). Human capital investment and the gender division of labor in a brawn-based economy. *American Economic Review*, 102(7):3531–60.
- Polanyi, K. (2001). *The Great Transformation*. Beacon Press.
- Prescott, E. C. and Townsend, R. M. (1984). Pareto optima and competitive equilibrium with adverse selection and moral hazard. *Econometrica*, 52:21–45.
- Prichett, L. (1997). Divergence big time. *Journal of Economic Perspective*, 11(3):3–17.
- Quah, D. (1993). Empirical cross-section dynamics in economic growth. *European Economic Review*, pages 426–434.
- Ray, D. (2006). Aspirations, poverty and economic change. In Banerjee, A., Benabou, R., and Mookherjee, D., editors, *What Have We Learnt About Poverty*. Oxford University.
- Restuccia, D. and Rogerson, R. (2008). Policy distortions and aggregate productivity with heterogeneous plants. *Review of Economic Dynamics*, 11(4):707–720.
- Restuccia, D. and Santaeulàlia-Llopis (2013). Land missallocation and productivity. mimeo WUSTL.
- Ríos-Rull, J.-V. (1995). Models with heterogenous agents. In Cooley, T. F., editor, *Frontiers of Business Cycle Research*, chapter 4. Princeton University Press, Princeton.
- Ríos-Rull, J.-V. (1996). Life cycle economies and aggregate fluctuations. *Review of Economic Studies*, 63:465–490.

- Rosenzweig, M. R. and Binswanger, H. P. (1993). Wealth, weather risk and the composition and profitability of agricultural investments. *Economic Journal*, 103(416):56–78.
- Rosenzweig, M. R. and Stark, O. (1989). Consumption smoothing, migration, and marriage: Evidence from rural india. *Journal of Political Economy*, 97(4):905–26.
- Rosenzweig, M. R. and Wolpin, K. I. (1993). Credit market constraints, consumption smoothing, and the accumulation of durable production assets in low-income countries: Investment in bullocks in india. *Journal of Political Economy*, 101(2):223–44.
- Rosenzweig, M. R. and Wolpin, K. I. (2000). Natural 'natural experiments' in economics. *Journal of Economic Literature*, 38(4):827–874.
- Sahlins, M. (1972). *Stone Age Economics*. Aldine Transaction.
- Santaaulàlia-Llopis, R. (2011). Aggregate effects of aids on development. Mimeo Washington University in St. Louis.
- Santaaulàlia-Llopis, R. and Zheng, Y. (2013). Partial insurance in china 1989-2009: The effects of deng xiaoping's reforms on consumption inequality. mimeo WUSTL.
- Schulhofer-Wohl, S. (2011). Heterogeneity and tests of risk sharing. *Journal of Political Economy*, 119(5):925.
- Storesletten, K., Telmer, C., and Yaron, A. (2004). Cyclical dynamics in idiosyncratic labor market risk. *Journal of Political Economy*, 112(3):695–717.
- Strauss, J. and Thomas, D. (2007). Health over the life course. In Schultz, T. P. and Strauss, J., editors, *Handbook of Development Economics*, volume 4, chapter 54, pages 3375–3474. Amsterdam, North-Holland.
- Suri, T. (2011). Selection and comparative advantage in technology adoption. *Econometrica*, 79(1):159–209.
- Tertilt, M. (2005). Polygyny, fertility, and savings. *Journal of Political Economy*, 113(6):1341–1371.
- Thornton, R. L. (2008). The demand for, and impact of, learning hiv status. *American Economic Review*, 98(5):1829–63.
- Todd, P. E. and Wolpin, K. I. (2006). Assessing the impact of a school subsidy program in mexico: Using a social experiment to validate a dynamic behavioral model of child schooling and fertility. *American Economic Review*, 96(5):1384–1417.
- Townsend, R. and Ueda, K. (2006). Financial deepening, inequality and growth: A model-based quantitative evaluation. *Review of Economic Studies*, 73(1):251–293.
- Townsend, R. M. (1994). Risk and insurance in village india. *Econometrica*, 62(3):539–91.
- Udry, C. (1994). Risk and insurance in a rural credit market: An empirical investigation in northern nigeria. *Review of Economic Studies*, 61(3):495–526.
- Udry, C. (1996). Gender, agricultural production, and the theory of the household. *Journal of Political Economy*, 104(5):1010–46.



- Udry, C. and Anagol, S. (2006). The return to capital in ghana. *American Economic Review*, 96(2):388–393.
- Udry, C. and Conley, T. G. (2004). Social networks in ghana. Working Papers 888, Economic Growth Center, Yale University.
- Young, A. (1995). The tyranny of numbers: Confronting the statistical realities of the east asian growth experience. *Quarterly Journal of Economics*, 110(3):641–680.
- Young, A. (2005). The gift of the dying: The tragedy of aids and the welfare of future african generations. *The Quarterly Journal of Economics*, 120(2):423–466.
- Zeldes, S. (1989). Consumption and liquidity constraints: An empirical investigation. *Journal of Political Economy*, pages 305–346.