

Why Income Per Worker Differs Worldwide

The differences in real output per worker across countries are astounding. For example, while real gross domestic product (GDP) per worker was almost \$1,000 in Burundi in 2000, it exceeded \$77,000 in the United States.¹ How such large differences in GDP per worker can persist in an increasingly global marketplace is a key question in economics.

Some fundamental factors behind this disparity are obvious, including significant differences across countries in the quantity and quality of factories and equipment (physical capital) and workers' knowledge and ability (human capital). However, most income differences across nations cannot be explained by the accumulation of physical and human capital. Unexplained income differences are attributed to differences in *total factor productivity* (TFP), which measures how effectively fixed levels of inputs are used in the production of goods and services. Thus, understanding why TFP differs across countries is important for understanding why some countries have a much lower income per worker than others.

Economic distortions that hinder business formation (e.g., entry barriers, distortionary taxes, financial constraints) affect a country's industrial structure and may explain the cross-country variation in TFP. The World Bank's *Doing Business* survey finds policy in the United States is relatively encouraging.² New businesses can begin after an average of six procedures, a six-day wait, and paying regulatory fees less than 1 percent of income per capita. In some other countries, regulatory costs exceed 500 percent of per capita income. The chart shows the relationships between regulatory fees and macroeconomic variables across countries. On the horizontal axis are entry costs, measured as a percent of GDP per capita. The white dots, which measure productivity against entry costs, show a clear negative relationship.³ A similar pattern emerges when contrasting entry costs and output per worker (blue dots).

Current research further supports the importance of entry barriers by focusing on a broader measure of entry costs that includes nonregulatory costs—for example, sunk investment, technology acquisition, and advertisement.⁴ In this framework, the total effect of entry barriers on productivity is profound (Barseghyan and DiCecio, 2010): A 1 percent higher total entry cost implies a 0.14 percent lower level of TFP. This relationship—along with large variations in entry costs—leads to large differences in economic outcomes across

countries. TFP is 35 percent higher and output per worker is 57 percent higher, on average, in countries with low entry costs than in those with high entry costs.

—Riccardo DiCecio

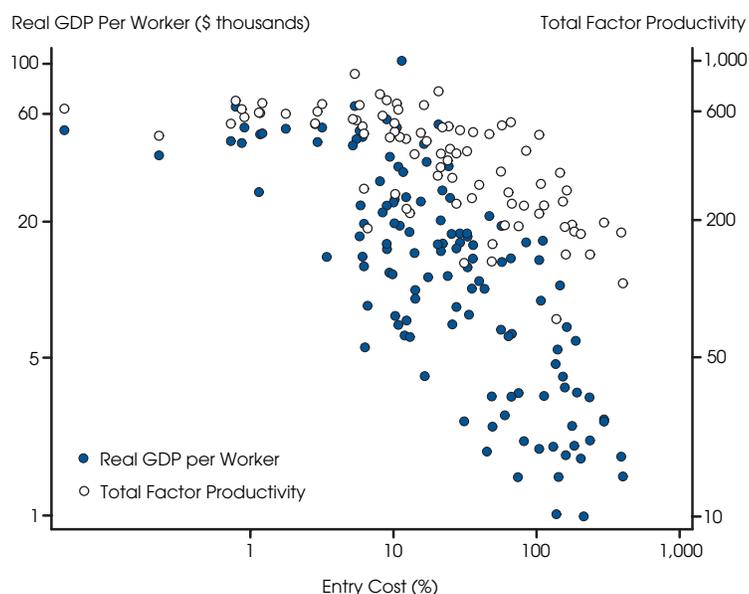
¹ See Heston, Alan; Summers, Robert and Aten, Bettina. "Penn World Table Version 6.1." Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, October 2002. The figures reported are real GDP per worker in international dollars at 1996 constant prices.

² The *Doing Business* project conducts annual surveys to measure business regulations and their enforcement across 183 economies.

³ TFP is computed as in Klenow, Peter J. and Rodríguez-Clare, Andrés. "Externalities and Growth," in Philippe Aghion and Steven N. Durlauf, eds., *Handbook of Economic Growth, Volume 1A*. Amsterdam: Elsevier, 2005, pp. 817-64.

⁴ See Barseghyan, Levon and DiCecio, Riccardo. "Entry Costs, Industry Structure, and Cross-Country Income and TFP Differences." Federal Reserve Bank of St. Louis Working Paper 2009-005B, January 2010; <http://research.stlouisfed.org/wp/2009/2009-005.pdf>.

Entry Cost, Total Factor Productivity, and Real GDP Per Worker Across Countries



SOURCE: Heston, Summers, and Aten (real GDP per worker for the year 2000; thousands of international dollars in 1996 constant prices); Klenow and Rodríguez-Clare (TFP); World Bank (entry cost as a percentage of per capita income, averaged over 2004-8).

Views expressed do not necessarily reflect official positions of the Federal Reserve System.