1 Debates about the basics

Maddison counting

A long, passionate affair with numbers has finally come to an end

ANGUS MADDISON, who died on April 24th 2010 at the age of 83, described himself as a chiffrephile – a lover of figures. Like many men, he had his first serious crush at the age of 13. He read "How to Pay for the War", by John Maynard Keynes; it was the annex on national income that most tickled his fancy. For the next 70 years he pursued ever more elusive numbers, estimating GDP for a growing range of countries over a lengthening span of time. In 1995 he published GDP estimates for 56 countries as far back as 1820. In 2001 his romantic adventures culminated in an estimate for world output in the year 1AD: $105.4 billion at 1990 prices.

GDP is a modern term, but the urge to count the nation's produce and compare countries' standards of living predates Adam Smith. Maddison saw himself as heir to a tradition that began with William Petty, the pioneer of "political arithmetick", who in 1665 estimated the income of England and Wales at £40m. That calculation was of pressing concern to Petty, who wanted to show the king how to pay for the war against the Dutch. But why did Maddison care about the GDP of the distant past?

He believed that the "pace and pattern" of economic activity had deep historical roots. Economies, he thought, do not "take off", as if from nowhere. Even the industrial revolution was too gradual to warrant the term revolution and too broad to be considered merely industrial. Take, for example, the progress of maritime technology. By 1773, John Harrison was claiming a £20,000 prize from the British Parliament for inventing a seaworthy chronometer. Captain James Cook

had reached Australia's east coast, and thanks to sauerkraut and citrus juice, he had lost none of his crew to scurvy.

Even scholars who believed there was a lot of economic progress to measure before the 19th century doubted there was enough data to measure it. Maddison made the most of whatever was available. He drew on one scholar's work on probate inventories in 17th and 18th century England, which showed that each generation passed on more property, furniture and houselinen to its descendants than the last. His economic portrait of Mughal India was influenced by a 16th-century survey by Abu Fazl, vizier to Emperor Akbar. His estimates of Japan's population relied on the annual register of religious affiliation, brought in after the Portuguese were expelled and Christianity outlawed in 1587. One of his students, Bart van Ark, now chief economist of the Conference Board, says Maddison urged him to venture beyond libraries and statistical offices. Even a painting in a museum might provide some clue to a country's standard of living centuries before.

"There is room for two or three economic theorists in each generation, not more," wrote Colin Clark, one of Maddison's heroes. Every other economist, he added, should be content to build knowledge by steadily laying "stone on stone". Maddison laid the foundations for many big thoughts. Ten days before his death he was cited in a speech by Robert Zoellick, president of the World Bank, declaring the end of the "third world". Maddison's figures show that Asia accounted for more than half of world output for 18 of the last 20 centuries. Its growing clout in the world economy is, therefore, a "restoration" not a revolution.

Even as they foreshadow the rise of Asia, his numbers also help explain the historical rise of Europe. His estimates of per head GDP provide a useful empirical crosscheck for a grand thesis proposed by Daron Acemoglu, Simon Johnson and James Robinson in 2005. They argued that European countries prospered after 1500 in so far as they imposed checks on monarchical power and enjoyed access to the Atlantic Ocean, with its lucrative trade in commodities and slaves. Maddison's estimates also appear in their work explaining why poor colonies became rich, and rich colonies became poor. They conclude that sparsely populated colonies benefited over the long run from the

property rights that European settlers brought with them. Richer, well-populated colonies suffered from efforts to suck them dry.

Messrs Acemoglu, Johnson and Robinson caution that Maddison's figures for the years before 1820 are "no more than educated guesses". Maddison freely conceded that the further back he went, the more he had to rely on "clues and conjecture". In an intemperate article in 2009, Gregory Clark of the University of California, Davis, described these numbers as "fictions, as real as the relics peddled around Europe in the Middle Ages". Credulous economists demanded numbers, "however dubious their provenance", and Maddison supplied them.

Go figure

Quantification can create the illusion of precision. For example, Maddison assumes that African GDP before 1820 remained more or less at subsistence levels. If that is all that can be said, does it add anything to put a number on it ($400–425 per head)? But he was not selling comforts to the credulous. He believed that numbers sharpened debate. Quantification, he wrote, "is more readily contestable and likely to be contested." In disputing his figures, scholars would be inspired to provide their own. Even those who disagreed with his work would be influenced by it.

Given the length and depth of his career, it is tempting to say that this intellectual influence is impossible to measure. But that would be contrary to his faith in quantification. His curriculum vitae counts 20 books and 130 articles, plus another 19 volumes that he edited or co-authored. His work has been translated into 12 languages and two books have racked up more than 2,000 citations, according to Google Scholar. He supervised 13 doctoral students, as well as co-founding the Groningen Growth and Development Centre at the University of Groningen, which he joined in 1978, and the Club des Chiffrephiles in 1990. But as even Maddison admitted, "no sensible person would claim that [quantification] can tell the whole story." He was deeply fond of numbers. And a large number were deeply fond of him.

Measuring what matters

Man does not live by GDP alone. A new report urges statisticians to capture what people do live by

HOW WELL OFF are Americans? Frenchmen? Indians? Ghanaians? An economist's simplest answer is the gross domestic product, or GDP, per person of each country. To help you compare the figures, he will convert them into dollars, either at market exchange rates or (better) at purchasing-power-parity rates, which allow for the cheapness of, say, haircuts and taxi rides in poorer parts of the world.

To be sure, this will give you a fair guide to material standards of living: the Americans and the French, on average, are much richer than Indians and Ghanaians. But you may suspect, and the economist should know, that this is not the whole truth. America's GDP per head is higher than France's, but the French spend less time at work, so are they really worse off? An Indian may be desperately poor and yet say he is happy; an American may be well fed yet fed up. GDP was designed to measure only the value of goods and services produced in a country, and it does not even do that precisely. How well off people feel also depends on things GDP does not capture, such as their health or whether they have a job. Environmentalists have long complained that GDP treats the despoliation of the planet as a plus (via the resulting economic output) rather than a minus (forests destroyed).

In recent years economists have therefore been looking at other measures of well-being – even "happiness", a notion that it once seemed absurd to quantify. Among those convinced that official statisticians should join in is Nicolas Sarkozy, the French president. On September 14th 2009 a commission he appointed in 2008, comprising 25 prominent social scientists, five with Nobel prizes in economics, presented its findings.[1] Joseph Stiglitz, the group's chairman and one of the laureates, said the 292-page report was a call to abandon "GDP fetishism". France's national statistics agency, Mr Sarkozy declared, should broaden its purview.

The commission divided its work into three parts. The first deals with familiar criticisms of GDP as a measure of well-being. It takes no account of the depreciation of capital goods, and so overstates the value of production. Moreover, the value of production is based on market prices, but not everything has a price. The list of such things includes more than the environment. The worth of services not supplied through markets, such as state health care or education, owner-occupied housing or unpaid child care by parents, is "imputed" – estimated, using often rickety assumptions – or left out, even though private health care and schooling, renting and child-minding are directly measured.

The report also argues that official statisticians should concentrate on households' incomes, consumption and wealth rather than total production. All these adjustments make a difference. In 2005, the commission found, France's real GDP per person was 73% of America's. But once government services, household production and leisure are added in, the gap narrows: French households had 87% of the adjusted income of their American counterparts. No wonder Mr Sarkozy is so keen.

Sizing up the good life

Next the commission turns to measures of the "quality of life". These attempt to capture well-being beyond a mere command of economic resources. One approach quantifies people's subjective well-being – divided into an overall judgment about their lives (a "ladder of life" score) and moment-by-moment flows of positive and negative feelings. For many years researchers had been spurred on by an apparent paradox: that rising incomes did not make people happier in the long run. Recent studies suggest, though, that countries with higher GDP per person do tend to have higher ladder-of-life scores. Exactly what, beyond income, affects subjective well-being – from health, marital status and age to perceptions of corruption – is much pored over. The unemployed report lower scores, even allowing for their lower incomes. Joblessness hits more than your wallet.

Third, the report examines the well-being of future generations. People alive today will pass on a stock of exhaustible and other

natural resources as well as machines, buildings and social institutions. Their children's human capital (skills and so forth) will depend on investment in education and research today. Economic activity is sustainable if future generations can expect to be at least as well off as today's. Finding a single measure that captures all this, the report concludes, seems too ambitious. That sounds right. For one thing, statisticians would have to make assumptions about the relative value of, say, the environment and new buildings – not just today, but many years from now. It is probably wiser to look at a wide range of figures.

Some members of the commission believe that the financial crisis and the recession have made a broadening of official statistics more urgent. They think there might have been less euphoria had financial markets and policymakers been less fixated on GDP. That seems farfetched. Stockmarket indices, soaring house prices and low inflation surely did more to feed bankers' and borrowers' exaggerated sense of well-being.

Broadening official statistics is a good idea in its own right. Some countries have already started – notably, tiny Bhutan. There are pitfalls, though. The report justifies wider measures of well-being partly by noting that the public must have trust in official statistics. Quite so; which makes it all the more important that the statisticians are independent of government. The thought of grinning politicians telling people how happy they are is truly Orwellian. Another risk is that a proliferation of measures could be a gift to interest groups, letting them pick numbers that amplify their misery in order to demand a bigger share of the national pie. But these are early days. Meanwhile, get measuring.

Note

1 "Report by the Commission on the Measurement of Economic Performance and Social Progress", available at www.stiglitz-sen-fitoussi.

Light relief

Data about light emitted into space may help improve growth estimates

HOW RAPIDLY DID Equatorial Guinea's GDP grow between 1975 and 1999? According to the latest version of the Penn World Table (PWT), the most comprehensive source of figures about countries' GDP since 1950, the answer is 4% a year. But the data in the 2002 version suggest an annual rate of −2.7%. As Arvind Subramanian, an economist who worked on the sums, points out, Equatorial Guinea may therefore have had the second-fastest economy in Africa. Unless, that is, it was the slowest.

This may be an extreme case but the PWT reckons that data for all 43 sub-Saharan African countries have margins of error of 30–40%. Much of this is due to the underfunding and overstretching of their statistical agencies. Some researchers have tried to use things like changes in electricity consumption as proxies for GDP growth. But these numbers also come from official agencies.

In a working paper, Vernon Henderson, Adam Storeygard and David Weil of Brown University suggest an alternative source of data: outer space. In particular they track changes in the intensity of artificial light over a country at night, which should increase with incomes. American military weather satellites collect these data every night for the entire world.

It is hard to know exactly how much weight to put on extraterrestrial brightness. Changes in the efficiency of electricity transmission, for example, may cause countries to look brighter from outer space, even if economic activity has not increased much. But errors in its measurement are unlikely to be correlated with errors in the calculation of official GDP, since they arise for different reasons. A weighted average of the growth implied by changes in the intensity of artificial light and official GDP growth rates ought to improve the accuracy of estimates of economic growth. Poor countries in particular may have dodgy GDP numbers but their night-light data are as reliable as anyone else's.

Take Myanmar's economy, which grew at an official but improbable 8.3% a year between 1993 and 2003; adjusting for brightness suggests a more modest 5.8%. But night-light data suggest that official figures may be understating growth in places like Tajikistan or the Congo, perhaps because of rising informal economic activity.

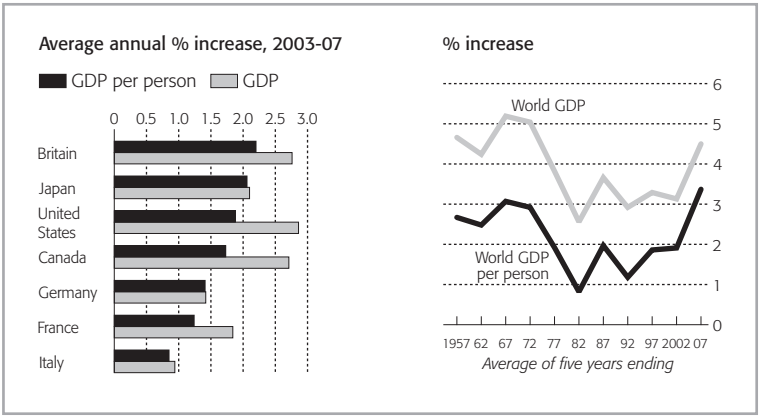
Grossly distorted picture

If you look at GDP per head, the world is a different – and, by and large, a better – place

WHICH ECONOMY ENJOYED the best economic performance between 2003 and 2007: America's or Japan's? Most people will pick America. The popular perception is that America's vibrant economy was sprinting ahead (albeit fuelled by credit and housing bubbles that have now painfully burst), whereas Japan crawled along at a snail's pace. And it is true that America's average annual real GDP growth of 2.9% was much faster than Japan's 2.1%. However, the single best gauge of economic performance is not growth in GDP, but GDP per person, which is a rough guide to average living standards. It tells a completely different story.

GDP growth figures flatter America's relative performance, because its population is rising much faster, by 1% a year, thanks to immigration and a higher birth rate. In contrast, the number of Japanese citizens has been shrinking since 2005. Once you take account of this, Japan's GDP per head increased at an annual rate of 2.1% between 2003 and 2007, slightly faster than America's 1.9% and much better than Germany's 1.4%. In other words, contrary to the popular pessimism about Japan's economy, it has actually enjoyed the biggest gain in average income among the big three rich economies. Among all the G7 economies it ranks second only to Britain (see Figure 1.1, left-hand side).

Using growth in GDP per head rather than crude GDP growth reveals a strikingly different picture of other countries' economic health. For example, Australian politicians often boast that their economy has had one of the fastest growth rates among the major developed nations – an average of 3.3% over the five years to 2007. But Australia has also had one of the biggest increases in population; its GDP per head grew no faster than Japan's over this period. Likewise, Spain has been one of the euro area's star performers in terms of GDP growth, but over the three years to 2007 output per person



Sources: IMF; Angus Maddison; Economist Intelligence Unit; National statistics

FIG 1.1 Looking through a di erent lens

grew more slowly than in Germany, which like Japan, has a shrinking population.

Some emerging economies also look less impressive when growth is compared on a per-person basis. One of the supposedly booming BRIC countries, Brazil, has seen its GDP per head increase by only 2.3% per year since 2003, barely any faster than Japan's. Russia, by contrast, enjoyed annual average growth in GDP per head of 7.4% because the population is falling faster than in any other large country (by 0.5% a year). Indians love to boast that their economy's growth rate has almost caught up with China's, but its population is also expanding much faster. Over the five years to 2007, the 10.2% average increase in China's income per head dwarfed India's 6.8% gain.

Focusing on GDP per person also affects comparisons of economic health over time. During the five years to 2007, world GDP grew by an average of 4.5% a year, its fastest for more than three decades, though not as fast as during the golden age of the 1960s when annual growth exceeded 5%. But the world's population is now growing at half of its pace in the 1960s, and so world income per head has increased by more over the five years to 2007 than during any other period on record (see Figure 1.1, right-hand side). Mankind has never had it so good.

Redefining recession

Once you accept that growth in GDP per head is the best way to measure economic performance, the standard definition of a recession – a decline in real GDP over some period (eg, two consecutive quarters or year on year) – also seems flawed. For example, zero GDP growth in Japan, where the population is declining, would still leave the average citizen better off. But in America, the average person would be worse off. A better definition of recession, surely, is a fall in average income per person. On this basis, America has been in recession since the fourth quarter of 2007 when its GDP rose by an annualised 0.6%, implying that real income per head fell by 0.4%.

Many Americans will shrug this off, especially those politicians who believe that the prime goal of policy is to retain their economic and military dominance over the world. They see the size of a country's GDP as the best measure of its economic clout, in which case the absolute rate of GDP growth matters more than growth in income per head.

There are several other reasons Americans can quibble over the use of GDP per head, especially with reference to Japan. Firstly, its shrinking population is also an ageing one in which the labour force will decline as a share of the population. Unless this is offset by more rapid productivity growth, this could make it harder to maintain the same growth in output per person in future and so harder to pay pension bills. Secondly, slower GDP growth makes it more difficult to reduce the ratio of existing public-sector debt to GDP, which by 2010 was nearing 200% in Japan. Last, but not least, investors care about GDP growth. Corporate profits depend upon the absolute rate of growth of an economy. And companies wanting to invest abroad will favour markets that are expanding more rapidly.

If GDP per head is nevertheless a superior measure of people's prosperity, why do governments not publish such figures each quarter along with their standard GDP figures? Population statistics tend to be less up-to-date than GDP figures and are generally not available on a quarterly basis. But that is a lame excuse: it should be much easier to count bodies than to put a value on diverse sorts of economic output. Not only do people have a right to know whether average

living standards are rising or falling, but publishing such numbers could also benefit some countries. If Japan's government had drawn attention to the sprightlier growth in income per head in recent years, in contrast to endless reports about its "underperforming" economy, consumers may have felt cheerier and spent more – in other words, its GDP growth would have been stronger.

On the poverty line

Has "a dollar a day" had its day?

IN DECEMBER 2007 the World Bank unveiled the results of the biggest exercise in window shopping in history. Scouts in 146 countries scoured stalls, supermarkets and mail-order catalogues, recording the price of more than 1,000 items, from 500-gram packets of durum spaghetti to low-heeled ladies' shoes.

This vast enterprise enabled the bank to compare the purchasing power of many countries in 2005. It uncovered some statistical surprises. Prices in China, for example, were much higher than earlier estimates had indicated, which meant the Chinese income in 2005 of 18.4 trillion yuan ($2.2 trillion at then-market exchange rates) could buy less than previously thought. At a stroke, the Chinese economy shrank, in real terms, by 40%.

Since then, many scholars have wondered what this economic demotion means for the bank's global poverty counts. It famously draws the poverty line at "a dollar a day", or more precisely $1.08 at 1993 purchasing-power parity (PPP). In other words, a person is poor if they consume less than an American spending $1.08 per day in 1993. By this yardstick 969m people suffered from absolute poverty in 2004, a drop of over 270m since 1990. The world owed this progress largely to China, where poverty fell by almost 250m from 1990 to 2004.

But if the Chinese economy was 40% smaller than previously thought, surely its poverty count must be correspondingly higher. Surjit Bhalla, of Oxus Investments, speculated that China's toll would increase by more than 300m. He mischievously accused the bank's number-crunchers of conspiring to lift the poverty count so as to keep their employer in business beyond its natural life.

Give a quarter, take a quarter

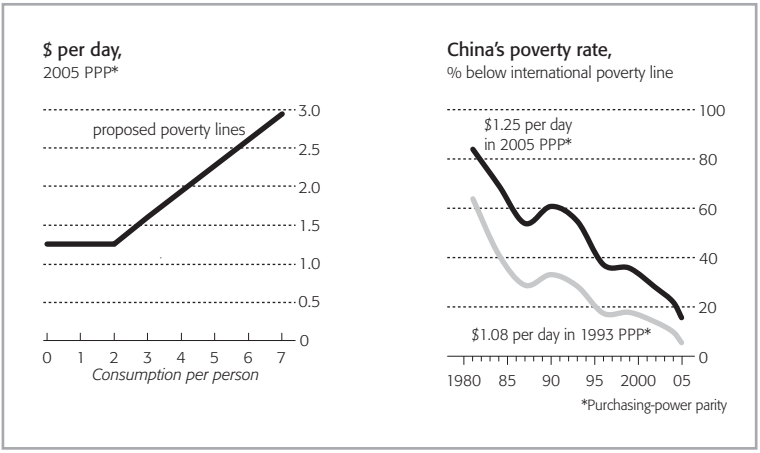
The dollar-a-day definition of global destitution made its debut in the bank's 1990 *World Development Report*. It was largely the discovery of Martin Ravallion, a researcher at the bank, and two co-authors, who noticed that the national poverty lines of half-a-dozen developing countries clustered around that amount. In two working papers[2] published in May 2008, Mr Ravallion and two colleagues, Shaohua Chen and Prem Sangraula, revisit the dollar-a-day line in light of the bank's new estimates of purchasing power. They also provide a new count of China's poor.

Thanks to American inflation, $1.08 in 1993 was worth about $1.45 in 2005 money. In principle, the researchers could count the number of people living on less than this amount, converted into local money using the bank's new PPP rates. But $1.45 a day strikes the authors as a bit high. Rather than update their poverty line, they propose to abandon it. It is time, they say, to return to first principles, repeating the exercise Mr Ravallion performed almost two decades ago, using the better, more abundant data available now.

They gather 75 national poverty lines, ranging from Senegal's severe $0.63 a day to Uruguay's more generous measure of just over $9. From this collection, they pick the 15 lowest (Nepal, Tajikistan and 13 sub-Saharan countries) and split the difference between them. The result is a new international poverty line of $1.25 a day.

Why those 15? The answer is philosophical, as well as practical. In setting their poverty lines, most developing countries aim to count people who are poor in an absolute sense. The line is supposed to mark the minimum a person needs to feed, clothe and shelter himself. In Zambia, say, a poor person is defined as someone who cannot afford to buy at least two to three plates of *nshima* (a kind of porridge), a sweet potato, a few spoonfuls of oil, a handful of groundnuts and a couple of teaspoons of sugar each day, plus a banana and a chicken twice a week.

But even in quite poor countries, a different concept of poverty also seems to creep in, the authors argue. It begins to matter whether a person is poor relative to his countrymen; whether he can appear in public without shame, as Adam Smith put it.



Source: Shaohua Chen and Martin Ravallion

FIG 1.2 Lines, damned lines and statistics

This notion of relative deprivation seems to carry weight in countries once they grow past a consumption of $1.95 per person a day. Beyond this threshold, a country that is $1 richer will tend to have a poverty line that is $0.33 higher (see Figure 1.2). The authors thus base their absolute poverty line on the 15 countries in their sample below this threshold.

How many people in the world are poor by this new definition? The authors are not yet ready to say. But they have taken another look at China. By their new standard, they find that 204m Chinese people were poor in 2005, about 130m more than previously thought.

That is the bad news. The brighter news is that China's progress against poverty is no less impressive than previously advertised. By Mr Ravallion's and Ms Chen's new standard, the number of poor in China fell by almost 407m from 1990 to 2004, compared with the previous estimate of almost 250m.

China's economic co-ordinates may be different than thought, but its trajectory is much the same. And therein lies a lesson. Give or take a dime or two, it matters little where a poverty line is drawn. Like a line in the sand, an absolute poverty standard shows whether the economic tide is moving in or out. It does not matter too much where on the beach it is drawn.

For practical purposes, policymakers will always care more about their own national poverty lines than the bank's global standard. The dollar-a-day line is more of a campaigning tool than a guide to policy. And as a slogan, $1.25 just doesn't have the same ring to it. A better option might be to reset the poverty line at $1 in 2005 PPP, which would line up reasonably well with at least ten countries in the authors' sample. In adding a quarter to the dollar-a-day poverty line, the researchers may cut its popular appeal by half.

Note

1 "Dollar a day revisited", Working Paper 4620. "China is poorer than we thought, but no less successful in the fight against poverty", Working Paper 4621.

Redefining recession

A new yardstick for measuring slumps is long overdue

THERE HAS BEEN a nasty outbreak of R-worditis. Newspapers are full of stories about which of the big economies will be first to dip into recession as a result of the credit crunch. The answer depends largely on what you mean by "recession". Most economists assume that it implies a fall in real GDP. But this has created a lot of confusion: the standard definition of recession needs rethinking.

In the second quarter of 2008, America's GDP rose at a surprisingly robust annualised rate of 3.3%, while output in the euro area and Japan fell, and Britain's was flat. Many economists reckon that both Japan and the euro area could see a second quarter of decline in the three months to September. This, according to a widely used rule of thumb, would put them in recession, a fate which America has so far avoided. But on measures other than GDP, America has been the economic laggard over the past year.

Figure 1.3 looks at several different ways to judge the severity of the economic slowdown since the start of the credit crunch in August 2007. On GDP growth, America has outperformed Europe and Japan. Unemployment, however, tells a very different tale. America's jobless rate hit 6.1% in August, up from 4.7% a year earlier, and within spitting distance of its peak of 6.3% during the previous recession after the dotcom bust. Other countries have so far published figures only for July, but their jobless rates have barely moved over the past year: Japan's has risen by only 0.2%, the euro area's has fallen slightly (though in absolute terms it is still a bit higher than America's). Another yardstick, GDP per head, takes account of the fact that America's population is rising rapidly, whereas Japan's has started to shrink. Since the third quarter of 2007 America's average income per person has barely increased; Japan's has enjoyed the biggest gain.

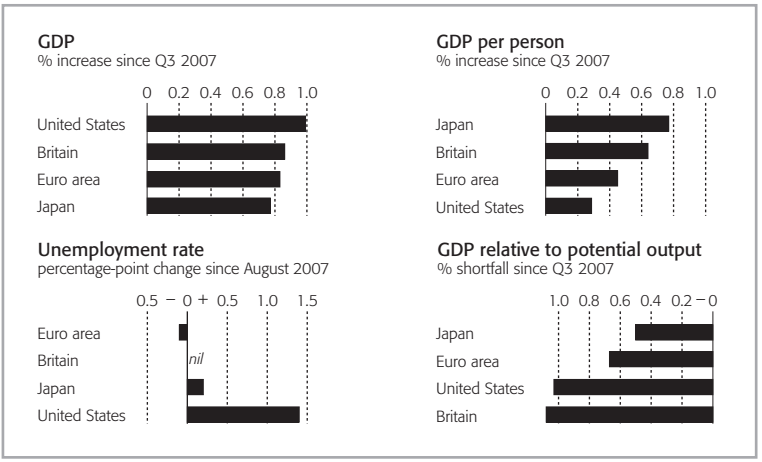
To the average person, a large rise in unemployment means a recession. By contrast, the economists' rule that a recession is defined by two consecutive quarters of falling GDP is silly. If an economy

grows by 2% in one quarter and then contracts by 0.5% in each of the next two quarters, it is deemed to be in recession. But if GDP contracts by 2% in one quarter, rises by 0.5% in the next, then falls by 2% in the third, it escapes, even though the economy is obviously weaker. In fact, America's GDP did not decline for two consecutive quarters during the 2001 recession.

However, it is not just the "two-quarter" rule that is flawed; GDP figures themselves can be misleading. The first problem is that they are subject to large revisions. An analysis by Kevin Daly, an economist at Goldman Sachs, finds that since 1999, America's quarterly GDP growth has on average been revised down by an annualised 0.4 percentage points between the first and final estimates. In contrast, figures in the euro area and Britain have been revised up by an average of 0.5 percentage points. Indeed, there is good reason to believe that America's recent growth will be revised down. An alternative measure, gross domestic income (GDI), should, in theory, be identical to GDP. Yet real GDI has risen by a mere 0.1% since the third quarter of 2007, well below the 1% gain in GDP. A study by economists at the Federal Reserve found that GDI is often more reliable than GDP in spotting the start of a recession.

Tapping the slumpometer

These are good reasons not to place too much weight on GDP in trying to spot recessions or when comparing slowdowns across economies. The Business Cycle Dating Committee of the National Bureau of Economic Research (NBER), America's official arbiter of recessions, instead makes its judgments based on monthly data for industrial production, employment, real income, and wholesale and retail trade. It has not yet decided whether a recession has begun. But even the NBER's more sophisticated approach is too simplistic in that it defines a recession as an absolute decline in economic activity. This can cause problems when trying to compare the depth of downturns in different cycles or across different countries. Suppose country A has a long-term potential (trend) growth rate of 3% and country B one of only 1.5%, due to slower labour-force growth. Annual GDP growth of 2% will cause unemployment to rise in country A (making it feel



Sources: Thomson Datastream; IMF; *The Economist*

FIG 1.3 Don't say "R"

like a recession), but to fall in country B. Likewise, if faster productivity growth pushes up a country's trend rate of growth, as it has in America since the mid-1990s, an economic downturn is less likely to cause an absolute drop in output.

This suggests that it makes more sense to define a recession as a period when growth falls significantly below its potential rate. The IMF estimates that America and Britain have faster trend growth rates than Japan or the euro area. The bottom-right chart in Figure 1.3 shows that since the third quarter of 2007, growth has been below trend in all four economies, but Britain, closely followed by America, has seen the biggest drop relative to potential.

But even if this is a better definition of recession, potential growth rates are devilishly hard to measure and revisions to GDP statistics are still a problem. One solution is to pay much more attention to unemployment numbers, which, though not perfect, are generally not subject to revision and are more timely. A rise in unemployment is a good signal that growth has fallen below potential. Better still, it matches the definition of recession that ordinary people use. During the past half-century, whenever America's unemployment rate has risen by half a percentage point or more the NBER has later (often

much later) declared it a recession. European firms are slower at shedding jobs, so unemployment may be a lagging indicator. Even so, the jobless rate has usually started to rise a few months after the start of a recession.

As the old joke goes: when your neighbour loses his job, it is called an economic slowdown. When you lose your job, it is a recession. But when an economist loses his job, it becomes a depression. Economists who ignore the rise in unemployment deserve to lose their jobs.

Note

This piece was published before it was certain that the world economy as a whole would contract in 2009.

Paul Samuelson

The last of the great general economists died on December 13th 2009, aged 94

"I WAS REBORN, born as an economist, at 8.00am on January 2nd 1932, in the University of Chicago classroom," wrote Paul Samuelson in a memoir published at the beginning of December 2009. He became probably the most influential economist of the second half of the 20th century. For his work in several branches of the dismal science he became the first American economics Nobel laureate. Through his bestselling textbook, he introduced millions of people to the subject. And right to the end he kept on mentoring the profession's brightest stars.

His actual birth took place almost 17 years earlier in the steel town of Gary, Indiana, to a family of upwardly mobile Polish immigrants. His earliest memories – of the recession of 1919–21 and strikebreaking immigrant workers from Mexico, and of the boom and bust that followed – shaped Mr Samuelson's macroeconomic views throughout his life. He approved of massive government spending to help an economy escape from recession when monetary policy can do no more. When the Obama administration introduced just that sort of stimulus in 2009, partly on the advice of Mr Samuelson's nephew, Larry Summers, who is Mr Obama's chief economic adviser, he was quick to approve.

Though regarded as America's leading standard-bearer for Keynesian economics, he called himself a "cafeteria Keynesian", just picking the bits he liked. His combination of Keynesian and classical economic ideas became known as the "neoclassical synthesis". From his chair at the Massachusetts Institute of Technology and in his column in *Newsweek*, the self-described "dull centrist" became a fierce critic of the libertarian Chicago School, and especially of Milton Friedman (writer of a rival *Newsweek* column). Markets are not perfect, he believed, and dire warnings from Friedman, and earlier from Friedrich von Hayek, about the regulation of markets "tells us something

about them rather than something about Genghis Khan or Franklin Roosevelt. It is paranoid to warn against inevitable slippery slopes … once individual commercial freedoms are in any way infringed upon."

As for Mr Samuelson's friend of 50 years, Alan Greenspan, once chairman of the Federal Reserve, "the trouble is that he had been an Ayn Rander" – a devotee of laissez-faire capitalism. "You can take the boy out of the cult but you can't take the cult out of the boy," Mr Samuelson told the *Atlantic* in summer 2009. "He actually had [an] instruction, probably pinned on the wall: 'Nothing from this office should go forth which discredits the capitalist system. Greed is good'."

The huge sales of Mr Samuelson's textbook, "Economics", first published in 1948 and updated every three years, owed much to his lively writing. (The abstract of his memoir ended with the words: "Boo hoo.") The book transformed how economics was – and is – taught around the world. If the earlier editions too readily believed that an economy could achieve equilibrium, that may have stemmed from the author's conviction that mathematics could be a useful tool for economists, and that economics had much to learn from physics and the laws of thermodynamics. Today it is fashionable to argue that economics was led astray by "physics envy", which blinded it to the subtleties of human behaviour, yet after winning his Nobel prize in 1970 Mr Samuelson anticipated economists' current interest in biological systems by writing several papers on Mendelian dynamics.

The inefficient market

He was the last of the great general economists, making important contributions on trade, macroeconomics, public finance and consumer behaviour. Yet he decided, at around 50, that to remain academically competitive he had to specialise. Perhaps because it was close to his beloved mathematics, the specialist field he chose was financial economics.

His work helped lay the foundations for two of the field's biggest ideas: the efficient-market hypothesis and options pricing. In 1965 he published a paper explaining that in well-informed and competitive speculative markets, price movements over time will be essentially

random – a concept at the heart of the efficient-market hypothesis later described in its full majesty by Eugene Fama, whom Mr Samuelson believed ought to win a Nobel prize. In the 1950s it was Mr Samuelson who had rediscovered the pioneering early work of Louis Bachelier, a French mathematician whose insights would later underpin the Black-Scholes option-pricing model; and it was Mr Samuelson who suggested the assumption, that share prices move according to geometric Brownian motion, which makes this model workable. Mr Samuelson remained close to Robert Merton, who won a Nobel prize for his work with Fischer Black and Myron Scholes on options pricing.

Yet Mr Samuelson also understood that beyond the ivory tower the conditions necessary for efficient markets rarely existed; they needed regulating. "To understand economics you need to know not only fundamentals but also its nuances," Mr Samuelson would explain. "When someone preaches 'Economics in one lesson' I advise: Go back for the second lesson." The latest crisis (for which he felt some responsibility, since he had helped develop financial derivatives that company executives did not understand) proved that "free markets do not stabilise themselves. Zero regulating is vastly suboptimal to rational regulating. Libertarianism is its own worst enemy!"

Mr Samuelson was happy to be "linked with such Methuselah masters as Verdi" who did some of their best work in old age. He was able to do so, not least, because of his interest in evidence-based medicine. For decades he read the *New England Journal of Medicine*, and – noting a weakness in his male ancestors – he was an early adopter of cholesterol-reducing statin pills, as well as skimmed milk. His passion for "looking for theoretical understandings of empirical reality" may help explain his long life, as well as his lengthy list of achievements.

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