Productivity

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- What are the factors affecting Household Welfare?

Goal: what affects output

- Output Production (GDP)
  - Factors of production
    - Labor
    - Capital
    - Input Materials
  - TFP (Total Factor Productivity)
    - Technology
    - Allocation and Misallocation
    - Macroeconomic Stability
    - Macroeconomic policies
    - Institutions

Question

- Output per worker varies enormously across countries. Why?
- 35-fold difference in output per worker between the United States and Niger.
  - Capital : 1.5
  - Human Capital: 3.1
  - Remaining difference: 7.7 (productivity residual)
- Why do some countries invest more than others in physical and human capital?
- Why are some countries so much more productive than others?

Why Income Differences?

- Hall and Jones 1999 : Social Infrastructure
  - Institutions
  - Government policies

- They Determine the economic environment within which individuals accumulate skills, and firms accumulate capital and produce output.

- A social infrastructure favorable to high levels of output per worker provides an environment that supports productive Activities and encourages capital accumulation, skill acquisition, invention, and technology transfer.

- Such a social infrastructure gets the prices right

- In the language of North and Thomas (1973): Individuals capture the social returns to their actions as private returns

Social Infrastructure $\Rightarrow$ (Inputs,Productivity) $\Rightarrow$ Output per Worker

Why Income Differences?

- Productivity and Output per Worker
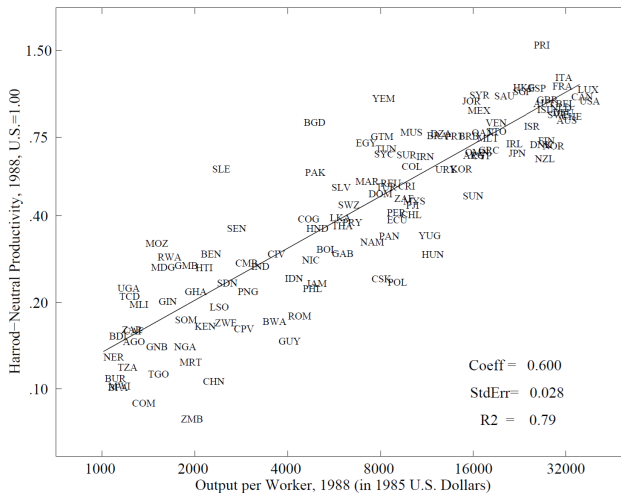
Why Income Differences?

- Productivity Calculations: Ratios to U.S. Values

Country	Y/L	$(K/Y)^{\alpha/(1-\alpha)}$	H/L	A
		Contribution from		
United States	1.000	1.000	1.000	1.000
Canada	0.941	1.002	0.908	1.034
Italy	0.834	1.063	0.650	1.207
West Germany	0.818	1.118	0.802	0.912
France	0.818	1.091	0.666	1.126
United Kingdom	0.727	0.891	0.808	1.011
Hong Kong	0.608	0.741	0.735	1.115
Singapore	0.606	1.031	0.545	1.078
Japan	0.587	1.119	0.797	0.658
Mexico	0.433	0.868	0.538	0.926
Argentina	0.418	0.953	0.676	0.648
U.S.S.R.	0.417	1.231	0.724	0.468
India	0.086	0.709	0.454	0.267
China	0.060	0.891	0.632	0.106
Kenya	0.056	0.747	0.457	0.165
Zaire	0.033	0.499	0.408	0.160
Average, 127 Countries:	0.296	0.853	0.565	0.516
Standard Deviation:	0.268	0.234	0.168	0.325
Correlation w/ Y/L (logs)	1.000	0.624	0.798	0.889
Correlation w/ A (logs)	0.889	0.248	0.522	1.000

Why Income Differences?

- Hsieh and Klenow 2010: Why TFP varies across countries?
  - Misallocation of inputs across firms and industries
- H : Human Capital, K : Physical Capital

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\begin{array}{rcl}
\text{Geography, Climate,Luck} & \Rightarrow & \text{H,K,TFP} \Rightarrow \text{Income} \\
& \Downarrow & \\
\text{Institutions, Culture} & \Rightarrow & \text{H,K,TFP} \Rightarrow \text{Income} \\
& \Downarrow & \\
\text{Policies, Rule of Law, Corruption} & \Rightarrow & \text{H,K, TFP} \Rightarrow \text{Income}
\end{array}
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