"In recent years, researchers have moved closer to answering the most important question in economics: why are some countries richer than others?"

UNDERSTANDING growth is surely the most urgent task in economics. Across the world, poverty remains the single greatest cause of misery; and the surest remedy for poverty is economic growth. It is true that growth can create problems of its own (congestion and pollution, for instance), which may preoccupy many people in rich countries. But such ills pale in comparison with the harm caused by the economic backwardness of poor countries - that is, of the larger part of the world. The cost of this backwardness, measured in wasted lives and needless suffering, is truly vast.

To its shame, economics neglected the study of growth for many years. Theorists and empirical researchers alike chose to concentrate on other fields, notably on macroeconomic policy. Until the 1980s, with a few exceptions, the best brains in economics preferred not to focus on the most vital issue of all. But over the past ten years or so, this has changed. Stars such as Robert Lucas of the University of Chicago, who last year won the Nobel prize in economics, have started to concentrate on growth. As he says of the subject, 'the consequences for human welfare ..are simply staggering. Once one starts to think about them, it is hard to think of anything else.'

Early economists certainly thought about them. Adam Smith's classic 1776 book was, after all, called an 'Inquiry into the Nature and Causes of the Wealth of Nations'. Many building-blocks for understanding growth derive from him. Smith reckoned that the engine of growth was to be found in the division of labour, in the accumulation of capital and in technological progress. He emphasised the importance of a stable legal framework, within which the invisible hand of the market could function, and he explained how an open trading system would allow poorer countries to catch up with richer ones. In the early 19th century, David Ricardo formalised another concept crucial for understanding growth - the notion of diminishing returns. He showed how additional investment in land tended to yield an ever lower return, implying that growth would eventually come to a halt - though trade could stave this off for a while.

The foundations of modern growth theory were laid in the 1950s by Robert Solow and Trevor Swan. Their models describe an economy of perfect competition, whose output grows in response to larger inputs of capital (ie, physical assets of all kinds) and labour. This economy obeys the law of diminishing returns: each new bit of capital (given a fixed labour supply) yields a slightly lower return than the one before.

Together, these assumptions give the neoclassical growth model, as it is called, two crucial implications. First, as the stock of capital expands, growth slows, and eventually halts: to keep growing, the economy must benefit from continual infusions of
technological progress. Yet this is a force that the model itself makes no attempt to explain: in the jargon, technological progress is, in the neoclassical theory, 'exogenous' (i.e., it arises outside the model). The second implication is that poorer countries should grow faster than rich ones. The reason is diminishing returns: since poor countries start with less capital, they should reap higher returns from each slice of new investment.

**Theory into practice**

Do these theoretical implications accord with the real world? The short answer is no. The left-hand chart on the next page shows average growth rates since 1870 of 16 rich countries for which good long-term data exist. Growth has indeed slowed since 1970. Even so, modern growth rates are well above their earlier long-run average. This appears to contradict the first implication, that growth will slow over time. It may be that an acceleration of technological progress accounts for this, but this should hardly console a neoclassical theorist, because it would mean that the main driving force of growth lies beyond the scope of growth theory.

What about the second implication - are poor countries catching up? The right-hand chart overleaf plots, for 118 countries, growth rates between 1960 and 1985 against their initial 1960 level of GDP per person. If poor countries were catching up, the plots on the chart should follow a downward-sloping pattern: countries that were poorer in 1960 should have higher growth rates. They do not. Indeed, if there is any discernible pattern in the mass of dots, it is the opposite: poorer countries have tended to grow more slowly.

Having arrived at neoclassical growth theory, however, economics by and large forgot about the subject. It had a model that was theoretically plausible, but did not seem to fit the facts. How best to proceed was unclear. Then, after a pause of 30 years, along came 'new growth theory'.

This new school has questioned, among other things, the law of diminishing returns in the neoclassical model. If each extra bit of capital does not, in fact, yield a lower return than its predecessor, growth can continue indefinitely, even without technological progress. A seminal paper was published in 1986 by Paul Romer (see references at the end). It showed that if you broaden the idea of capital to include human capital (that is, the knowledge and skills embodied in the workforce), the law of diminishing returns may not apply. Suppose, for example, that a firm which invests in a new piece of equipment also learns how to use it more efficiently. Or suppose it becomes more innovative as a by-product of accumulating capital. In either case, there can be increasing, not decreasing, returns to investment.

In this and other ways, new growth theorists can explain how growth might persist in the absence of technological progress. But, they have gone on to ask, why assume away such progress? A second strand of new growth theory seeks to put technological progress explicitly into the model (making it 'endogenous', in the jargon). This has obliged theorists to ask questions about innovation. Why, for instance, do
companies invest in research and development? How do the innovations of one company affect the rest of the economy?

A further divergence from the neoclassical view follows. As a general rule, a firm will not bother to innovate unless it thinks it can steal a march on the competition and, for a while at least, earn higher profits. But this account is inconsistent with the neoclassical model's simplifying assumption of perfect competition, which rules out any 'abnormal' profits. So the new growth theorists drop that assumption and suppose instead that competition is imperfect. Attention then shifts to the conditions under which firms will innovate most productively: how much protection should intellectual-property law give to an innovator, for instance? In this way, and not before time, technological progress has begun to occupy a central place in economists' thinking about growth.

In the latest resurgence of interest in growth theory, however, the original neoclassical approach has enjoyed something of a revival. Some economists are questioning whether the 'new' theories really add much. For instance, the new theory emphasises human capital; arguably, this merely calls for a more subtle measure of labour than the ones used by early neoclassical theorists. More generally, it is argued that if factors of production (capital and labour) are properly measured and quality-adjusted, the neoclassical approach yields everything of value in the new theory, without its distracting bells and whistles. So it often proves in economics: the mainstream first takes affront at new ideas, then reluctantly draws on them, and eventually claims to have thought of them first.

The missing link

To non-economists, however, both approaches seem curiously lacking in one crucial respect. Whereas in popular debate about growth, government policy is usually the main issue, in both neoclassical and new growth theory discussion of policy takes place largely off-stage. To the extent that government policy affects investment, for instance, either could trace out the effects on growth - but the connection between policy and growth is tenuous and indirect. Each approach may take a strong view about the role of diminishing returns, but both remain frustratingly uncommitted about the role of government.

An upsurge of empirical work on growth is helping to fill this hole - and, as a by-product, shedding further light on the relative merits of the new and neoclassical theories. The nuts and bolts of this work are huge statistical analyses. Vast sets of data now exist, containing information for more than 100 countries between 1960 and 1990 on growth rates, inflation rates, fertility rates, school enrolment, government spending, estimates of how good the rule of law is, and so on. Great effort has been devoted to analysing these numbers.

One key finding is 'conditional convergence', a term coined by Robert Barro, a pioneer of the new empirical growth studies. His research has found that if one holds constant such factors as a country's fertility rate, its human capital (proxied by various
measures of educational attainment) and its government policies (proxied by the share of current government spending in GDP), poorer countries tend to grow faster than richer ones. So the basic insight of the neoclassical growth model is, in fact, correct. But since, in reality, other factors are not constant (countries do not have the same level of human capital or the same government policies), absolute convergence does not hold.

Whether this is a depressing result for poor countries depends on what determines the 'conditional' nature of the catch-up process. Are slow-growing countries held back by government policies that can be changed easily and quickly? Or are more fundamental forces at work?

Most empirical evidence points to the primacy of government choices. Countries that have pursued broadly free-market policies - in particular, trade liberalisation and the maintenance of secure property rights - have raised their growth rates. In a recent paper, Jeffrey Sachs and Andrew Warner divided a sample of 111 countries into 'open' and 'closed'. The 'open' economies showed strikingly faster growth and convergence than the 'closed' ones. Smaller government also helps. Robert Barro, among others, has found that higher government spending tends to be associated with slower growth.

Human capital - education and skills - has also been found to matter. Various statistical analyses have shown that countries with lots of human capital relative to their physical capital are likely to grow faster than those with less. Many economists argue that this was a factor in East Asia's success: in the early 1960s the Asian tigers had relatively well-educated workforces and low levels of physical capital.

A more difficult issue is the importance of savings and investment. One implication of the neoclassical theory is that higher investment should mean faster growth (at least for a while). The empirical studies suggest that high investment is indeed associated with fast growth. But they also show that investment is not enough by itself. In fact the causality may run in the opposite direction: higher growth may, in a virtuous circle, encourage higher saving and investment. This makes sense: communist countries, for instance, had extraordinarily high investment but, burdened with bad policies in other respects, they failed to turn this into high growth.

The number-crunching continues; new growth-influencing variables keep being added to the list. High inflation is bad for growth; political stability counts; the results on democracy are mixed; and so on. The emerging conclusion is that the poorest countries can indeed catch up, and that their chances of doing so are maximised by policies that give a greater role to competition and incentives, at home and abroad.

But surely, you might think, this hides a contradiction? The new growth theory suggests that correct government policies can permanently raise growth rates. Empirical cross-country analysis, however, seems to show that less government is better - a conclusion that appeals to many neoclassical theorists. This tension is especially pronounced for the East Asian tigers. Advocates of free markets point to East Asia's trade liberalisation in the 1960s, and its history of low government spending, as keys to
the Asian miracle. Interventionists point to subsidies and other policies designed to promote investment.

Reflecting the present spirit of rapprochement between the growth models, it is now widely argued that this contradiction is more apparent than real. Work by Alwyn Young, popularised by Paul Krugman, has shown that much of the Asian tigers' success can be explained by the neoclassical model. It resulted from a rapid accumulation of capital (through high investment) and labour (through population growth and increased labour-force participation). On this view, there is nothing particularly miraculous about Asian growth: it is an example of 'catch-up'. Equally, however, the outlines of East Asian success fit the new growth model. Endogenous growth theory says that government policy to increase human capital or foster the right kinds of investment in physical capital can permanently raise economic growth.

The question is which aspect of East Asian policies was more important - which, up to a point, is the same as asking which growth model works best. Although debate continues, the evidence is less strong that micro-level encouragement of particular kinds of investment was crucial in Asia. Some economists dissent from that judgment, but they are a minority. Most agree that broader policies of encouraging education, opening the economy to foreign technologies, promoting trade and keeping taxes low mattered more.

**One more heave**

There is no doubt that the neoclassical model of the 1950s, subsequently enhanced, together with the theories pioneered by Mr Romer, have greatly advanced economists' understanding of growth. Yet the earlier doubt remains. Both models, in their purest versions, treat the role of government only indirectly. The new empirical work on conditional convergence has set out to put this right. The fact remains that in the earlier theoretical debate between the neoclassical and the new schools, the question that matters most - what should governments do to promote growth? - was often forgotten.

A new paper by Mancur Olson makes this point in an intriguing way. The starting-point for today's empirical work is a striking fact: the world's fastest-growing economies are a small subgroup of exceptional performers among the poor countries. Viewed in the earlier theoretical perspective, this is actually rather awkward. Mr Romer's theories would lead you to expect that the richest economies would be the fastest growers: they are not. The basic neoclassical theory suggests that the poorest countries, on the whole, should do better than the richest: they do not. Neither approach, taken at face value, explains the most striking fact about growth in the world today.

Mr Olson argues that the simplest versions of both theories miss a crucial point. Both assume that, given the resources and technology at their disposal, countries are doing as well as they can. Despite their differences, both are theories about how changes in available resources affect output - that is, both implicitly assume that, if resources do not change, output cannot either. But suppose that poor countries simply waste lots of resources. Then the best way for them to achieve spectacular growth is not to set about
accumulating more of the right kind of resources - but to waste less of those they already have.

Marshalling the evidence, Mr Olson shows that slow-growing poor countries are indeed hopelessly failing to make good use of their resources. Take labour, for instance. If poor countries were using labour as well as they could, large emigrations of labour from poor to rich countries (from Haiti to the United States, for instance) ought to raise the productivity of workers left behind (because each worker now has more capital, land and other resources to work with). But emigration does not have this effect.

Data on what happens to migrants in their new homes are likewise inconsistent with the two growth theories. Immigrants' incomes rise by far more than access to more capital and other resources would imply. It follows that labour (including its human capital, entrepreneurial spirit, cultural traits and the rest) was being squandered in its country of origin. When workers move, their incomes rise partly because there is more capital to work with - but also by a further large margin, which must represent the wastage incurred before. Mr Olson adduces similar evidence to show that capital and knowledge are being massively squandered in many poor countries.

This offers a rationale for the pattern of growth around the world - a rationale that, consistent with the recent work on conditional convergence, places economic policies and institutions at the very centre. According to this view, it is putting it mildly to say that catch-up is possible: the economic opportunities for poor countries are, as the tigers have shown, phenomenal. The problem is not so much a lack of resources, but an inability to use existing resources well. It is surely uncontroversial to say that this is the right way to judge the performance of communist countries (those exemplars of negative value-added) before 1989. Mr Olson's contention is that most of today's poor countries are making mistakes of an essentially similar kind.

The question still remains: what are the right policies? One must turn again to the empirical evidence. That seems a frustrating answer because, suggestive though recent work on conditional convergence may be, such findings will always be contested. Citizens of the world who sensibly keep an eye on what economists are up to can at least take pleasure in this: the profession has chosen for once to have one of its most vigorous debates about the right subject.

**Main papers cited**


'The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Experience'. By Alwyn Young. NBER working paper 4680, 1994.


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