

Differences in Technologies Across Time and Space

June 16-18, 2010 Barcelona
CREI, UPF - Ciutadella Campus



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CREI Lectures in Macroeconomics 2010



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The Centre de Recerca en Economia Internacional (CREI) is a research centre sponsored by the Universitat Pompeu Fabra (UPF) and the Generalitat de Catalunya. It is located at the main campus of the UPF in Barcelona.

In 2008, CREI launched a new series of bi-annual lectures in macroeconomics, with support from Princeton University Press. The aim was to bring young but already senior speakers to Barcelona who had significantly contributed to the study of macroeconomics or international economics, and to provide them with an opportunity to present a high-level summary of recent work that has already had a large impact on the profession. The inaugural lectures were delivered by Professor Robert Shimer (University of Chicago). They were published as Labor Markets and Business Cycles (Princeton University Press, 2010).

Francesco Caselli

Francesco Caselli is a professor at the London School of Economics and acts as the director of the Macroeconomics Programme at the LSE Centre for Economic Performance (CEP). He is currently Banco de España Visiting Professor at CREI. He graduated with a BA from the University of Bologna in 1991, and holds a PhD in Economics from Harvard. Prior to joining the LSE faculty, Caselli taught at Harvard and at the University of Chicago. He is associated with the NBER, CEPR and the Bureau for Research and Economic Analysis of Development. Caselli is a co-editor of the *Journal of Economic Development*.

Some of his recent publications include:

- "Leader Behavior and the Natural-Resource Curse", 2009, with Tom Cunningham. *Oxford Economic Papers*, 61: 628-50.
- "Economics and Politics of Alternative Institutional Reforms", 2008, with Nicola Gennaioli. *Quarterly Journal of Economics*, 3: 1197-1250.
- "The Marginal Product of Capital", 2007, with James Feyrer. *Quarterly Journal of Economics*, 2: 535-68.
- "The World Technology Frontier", 2006, with John Coleman. *American Economic Review*, vol.96 (3): 499-522.

Schedule

June 16 th , 13:00-15:00	Lecture 1
June 17 th , 13:00-15:00	Lecture 2
June 18 th , 13:00-15:00	Lecture 3

Lectures will be held at CREI (Mercè Rodoreda building, room 23.S05), c/Wellington-Ramon Turró. Ciutadella Campus, UPF. Due to limit seating availability, please register with mnovoa@crei.cat

Differences in Technologies Across Time and Space

The lectures will discuss, update, and extend previous work asking to what extent differences in observables factor endowments can account for differences in per worker income among developed and developing countries. This body of work also uncovers and characterizes systematic differences across countries in the shape of the aggregate production function. The same techniques can be applied to characterizing changes in the aggregate production function over time.

Lecture 1 will lay out a production-function approach to the quantitative study of income differences over space and time. Central to this approach is the estimation of stocks of factor inputs. The lectures will focus on (quality-adjusted) labor, reproducible capital, and non-reproducible (natural) capital. Most of Lecture 1 will be devoted to the construction of such estimates, as well as a preliminary discussion of how these input stocks vary with the level of development. Significant space will be devoted to highlighting the limitations of these input-stock estimates relative to ideal measures better grounded in production theory (with a hope to stimulating further research on the topic).

Lecture 2 will deploy the input-stock measures developed in Lecture 1 to evaluate the extent to which such stocks are able to account for income

differences. The answer will be seen to be extremely sensitive to assumptions made on the degree of substitutability among various types of labor inputs as well as, and indeed especially, between labor inputs and capital. Unfortunately, the latter is still largely unknown so conclusions from this exercise are tentative at best. Nevertheless, one clear message is that the data is not consistent with the view that production functions are identical across countries: in particular, more developed countries appear to use production functions that are relatively biased towards labor, and highly-educated labor in particular. The lecture concludes with the presentation of a simple model of technology choice that rationalizes these findings.

Lecture 3 will extend the cross-country results to the time dimension. The main interest of this analysis will be to track changes in the shape of the production function over time in selected countries for which such exercise is possible. There will be a particular focus on the US, for which the techniques developed in the previous lecture can be extended to account for patterns of skill bias as well as age bias in technical change. This sheds light on remarkable changes in inequality occurring over the last few decades.