



UNIVERSIDAD NACIONAL MAYOR DE

SAN MARCOS

Universidad del Perú, DECANA DE AMÉRICA
FACULTAD DE CIENCIAS ECONÓMICAS

143^o
Aniversario

SEMINARIO INTERNACIONAL ACERCA DE LA GLOBALIZACIÓN ECONÓMICA

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Doctor en Ciencias Económicas y Empresariales por la Universidad de Cantabria. Licenciado en Ciencias Políticas y Sociología por la universidad complutense en Madrid. Miembro del Departamento de Economía de la Universidad de Cantabria, donde se ha desempeñado como Director y Subdirector del Departamento de Economía. Tiene diversas publicaciones internacionales (artículos y libros) relacionados con el tema.

Profesores Panelistas

Mg. Carlos Aquino Rodríguez
Mg. Richard Roca Garay

ORGANIZA: VICEDECANATO DE INVESTIGACION Y POSGRADO

Día: Jueves 10: Globalización y competitividad

Día Viernes 11: Integración del progreso técnico

Mayo 2018

Hora: 11.00 a. m.

Lugar: Salón de Grados FCE – 1er. piso

Ingreso
libre

Se entregará Constancia de participación

GLOBALIZACIÓN, CRECIMIENTO Y COMPETITIVIDAD

Patricio Pérez

Universidad de Cantabria

Lima, 10 de mayo de 2018

1. <http://www.gifex.com/images/0X0/2009-12-08-11364/Mapa-de-las-Comunidades-Autnomas-de-Espaa.png>

UNMSM vs UC

| | | UNMSM | UC |
|-----------|-------------|---------------|--------------|
| Fundación | Universidad | 1551 | 1972 |
| | Facultad CE | 1875 | 1987 |
| | | | |
| Alumnos | Pregrado | 32.621 | 9.389 |
| | Posgrado | <u>11.418</u> | <u>4.064</u> |
| | Total | 44.039 | 13.453 |
| | | | |
| Docentes | | 2.943 | 1.273 |

RÁNKING POR INVESTIGACIÓN

Los resultados se ordenan por número de indicadores de mayor rendimiento relativo.
El orden resultante no se corresponde necesariamente con una ordenación de mayor a menor calidad.

■ Mayor rendimiento relativo
 ■ Rendimiento intermedio
 ■ Menor rendimiento relativo
 ■ No aplica / Sin datos

| Rango | Universidad | Mayor rendimiento relativo | Rendimiento intermedio | Menor rendimiento relativo | No aplica / Sin datos |
|-------|--------------------------|----------------------------|------------------------|----------------------------|-----------------------|
| 1 | Navarra | 7 | 1 | 0 | 0 |
| 2 | Cantabria | 7 | 0 | 1 | 0 |
| 3 | Pompeu Fabra | 7 | 0 | 0 | 1 |
| 4 | Girona | 6 | 2 | 0 | 0 |
| 5 | Jaume I de Castelló | 6 | 2 | 0 | 0 |
| 6 | Rovira i Virgili | 6 | 2 | 0 | 0 |
| 7 | Carlos III de Madrid | 6 | 1 | 1 | 0 |
| 8 | Córdoba | 6 | 1 | 1 | 0 |
| 9 | Politécnica de Catalunya | 6 | 1 | 1 | 0 |
| 10 | Lleida | 5 | 3 | 0 | 0 |
| 11 | Santiago de Compostela | 5 | 3 | 0 | 0 |
| 12 | Vigo | 5 | 3 | 0 | 0 |
| 13 | Autònoma de Barcelona | 5 | 2 | 1 | 0 |
| 14 | Politécnica de València | 5 | 2 | 1 | 0 |
| 15 | Autónoma de Madrid | 5 | 1 | 2 | 0 |
| 16 | Barcelona | 5 | 1 | 2 | 0 |
| 17 | Deusto | 5 | 1 | 2 | 0 |
| 18 | Pontificia Comillas | 5 | 3 | 0 | 0 |
| 19 | Alcalá | 4 | 4 | 0 | 0 |
| 20 | Ramon Llull | 4 | 4 | 0 | 0 |

Contents

1. OLD AND NEW FACTS OF ECONOMIC GROWTH.
2. ON THE COMPETITIVENESS IN LATIN AMERICA AND THE CARIBBEAN, AND EUROPE.

I. OLD AND NEW FACTS OF ECONOMIC GROWTH

SIX “STYLIZD FACTS”:

KALDOR (1961)



JONES AND ROMER (2010)

Kaldor, N. (1961): "Capital Accumulation and Economic Growth." In *The Theory of Capital*, ed. F. A. Lutz and D. C. Hague, pp.177-222. New York: St. Martins Press.



Jones, C. I. and Romer, P.M. (2010): "The New Kaldor Facts: Ideas, Institutions, Population, and Human Capital", *American Economic Journal: Macroeconomics*, Vol. 2, No. 1, pp.224-245

Kaldor's stylized facts



1. Labor productivity has grown at a sustained rate.
2. Capital per worker has also grown at a sustained rate.
3. The real interest rate, or return on capital, has been stable.
4. The ratio of capital to output has also been stable.
5. Capital and labor have captured stable shares of national income.
6. Among the fast growing countries of the world, there is an appreciable variation in the rate of growth of the order of 2-5% percent.



1. Increases in the extent of the market (goods, ideas, finance,..).
2. Accelerating growth in both population and per capita GDP.
3. Variation in growth rates of per capita GDP increases with the distance from the technology frontier.
4. Large income and TFP differences:
 - Differences in measured inputs explain less than half of cross country differences in per capita GDP.
5. Increases in human capital per worker, rising dramatically throughout the world.
6. Long-run stability of relative wages.



- **How much progress we have made?**
 - Modern growth theory (Romer, 1986; Lucas, 1988) has added a stock of ideas and a stock of human capital to the familiar inputs of physical capital and workers (Solow, 1956; Swan, 1956).
 - Ideas, institutions, population, and human capital are now at the center of growth theory:
 - Human capital produces ideas, and ideas are used to produce human capital.
 - Production of ideas in turn, is proportional to population growth.
 - Because they are no-rival goods, ideas introduce scale effects. They also change the feasible and optimal economic institutions.

Jones and Romer new stylized facts



$$Y_t = A_t^\sigma K_t^\alpha L_{Yt}^{1-\alpha}$$

$$\dot{A}_t = \vartheta L_{At} A_t^\phi$$

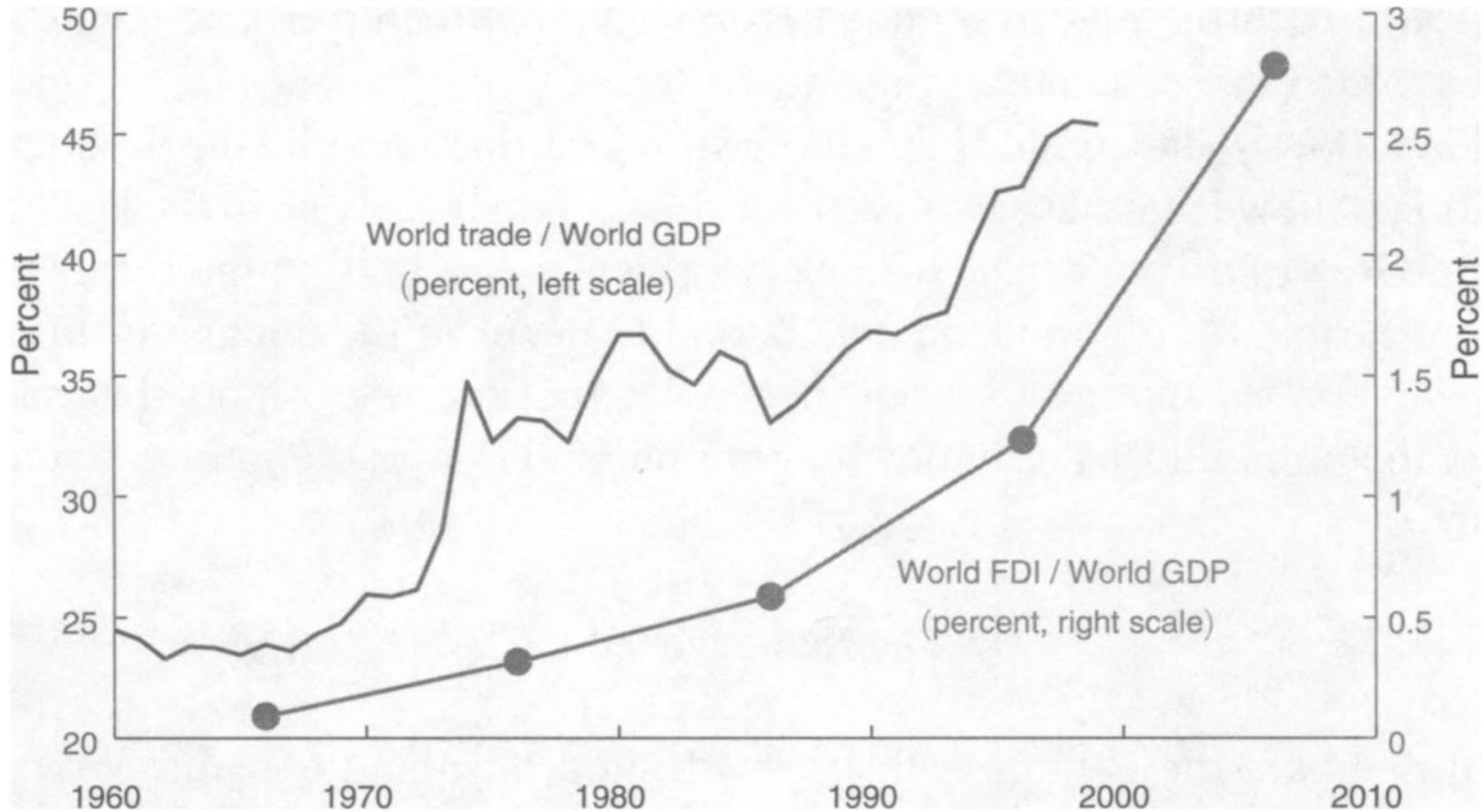
Jones, C.I. (2004): “Growth and Ideas”, in Aghion, P. and Romer, P. (ed.): *Handbook of Economic Growth*, Elsevier



Fact 1: Increases in the extent of the market

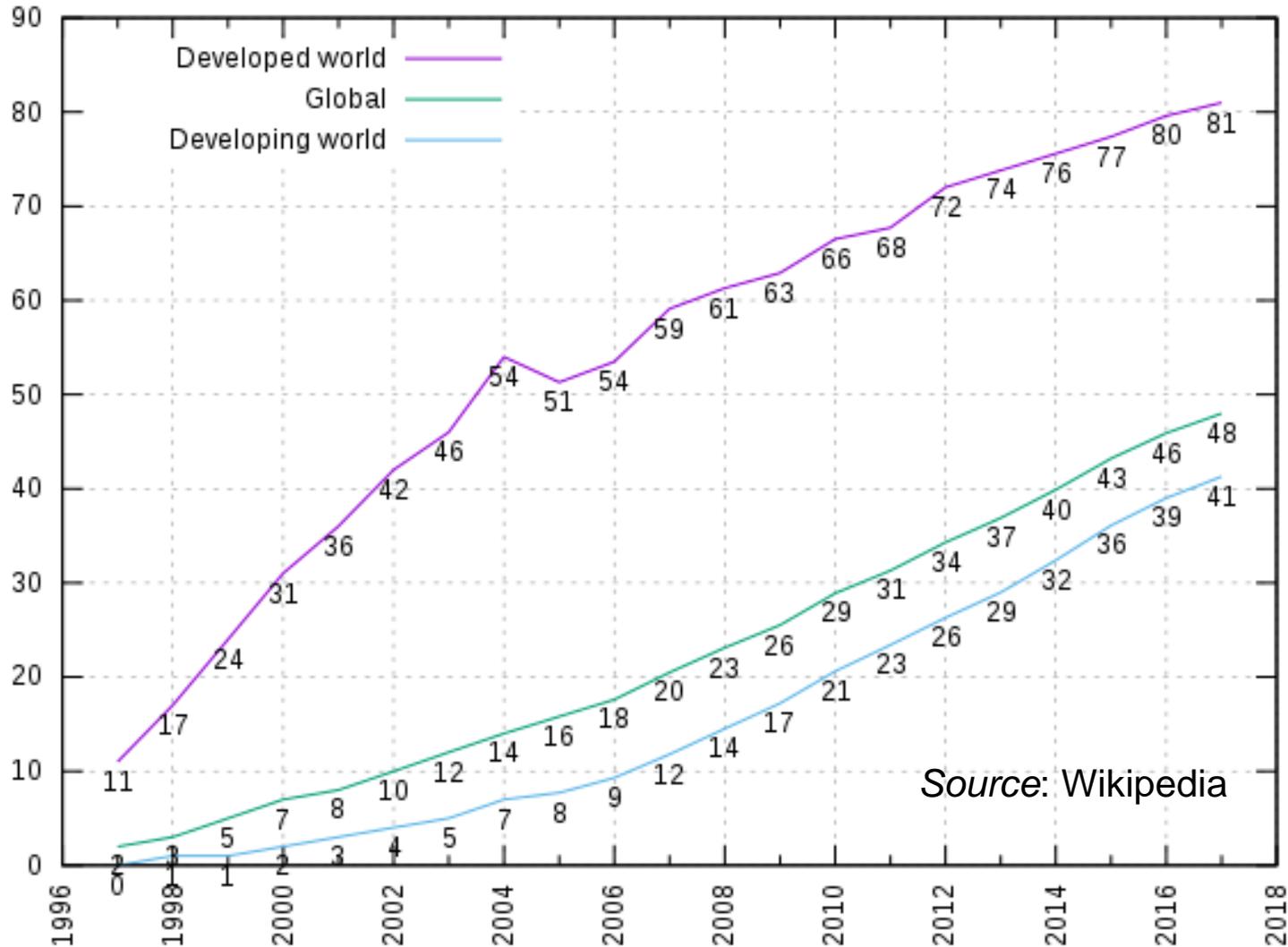
- Goods, ideas, finance, and people –via globalization, as well as urbanization– have increased the extent of the market.
 - World trade as a share of GDP has nearly doubled since 1960.
 - Foreign direct investment (FDI) as a share of world GDP has increased by a factor of 30, from less than one-tenth of a percent of GDP in 1965 to 2.8 percent of GDP in 2006.
 - With the rise of the WWW, information flows across and within countries have exploded.

Fact 1: Increases in the extent of the market



Fact 1: Increases in the extent of the market

Internet Users Per 100 Inhabitants



Source: Wikipedia

Fact 1: Increases in the extent of the market

- “The Internet, the World Wide Web, and a variety of networks increasingly based on wireless platforms constitute the technological infrastructure of the network society, as the electrical grid and the electrical engine were the support system for the form of social organization that we conceptualized as the industrial society.”

Castells, M. (2012), *The Impact of the Internet on Society: A Global Perspective*.

Fact 2: Accelerating growth in both population and per capita GDP



- Plotted on a linear scale, the "hockey stick" pattern would be highlighted:
 - Both population and per capita GDP appear essentially flat for nearly 2000 years, and then rise very sharply in the last two centuries (Malthus' prediction).
- Plotting these two series on a logarithmic scale emphasizes the point that the rates of growth –the slopes of the two series– have, themselves, been rising over time.
- The fraction of the world's population living in cities increased from 29.1% in 1950 to 49.4 % in 2007, and 51.9% in 2016.



Fact 2: Accelerating growth in both population and per capita GDP

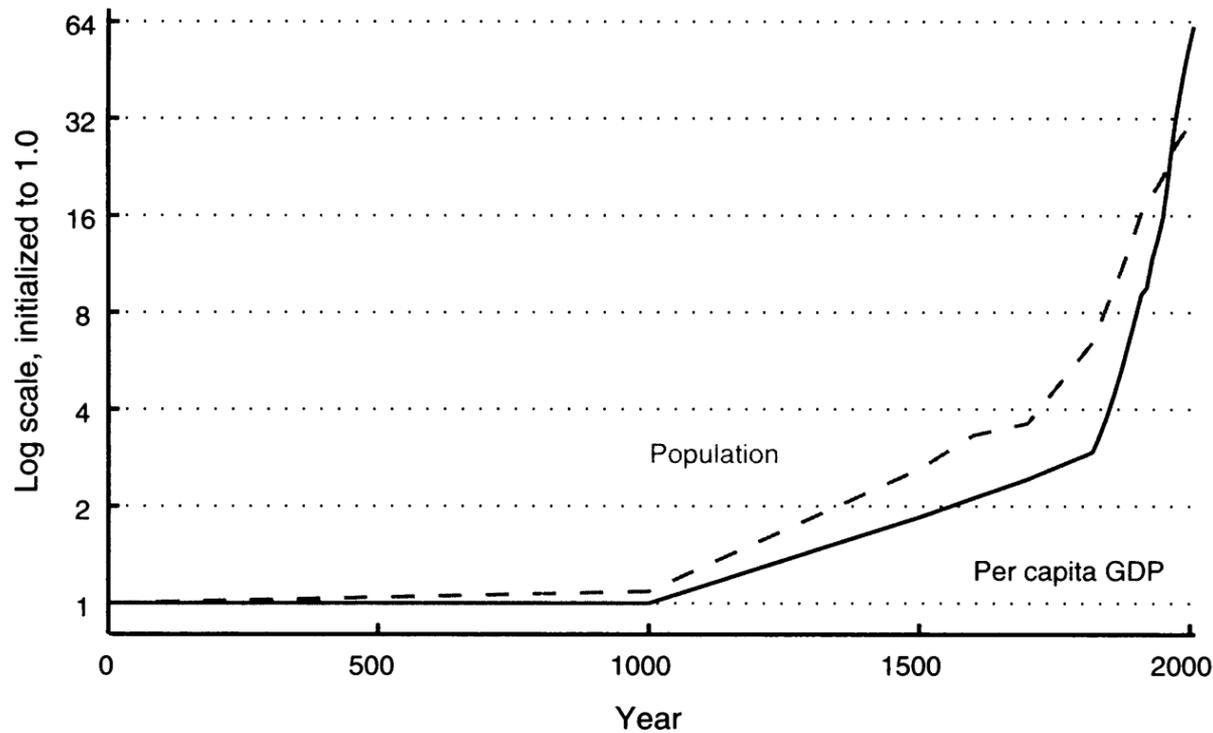


FIGURE 2. POPULATION AND PER CAPITA GDP OVER THE VERY LONG RUN

Notes: Population and GDP per capita for “the West,” defined as the sum of the United States and 12 western European countries. Both series are normalized to take the value 1.0 in the initial year, 1 AD.

Source: Maddison (2008).

Fact 2: Accelerating growth in both population and per capita GDP



| UN | World | Population | Growth rate |
|------|-----------|------------|-------------|
| Year | Data | Billions | Percent |
| 2005 | Actual | 6.5 | .. |
| 2015 | Actual | 7.3 | 1.16 |
| 2050 | Projected | 9.5 | 0.75 |

PEOPLE LIVING IN CITIES:

Source: UN

- Peru: 44% (1955) \Rightarrow 79% (2016)
- Megacities (>10 millions) (> 30 mill. Tokio, Mexico,..)

| Year | Num | Millions | Average |
|------|-----|----------|---------|
| 1990 | 10 | 153 | 15.3 |
| 2014 | 28 | 453 | 16.2 |

Lima = 27^a



Fact 3: Variation in modern growth rates

- The variation in the rate of growth of per capita GDP increases with the distance from the technology frontier.
- Figure 3 illustrates this fact by showing the "triangle" plot of the 1960 and 2000 against initial per capita GDP:
 - The variation of growth rates is much more smaller for the richest countries than for the poorest.
 - For many countries, it required breaking out of vicious circles to enter virtuous circles (Korea Rep., Ireland, China)
 - At of the frontier, the US –one of the richest countries in the world– exhibits steady state growth at a rate of about 2% per year.



Fact 3: Variation in modern growth rates

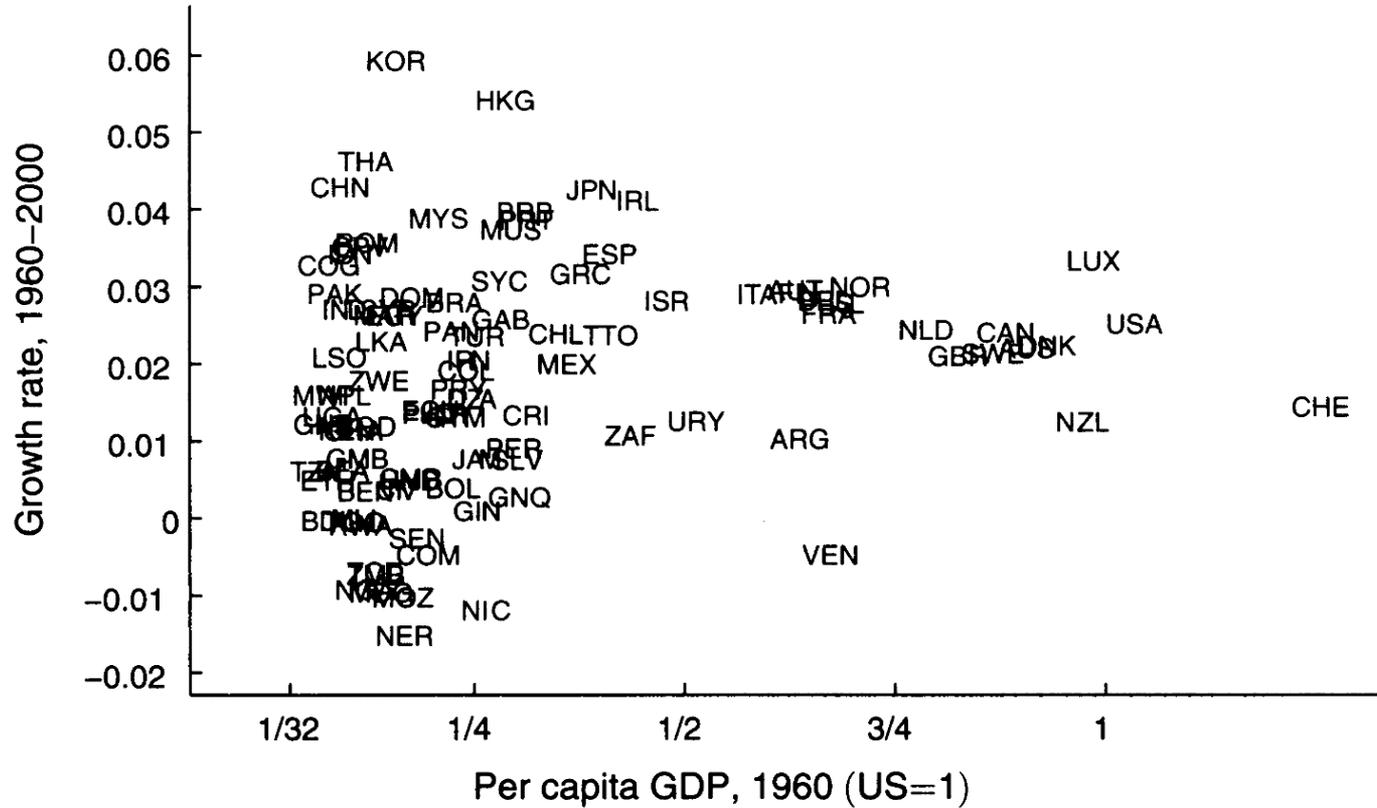


FIGURE 3. GROWTH VARIATION AND DISTANCE FROM THE FRONTIER

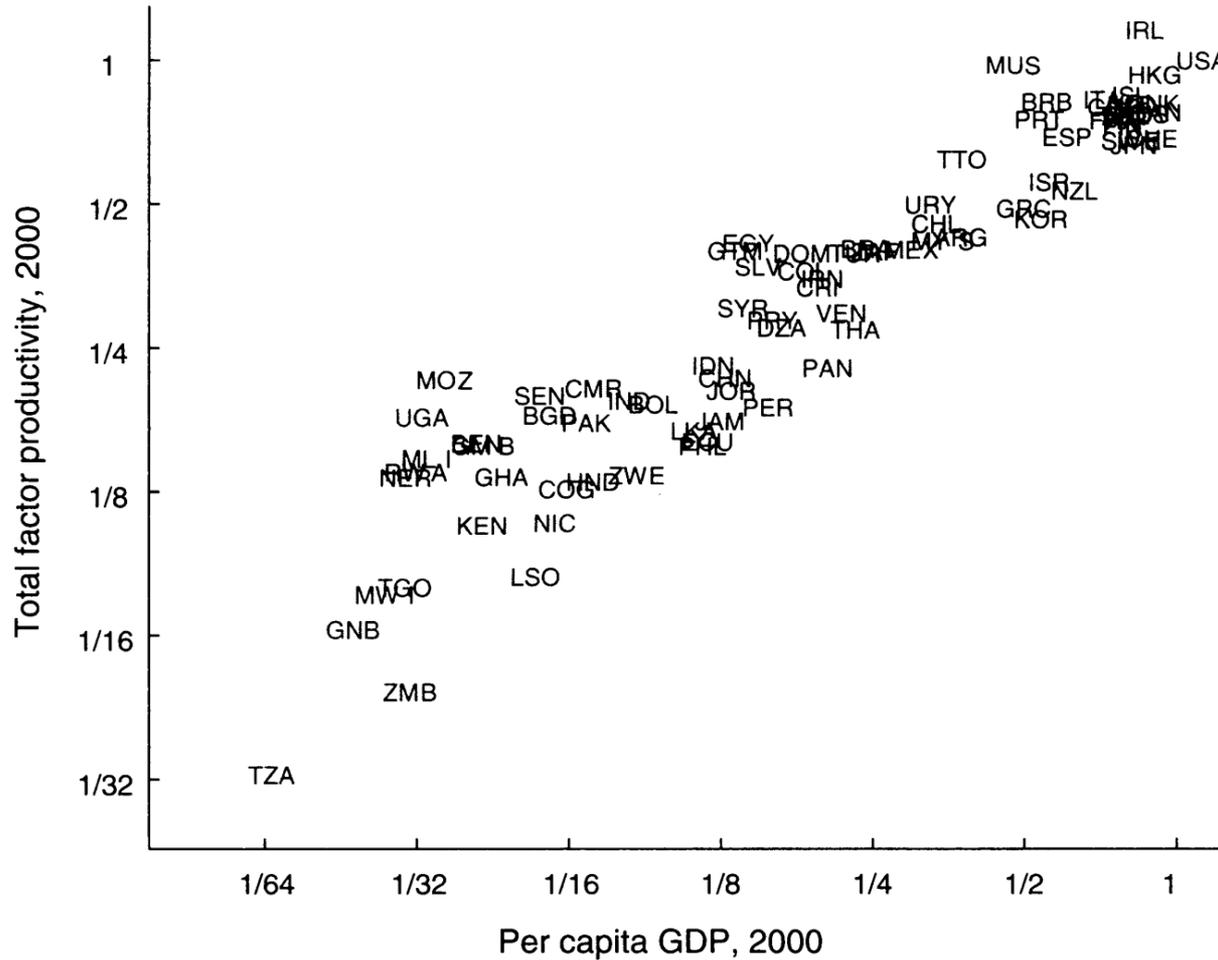
Source: Penn World Tables 6.1.



Fact 4: Large income and TFP differences

- Differences in measured inputs explain less than half of the cross country differences in per capita GDP.
- Differences in income and TFP across countries are highly correlated (bisector line):
 - Poor countries are poor not only because they have less physical and human capital per worker than rich countries, but also because they use their inputs much less efficiently.

Fact 4: Large income and TFP differences



Fact 4: Large income and TFP differences

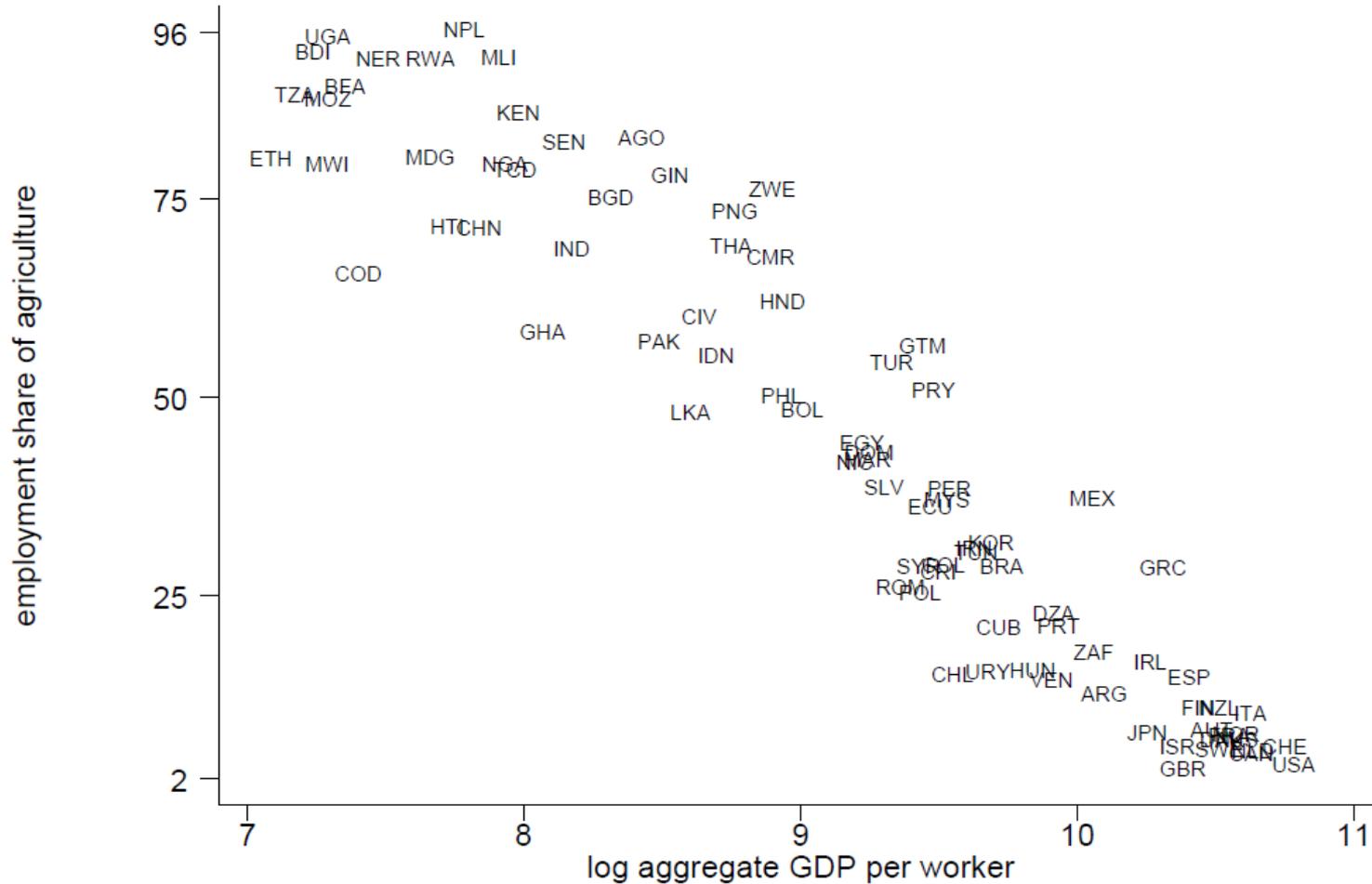
- Facts 3 and 4 are closely related:
 - There are enormous income differences across countries, but these gaps can occasionally be closed with remarkable speed (Japan, South Korea, China).
 - Differences in institutions must be the fundamental source of the wide differences in growth rates observed for countries at low levels of income, and for the low income and TFP levels themselves.

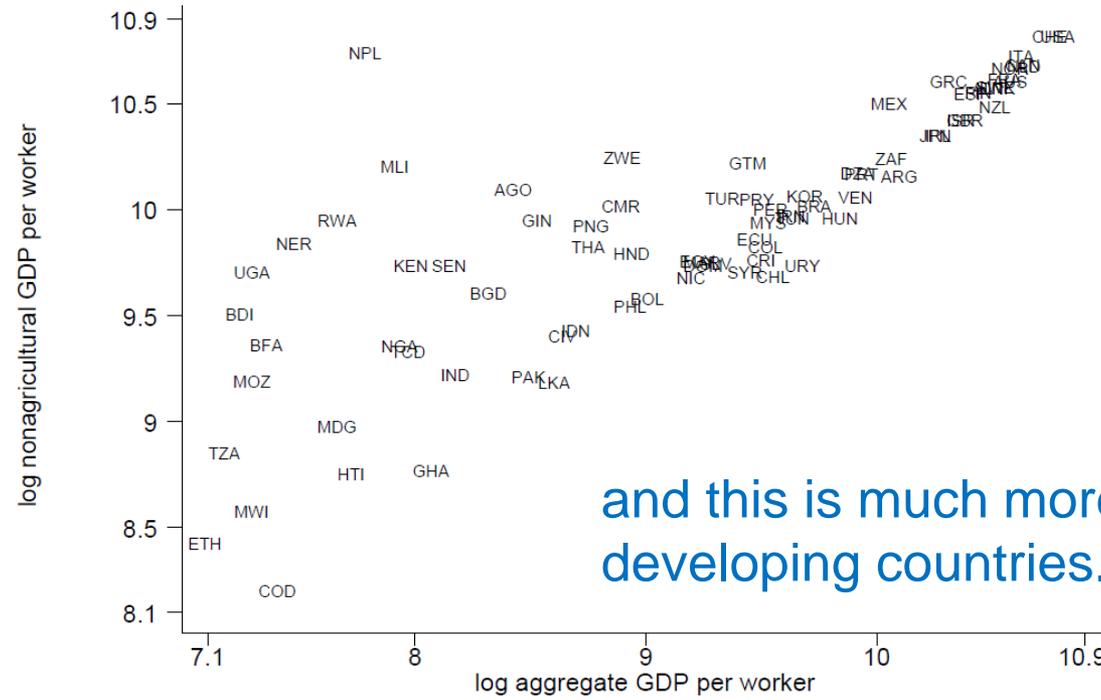
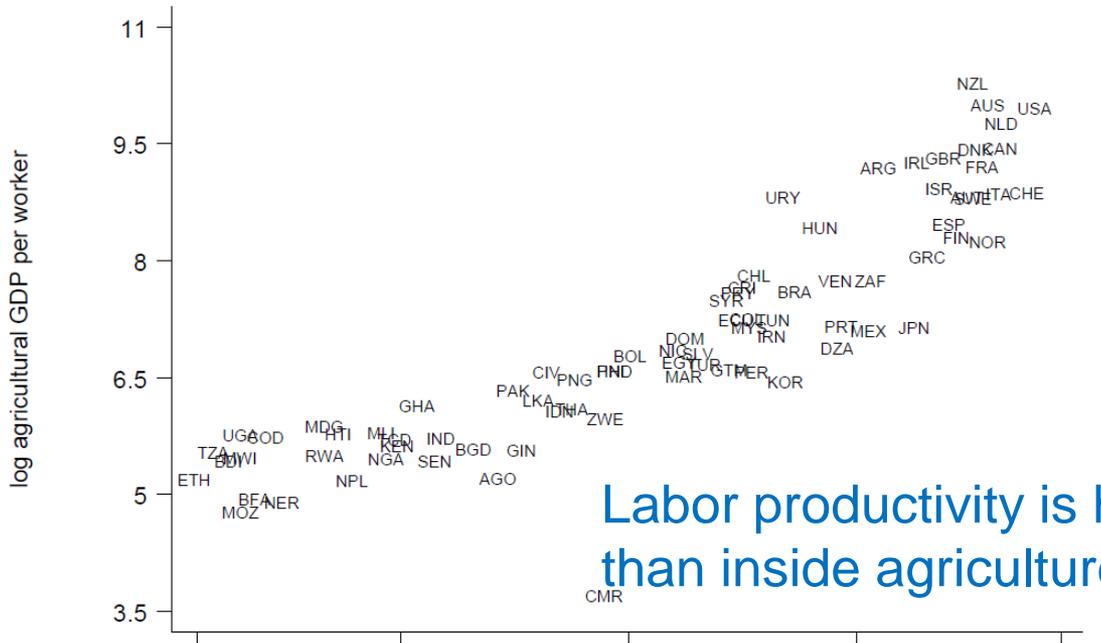
Caselli, F. (2005): “Accounting for Cross-Country Income Differences”. In *Handbook of Economic Growth*, Volume 1, Part A, pp. 679-741



- Caselli (2005) points to differences in TFP signal barriers to technology adoption...
 - The studies point to a link between the degree of competition domestic producers are exposed to, and the efficiency with which they organize their labor input.
- ... but also variation in the weights in GDP of sectors with different sectorial-level productivity \Rightarrow
 - Caselli focuses on barriers to the mobility of factors across sectors, instead of technology or work practices across countries.
 - He finds that an agriculture–nonagriculture split of GDP is the most important source of variation in the composition of GDP.

Accounting for cross-country ...





Fact 4: Large income and TFP differences

$$y = PA.yA.lA + PA.yA.lA$$

- There are three reasons for poor countries' poverty:
 - their much lower labor productivity in agriculture;
 - their somewhat lower labor productivity outside agriculture;
 - their larger share of employment in the less productive sector.
- Table 4 presents income-dispersion statistics in the data, and under alternative counterfactual assumptions on industry-level productivity and labor shares.

Fact 4: Large income and TFP differences

$$y = PA.yA.lA + PA.yA.lA$$



Counterfactual World Income Distributions

| Variable | log-variance | int. range |
|--|--------------|------------|
| Actual real output per worker | 1.18 | 22 |
| — <i>Counterfactual 1:</i> US y_A , own y_A & l_A | 0.04 | 1.6 |
| — <i>Counterfactual 2:</i> own y_A , US y_A & l_A | 0.58 | 7.0 |
| — <i>Counterfactual 3:</i> own y_A , y_A & US l_A | 0.34 | 4.2 |



Fact 5: Rising human capital

- Human capital per worker is rising throughout the world.
- Figure 5 documents the sustained increase in educational attainment over time in the US economy:
 - The cohort born in 1920 obtained just over 10 years of education, while the cohort born in 1980 went to school for 14 years.
 - Assuming a Mincerian return to education of 6% per year, this increase contributes about 0.6 pp per year to US growth, a significant fraction of our 2% per capita growth.
- Next Fig. suggests the average years of education in the labor force is destined to slow in the future.

Fact 5: Rising human capital

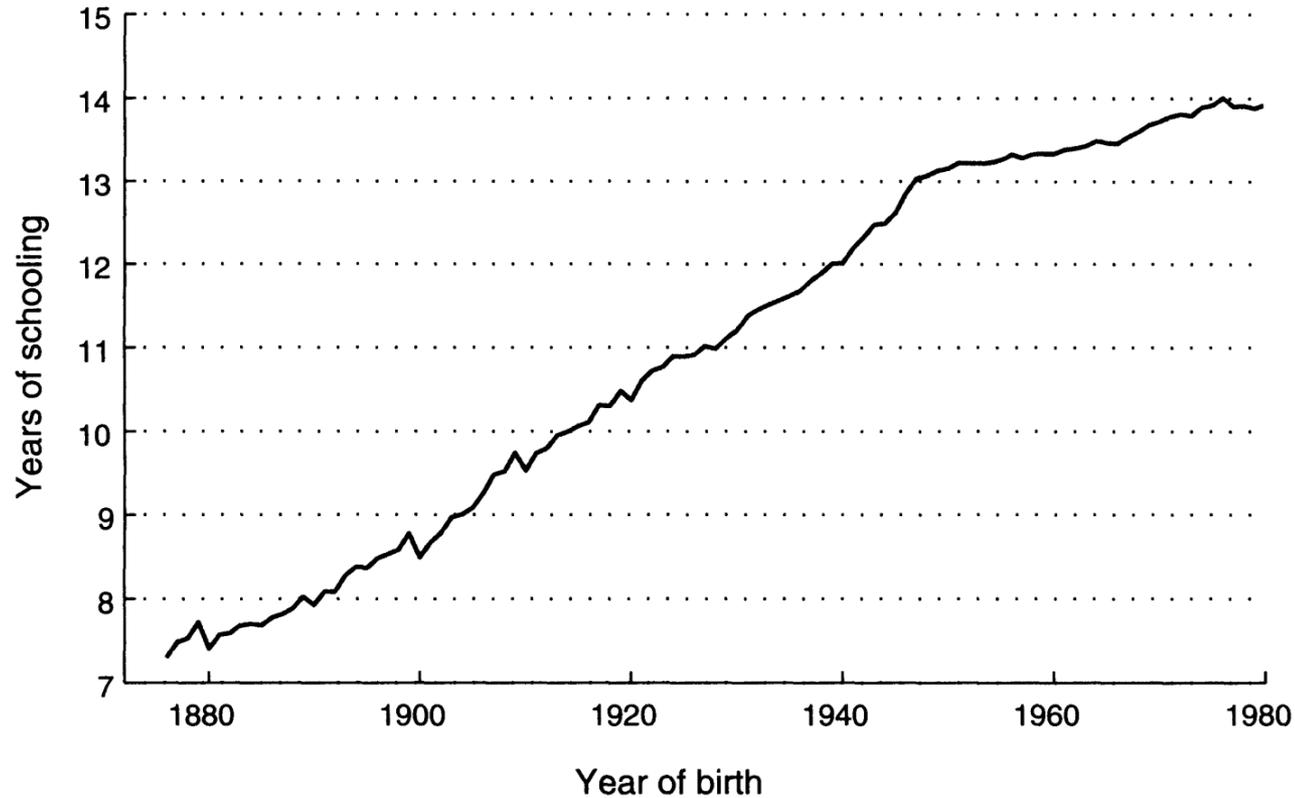
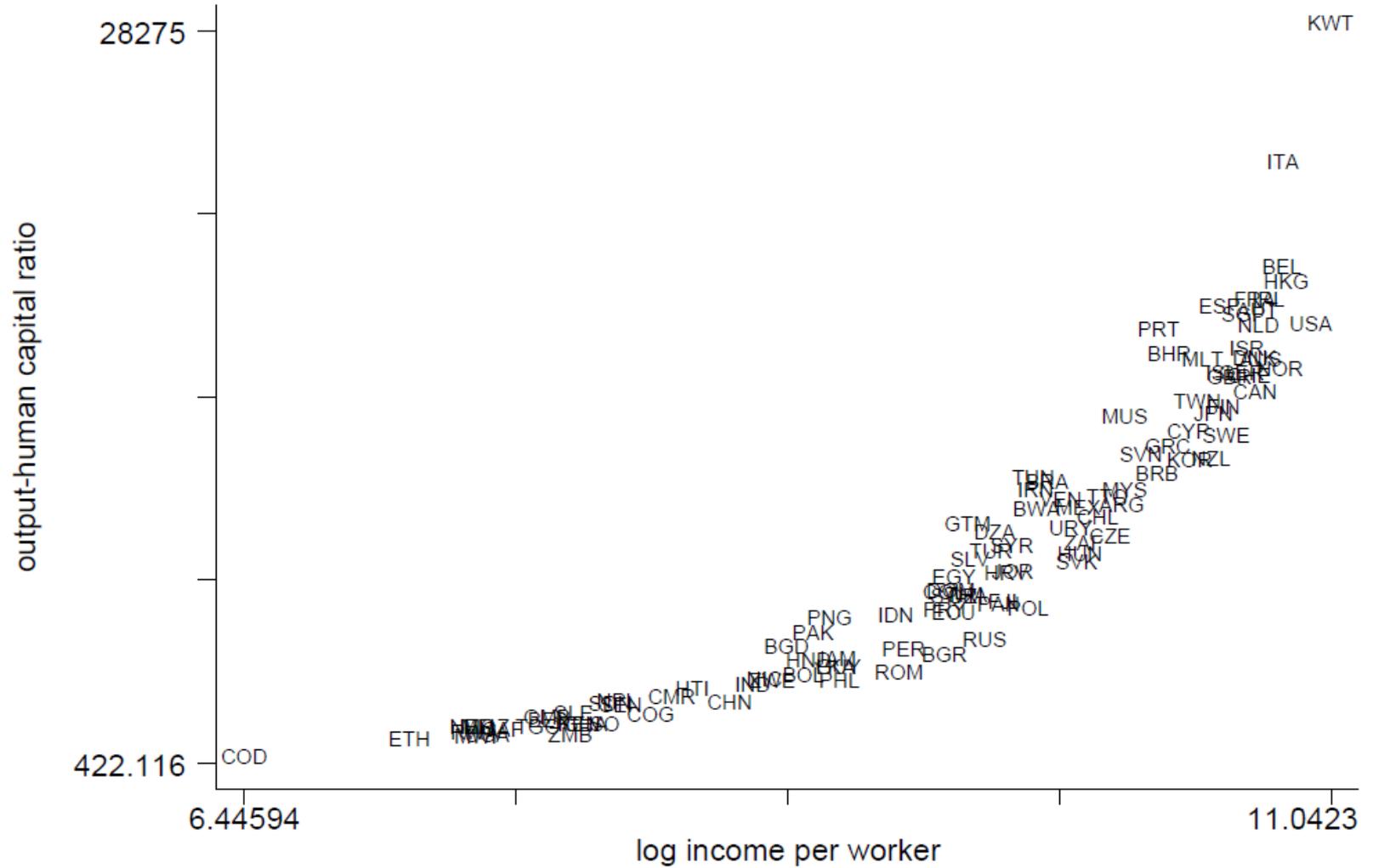


FIGURE 5. YEARS OF SCHOOLING BY BIRTH COHORT, UNITED STATES

Source: Claudia Goldin and Lawrence F. Katz (2007), Figure 7.

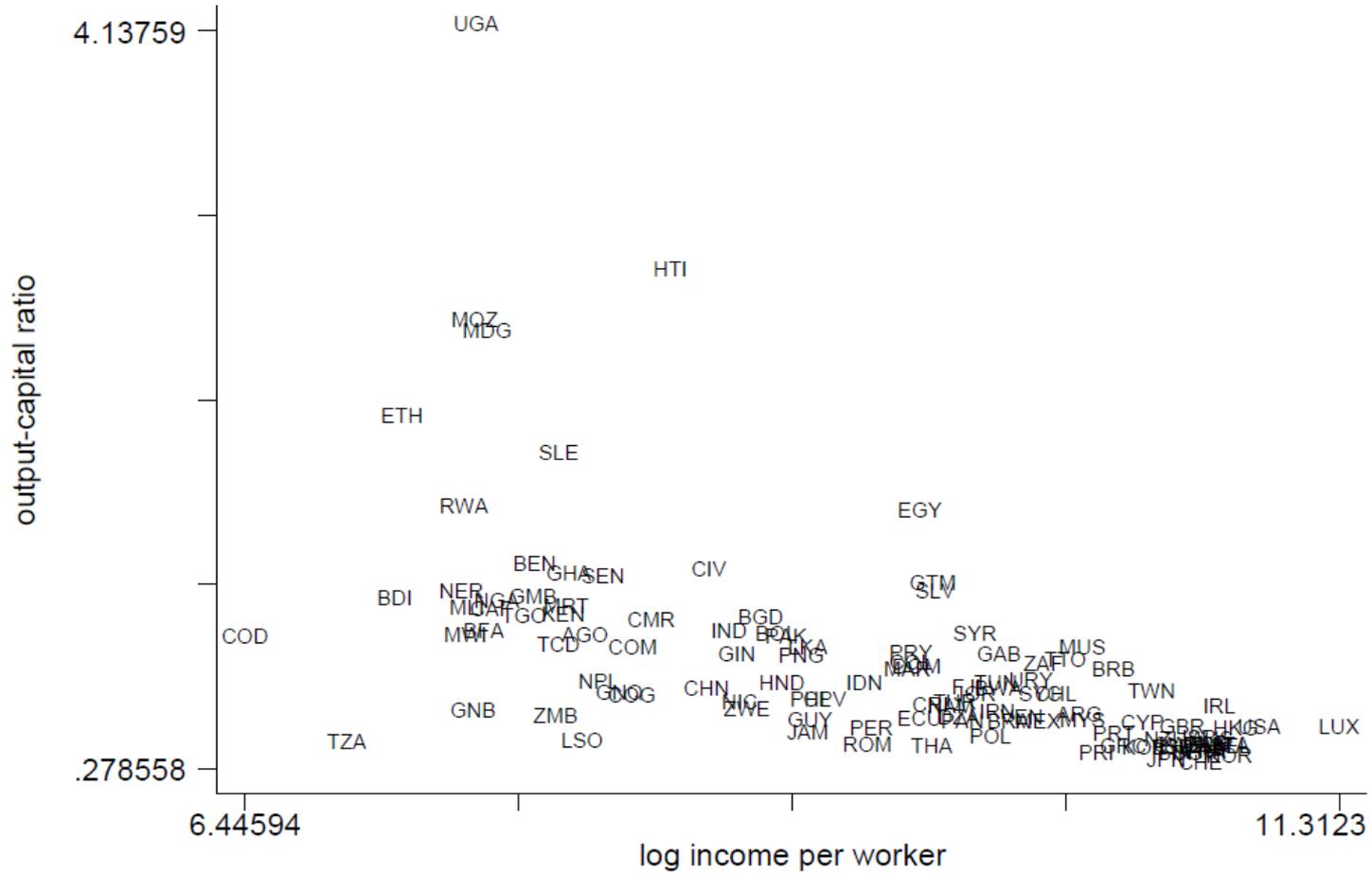


Fact 5: Rising human capital





Fact 5: Rising human capital



Fact 6: Long-run stability of relative wages

- The rising quantity of human capital relative to unskilled labor has not been matched by a sustained decline in relative price.
- Some interpretations:
 - Skill-biased change has shifted out the relative demand for high-educated workers, more than offsetting the downward pressure associated with the increase in relative supply.
 - A key determinant of the direction of technical change is the number of people for whom the new technology will be useful.

Fact 6: Long-run stability of relative wages

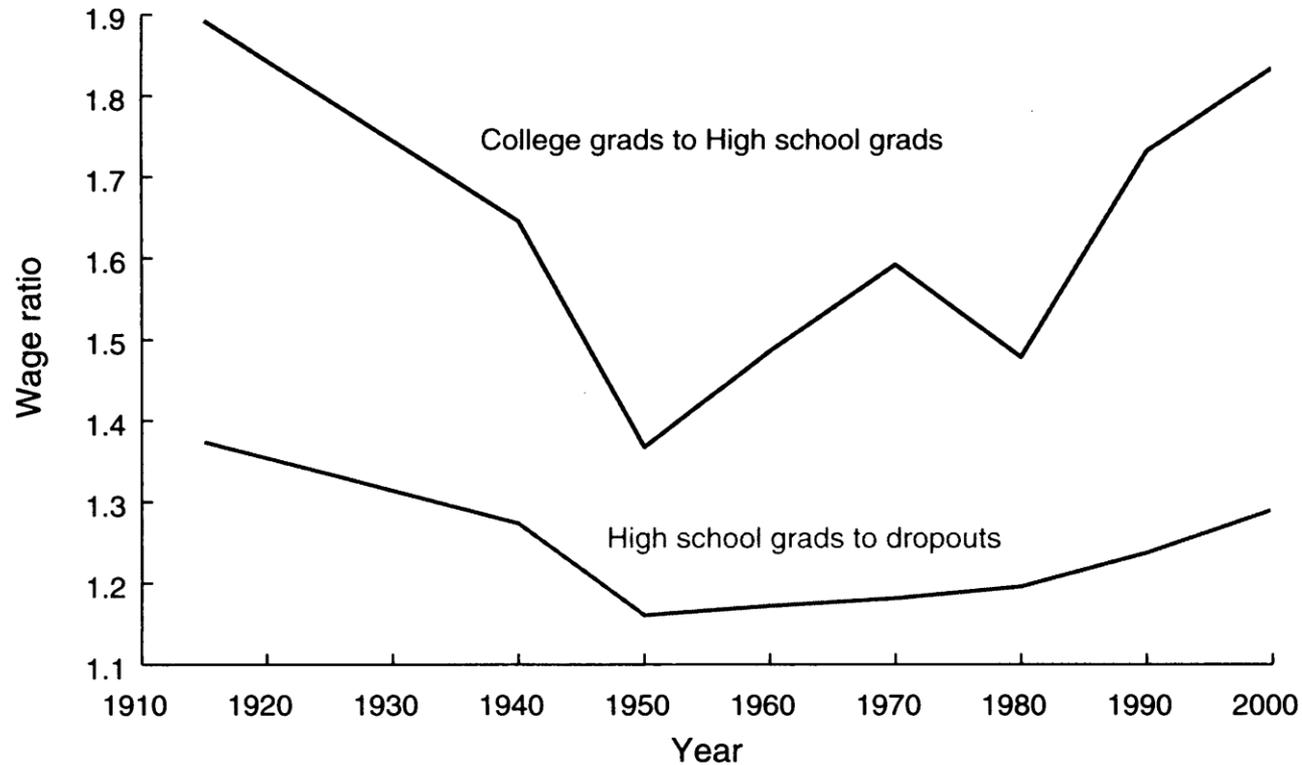


FIGURE 6. THE US COLLEGE AND HIGH SCHOOL WAGE PREMIUMS

Source: Goldin and Katz (2008), Table D1.



- EDUCATION SPENDING ACROSS THE OECD COUNTRIES (pdf)



- HUMAN AND FINANCIAL RESOURCES DEVOTED TO R&D, 2015
- <http://www.oecd.org/sti/inno/researchanddevelopmentstatisticsrds.htm>



- CORRUPTION PERCEPTIONS INDEX 2017
- https://www.transparency.org/news/feature/corruption_perceptions_index_2017



- These facts reveal important complementarities:
 - a) The virtuous circle between population and ideas accounts for the acceleration of growth.
 - b) Institutions may have their most important effects by hindering the adoption and utilization of ideas from throughout the world.
 - c) Institutions like public education and the university system are surely important for understanding the growth in human capital.
 - d) Finally, the rising extent of the market may help explain why the college wage premium has not fallen, despite the huge increases in the ratio of college graduates to high school graduates.



a) The virtuous circle between population and ideas accounts for the acceleration of growth.

- $Y_t = A_t X^\beta L_t^{1-\beta} \quad (1)$

- Interpret the rival good X as land, which is fix and normalized to 1

- Assume each person discovers α ideas as a side effects of other activities

- $\dot{A}_t = \alpha L_t \quad (2)$

- $\frac{Y_t}{L_t} = \bar{y} = 1 \quad (3)$

- $\dot{A}_t = \alpha A_t^{1/\beta} \quad (4)$

– Because β is less than one, the exponent of Eq. (4) is grater than one \Rightarrow The growth of ideas accelerates over time.

Why does productivity grow much more in the United States than in European countries?

ARCH, TECHNOLOGY FRONT ND PRODUCTIVITY GROWTH

PÉREZ – Marta BENGGOA – Adolfo C. FERNÁN

*received: 8 March 2013; revision received: 4 February 2014
accepted: 15 October 2014)*

Estimation results: **BASELINE SCENARIO**



$$\Delta a_{t+1} = c_2 + \lambda l_t + 2(\gamma - 1)a_t + (1 - \gamma)a_t^{US} + \varepsilon_{t+1}$$

| | Germany | France | UK | US |
|-----------|---------|---------|---------|---------|
| λ | 0.04*** | -0.00 | 0.04** | 0.06*** |
| γ | 0.92*** | 0.98*** | 0.90*** | 0.83*** |

- The researcher’s performance is significant for Germany, UK, US.
- The magnitude of λ implies US performance is larger than the European counterparts (0.06 vs. 0.04).
- The technology share γ enters positively and it is significant at 1% level.

Estimation results: STATE SPACE MODEL

$$\Delta \mathbf{a}_{t+1} = c_1 + \lambda \mathbf{1}_t + 2(\gamma - 1)\mathbf{a}_t + (1 - \gamma)\boldsymbol{\xi}_t + \mathbf{w}_{t+1}$$

$$\boldsymbol{\xi}_t = c_2 \boldsymbol{\xi}_{t-1} + \boldsymbol{\beta} + \mathbf{v}_t$$

| | Germany | France | UK | US |
|-----------|---------|---------|---------|---------|
| λ | 0.23*** | -0.16 | 0.12*** | 0.17*** |
| γ | 0.76*** | 1.19*** | 0.86*** | 0.80*** |

- Researchers' performance becomes much larger than when the frontier lied on the US:
 - For the US (and the UK) it is three times higher (0.17 vs. 0.06), while for Germany is six times higher (0.23 vs. 0.04).
 - Differences across countries are reduced to the bare minimum.
- Technology shares are broadly similar across countries (0.80).

THANKS FOR YOUR ATTENTION

GLOBALIZACIÓN, CRECIMIENTO Y COMPETITIVIDAD

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