PROJECT SYNDICATE

The Tacit-Knowledge Economy

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CAMBRIDGE – Almost all rich countries are rich because they exploit technological progress. They have moved the bulk of their labor force out of agriculture and into cities, where knowhow can be shared more easily. Their families have fewer children and educate them more intensively, thereby facilitating further technological progress.

Poor countries need to go through a similar change in order to become rich: reduce farm employment, become more urban, have fewer children, and keep those children that they have in school longer. If they do, the doors to prosperity will open. And isn't that already happening?

Let us compare, for example, Brazil in 2010 with the United Kingdom in 1960. Brazil in 2010 was 84.3% urban; its fertility rate was 1.8 births per woman; its labor force had an average of 7.2 years of schooling; and its university graduates accounted for 5.2% of potential workers. These are better social indicators than the United Kingdom had in 1960. At that time, the UK was 78.4% urban; its fertility rate was 2.7; its labor force had six years of schooling on average, and its university graduates accounted for less than 2% of potential workers.

Brazil is not a unique case: Colombia, Tunisia, Turkey, and Indonesia in 2010 compare favorably to Japan, France, the Netherlands, and Italy, respectively, in 1960. Not only did these countries achieve better social indicators in these dimensions; they also could benefit from the technological innovations of the past half-century: computers, cellphones, the Internet, Teflon, and so on. This should allow higher productivity than was feasible in 1960.

So today's emerging-market economies should be richer than today's advanced economies were back then, right?

Wrong – and by a substantial margin. *Per capita* GDP at constant prices was 140% higher in Britain in 1960 than in Brazil in 2010. It was 80% higher in Japan back then than in Colombia today, 42% higher in old France than in current Tunisia, 250% higher in the old Netherlands than in current Turkey, and

470% higher in old Italy than in current Indonesia.

Why is it that today's smaller and more educated urbanized families in emerging-market economies are so much less productive than their counterparts were a half-century ago in today's rich countries? Why can't today's emerging markets replicate levels of productivity that were achieved in countries with worse social indicators and much older technologies?

The key to this puzzle is tacit knowledge. To make stuff, you need to *know* how to make it, and this knowledge is, to a large extent, latent – not available in books, but stored in the brains of those who need to use it.

Getting it there is really tough. Tacit knowledge is acquired mostly through learning by doing. That is how we train musicians, barbers, doctors, and scientists. Consider how long it takes an adult to learn to speak a language or a musician to master the violin.

Moreover, tacit knowledge is vast and growing, so that only a miniscule fraction of it fits in anybody's head. But most products require much more knowledge than fits in anybody's head, so that making them requires teams of people with different pieces of knowledge, not unlike a symphonic orchestra.

Getting more tacit knowledge is easier said than done, because economies can offer experience only on the basis of current jobs. How do people learn to do jobs that do not yet exist? How do they create and mobilize coherent teams of people in new economic activities if the requisite tacit knowledge is missing?

Recent research at Harvard University's Center for International Development (CID) suggests that tacit knowledge flows through amazingly slow and narrow channels. The productivity of Nuevo León, Mexico, is higher than in South Korea, but that of Guerrero, another Mexican state, resembles levels in Honduras. Moving knowledge across Mexican states has been difficult and slow.

It is easier to move brains than it is to move tacit knowledge into brains, and not only in Mexico. For example, as the CID's Frank Neffke has shown, when new industries are launched in German and Swedish cities, it is mostly because entrepreneurs and firms from other cities move in, bringing with them skilled workers with relevant industry experience. They seldom hire locals.

The recently deceased economist Steven Klepper argued that industries tend to cluster in particular cities simply because new firms are formed mainly by workers who leave other successful firms, taking the relevant tacit knowledge with them. Indeed, a large literature on knowledge spillovers points to their remarkably narrow geographic range. The exceptions often confirm the rule. The US would not have been able to build the first atomic bomb in just four years had Hitler not encouraged so many key scientists to leave Europe.

The bottom line is that urbanization, schooling, and Internet access are woefully insufficient to transmit effectively the tacit knowledge required to be productive. That is why today's emerging markets are so much less productive than rich countries were in 1960, even though the latter were less urban, had higher birth rates and less formal schooling, and used much older technologies.

The policy implications are clear. Knowhow resides in brains, and emerging and developing countries should focus on attracting them, instead of erecting barriers to skilled immigration. They should tap into their diasporas, attract foreign direct investment in new areas, and acquire foreign firms if possible. Knowledge moves when people do.