The Growth of Human Capital and the Role of Intellectual Property Rights in Emerging Economies

Daniel Lederman
Deputy Chief Economist
Latin America & the Caribbean
The World Bank Group

Washington, DC
December 11th, 2015

Chief Economist Office
Latin America and the Caribbean Region
The World Bank

World Bank
Latin America and the Caribbean Region

Outline for Today

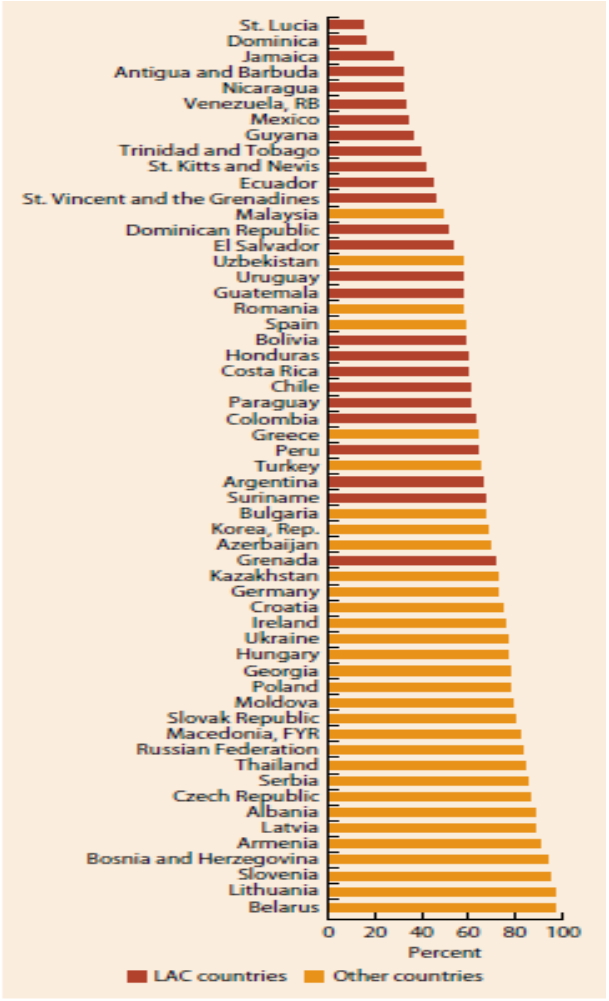
- The “conventional wisdom” on the relationship between intellectual property rights and development: pessimism
- Innovation around the world: international benchmarking on product innovation and patents
- Data on the growth of human capital in emerging economies: just data
- Intellectual property rights as a human-capital allocation device: preliminary evidence

The conventional wisdom on Intellectual property rights and economic development: Some literature

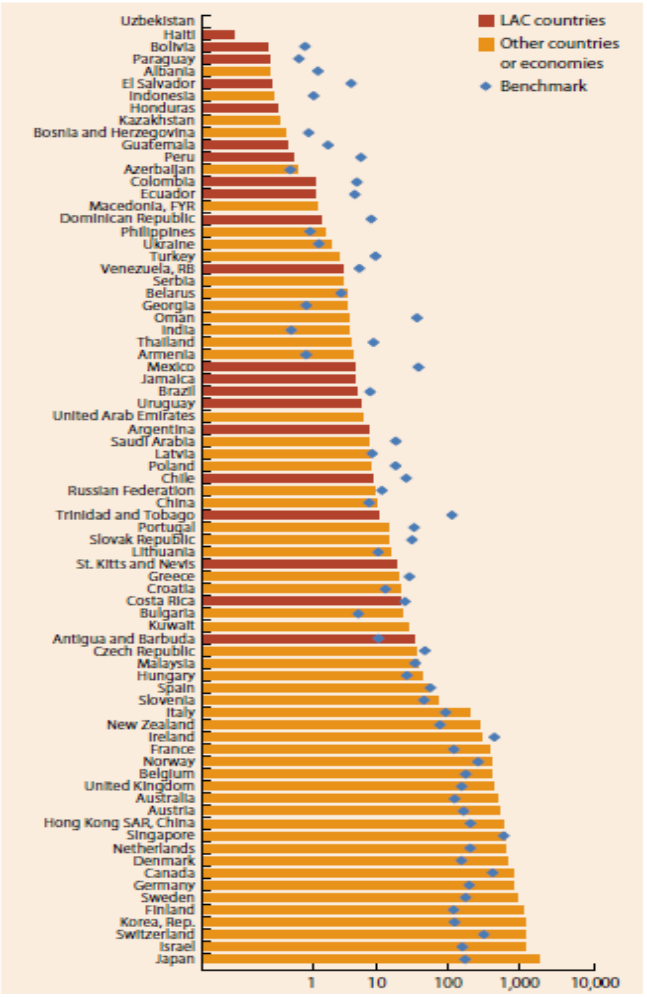
- Grossman, G. and E. Helpman. 1991. *Innovation and Growth in the Global Economy.* Cambridge, MA: MIT Press.
- Grossman, G. and E. Lai. 2005. "International Protection of Intellectual Property." *American Economic Review* 94: 1635-53.
- Helpman, E. 1993. "Innovation, Imitation, and Intellectual Property Rights." *Econometrica* 61(6): 1247-80.
- Maskus, K.E. 2000. *Intellectual Property Rights in the Global Economy.* Washington, DC: Institute for International Economics.
- Yang, L. and K.E. Maskus. 2009. "Intellectual Property Rights, Technology Transfer and Exports in Developing Countries." *Journal of Development Economics* 90: 231-36

Product innovation and patent production around the World: International benchmarking

Percentage of firms introducing a new product



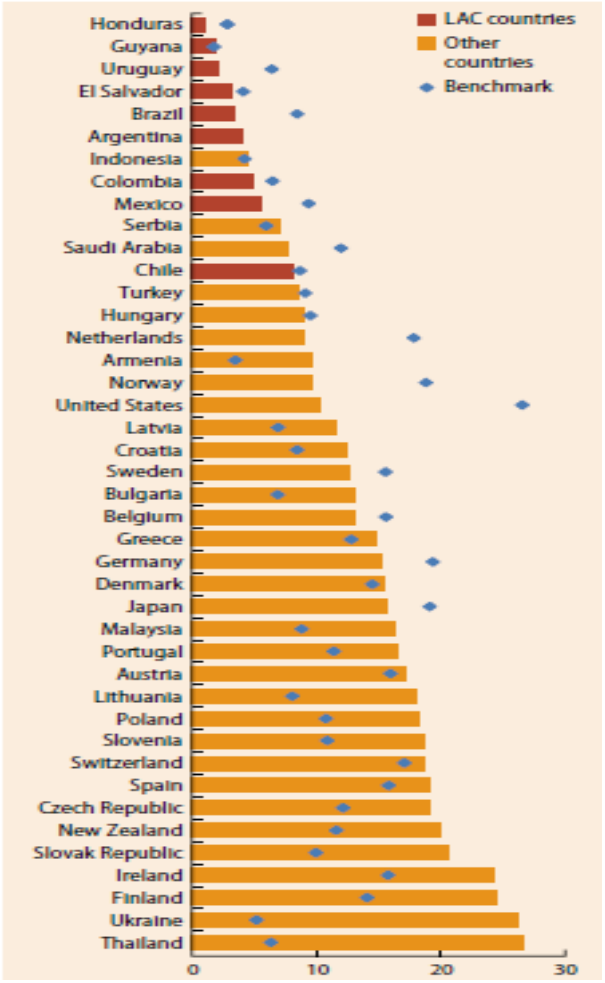
Number of patents per 1 million people



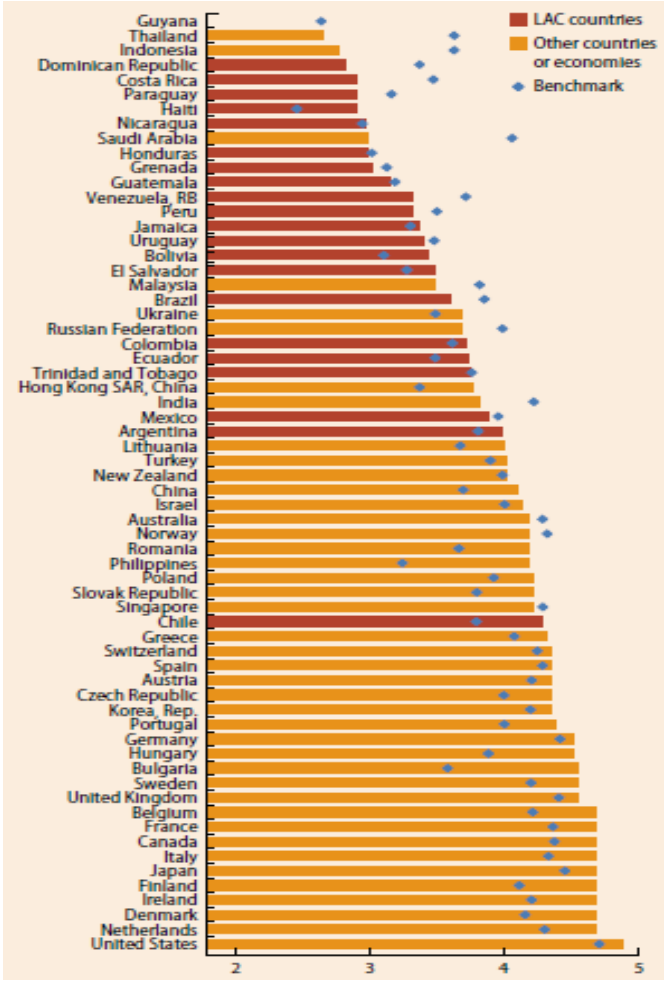
Source: World Bank, based on data from World Development Indicators, Seker 2013 and 2006 – 10 enterprise surveys, and USPTO 2012

Human-capital deficits and IPRs around the World

Engineering Grads per thousand people, ages 15-24

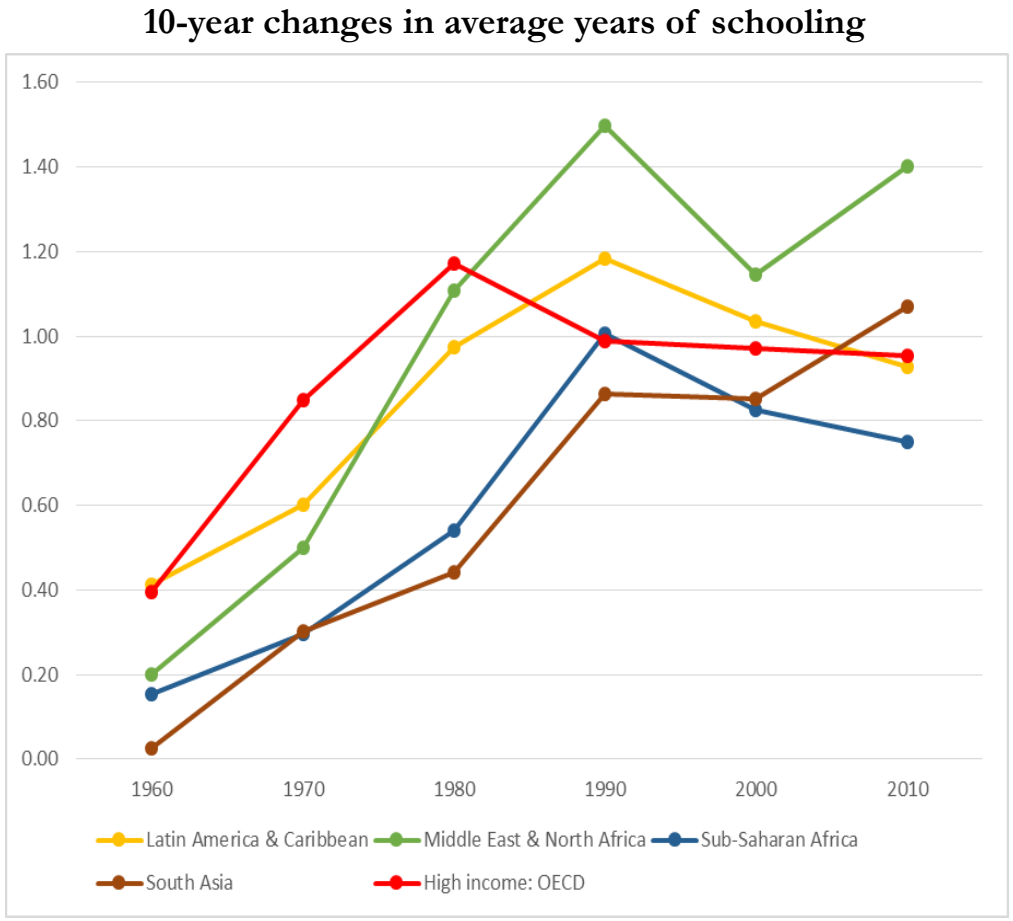


Index of IPR, 2005



Source: World Bank, based on data from World Development Indicators, UNESCO 2013, and Park 2008

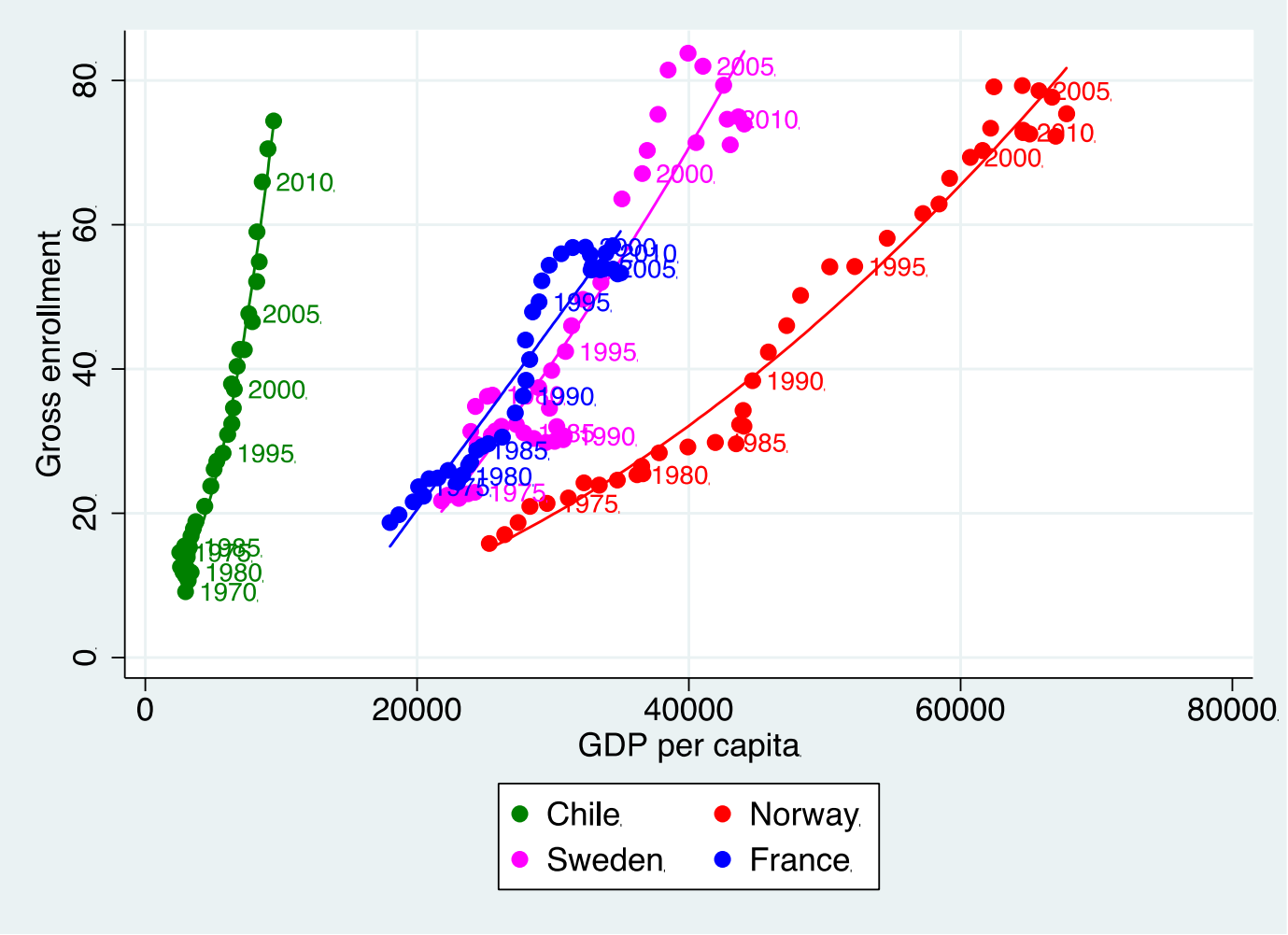
Education push in the developing world: The rising years of schooling in emerging economies



- Steady increases in average years of education across the developing world since the 1950s
- Regions such as Latin America & Caribbean & Middle East & North Africa have outpaced high-income OECD countries in *improvements* in educational attainment over the past 20 years

Source: Barro-Lee Educational Attainment Dataset

An example: Chile's fast track



Source: Espinoza y Urzua, 2014.

IPRs as a human-capital allocation device: Some evidence on the Determinants of R&D.

	No FE	FE	RE	FE&TE	RE&TE
Average Years of Schooling (H)	-0.147	-0.143	-0.151	-0.195	-0.152
	[0.060]*	[0.144]	[0.039]**	[0.105]	[0.045]**
Intellectual Property Rights (IPR) Index	0.095	0.064	0.153	0.079	0.156
	[0.671]	[0.856]	[0.514]	[0.825]	[0.512]
Schooling Squared	-0.003	0.010	0.008	0.013	0.008
	[0.663]	[0.154]	[0.162]	[0.102]	[0.184]
IPR Squared	-0.111	-0.085	-0.101	-0.073	-0.090
	[0.056]*	[0.175]	[0.051]*	[0.258]	[0.088]*
Schooling*IPR	0.127	0.074	0.086	0.064	0.080
	[0.000]***	[0.020]**	[0.002]***	[0.053]*	[0.005]***

Specification Test	No FE	FE	RE	FE&TE	RE&TE
Linearity Test: P-Value	0.000	0.007	0.000	0.007	0.000
Separability Test: P-Value	0.000	0.261	0.016	0.315	0.014
FE=RE: P-Value		0.348		0.991	

- Interactions between human capital and IPRs determine global patterns of R&D activities
- Share of R&D in GDP is a non-linear function of IPRs and human capital
- The existence of strong IPRs provides incentives for the allocation of human capital into R&D

Source: Bravo-Ortega, C. and D. Lederman. 2010. "Intellectual Property Rights, Human Capital and the Incidence of R&D Expenditures." World Bank Policy Research Working Paper No. 5217, Washington, DC

Summary: New World in Search of New Wisdom

- "Conventional wisdom" suggests that stronger IPRs harm developing countries, which lack the human capital to innovate and to absorb the positive effects from technology spillovers.
- But the big push in educational attainment in recent decades has largely increased the endowment of human capital in the developing world.
- IPRs can thus increase the welfare of developing countries by allocating human capital to R&D activities, thereby increasing innovation.