

What have we learned from a decade of empirical research on growth?

Comment on “It’s Not Factor Accumulation:
Stylized Facts and Growth Models,”
by William Easterly and Ross Levine

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William Easterly and Ross Levine document five stylized facts about growth and argue that they imply a bigger role for total factor productivity (TFP) and technology than for physical and human capital. I agree with the first four of their facts and believe facts 1 and 3 provide strong support for their conclusion that TFP should be the focus of growth research.

FACT 1: TFP ACCOUNTS FOR MOST INCOME AND
GROWTH DIFFERENCES

I would add another piece of evidence pointing to the same conclusion. Jasso, Rosenzweig, and Smith (2000) compare earnings of U.S. immigrants with their earnings in their country of origin. With adjustments for local purchasing power, the average immigrant earns 2.2 times as much in the United States as in their country of origin. That is 75 percent as big as the earnings gap between the average U.S. worker and the average worker in source countries, suggesting that 75 percent of the gap between U.S. and source country earnings cannot be explained by general human capital. Easterly and Levine attribute about 25 percent of the gap to physical capital per worker. That leaves about 50 percent accounted for by TFP.

TFP differences could reflect disembodied technology, human capital externalities, access to specialized or high-quality capital or intermediate goods, the degree of competition, or measurement error. Research has barely begun to quantify the contributions of each of these.

As important as TFP is for country differences, it seems less important for the overall upward trend in GDP per capita. Averaging across 98 countries, Klenow and Rodriguez-Clare (1997) attributed 70 percent of growth to physical and human capital.

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FACT 2: INCOME DIVERGES OVER THE LONG RUN

Whether income diverges over the long run is not so clear for more recent periods. Parente and Prescott (2000) find that the “East” grew much faster than the “West” during 1960–95. Using Summers and Heston data for 102 countries over 1960–90, I find a 2 percent *decline* in the population-weighted standard deviation of log per capita income.

Easterly and Levine argue that divergence is inconsistent with growth being driven by factor accumulation; because of diminishing returns, factors should tend to equalize rather than diverge. But differences in institutions can work against factor convergence. Certain policies (high tax rates, protectionism, weak property rights) can reduce accumulation of physical and human capital. Divergence in policies can therefore lead to divergence of factors. The West’s institutions may have improved in the 19th century, producing a century of divergence. The East may have adopted better policies since 1960, leading to factor convergence since then.

This is not to say that divergence—even if traced to policy divergence—requires a factor interpretation. Policies can affect TFP, too. Similarly, one can offer TFP explanations for convergence episodes. Parente and Prescott (2000) note that all 20th-century growth miracles have occurred in countries starting far behind the richest countries, consistent with technology catch-up. And the later they take off, the faster they catch up.

Factors can diverge or converge, and so can TFP. Episodes of divergence and convergence need to be examined more closely to determine the roles of physical capital, human capital, and TFP. For the five Asian miracle economies, Young (1995, 2000) points to factor accumulation.

FACT 3: FACTOR ACCUMULATION IS PERSISTENT, GROWTH IS NOT

The corollary to fact 3 is that TFP growth is not very persistent. Related, Easterly and others (1993) show that country policy differences are much more persistent than country growth rate differences. Why would policies be more persistent than TFP growth?

The answer may be that policies affect the *level* of a country’s TFP, not its growth rate. And changes in policies may only temporarily affect a country’s growth rate. Picture countries trending together, linked by technology diffusion. Countries with higher levels of income are the ones with better policies. Growth miracles are produced by dramatic improvements in policies, and growth disasters by deteriorating policies. China is a fast grower not because its institutions are among the best but because it has improved its institutions so much in the last two decades. If it does not reform further, its per capita income might level out at, say, 30th percentile in the world distribution.

In this view, TFP growth is not persistent because changes in policies are not persistent. Some countries follow up reforms with more reforms, but others go

back on their reforms. This conjecture could be investigated by looking at the persistence of policy changes and how policy changes correlate with TFP growth.

If policy changes are not persistent, however, why is factor accumulation persistent? Schooling yields returns for decades. Schooling may respond not to current policies but to the much smoother “average” policy expected over future working life. Physical capital investments are shorter lived, but still last a decade or more on average.

In contrast, private returns to raising TFP may be shorter-lived and more sensitive to current policy. A firm improving its efficiency may gain for only a few years, until competitors imitate it. Changes in market share between efficient and less efficient firms may be reversed when policies are reversed.

FACT 4: ECONOMIC ACTIVITY IS HIGHLY CONCENTRATED GEOGRAPHICALLY

As Easterly and Levine document, economic activity is highly concentrated even within countries. They argue that, without differences in TFP, factors should spread out evenly because of diminishing returns. That factors do not spread out evenly suggests differences in TFP, perhaps owing to technology and externalities.

But just as policy divergence could lead to factor divergence, policy differences can lead to geographic concentration within countries. Take the coastal areas of China. These areas were opened to foreign trade much earlier and more extensively than the rest of China, attracting huge inflows of labor and capital. For another example, Holmes (1998) documents heavy concentration of manufacturing in right-to-work states within the United States.

If land is not a very important factor, then lots of concentration can result from modest differences in policy or geography or technology. Suppose land’s share is 5 percent, as in Lucas (forthcoming). If TFP differs across locations by a factor of 1.4 (compared to say 5 or 6 across countries), then output per unit of land will differ by a factor of 1,000 to equate returns to physical and human capital. If TFP differs by a factor of 1.6, output per unit of land will differ by a factor of 10,000.

FACT 5: NATIONAL POLICIES AFFECT LONG-RUN NATIONAL GROWTH RATES

Easterly and Levine show that country growth rates are correlated with country policy variables such as schooling, openness to trade, the size of government, the black market premium, and private credit. They are keenly aware that some of these variables may result from growth rather than cause it, so they are careful to instrument with lags. But even lagged variables can be subject to reverse causality. For example, increases in private credit could result from higher expected future growth.

If establishing any causal effect is difficult, establishing a *long-run* effect on the growth rate is harder still. The data could be revealing temporary rather than permanent growth effects. Consistent with this, many policies are correlated with growth only when simultaneously controlling for initial income. Openness to trade, for example, might have a positive coefficient because it facilitates technology diffusion. But once a country closes in on the technology frontier, openness will not continue to keep the growth rate high, only the level of income high. The fact that policies are more persistent than growth rates is consistent with policies affecting long-run levels more than long run growth rates.

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