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The Future of Global Economics



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Which Way the Wind Blows

YOU can call this our Bob Dylan issue. It may seem odd for an economics magazine to draw inspiration from the legendary singer/songwriter, but one of his most famous lines, “The times, they are a-changin’,” reverberated through our corridors as we put together this special issue on the global economy’s past and future.

We weren’t humming the tune to pass the time. The lyrics seemed especially relevant to us this year, as we mark the 70th anniversary of the IMF and World Bank and the 50th anniversary of *F&D*. The world has seen a staggering amount of change in the past seven decades.

So, with these two anniversaries in mind and with Dylan’s ode to changing times in the air, we focused our attention on the transformation of the global economy—looking back and looking ahead. We wanted to address the question, what will the global economy look like in another 70 years?

To help us, we turned to some of the sharpest minds in economics. We asked five Nobel laureates—George Akerlof, Paul Krugman, Robert Solow, Michael Spence, and Joseph Stiglitz—to share their thoughts on which single “frontier” issue promises to shape the economic landscape in the years ahead. Their responses might surprise you.

Elsewhere, IMF Chief Christine Lagarde charts a course for the IMF in the next decade in a Straight Talk piece, and IMF Chief Economist Olivier Blanchard distills the lessons of the most jarring economic event in recent memory—the 2008 global financial crisis—and underscores the need for economists to change the way they look at the world. Dylan was on the minds of Ayhan Kose and Ezgi Ozturk, who begin their chart-article on economic transformations of the past 70 years with words from the singer himself.

Other articles on the global economy’s past and future include a piece on the perils and promise of globalization by Martin Wolf of the *Financial Times*; a look at economic trends that can help us prepare for future challenges by Kalpana Kochhar, Yan Sun, Evridiki Tsounta, and Niklas Westelius; and a primer on the postwar monetary system by Rex Ghosh. Articles on the future of energy in the global economy by Jeffrey Ball and on measuring inequality—the most hotly debated economic issue of recent days—by Jonathan Ostry and Andrew Berg round out the package.

In keeping with our “change” theme, we sought to try a few things for the first time: cartoonist Nick Galifianakis and Joe Procopio tell the story of the IMF’s origins in a way that’s never been done before in the pages of *F&D*—a seven-page comic. And to press the music theme a bit further, our Picture This looks at the Beatles and their role as an export earner.

Finally, we profile a giant in economics—Nobel winner and Stanford professor Ken Arrow, who built on an early passion for math and work in meteorology during World War II to launch a storied career in economics. To paraphrase Mr. Dylan, Ken Arrow certainly knows which way the wind blows.

Jeffrey Hayden
Editor-in-Chief


 A portrait of Kenneth J. Arrow, an elderly man with white hair and glasses, wearing a blue and white checkered shirt. He is smiling slightly and looking towards the camera. The background is a blurred outdoor setting with greenery and a building.

Path BREAKER

Janet Stotsky
profiles
Kenneth J.
Arrow, a Nobel
Prize-winning
theorist who
has done
pioneering
work in many
areas of
economics

KENNETH J. ARROW'S path-breaking contributions to economic theory in the years after World War II are the cornerstones of the work of successive generations of theoretical and applied scholars across the economics profession.

The late economic theorist Frank Hahn, alluding to Shakespeare's description of Julius Caesar, once said that his colleague Arrow "bestrides the world like a colossus" There is hardly any area of our subject which he has not illuminated and often profoundly changed," demonstrated perhaps by the disparate economic concepts with his name attached—such as the Arrow-Debreu model, the Arrow impossibility theorem, and Arrow securities.

Although Arrow's first love was mathematics and mathematical statistics, he ended up an economist for a very economic reason. He ran out of money while a graduate student in mathematical statistics at Columbia University just before World War II, and the economics department offered him financial aid.

The highest bidder

Harold Hotelling, an economist, taught some of the statistics courses and "gave a course in mathematical economics" that Arrow said he took "out of curiosity." But because it began to hook him on economics, when his cash ran down Arrow approached Hotelling. The economist told Arrow that he had no influ-

ence over the math department's financial awards, but he could help him if he switched to economics. "So I switched to economics. People get very shocked by this. I said, 'You're all economists—why shouldn't I go to the highest bidder?'" he recalled in a recent interview in his office at Stanford University, where he spent most of his professional life.

That move to the economics department started a career during which he would share a Nobel Prize for economics in 1972—at 51, the youngest economist ever to win one. The Nobel committee cited the work of Arrow and British economist John Hicks in two areas: *general equilibrium theory*, which seeks to explain how prices are set across an economy, and *welfare theory*, which analyzes the optimal allocation of goods and services in an economy. But the Nobel committee also noted that both economists had made important contributions in other areas.

That is clearly true of Arrow, who has studied what happens when one side in a transaction knows more than the other, showed how technical change can arise from economic activity, and introduced the idea of risk and uncertainty to equilibrium analysis. He has also made contributions to the economic analysis of racial discrimination and health care. Moreover, in his first major foray into economic analysis, his doctoral dissertation, Arrow essentially invented the field of *social*

choice theory, which looks at how individual preferences are aggregated into social choice decisions, such as in voting.

In nearly all his endeavors Arrow introduced mathematical rigor and was a major influence in making economic theory as mathematically oriented as it is today.

The son of immigrants from Romania, Arrow was born in New York City in 1921. Like many in his generation, he was strongly affected by the dislocations of growing up during the Great Depression. His father's comfortable living as a banker was upended and the family moved frequently as his father's income rose and fell. "I wound up going to school in a lot of different places," he recalled. But the family finally settled back in New York, where he attended Townsend Harris, a three-year public high school ("you did that by staying an extra hour a day in class"). There the mathematics bug bit him. When he graduated from high school in 1936, "we were still very poor . . . so the only real chance of going to college" was the tuition-free City College of New York (CCNY).

Like many young people who experienced the ravages of the Depression, "I was concerned about getting a job . . . The question was, where could I get a secure job? And there was one obvious one—being a high school teacher of mathematics." As a result he majored in math and education, although he found education courses "not very inspiring."

No jobs teaching math

And, as would happen several years later at Columbia, mathematics did not come through for Arrow. There was such a backlog of applicants who had passed the exam for math teachers in 1933 that New York hadn't held an examination since. As a result, Arrow said, he decided that he'd "better not bet everything on this job. So I learned to do something called statistics, and I got interested in it . . . It happened that Columbia fortunately was the place to study." After he graduated from CCNY in 1940, his father borrowed money to pay his tuition at Columbia, and "I easily enrolled in the math department. . . . But I realized, as I've learned through the rest of my life, mathematicians look down on statistics."

That's when Hotelling stepped in to entice Arrow to study economics. After receiving a master's degree in mathematics, Arrow pushed hard to learn economics. He took all his qualifying courses and passed his oral exam for a doctorate by the end of 1941. But World War II intervened, putting a temporary halt to his studies. "It was clear I was going in the Army." So instead of waiting to be drafted, he decided to find something that would interest him. "The closest thing I could find was weather forecasting," a crucial activity for the Air Force, which was then part of the U.S. Army.

He studied meteorology at New York University, then was assigned to a research center, where part of what he did "was verifying how good weather forecasts are." But he also identified "a real problem: How do you use wind forecasts to guide the plane so the plane could take advantage of the winds?" It wasn't important for getting planes more quickly to Europe from North America, but it was important for conserving fuel. Arrow said he worked out a method to reduce fuel consumption by 20 percent. He never persuaded the military to use

his technique, but "I think it's been used commercially since then." Moreover, his research was the basis for a paper, "On the Optimal Use of Winds for Flight Planning," which appeared in 1949. The first published paper by the future Nobel Prize winner in economics was in the *Journal of Meteorology*.

"There is hardly any area of our subject which he has not illuminated and often profoundly changed."

When the war ended, Arrow returned to Columbia, with a good fellowship that had been held for him while he was in the service and a belief that "I had to do something very important. . . . I felt I was a very good student, but without having an original idea."

In 1947, still casting about for a dissertation topic, he joined the Cowles Commission for Research in Economics at the University of Chicago as a researcher with a faculty appointment. The commission, founded in 1932 by businessman Alfred Cowles, studied the link between economic theory and mathematics and statistics. At Cowles he met Selma Schweitzer, who was studying there. Not only did he marry her that year, but she introduced him to statistician M.A. Girschik, who invited Arrow to spend the next summer at the RAND Corporation, a global policy think tank. "That summer, 1948, was the year I took off."

In conversations at RAND with German philosopher and futurologist Olaf Helmer, Arrow was inspired to write his dissertation on social choice theory. The concept was so new that his dissertation adviser, Albert Hart, knew nothing of what Arrow was exploring. "But he had a lot of confidence in me He said, 'Well, I don't know what it's all about, but I will trust you,'" Arrow said.

In the dissertation and a book, *Social Choice and Individual Values*, which was published in 1951, the year he received his doctorate, Arrow laid the foundations for the field of social choice theory, which examines mathematically such issues as how well individual voters' different views about candidates and issues are reflected in an election outcome. In what is now called the Arrow impossibility (or possibility) theorem, he postulated that when certain reasonable conditions of fairness are imposed, it is impossible for a voting system to accurately reflect societal preferences. Mainstream economists tend to model individuals as rational. One implication is that preferences are transitive—meaning, for example, that voters who prefer candidate Smith to Jones and Jones to Williams will prefer Smith to Williams. Arrow's theorem shows that when only four reasonable conditions are imposed on three or more choices, it is impossible to aggregate rational individual preferences into social preferences that maintain transitivity of decision making. That is, there is no method to ensure that social preferences (winners of elections, say) will be accurately reached from individual preferences. Social choice theory is used to help understand group decision making and to design voting rules.

Unblocked

Completing his dissertation was the key to his success. “Once I got that dissertation out of the way on social choice, it unblocked me somehow.”

Arrow applied advanced mathematics to the theory of general equilibrium, an idea that went back to economist Léon Walras in 1874 and was, in a sense, a demonstration that Adam Smith was right. Myriad economic actors seeking to further their own ends do not create chaos but are guided by an “invisible hand” that results in relatively orderly economy-wide production of goods, services, and jobs.

In economics, market equilibrium refers to a set of prices for which demand equals supply for all goods. Partial equilibrium analysis looks at the demand for (or supply of) a good as a function of its price, holding other prices fixed. General equilibrium analysis looks at all prices as variable and for equality of demand and supply in all markets. For example, the demand for natural gas in global markets may depend not only on its price but also on those of oil and other fossil fuels and of goods and services that may have a less immediate relationship to energy markets—and also on wages and interest rates.

In 1954, Arrow, working with French economist Gérard Debreu, developed general conditions for prices at which overall supply equals overall demand for every item in an economy (now known as the Arrow-Debreu model of general equilibrium). Working independently, Lionel McKenzie arrived at a similar result in a somewhat different manner. Arrow and Debreu (who won a Nobel in 1983) drew on ideas John Nash had developed in game theory—then a new field of study in mathematics that analyzes strategies for competition in which the outcome of one participant’s actions depends on actions of others and for which Nash won a 1994 Nobel Prize.

In later work, including that written with Leonid Hurwicz, Arrow looked at the stability of markets and how prices adjust to equilibrate supply and demand.

General equilibrium thinking led to the development of theoretical and empirical models that explicitly incorporate interactions between parts of the economy—such as those that tie together the consumption and production sides.

Such general equilibrium models are used in many areas of economics. In public finance and international trade, these models might assess whether countries are better or worse off because of tax and tariff changes. In the early 1970s, John Shoven, a longtime Stanford colleague of Arrow, and British economist John Whalley devised the first applied general equilibrium model of the U.S. economy to assess tax changes. When applied to economic development, such models might assess how a growing export sector affects wages.

General equilibrium analysis has also greatly influenced modern thought about the macro, or overall, economy. Economists sought to find in microeco-

nomics, which studies the behavior of individual markets, the foundations of the macroeconomy. New classical macroeconomic theory draws on general equilibrium as the basis for its view of the economy as fundamentally in equilibrium, with flexible prices and wages in individual markets. Deviations from equilibrium quickly clear (resolve themselves). The Keynesian or neo-Keynesian schools (See “What Is Keynesian Economics?” in this issue of *F&D*) also draw on general equilibrium ideas, but reject the idea that markets always or quickly clear. Prices and wages tend to be slow to change, they argue, allowing economies to be out of equilibrium for long periods—and providing a rationale for activist fiscal and monetary policies. *Dynamic stochastic general equilibrium models* try to capture the inherently changing and uncertain nature of macroeconomic developments. Arrow believes that macroeconomic models must address the tendency of markets to remain out of equilibrium, as they did with prolonged unemployment during the Great Depression.

Welfare breakthrough

In 1951, just after introducing social choice theory, Arrow applied advanced mathematics to the area of welfare economics that is concerned with so-called Pareto optimality, a situation in which it is impossible to make one person better off without making someone else worse off. Pareto optimality is one criterion to measure whether an economy is functioning well. The first theorem of welfare economics describes the conditions under which a competitive general equilibrium results in a Pareto optimal allocation of resources; the second theorem describes the conditions under which every Pareto optimal outcome for an economy can be achieved with a competitive equilibrium and some redistribution of resources. Arrow’s treatment generalized these theorems so that they apply when some goods or services are not demanded or supplied, which happens often and is what economists refer to as a “corner solution.”

General equilibrium theory initially contained no element of uncertainty or risk. Building on the difficulty of insuring against risk in markets, Arrow introduced the notion of a “contingent” commodity, one that combines a commodity’s physical characteristics with what is going on in the world into which it is delivered (wheat produced during a drought is different from wheat produced in a year of abundance). He then postulated a financial security whose payout depends on the state of the world. This so-called Arrow security is at the foundation of modern finance theory. It allows market participants to economize on the number of commodities they need to trade. For instance, farmers can enter into contracts to sell their wheat in the future at a specific price to insure against the risk of the price falling too much. These futures contracts can then be traded in a market where participants have different expectations about prices.



A crucial tool of economic analysis is the production function, which describes how inputs such as labor and capital combine to produce final output. Theories of growth had assumed that technical change, an important driver of productivity growth (using fewer inputs to produce a particular output), was not the result of economic activity but came from outside, even though common sense suggested that

“Arrow’s students absolutely loved him. He shared brilliance and insight with us.”

many technical improvements were the result of economic activity. Arrow’s 1962 paper on learning by doing developed the idea that through experience, workers and businesses improve their productivity and that some of this knowledge generates benefits for the economy as a whole. This idea helps explain certain realities, such as the persistently large differences in productivity across countries.

Arrow’s 1963 paper on uncertainty and the welfare economics of medical care explained the difficulties in designing a well-functioning market for medical care both because some participants know more than others—for example, the gap in medical knowledge between doctors and their patients—and because there is an absence of price competition in this market. He demonstrated the central importance of moral hazard in the medical marketplace—for example, greater demand for medical care by patients with insurance. A committee of leading economists said the article was one of the 20 most influential in the first century of the *American Economic Review*, the flagship publication of the American Economic Association.

Branching out

In other important efforts, Arrow, with Mordecai Kurz, set out an approach to optimizing public investments. Arrow also looked at some of the economic and noneconomic explanations for the persistence of racial discrimination in and outside the workplace.

Arrow’s concern for the practical problems of economics and social and political issues has taken him from work on climate change to work on subsidizing medicine in developing economies. He was one of the first contributors to the intergovernmental panel on climate change, which provides authoritative estimates on its impact.

Much of his work on climate change has focused on the way individuals evaluate what might happen in the future. In a recent article in the journal *Nature*, Arrow and his coauthors argue that the U.S. government underestimated the cost of carbon, which the Obama administration is using as the basis for its plan to limit carbon emissions from power plants.

In recent years he chaired an Institute of Medicine committee that lent weight to the idea of subsidizing antimalarial treatments to make them more affordable in low-income countries. He is also a founding trustee of Economists for

Peace and Security, which is committed to supporting non-military solutions to world challenges.

Except for 11 years at Harvard from 1968 to 1979, Arrow spent his career at Stanford. Arriving in 1949, he quickly became Professor of Economics, Statistics, and Operations Research and helped Stanford become a center for the study of economic theory, econometrics, and applied mathematics.

He counts four Nobel Prize winners among his Stanford and Harvard students: John Harsanyi in 1994, Michael Spence in 2001, and Eric Maskin and Roger Myerson in 2007. Spence recalled, in his Nobel autobiography, the awe in which Arrow’s students held him. “Describing Ken Arrow’s contributions to economics in the second half of the 20th century would come quite close to just describing the evolution of economics during that period.” Former Stanford student Ross Starr, who extended general equilibrium theory, recalls the affection he inspired. In a phone interview Starr said that “Arrow’s students absolutely loved him. He shared brilliance and insight with us.”

Arrow is also a member of a prominent academic family. His sister, Anita Summers, is a retired professor at the University of Pennsylvania, where her late husband, Robert, was an economics professor. Arrow’s nephew, Lawrence Summers, is a well-known economist at, and former president of, Harvard University. The late Paul Samuelson, who in 1970 was the first U.S. citizen to win a Nobel Prize in economics, was the brother of Robert Summers.

Colleagues and students remember Arrow’s distinctive presence in departmental seminars. Early in a seminar, for example, he might appear distracted, even seeming to nap. But suddenly he would turn his attention to the blackboard, contemplate for a few minutes what the speaker had been writing, and then politely point out a fatal flaw in the line of reasoning. Arrow, who continues to advise students but stopped teaching after his retirement in 1991, downplays his classroom skills. Some former students remember him putting up so many ideas almost simultaneously on the blackboard, all the while tossing chalk up and down without dropping it, that it was a challenge to keep up.

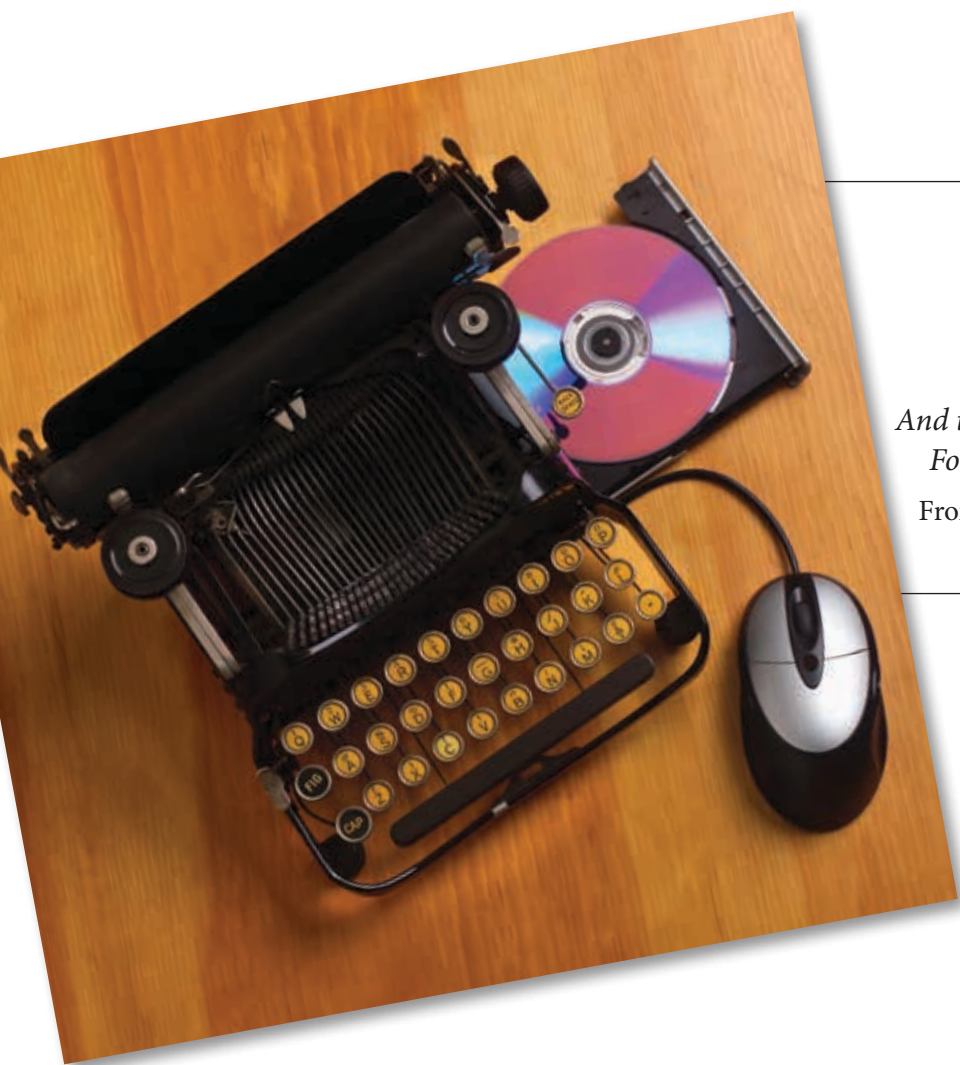
Until recent years Arrow would bike to campus, and former students recall him arriving at class, bike helmet on head, with a pump jutting from his backpack.

Arrow, 93, said he has always been more stimulated by working out problems and that once he works them out “I must say I kind of lose interest.” That’s why even though he received a Nobel Prize for his work on general equilibrium theory, he is prouder of his work on social choice theory.

Several other researchers, such as the late Lionel McKenzie, were working on the same problems in general equilibrium theory at the time Arrow and Debreu formulated their model. “In some respects . . . if I weren’t there, it wouldn’t have made that much difference.”

But no one else was asking the social choice questions. “So that I am proud of.” ■

Janet Stotsky was until recently an Advisor in the IMF’s Office of Budget and Planning and is now a consultant on fiscal policies, women and development, and development macroeconomics.



*The slow one now
Will later be fast
As the present now
Will later be past
The order is rapidly fadin'
And the first one now will later be last
For the times they are a-changin'*

From "The Times They Are a-Changin'"
by Bob Dylan, 1964

A World of CHANGE

Taking stock of the past half century

M. Ayhan Kose and Ezgi O. Ozturk

WHEN the inaugural issue of *Finance & Development* appeared in June 1964, the world economy was enjoying its best 10-year growth performance since World War II. The massive postwar reconstruction effort of the preceding decade led to vibrant growth in Europe and Asia. The U.S. economy, which accounted for almost one-third of world output during the 1960s, was experiencing its longest expansion to date.

In the same year, Bob Dylan's timeless song captured the rapidly changing nature of the times. Although Dylan probably did not have global production in mind, the world economy witnessed some truly unimaginable changes during the ensuing half century. Some low-income countries with chronic development problems started growing much faster and eventually became major contributors to global growth. The world economic order went through a tectonic transformation, accom-

panied by, and in part caused by, groundbreaking advances in science and technology and the rise of globalization.

How has the global economy changed since 1964? We present an eclectic answer to this question by summarizing some major changes over the past 50 years. The progress the world economy experienced during this period has been impressive. There is still a glaring need for progress in many areas, but there is also cause for optimism.

New technologies

Had we written this article in 1964, we would have used typewriters, not computers, and might have relied for background research on hard copies of journals and books. It could have taken many weeks to assemble the related statistics and to translate them into the charts. It could, as well, have taken several weeks to ship printed issues of the magazine to readers around the world.

Thanks to many technological developments over the past half century, today we have instant access to a vast array of information sources and are able to share new knowledge with the rest of the world in seconds. Rapid progress in communication and transportation technologies has facilitated major innovation in many other fields, radically changed how we work, raised productivity, and led to stronger international trade and financial links.

How we communicate has changed the most, as advances in computers and mobile technologies have revolutionized all mediums of communication. In 1965, the first commercially successful minicomputer had an inflation-adjusted price tag of \$135,470. It was able to undertake basic computations, such as addition and multiplication. Its capacity was about 4,000 words of 12 bits. Today's typical smartphone has a capacity 3 million times larger and costs less than \$600.

The introduction of the Internet to the public in 1991 started a new era in communication. The tremendous increase in Internet access has brought people, businesses, and coun-

Advances in computers and mobile technologies have revolutionized all mediums of communication.

tries closer, while mobile communication has become cheaper and more accessible. In 1965, the first commercial communications satellite was launched from the United States, providing 240 two-way telephone circuits. Today, there are about 400 commercial communication satellites processing and transmitting information across the world, with a capacity that dwarfs 1965. In 1980, there were five mobile phone subscriptions for every million people; today there are more than 90 for every 100 people (see Chart 1). New technologies have been making earlier modes of communication obsolete. With the rapid rise of wireless communication, landlines, for example, have declined during the past decade.

The transportation sector has also gone through a major change over the past 50 years. Today, we can travel and ship goods much faster and more cheaply than a half century ago. A round-trip airline ticket from Miami to New Orleans in the early 1960s was \$927 (inflation adjusted); it now costs about \$330. With the availability of cheaper and faster communication and declining shipping costs, even small businesses have access to overseas markets.

Although annual global energy consumption from primary resources (fossil fuel, natural energy, nuclear power) has more than tripled over the past half century, technological improvements in the energy sector made production more efficient than ever. To produce \$1,000 in output, the world used the equivalent of 137 kilos of oil in 2011, 50 fewer than 20 years earlier. The global oil supply as a percent of total primary energy supply has also declined with increased supplies of natural gas, nuclear power, and renewable energy sources such as geothermal, solar, and wind.

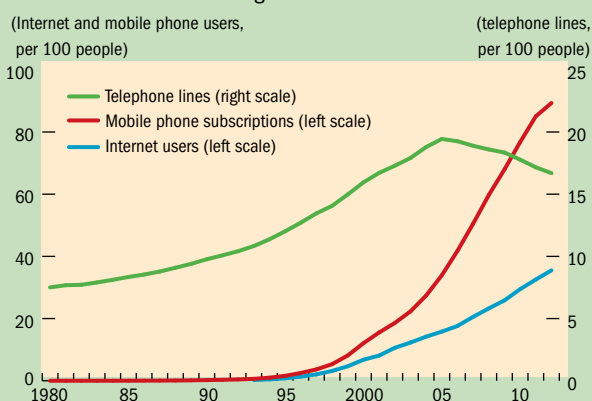
Rise of globalization

"We live in a global world." This sentence did not mean much in 1964. However, it has become a cliché, especially over the past two decades with the rise of globalization—the growing trade and financial integration of the world economy (see Chart 2). Advances in communication and transportation technologies coincided with and fostered accelerated globalization as countries became more interdependent through a rapid increase in cross-border movement of goods, services, capital, and labor—and led to much faster diffusion of ideas and cultural products.

Chart 1

New ways to communicate

Internet and mobile phone use has grown dramatically, while some customers are ditching landlines.



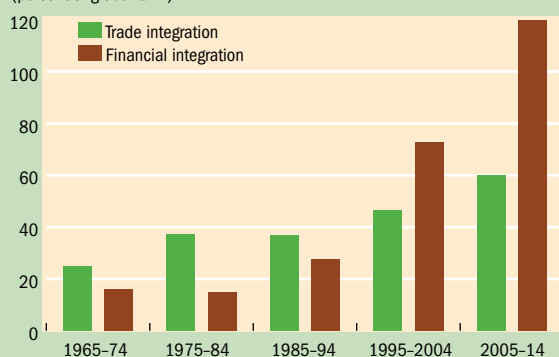
Source: World Bank, World Development Indicators database.

Chart 2

The world grows closer

Global trade and financial links increased dramatically in the past 50 years.

(percent of global GDP)



Sources: Lane, Philip R., and Gian Maria Milesi-Ferretti, 2007, "The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970-2004," *Journal of International Economics*, Vol. 73, No. 2, pp. 223-50; and IMF World Economic Outlook database.

Note: Trade integration is measured by the ratio of total imports and exports to global GDP. Financial integration is the ratio of total financial inflows and outflows (including bank loans, direct investment, bonds, and equities) to global GDP. Financial integration data are through 2011. Trade integration data for 2014 are forecasts.

The past 50 years have witnessed profound changes in the volume, direction, and nature of international trade: global trade in goods and services has risen rapidly, aided by the liberalization of trade policies around the world. Intraregional

Box 1

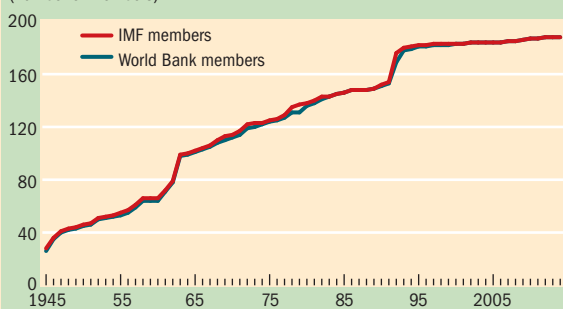
New countries, new members

Wars, political and social conflicts, and the dissolution of the Soviet Union increased the number of independent countries from 139 in 1965 to 204 in 2014. These new countries quickly assumed their roles in international policy forums. For example, at the end of 1965, the International Monetary Fund and the World Bank each had slightly more than 100 members. Over the past 50 years, they have added about 85 members—first from newly independent African countries and more recently from former states of the Soviet Union. Each institution now has 188 members.

Growing bigger

The number of countries that are members of the IMF and the World Bank has grown from less than 40 in 1946 to 188 today.

(number of members)



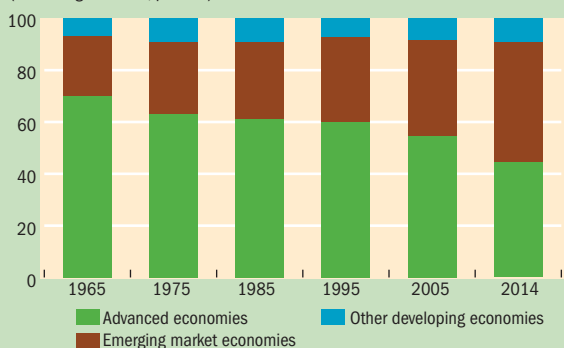
Sources: IMF and World Bank.

Chart 3

Rise of emerging markets

Emerging market economies' share of global GDP has risen steadily since 1965.

(share of global GDP, percent)



Source: IMF, World Economic Outlook database.

Note: Data are measured in purchasing power parity—the rate at which currencies would be converted if they were to buy the same quantity of goods and services in each country. Data for 2014 are forecasts.

trade flows have also become more prominent with the proliferation of regional trade agreements. Trade in manufacturing goods has grown rapidly, and led to cross-border supply chains—companies can now locate different stages of the production process in several countries.

The change in international financial flows has been even more dramatic: the fraction of countries with a liberalized financial system has risen threefold over the past 50 years. As more countries have embraced the benefits of permitting the free movement of capital, international financial flows have increased markedly. Total global financial assets rose from \$250 billion in 1970 to almost \$70 trillion in 2010. The composition of international financial flows has also changed: the share of portfolio equity investments is much larger.

Although the extent of integration of labor markets across countries is much lower than that of trade and financial markets, cross-border movements of labor have also registered a considerable increase over the past 50 years. About 230 million people live as migrants today, up from 77 million in 1970. Two decades ago, people migrated mostly from developing to developed economies. Regional migration between developing economies now exceeds migration to developed economies.

New global actors

A number of countries became independent during the past 50 years (see Box 1). In much of this period, however, a bipolar world economy—composed of developing countries in the South and developed countries in the North—was the norm. The South consisted of mostly poor and labor-abundant economies that supplied agricultural products and raw materials to the North. The countries of the North were richer and more developed. They produced manufactured goods and accounted for the bulk of global trade and financial flows.

Since the mid-1980s, however, some of the countries of the South, the so-called emerging market economies, have grown at an extraordinary pace while rapidly integrating into the global economy. They have also diversified their production base and exports toward manufactured goods and services and away from agricultural products.

While their shares of world population and labor force have remained relatively stable over the past 50 years, the emerging market economies have established a growing presence in every other economic dimension. As a group, their share of global GDP nearly doubled (see Chart 3). Their contribution to global growth was on average 30 percent between 1965 and 1974, roughly half that of advanced economies in that period. During the past decade, they accounted for more than 70 percent of global growth, while advanced economies' share fell to about 17 percent (see Chart 4). Emerging market economies have also become the main engine of global trade while rapidly establishing stronger banking and other financial links with the rest of the world.

Some emerging market economies have performed even better. For example, Brazil, Russia, India, and China, the so-called BRIC countries, accounted for half of global growth over the past decade. China is now the world's 2nd and

Brazil the 7th largest economy, up from the 8th and the 16th, respectively, in 1970. The list of the 20 largest economies now includes South Korea and Indonesia, which were nowhere close a few decades ago.

Painful interruptions

The world economy is six times larger than it was half a century ago, growing at an annual rate of 4 percent during the period. New technologies have paved the way for more efficient production systems in a wide range of industries and promoted economic growth. From 1965 to 2013, the average annual growth rate of world GDP per capita was about 2 percent, and in more than half of the past 50 years, the world grew faster than this average. As a result, global per capita GDP more than doubled between 1965 and 2013 despite a major increase in population (see Chart 5).

But the global growth process itself has never been smooth. Many countries experienced financial crises that led to significant declines in their growth during the past half century (see Box 2). The global economy also went through periods of severe interruptions in growth. In every decade after the 1960s, there was a global recession (see Chart 6). In 1975, 1982, 1991, and 2009, world per capita output declined and various other measures of global activity fell simultaneously (Kose and Terrones, forthcoming).

Each of these global recessions coincided with severe economic and financial disruptions in many countries around the world. A sharp increase in oil prices triggered the 1975 recession. A series of global and national shocks—including another jump in oil prices in 1979, the U.S. Federal Reserve's battle against high inflation in 1979 and 1980, and the Latin American debt crisis—played significant roles in the 1982 recession.

Although the 1991 recession coincided with many adverse global and national developments, it became a worldwide event because various domestic difficulties were transmitted to other countries: financial disruptions in the United

States, Japan, and several Scandinavian countries; exchange rate crises in many advanced European economies; German unification; and the collapse of the Soviet Union. The 2009

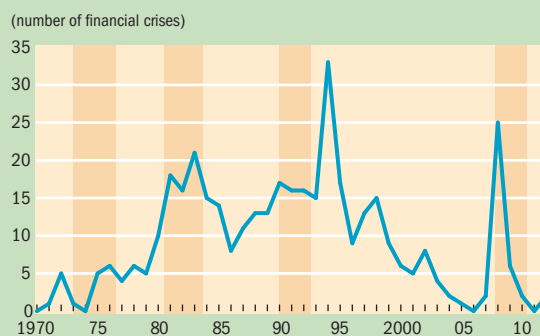
Box 2

Recurrent financial crises

Financial crises have interrupted economic growth around the world. Roughly 400 of them took place between 1970 and 2013. Advanced economies experienced only 35 crises, half of them after 2007. Emerging market economies had 218 financial crises, most of them in the 1980s and 1990s, especially during the 1997 Asian financial crisis. Currency crises were the most prevalent, accounting for half of all crisis episodes. Banking and debt crises accounted for the rest. It is still impossible to predict the location and time of the next financial crisis.

Financial crises are widespread

Between 1970 and 2013 there were more than 400 banking, currency, or debt crises.



Source: Laeven and Valencia (2013).

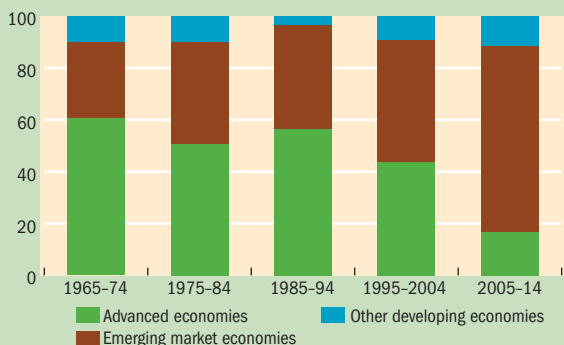
Note: The shaded bars represent the three years surrounding global recessions—which occurred in 1975, 1982, 1991, and 2009.

Chart 4

Growing up

Emerging market economies account for a growing share of world GDP growth.

(contribution to world GDP growth, percent)



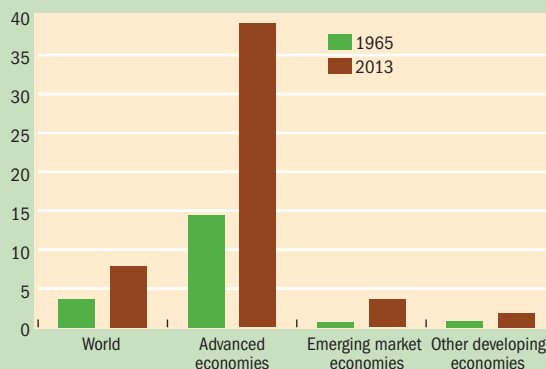
Source: IMF World Economic Outlook database.
Note: The data for 2014 are forecasts.

Chart 5

Sharing prosperity?

Although the average person is richer today than in 1965, those in advanced economies have done far better than those in emerging market and other developing economies.

(GDP per capita, thousands of constant 2005 dollars)



Source: World Bank, World Development Indicators database.

Population growth slows but people live longer

Life expectancy has grown steadily over the past half century.

	1965-74	1975-84	1985-94	1995-2004	2005-14
Population growth (percent change)	2.1	1.7	1.7	1.3	1.2
Life expectancy at birth (years)	59.0	63.0	65.5	67.6	69.9
Birth rate (per 1,000 people)	32.1	27.6	25.7	21.7	19.8
Death rate (per 1,000 people)	12.0	10.2	9.2	8.6	8.1
Output growth (percent change)	5.0	3.3	3.1	3.6	3.7
Per capita output growth (percent change)	2.9	1.5	1.4	2.2	2.5

Sources: World Bank, World Development Indicators database; IMF, World Economic Outlook database.

Note: Output is GDP weighted by purchasing power parity for individual countries. Purchasing power parity is the rate at which currencies would be converted if they were to buy the same quantity of goods and services in each country. Data for 2014 for output growth and per capita output growth are forecasts from the *World Economic Outlook*. Population-related data are through 2012.

episode started with a financial crisis in the United States in 2007, but rapidly spread to other advanced economies and some emerging markets through trade and financial linkages.

Each global recession lasted only a year, but exacted deep and long-lasting human and social costs: millions lost their jobs, businesses closed, and financial markets plunged. The most recent global recession was the deepest since the Great Depression of the 1930s: worldwide, the number of unemployed people rose by almost 20 percent between 2007 and 2009. In 2009, 83 million young people were unemployed—more than at any time in the past two decades. The global economy, especially labor markets, still suffers the effects of the 2009 recession, seven years after the beginning of the crisis.

Poverty and inequality

The world population grew from 3 billion in 1965 to about 7 billion in 2013, but the global economy grew faster than the world population, leading to a better standard of living for the average world citizen.

Improvements in medical technology, sanitation, and vaccination helped reduce the death rate and, despite declining birth

rates, the world population has kept rising as people enjoy longer lives. In the mid-1960s, life expectancy at birth was about 55 years; today a newborn is expected to live about 70 years (see table).

There has been progress in schooling too. The number of children completing primary education increased from 80 percent of the global school-age population in the 1980s to 92 percent in 2012. In low-income countries, this change has been more dramatic—from 45 percent to slightly more than 70 percent in the past three decades.

The average world citizen is richer than ever thanks to the growth the global economy has enjoyed over the past 50 years. However, the benefits of this growth have not been equally distributed—the result is enduring poverty and inequality.

One of the Millennium Development Goals the United Nations agreed to in 2000 was to reduce extreme poverty by half between 1990 and 2015. Although that goal was achieved five years ahead of schedule, extreme poverty remains widespread in a number of low-income countries. In 1981, the percent of people living on less than \$1.25 a day, the extreme poverty line, was about half in both upper-middle- and low-income countries (see Chart 7). Thirty years later, upper-middle-income countries have achieved a substantial decline in poverty thanks mostly to rapid growth in emerging market economies. However, in low-income countries, almost half of the population still lives in extreme poverty. At the global level, more than a billion people, mostly in sub-Saharan Africa and south Asia, are in extreme poverty.

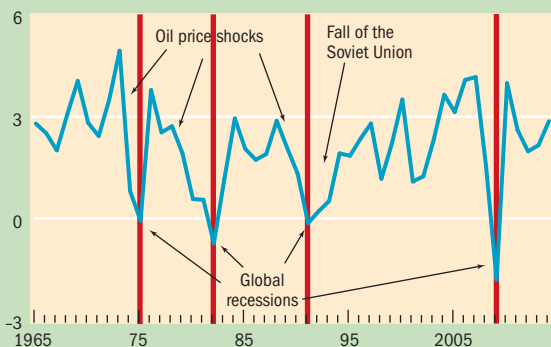
Inequality has also increased in most countries. For example, from 1990 to 2010, inequality increased in more than

Chart 6

Up and down

Global GDP per capita grew at an average 2 percent a year in the past half century, but that average masks years of strong growth and years of recession.

(growth in GDP per capita, percent, weighted by purchasing power parity)



Source: IMF, World Economic Outlook database.

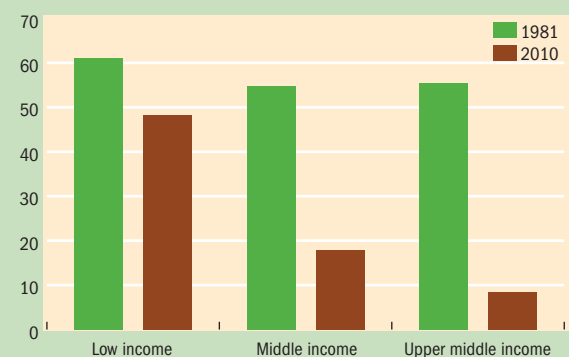
Note: Data are for 163 countries. Red bars indicate years of global recession. Purchasing power parity is the rate at which currencies would be converted if they were to buy the same quantity of goods and services in each country.

Chart 7

Poverty endures

Extreme poverty fell across the globe, but it fell the least in low-income countries and the most in upper-middle-income countries.

(percent of population living in extreme poverty)



Source: World Bank, World Development Indicators database.

Note: Extreme poverty is a per capita daily income of less than \$1.25. Income is measured in purchasing power parity, which is the rate at which currencies would be converted if they were to buy the same quantity of goods and services in each country. Low-income countries had gross national income (GNI) of less than \$1,045 a person in 2013. Middle-income countries had GNI of more than \$1,045 a person and less than \$12,746. Upper-middle-income countries had per capita GNI between \$4,125 and \$12,746.

two-thirds of countries with data available. Cross-country inequality reached its highest level in the late 1990s and then started declining, but is still higher than in the early 1980s. Moreover, the share of income earned by the top 1 percent of the population has risen in most of the major advanced and emerging market economies (see Chart 8). For instance, in the United States, the richest 1 percent of the population receives about 18 percent of national income today, compared with about 8 percent 50 years ago.

A major challenge of a different sort for the global economy is climate change. Carbon dioxide emissions have risen significantly, especially over the past two decades, and appear

While generating growth is critical to overcoming many challenges, that growth must include all segments of society.

to have led to a wide range of problems, including rising sea levels, melting glaciers, and more extreme weather events. The number of reported weather-related natural disasters has increased more than three times since the 1960s. In addition to extreme poverty, low-income countries are vulnerable to the risks stemming from climate change. Although there has been progress in regulating global emissions of greenhouse gases over the past 25 years, much more needs to be done to mitigate the adverse effects of climate change.

Looking back, looking forward

The world economy has gone through a period of great transformation since 1964. The breathtaking pace of technological progress and international integration has

resulted in a truly global village, where countries are much closer because of faster and better modes of communication and stronger trade and financial linkages than could have been imagined 50 years ago. The world economy moved from a bipolar to a multipolar configuration with emerging market economies now accounting for the lion's share of global growth. There has been considerable progress in elevating living standards in many corners of the world. However, much still needs to be done to improve macroeconomic and financial policies to allow a better response to financial crises and to reduce poverty and inequality.

The good news is that there is clear recognition of these massive challenges. And, through multilateral organizations—such as the International Monetary Fund and the World Bank, which turn 70 this year—there has been a concerted effort to overcome them. The IMF has taken steps to improve its policy advice for crisis prevention and management and enhanced its macroeconomic and financial sector surveillance facilities. The Bank has implemented measures to achieve its newly established “twin” goals of ending extreme poverty at the global level within a generation and promoting “shared prosperity” aimed at improving the well-being of the poorer segments of society. There is also consensus that, while generating growth is critical to overcoming many challenges, that growth must include all segments of society and be environmentally friendly and sustainable.

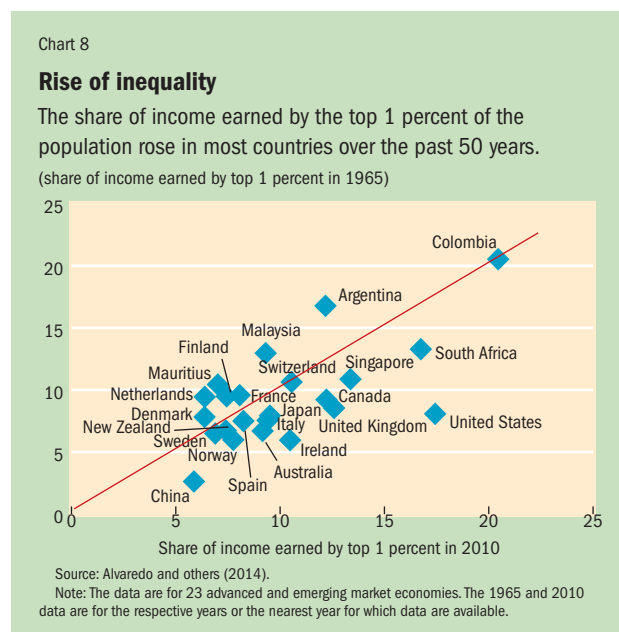
There has been lively debate about the future of the world economy after the global financial crisis. Some argue that advanced economies will likely enter a period of secular stagnation because of misguided policies. Others claim that the days of robust growth are behind us because today's innovations are less useful than the major inventions of the past. Another view, though, is that the global economy has enormous potential to generate a healthy dose of growth in the coming decades. Innovations, well-designed policies, and vibrant emerging market and frontier economies can help realize that potential.

No one could have accurately predicted the changes the world economy has experienced during the past half century. And no one can predict what an article like this one will say in 2064. But one prediction is as true today as in Dylan's 50-year-old song: “*the times they are a-changin'.*” ■

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References:

- Alvaredo, Facundo, Tony Atkinson, Thomas Piketty, and Emmanuel Saez, 2014, *The World Top Incomes Database*. <http://topincomes.g-mond.parisschoolofeconomics.eu>
- Kose, M. Ayhan, and Marco E. Terrones, forthcoming, *Collapse and Revival: Understanding Global Recessions and Recoveries* (Washington: International Monetary Fund).
- Laeven, Luc, and Fabián Valencia, 2013, “Systemic Banking Crises Database,” *IMF Economic Review*, Vol. 61, No. 2, pp. 225–70.



Crystal Ball

A look at trends and uncertainties can help prepare for future economic challenges

Kalpana Kochhar, Yan Sun, Evridiki Tsounta, and Niklas Westelius

"All predictions are wrong; that's one of the few certainties granted to mankind."

—Milan Kundera

THE global economy is undergoing a series of transformations that subject the future to considerable uncertainty, complexity, and unpredictability. Some transformations, like recovery from the global financial crisis, are cyclical; others, like demographic developments and the rapid increase in interconnectedness, are longer term and more structural in nature. These transformations interact in shaping the future, making extrapolation from the past an increasingly unreliable lens for peering into the future.

With the global financial crisis in the rearview mirror, an effort was initiated at the IMF last year to better tailor the Fund's near-term focus on managing transition from the crisis to long-term perspectives. The work focused on identifying underlying currents and associated uncertainties that will mold the world we live in over the coming decades. Understanding their nature, speed, and—importantly—how they interact is crucial to preparing for future challenges and being alert to risks that could lead to new crises.

Of course, selecting which trends and uncertainties could shape the future global economy is daunting too. Aided by extensive internal and external consultations, the IMF staff team narrowed its focus to a critical few: demographics, diffusion of power, resource and environmental sustainability, interconnectedness, and income inequality. These were deemed particularly relevant for the IMF and its membership thanks to their potential large impact on the sustainability and stability of economic growth. They should not be interpreted as predictions about the future, and their evolution over time is also uncertain.

Demographic pressures

The world population is projected to increase to more than 8 billion by 2030 and to age at an unprecedented rate; for the first time in history, by 2020 children younger than 5 will be outnumbered by people 65 and older (NIA, 2007). In all regions except sub-Saharan Africa the elderly population will increase more than the working-age population, driving

up age-related costs. At the same time, increased life expectancy means people can work longer. Some emerging markets, including China, may get old before they get rich owing to a declining population. But many developing economies, especially in sub-Saharan Africa and south Asia, will have to generate job opportunities for new labor market entrants amid rapidly increasing populations. Changing demographic patterns could also affect individual countries' saving and investment and alter future global financial and labor flows.

A single global power? Not anymore

Global power is shifting from advanced to emerging market and developing economies, while nongovernmental organizations, multinational corporations, and cities are gaining national and international influence.

Advanced economies accounted for two-thirds of world GDP (in purchasing-power-parity terms) in 1992 but their contribution fell to less than half of global GDP by 2012 (IMF), with cities emerging as power centers—about 60 percent of global GDP today is generated by 600 urban centers (McKinsey, 2011).



But the dynamics of future power shifts are far from clear. The trajectory of emerging market and developing economies' growth may be uneven, and the rising power of cities and non-state actors such as multinational corporations and nongovernmental organizations could be put to the test. Whether the diffusion of power will help or hurt the global community's ability to cooperate and address common problems remains to be seen. The shift of power from advanced to emerging market and developing economies offers a great opportunity to preserve global stability and enhance resilience and growth potential as more countries have a stake in shared global prosperity. At the same time, multiple players with diverse interests may also result in more conflicts and instability, or policy inertia and inaction.

Saving the planet

Higher and more volatile commodity prices during the past decade have renewed concerns about natural resource scarcity. Signs of a changing climate are also on the rise, with a projected impact well beyond country borders; the 12 warmest years on record have occurred since 1997, along with rising sea levels and melting glaciers (GISS, 2012). Growing global population and income will put increasing pressure on natural resources such as water and the environment if corrective actions are not taken now. Resource scarcity and environmental degradation will likely have a disproportionate impact on developing economies. Technological innovation has helped in the past but may not be sufficient to address the balancing act between supporting growth and protecting the environment. Timely and coordinated measures are needed now to avoid potentially dire consequences, which are likely to occur in the second half of this century.

All in the same boat

The global financial crisis was a wake-up call. The world is becoming more and more integrated in an increasingly complex manner, facilitating the spread of both prosperity and risks. Trade and financial links between countries have grown sharply, with world export volume now six times higher than two decades ago (IMF). Financial intermediaries have expanded through networks of subsidiaries and branches, and corporations have become global at an increasing pace. Labor flows have also increased: today, more people than ever—232 million—live abroad, 33 percent more than in 2000 (UN, 2013). Technology has broadened access to information and enhanced the speed of data transmission and processing.

Interconnectedness is likely to continue to grow, but there is significant uncertainty about its pace, nature, and implications for risk. While beneficial to the global economy, it can lead to the buildup of systemic risk, facilitate the transmission of shocks, and raise the potential cost of crises. It is unclear whether our understanding of interconnectedness will catch up with its ever-changing pace and nature.

Sharing the pie

Income inequality has risen significantly over the past few decades. Globalization and technological advances have lifted billions out of poverty but also contributed to the rise in income

inequality. There are many reasons to believe that income inequality will persist, given its inertia and the interplay between inequality and political polarization, which makes consensus on redistributive policies all the more difficult. Persistent inequality threatens growth and macroeconomic stability.

Challenging futures

How will these trends and uncertainties evolve, interact, and shape the future global economy? With the help of scenario analysis—a management tool frequently used to construct alternative futures for strategic purposes—it is not difficult to construct a future where tensions and risks arise in differ-

Global public goods will be indispensable.

ent dimensions, develop more suddenly, and build on each other, challenging our ability to deliver continued stability and shared prosperity. For example, interconnectedness and diffusion of power could point to a future that is both increasingly integrated and politically and socially fragmented, with profound implications for policy cooperation at different levels. Moreover, economic growth could raise living standards, but it could also inflict environmental, social, and political costs, undermining some of its benefits and thereby sustainability.

The complexity and uncertainty of the future present opportunities and challenges to the IMF and its membership. Global public goods—including, for example, a bigger global financial safety net in a more interconnected world and a global solution to climate change—will be indispensable. The IMF must continue applying its unchanging mandate—safeguarding global economic and financial stability—to these changing circumstances and demands.

The American civil rights activist Malcolm X noted that the future belongs to those who prepare for it today. In a time of change and transformation, this is perhaps more true than ever. ■

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References:

- Goddard Institute for Space Studies (GISS), 2012, *Surface Temperature Analysis* (New York).
- International Monetary Fund (IMF), *World Economic Outlook database* (Washington, various years).
- McKinsey Global Institute, 2011, *Urban World: Mapping the Economic Power of Cities* (Seoul, San Francisco, London, Washington).
- National Institute on Aging (NIA), 2007, *Why Population Aging Matters: A Global Perspective* (Washington).
- United Nations (UN), 2013, *International Migration and Development: Contributions and Recommendations of the International System* (New York).

Looming ahead

Five Nobel Prize winners discuss what they each see as the biggest problem facing the global economy of the future

Global Warming A Second Inconvenient Truth

George A. Akerlof

PEOPLE think in terms of stories (or narratives). Tell the wrong story and you get yourself into trouble. American linguist-anthropologist-hobbyist Benjamin Lee Whorf documented this phenomenon in the 1920s. In his day job as a fire-prevention engineer he noticed a large number of fires occurred at gas stations. Putting his linguistics to work, Whorf discovered that the workers who handled the gasoline drums then used to transport gasoline chose to light up for a smoke around barrels they “knew” were “empty.”

A similar bit of linguistics is now getting the world into a great deal of trouble. Every few years the world’s leaders gather in grand conclave: Rio de Janeiro, Kyoto, Johannesburg,

The stories we tell ourselves about global warming are too cold and too cautious.

Copenhagen. Solemn pronouncements are made, but the can of global warming action is once again kicked down the road. The language of global warming doesn’t motivate individuals, on the one hand, and their governments, on the other, to take action today.

One simple story is both compelling and true. The Earth’s atmosphere acts like a protective blanket around us. This blanket allows the energy from the sun to penetrate, so the sun warms the Earth, and then the atmosphere benignly slows the rate at which that warmth radiates out.

Collectively we humans have a baby: the Earth. Year by year, inexorably, the atmosphere-blanket around our baby is getting heavier and heavier and heavier. Even a short road



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trip of 50 miles each way, using five gallons of gasoline, adds 100 pounds of carbon dioxide to the atmosphere. Through such innocent activities, the average U.S. family, for example, thus adds 1,800 pounds a week to Earth’s blanket. Add up all the families around the world, and with a dollop of science on top of our intuitive understanding about babies and blankets, and it’s easy to see that the world is, in all likelihood, getting warmer and warmer and warmer.

Any parent would rush to rescue a baby in such circumstances. But the stories we tell ourselves about global warming are too cold and too cautious. We read the proclamations of the Intergovernmental Panel on Climate Change. We defer to the conclusions of “scientists.” The scientists have spoken, with all but unanimous voice and often with great passion and force, but the professional dispassion of science muffles the message. I remember sitting next to a famous astronomer at a dinner some 20 years ago. Not knowing what to say to an astronomer, I brought up climate change. “We do not

(continued on p. 19)

Increasing Demand

The Unresolved Crisis

Paul Krugman

MIDWAY into the second decade of the 21st century, the biggest problem facing the world economy—or at least its relatively rich countries—is a problem many economists never thought we’d see. For the first time since the 1930s, the world appears to be suffering from a persistent lack of adequate demand; people just aren’t spending enough to make use of the productive capacity we have. This was supposed to be a solved problem, one that may have bedeviled our grandfathers but wasn’t going to come back. But it did, and answers remain elusive.

Let me offer some crude summary numbers. If we take the IMF’s “advanced economies” aggregate from its World Economic Outlook (WEO) database, we find that the combined real GDP of these economies grew 18 percent between 2000 and 2007. Projections made at the time called for a continuation of growth at similar rates over the medium term. In

Our economic policymaking institutions are not at all well suited to coping with large, sustained demand shortfalls.

fact, however, it now appears that the advanced economies will have grown only about 6 percent between 2007 and 2014, implying a 10 percent shortfall relative to what we used to think was the trend.

True, it’s widely argued that the actual amount of economic slack is much less than this; the WEO database estimate of the current output gap for the advanced economy aggregate is only 2.2 percent. But it would be very wrong to take a low estimate of the output gap as a sign that policy isn’t failing that badly, after all, for two reasons.

First, we don’t really know how far below capacity we are operating. Are the large declines in U.S. labor force participation or British productivity secular—that is, long term—or cyclical, the result of workers dropping out because they don’t see job opportunities? Is the stability of inflation at a low level evidence that the economy is operating close to capacity or caused by the unwillingness of workers to accept wage cuts, which makes the Phillips curve—the historically inverse relationship between rates of unemployment and corresponding rates of inflation—flat at low inflation? Nobody knows—and it would be tragic to accept low output and high unemployment as inevitable when they might be simply reflections of insufficient demand.

Second, to the extent that growth of productive potential has in fact dropped as much as estimates suggest, this is evidence of powerful long-run effects of supposedly short-run



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economic troubles: allowing a deep global recession to take hold seems to have led, over time, to a huge deterioration in longer-term economic prospects. This in turn implies that sustaining adequate demand is hugely important, not just for the short run, but for the long run too.

Either way, then, increasing demand should be an urgent priority. Unfortunately, what we have learned since 2007 is that our economic policymaking institutions are not at all well suited to coping with large, sustained demand shortfalls.

During the Great Moderation—as American economists James Stock and Mark Watson called the reduction in U.S. macroeconomic volatility during the mid-1980s—we thought we had macroeconomic policymaking under control. Demand management was assigned to technocrats at independent central banks while fiscal policy focused on long-run issues. In the face of large, sustained shocks, however, it turns out that this system breaks down. On one side, central banks are constrained both by the zero lower bound—the fact that interest rates can’t go negative—and by concerns over the size of their balance sheets. On the other, fiscal policy, far from helping, quickly began making things worse. It has been hobbled both by asymmetry between debtors and creditors—the former forced to cut, while the latter have no obligation to expand—and by political infighting. I sometimes joke that Europe and the United States are in a competition over who can respond worse to the ongoing crisis; Europe is currently winning, but not by much.

It would be nice to believe that these problems are transitory, and maybe they are. But the stability of the Great Moderation was, we now realize, predicated on both ever-growing household debt and by relatively rapid growth in the working-age population, neither of which are coming back, and there are few signs of a policy turnaround.

So inadequate demand is still a very big problem, and looks likely to remain so for a long time to come. We need to find a way to deal with this situation. ■

Secular Stagnation

Affluent Economies Stuck in Neutral

Robert Solow

THERE is no chance that the world will run out of pressing economic problems in the next 50 years. Anyone's short list would likely include dealing with the causes and consequences of climate change, responding—or failing to respond—to increasing inequality of income and wealth within national economies and, for the affluent economies, altering or adjusting to the apparent tendency for the conjunction of technology and demand to create jobs at the upper and lower ends of the skill/wage spectrum but not nearly enough in the middle.

However I want to propose an apparently less cosmic question, and it is indeed a question: Are the affluent economies of Europe, Japan, and North America now caught in an episode of so-called secular stagnation that is likely to be more than transitory? My justification for choosing this issue is that, if the answer is yes, and if an exit from the trap is not found promptly, the likelihood of a successful response to the larger problems is very much diminished.

The term secular stagnation—which goes back to the writings of U.S. economist Alvin Hansen in the 1930s—refers to a persistent tendency for a national economy (or a group of

Only bubbles have been able to generate prosperity in recent years; we know that can't last.

them) not only to grow slowly but more particularly to find it difficult or impossible to use fully its productive potential. Back in the day, this would have been described as a shortage of investment opportunities yielding a rate of return acceptable to investors. Today's more general shorthand would say that the real rate of interest compatible with full utilization is negative, and not consistently achievable.

What is the evidence that secular stagnation is now a threat? It comes in two parts. The first is the argument, most forcefully made by U.S. economist Robert Gordon, that both population and total factor productivity will grow more slowly in the future than in the halcyon past. The demographic projection is pretty secure. The persuasiveness of pessimism about total factor productivity growth—in the efficiency of capital and labor—rests mainly on the belief that the information technology wave just cannot increase output/welfare as the great technological waves of the past—internal combustion, electrification, urbanization—did in their time. The secular stagnation argument holds even if this slow-growth scenario has a substantial probability of coming to pass.



Robert Solow won the Nobel Prize for economics in 1987 for his contributions to the theory of economic growth. He is an Emeritus Institute professor at the Massachusetts Institute of Technology.

The second part of the argument follows from the first. Population growth (through capital “widening”) and technological progress (through the need for novel capacity) are the main forces that have kept the return on private investment from falling, despite increasing capital intensity and diminishing returns. In a slow-growth future, saving will continue, the rate of return will fall, and private investment will weaken.

Moreover, it is argued, recent history confirms this pessimism. Only bubbles—dot-coms, housing—have been able to generate prosperity in recent years, and we know that can't last. Here we are, five years after the official end of the last recession, and neither the United States nor Europe—least of all Japan—has been able to restore anything like full utilization. This prolonged weakness is at least consistent with the idea of secular stagnation.

But not entirely. Much of the weakness in private demand can be traced directly to a shortfall in spending on construction, both residential and nonresidential. (This could account also for the disappearance of many well-paying jobs.) There is no mystery about the cause. Those economies that experienced housing bubbles in the precrisis years are left with an excess stock of houses and a disturbed mortgage market. Something similar occurred with office buildings and other business structures.

Nevertheless some mystery remains. In the United States, at least, business investment has recovered only partially from the recession, although corporate profits have been very strong. The result, as pointed out in an unpublished paper by Brookings Institution Senior Fellows Martin Baily and Barry Bosworth, is that business saving has exceeded business investment since 2009. The corporate sector, normally a net borrower, became a net lender to the rest of the economy. This does smell rather like a reaction to an expected fall in the rate of return on investment, as the stagnation hypothesis suggests.

The prudent conclusion—is prudence fashionable?—is that the stagnation hypothesis is not a sure thing, but neither is it a long shot. Hansen's worries were washed away by World War II and the expansion of government that followed. We should start thinking about the proper policy response now. ■

Inclusiveness

Enabling and Adapting to Developing Economy Growth

Michael Spence

THERE are many pressing challenges in the global economy, but to me, the central defining challenge is accommodating the growth of developing economies and completing the convergence process that began after World War II. This holds the promise not just of massive poverty reduction but also of expanding the opportunity for healthy, productive, and creative lives among the 85 percent of the world's population that experienced significant economic growth for the first time in the postwar period. This massive expansion of inclusiveness has the potential to be the defining characteristic of the century. But making it happen it is easier said than done.

Inclusiveness will require changes in mind-sets, policy responses, and institutions—international and domestic. The goal is to make the rise of the developing world as comprehensively beneficial as possible, even as major transitions compel shifts in relative prices, dramatic changes in economic structure in both advanced and developing economies, and changes in the distribution of income and wealth.

The convergence process, if successful, will triple the size of the global economy in the next 25 to 30 years—by a much larger multiple if our baseline is the start of the convergence process, 1950, instead of today. Attempting this journey without adjusting the world's use of natural resources will result either in growth grinding slowly to a halt or, worse, in catastrophic failure after an environmental or ecological tipping point. Environmental sustainability is essential to accommodate the rise of the developing world.

All economies rest on a foundation of tangible and intangible assets. It is often possible to sustain growth for some time while underinvesting and allowing these assets to run down or at least remain flat, but this cannot continue indefinitely. We are learning that natural capital is an important subclass of assets that underpin the global economy. Underinvestment in natural capital will not only diminish the quality of growth but will eventually undermine it or even push it into negative territory. That is why the current work on measuring natural capital is one important step in moving toward globally sustainable growth patterns.

Second, there are distributional issues. In advanced economies, technological and global market forces are reducing or eliminating an expanding array of jobs via automation, elimination of the middleman, and offshoring in evolving global supply chains. Because this is happening so quickly, labor markets are off balance; human capital is poorly matched to the shifting demand side of the global economy. Accelerating a return toward equilibrium is a high priority for growth and fair distribution pretty much everywhere. And even if this were to occur faster than it is now, inequalities would remain.



Michael Spence won the Nobel Prize for economics in 2001. He is Professor of Economics at New York University's Stern School of Business, Distinguished Visiting Fellow at the Council on Foreign Relations, Senior Fellow at Stanford University's Hoover Institution, and Academic Board Chairman of the Fung Global Institute.

At present, there is no consensus about how to deal with the various forms of inequality that exist. Some believe we should focus on poverty and let market outcomes decide the rest. Others worry about absolute losers—unemployed youth for example—and burden sharing, especially after large economic shocks of the type recently experienced. Still others focus on absolute versus relative gains and losses, and emphasize the absolute ones. Despite these differences, most

Inclusiveness will require changes in mind-sets, policy responses, and institutions—international and domestic.

societies, advanced and developing, share a desire for intergenerational upward mobility. Here the trends vary across countries and are worrisome in many.

If the labor-saving, skill-biased, and capital-saving digital technologies are as powerful as many of us believe, they will dramatically increase productivity. It is not obvious, at least not in high-income countries, that the resulting “surplus” should be deployed to produce and consume ever more goods and services. Perhaps it should be used to expand leisure. And maybe the workweek will—or should—become shorter on average. If so, we will need more comprehensive measures of welfare than the total value of goods and services acquired in recordable market transactions. This evolution won't work if the employment model remains the same, with a majority working full time in the conventional sense and a growing minority unemployed.

Turning to stability and international coordination of economic policy, it would be unfair to characterize this as an

(continued on p. 19)

Inequality

The Economy Should Serve Society

Joseph E. Stiglitz

THE major battle of the post–World War II global economy was a fight over alternative economic systems: Did Communism or capitalism provide the best way of achieving growth and prosperity for all? With the fall of the Berlin Wall, that battle was over. But there is a new one emerging: What form of market economy works best?

For a long while, American democratic capitalism seemed to triumph. The United States pushed deregulation, privatization, and liberalization around the world, through a set of policies that came to be called the Washington Consensus. But then came the 2008 global financial crisis, when it was government that saved the market from its excesses. The attempt to minimize the role of the government had failed miserably, and led to the government taking unprecedented actions.

In the aftermath, many took a closer look at the U.S. economic system. With median income stagnant for more than a quarter-century, it became clear that this system was *not* delivering for most citizens, even if it was doing very well

The high and growing inequality in the United States is a result of its policies.

for those at the top. And even its political system came to be questioned: economic inequality translated into political inequality, evidenced so clearly by the ability of the banks that had brought on the crisis to resist the reforms that most economists saw as necessary to prevent a recurrence. Democracy is more than just regular elections for the choice of political leaders, and the outcomes of America's democracy seemed increasingly more in accord with "one dollar, one vote" than "one person, one vote."

French economist Thomas Piketty has argued that high levels of inequality represent the natural state of capitalism—it was only during a brief interlude after World War II as a result of the solidarity the war had brought on that things were different. Piketty confirms what others have noted: the huge increase in inequality both of income and wealth in the past third of a century and the increasing importance of inherited wealth. He forecasts that these trends will continue.

I believe that this high and increasing level of inequality is not the inevitable result of capitalism, nor is it the working out of inexorable economic forces. There are countries with much lower levels of inequality—with just as strong growth—



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whose citizens, especially those in the bottom half, fare far better than their counterparts in the United States. Some countries have even significantly reduced inequality in recent years, namely, Brazil. The high and growing inequality in the United States is a result of its policies and politics, and those that have emulated the United States—the United Kingdom, for example—are seeing similar results. The inequality is a result of the country's ersatz capitalism—rampant with monopolies and oligopolies, government-conferred benefits on corporations and the rich, bailouts for the banks, deficiencies in corporate governance, and tax laws that allow the richest to move their money to offshore tax havens and pay far less than their fair share of taxes.

The IMF has rightly recently emphasized the adverse effects of this inequality on economic performance. In my book *The Price of Inequality*, I explained how we could simultaneously have more growth and stability and more equality—especially in those countries where inequality has reached the extremes that it has in the United States. Trickle-down economics doesn't work—as the U.S. data amply show. And this is especially true when so much of the inequality arises from rent seeking (the top appropriating a larger and larger share of the nation's pie for themselves) and from a lack of equality of opportunity, implying that those at the bottom never have a chance to live up to their potential.

The false capitalism that has emerged in the United States and some other countries is the predictable and predicted result of a flawed democracy that enables economic inequality to be easily translated into political inequality, in a vicious nexus where an increase in one form of inequality increases that of the other.

The major challenge facing the global economy in coming decades is more than just taming the excesses of the market economy—for instance, preventing the excessive risk taking, predatory lending, and market manipulation so strongly

(continued on p. 19)

(Akerlof, continued from p. 14)

yet have confirmation that there is global warming due to anthropogenic climate change,” he told me.

That statement was correct in science-speak, appropriately wrapped as it was in his degree of doubt. But for the purposes of public policy, given the high probability of man-made global warming, such caution is foolhardy. Parents don’t take a baby’s temperature to decide whether the room is too warm; likewise, for global warming we need a story that spurs us to do what is necessary.

We need such a rhetoric not just for ourselves but so our governments will have the legitimacy and the will they need to take action. The economics of global warming is as well understood as any economic problem could be. The best way to fight it (but not without considerable expense) is to place

a uniform tax on carbon emissions; that tax should escalate until emissions fall to desirable levels. Optimal policy also calls for subsidization of research and development into ways to reduce emissions.

But global warming is a global problem and emissions come from everywhere, so taxes and subsidies must be global. Each country must view it as its duty to come running. We need to enter into a global alliance in which “we” are all in this globally together. We must tell ourselves that we all need to pull together. We must pull as hard as we can, whatever the others do. Why? Because the Earth is our beautiful baby.

There are thus two inconvenient truths. The first is global warming itself. The second is that we aren’t yet telling ourselves the stories that compel us to combat it. ■

(Spence, continued from p. 17)

area of failure. The General Agreement on Tariffs and Trade had a material role in opening the global economy, leveling the playing field, and enabling growth in developing economies. Governments and central banks do cooperate in crisis conditions, making crucial positive contributions. And international financial institutions have contributed much to poverty reduction and economic stability in emerging economies, and displayed flexibility with respect to policy in light of growing understanding of the behavior of the global economy and financial systems.

But governance reform in these institutions is lagging the changing relative size and influence of major emerging economies. That undermines credibility and authority and hence the ability to coordinate policy. Second, particularly in the area of finance and monetary policy, spillovers are largely neglected by major national policy-setting entities, whose mandates call for a domestic focus. Policymakers seem to be

regulating the hubs in individual networks without regard for those decisions’ broader effects and feedback loops.

Effective supranational governance is at best a work in progress. One need only look at the European Union and the euro area to catch a glimpse of the challenges of bringing regulation and macroeconomic management in line with the rising networked interdependence of the global economy, or parts of it. The underlying issues are sovereignty, identity, and democratic self-determination.

Our children and grandchildren are set to live in a global economy that is much larger, more interconnected, and fairly distributed in terms of economic mass and power, and heterogeneous with respect to income levels, stages of development, and cultures. Learning how to make this journey sustainable, stable, and fair is the great economic challenge for all countries—whether their economies are advanced or developing—and their citizens. ■

(Stiglitz, continued from p. 18)

manifested by financial institutions in recent years. It entails making markets work as markets are supposed to work—with strong competition driving innovation that raises living standards, not the kind of innovation centered on how to appropriate a larger share of a nation’s income and circumvent the regulations designed to make the economy function well. It entails ensuring not only strong economic growth but also shared prosperity. It entails ensuring that the economy is the servant of society, not the other way around. When eco-

nomic “advances”—whether associated with globalization or the creation of the euro—entail large cuts in wages or public benefits for broad swaths of society, we have to ask whether we have confused means with ends.

And the major challenge facing our global politics is ensuring that democratic processes truly represent the interests of ordinary citizens. Breaking the power of money in politics will not be easy. But if we don’t, we will face disappointments in our economies and our democracies. ■

Generation NEXT

25 economists under 45 who are shaping the way we think about the global economy

We asked you, our readers, and assorted international economists and journal editors to tell us which economists under 45 will have the most influence in the coming decades on our understanding of the global economy. *F&D* researcher Carmen Rollins gathered information from scores of sources to compile this—by no means exhaustive—list of economists to keep an eye on.

NICHOLAS BLOOM, 41, British, Stanford University, uses quantitative research to measure and explain management practices across firms and countries. He also researches the causes and consequences of uncertainty and studies innovation and information technology.



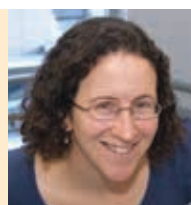
RAJ CHETTY, 35, Indian and American, Harvard University, received his Ph.D. at age 23. He combines empirical evidence and economic theory to research how to improve government policy decisions in areas such as tax policy, unemployment insurance, education, and equality of opportunity.

MELISSA DELL, 31, American, Harvard, examines poverty and insecurity through the relationship between state and nonstate actors and economic development, and studies how reforms such as government crackdowns on drug violence can influence economic outcomes.



ESTHER DUFLO, 42, French and American, Massachusetts Institute of Technology (MIT) and the Jameel Poverty Action Lab, focuses on microeconomic issues in developing economies, including household behavior, education, access to finance, health, and policy evaluation.

EMMANUEL FARHI, 35, French, Harvard, is a macroeconomist who focuses on monetary economics, international economics, finance and public finance, including research on global imbalances, monetary and fiscal policy, and taxation.



AMY FINKELSTEIN, 40, American, MIT, researches the impact of public policy on health care systems, government intervention in health insurance markets, and market failures.

KRISTIN FORBES, 44, American, Bank of England and MIT, has held positions in both academia and the U.S. and U.K. economic policy sphere, where she applies her research to policy questions related to international macroeconomics and finance.

ROLAND FRYER, 37, American, Harvard, focuses on the social and political economics of race and inequality in the United States. His research investigates economic disparity through the development of new economic theory and the implementation of randomized experiments.

XAVIER GABAIX, 43, French, New York University (NYU), has researched behavioral economics, finance, and macroeconomics, including corporate executives' compensation levels and asset pricing.



MATTHEW GENTZKOW, 39, American, University of Chicago, applies microeconomic empirical methods to the economics of the news media, including the economic forces driving the creation of media products, the media and the digital environment, and the media's effect on education and civic engagement.

GITA GOPINATH, 42, American and Indian, Harvard, studies international macroeconomics and trade with a focus on sovereign debt, the response of international prices to exchange rate movements, and the rapid shifts in relative value among world currencies.



OLEG ITSKHOKI, 31, Russian, Princeton University, specializes in macroeconomics and international economics with a focus on globalization, inequality and labor market outcomes, international relative prices and exchange rates, and macroeconomic policy in open economies.



HÉLÈNE REY, 44, French, London Business School, focuses on the determinants and consequences of external trade and financial imbalances, the theory of financial crises, and the organization of the international monetary system.



JONATHAN LEVIN, 41, American, Stanford, is an expert on industrial organization and microeconomic theory, specifically on the economics of contracting, organizations, and market design.



EMMANUEL SAEZ, 41, French and American, University of California, Berkeley, is recognized for using both theoretical and empirical approaches to income inequality and tax policy.

ATIF MIAN, 39, Pakistani and American, Princeton, studies the connections between finance and the macro economy. He is coauthor of the critically acclaimed *House of Debt*, which builds on powerful new data to describe how debt precipitated the Great Recession and continues to threaten the global economy.

EMI NAKAMURA, 33, Canadian and American, Columbia University, is a macroeconomist whose fields of research include monetary and fiscal policy, business cycles, finance, exchange rates, and macroeconomic measurement.

NATHAN NUNN, 40, Canadian, Harvard, focuses his research on economic history, economic development, political economy and international trade. Of particular interest is the long-term impact of historic events such as slave trade and colonial rule on economic development.

PARAG PATHAK, 34, American, MIT, played a role in applying engineering approaches to microeconomics. His research focuses on market design, education and urban economics.

THOMAS PHILIPPON, 40, French, NYU, studies the interactions of finance and macroeconomics: risk premia and corporate investment, financial crisis and systemic risk, and the evolution of financial intermediation.



THOMAS PIKETTY, 43, French, Paris School of Economics and École des hautes études en sciences sociales, is known for his research, with Emmanuel Saez, on the distribution of income and wealth. His bestseller, *Capital in the Twenty-First Century*, argues that global inequality will increase because the rate of capital return in developed economies is higher than the rate of economic growth, exacerbating wealth inequality.

AMIT SERU, 40, Indian, University of Chicago, researches financial intermediation and regulation as well as issues related to corporate finance, including resource allocation within and between firms, and organizational incentives.

AMIR SUFI, 37, American, University of Chicago, is coauthor of *House of Debt*. He studies links between finance and the macro economy, including the effect of house prices on spending and the effect of corporate finance on investment.

IVÁN WERNING, 40, Argentine, MIT, is a macroeconomist who aims to improve tax and unemployment insurance policies via theoretical economic models. As well as optimal taxation, he studies stabilization and monetary policy, including macroprudential policy.



JUSTIN WOLFERS, 41, Australian and American, Peterson Institute for International Economics and University of Michigan (on leave), studies labor economics, macroeconomics, political economy, law and economics, social policy, and behavioral economics. In addition to his research, Wolfers is a columnist for *The New York Times*.

Who do you think should be added to the list? Let us know—write to us or, better yet, go to *F&D*'s Facebook page to make suggestions and join the discussion. ■

Shaping Globalization

Martin Wolf

Done wisely, it could lead to unparalleled peace and prosperity; done poorly, to disaster

GLOBALIZATION is the big story of our era. It is shaping not just economies, but societies, politics, and international relations.

Many assume it is also, for good or ill, an unstoppable force. History, however, suggests this is not so. We can neither assume globalization will persist, nor that it will be desirable in all respects. But one thing we must assume: it is ours collectively to shape.

If globalization is done wisely, this century could prove an unparalleled era of peace, partnership, and prosperity. If it is done badly, it might collapse as completely as pre-World War I globalization between 1914 and 1945.

Globalization is the integration of economic activity across borders. Other forms of integration—above all, the spread of people and ideas—accompany it. Three interacting forces—technology, institutions, and policy—shape it.

Over the broad sweep of history, *technological and intellectual innovation* is the driving force behind globalization. It has lowered the cost of transportation and communication, increasing opportunities for profitable economic exchange over greater distances. In the long run, such opportunities will be exploited.


Even before the industrial revolution, mankind's ability to navigate the seas in sailing vessels facilitated the birth of global empires, transoceanic movement of people, and an expansion in worldwide commerce. But technological change accelerated after the industrial revolution, creating new opportunities.

Driving the globalization of the late 19th and early 20th centuries were the steam locomotive, the steamship, and the telegraph. Driving the globalization of the present era are the container ship, the jet aircraft, the Internet, and the mobile phone.

The integration of communications and computing is the technological revolution of our era. By 2014, the world had 96 mobile-phone subscriptions and 40 Internet users for every hundred inhabitants. Twenty years earlier neither was significant. Information is increasingly digital and the world increasingly interconnected. This is a revolutionary transformation.

Institutions also matter. Historically, empires facilitated long-distance commerce. That was true before modern times and, still more, with the European maritime empires from the 16th to the 20th centuries. Today, the institutions that facilitate long-distance commerce are treaties and multilateral organizations: the World Trade Organisation (WTO), the International Monetary Fund, and regional clubs, such as the European Union.

Semipublic and purely private institutions also matter. Think of the chartered trading company, notably the British East India Company, and then, since the 19th century, the limited liability joint-stock company. Also important are organized markets, notably financial markets, which developed from simple beginnings into the 24-hour, around-the-globe networks of today.



Man using a cell phone at the Pushkar Camel Fair, Rajasthan, India.

While technology's arrow has moved in one direction—toward opportunities for economic integration—institutions have not. Empires have come and gone. When the European empires disappeared after World War II, most of the newly independent countries turned away from international commerce, judging it exploitative.

This brings to mind the third driver—*policy*. The movement of newly independent developing countries toward self-sufficiency was a policy reversal. The most important reversal of all was the worldwide collapse in globalization that followed the two world wars and the Great Depression. The monetary order then disintegrated, and trade became increasingly restricted.

After World War II, a limited liberalization, largely of trade and the current account, spread across the high-income economies, under U.S. auspices. Then, in the late 1970s and in the 1980s and 1990s, domestic market liberalization, opening of international trade, and loosening of exchange controls spread across the world.

Crucial steps on this journey were China's adoption of "reform and opening up" in the late 1970s under the leadership of Deng Xiaoping; the election of Margaret Thatcher as U.K. prime minister in 1979 and Ronald Reagan as U.S. president in 1980; the launch of the European Union's "single market" program in 1985; the Uruguay Round of multilateral trade negotiations, which began in 1986 and ended eight years later; the collapse of the Soviet empire between 1989 and 1991; the opening up of India after its foreign exchange crisis of 1991; the 1992 decision to launch a European monetary union; the creation of the WTO in 1995; and China's entry into the WTO in 2001.

Embrace of markets

Underlying these changes was a rejection of central planning and self-sufficiency and an embrace of markets, competition, and openness. This is not a global empire. For the first time in history, an integrated world economy connects activities located in a large number of independent states with the shared goal of prosperity.

It worked, albeit imperfectly. According to the McKinsey Global Institute (2014), flows of goods, services, and finance rose from 24 percent of global output in 1980 to a peak of 52 percent in 2007, just before the Great Recession. Between 1995 and 2012, the ratio of trade in goods to world output rose from 16 to 24 percent.

Virtually all economies became more open to trade. The ratio of trade in goods (exports plus imports) to GDP in China rose from negligible levels in the 1970s to 33 percent in 1996 and 63 percent in 2006, before plunging during the financial crisis. The ratio of India's trade to GDP rose from 18 percent in 1996 to 40 percent in 2008 (see Chart 1).

An important driver of trade expansion was the availability of low-cost workers in emerging economies. Before World War I, the big opportunity was to incorporate undeveloped land, particularly in the Americas, into production for the global market. This time, the biggest opportunity is incorporating billions of previously isolated people as workers and then consumers and savers.

Trade involving emerging economies duly exploded. In 1990, 60 percent of trade in goods was among the high-income economies, another 34 percent was between high-income and emerging market economies, and just 6 percent was among emerging market economies. By 2012, these ratios were 31 percent, 45 percent, and 24 percent, respectively.

Global companies are central players. This is shown by, among other things, the growth of foreign direct investment (FDI), which results in cross-border ownership of businesses.

People trade more with fellow citizens than with foreigners.

In 1980, FDI was negligible. Today, it is not just a large flow (averaging 3.2 percent of global output between 2005 and 2012) but a stable one. It has proved triply helpful—as a source of knowledge transfer, a vehicle for promoting cross-border economic integration, and a stable form of finance.

Other areas of finance have been far less stable. Total cross-border financial flows peaked at 21 percent of global output in 2007, before collapsing to 4 percent in 2008 and 3 percent in 2009. A modest recovery ensued. But cross-border lending, bond issuance, and portfolio equity flows had not recovered to precrisis levels even by 2012. Cross-border lending, predominantly from banks, was particularly volatile, as is usual in crises (see Chart 2).

While trade, finance, and communication have grown rapidly, this is not so true of movements of people. Although, international travelers and foreign students increased markedly, migrants grew at virtually the same rate as the global population—despite huge gaps in real wages. Trade and capital flows are, to an extent, a substitute for movement of people. Yet great pressure for movement of people from poor countries to richer ones persists, particularly across the Rio Grande and the Mediterranean Sea.

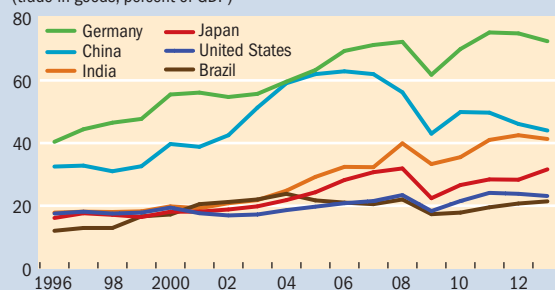
Globalization, then, has meant growing cross-border economic activity. But the story is more complex when it comes to prosperity.

Chart 1

Opening up

Until the global recession of 2008, the world's large economies were increasingly open to trade.

(trade in goods, percent of GDP)



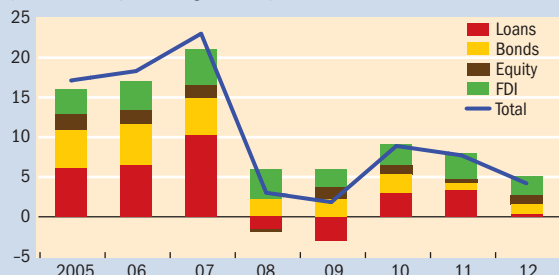
Source: Organisation for Economic Co-operation and Development database (2014).
Note: Trade in goods encompasses all of a country's exports and imports.

Chart 2

Fickle finance

Except for foreign direct investment, cross-border finance was highly unstable in the years before and after the 2008 global financial crisis.

(financial flows, percent of global GDP)



Source: McKinsey Global Institute (2014).

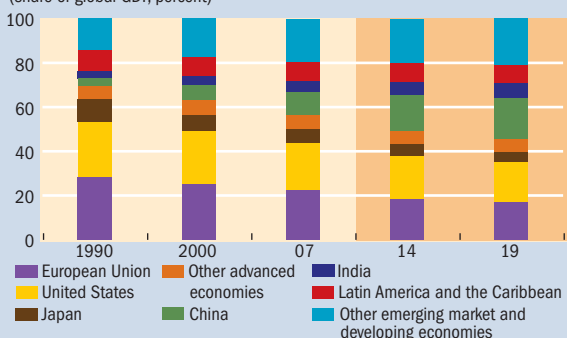
Note: FDI is foreign direct investment, which involves foreign ownership of a business.

Chart 3

Power shift

Advanced economies, including the United States and European Union, account for a shrinking share of world GDP, while China's and India's portions grow.

(share of global GDP, percent)



Source: IMF, World Economic Outlook database, April 2014.

Note: Data for 2014 and 2019 are forecasts. GDP is measured in terms of purchasing power parity—the rate at which currencies would be converted if they were to buy the same quantity of goods and services in each country.

The age of globalization has driven rapid shifts in the location of economic activity. In 1990, the share of the high-income economies in global output at purchasing power parity (or PPP, the rate at which currencies would be converted if they were to buy the same quantity of goods and services in each country) was 70 percent, with the European Union contributing 28 percent and the United States 25 percent. By 2019, according to the IMF, this total will be down to 46 percent.

Over the same period, China's share is forecast to rise from 4 percent to 18 percent and India's from 3 percent to 7 percent. The rapid growth of the most successful emerging market economies, which caused this shift, would not have occurred without the access to trade and know-how provided by globalization (see Chart 3).

A degree of convergence in standards of living has also occurred (see Chart 4). China's GDP per capita, relative to

the United States, is forecast to rise from 2 percent in 1980 to 24 percent in 2019. This is an extraordinary performance by any standard. China has become a middle-income country with a GDP per capita at PPP forecast to be higher than Brazil's by 2019. India, too, has registered convergence, though on a more modest scale. Indonesia and Turkey have also done quite well. But Brazil and Mexico are forecast to be poorer relative to the United States in 2019 than they were back in 1980. Seizing the opportunities afforded by globalization turns out to be hard.

Decline in mass poverty

The age of globalization has brought an extraordinary decline in mass poverty, again largely due to China. In east Asia and the Pacific, the proportion of the population living on less than \$1.25 a day (at PPP) fell, astonishingly, from 77 percent in 1981 to 14 percent in 2008 (World Bank, 2014). In south Asia, the proportion in extreme poverty declined from 61 percent in 1981 to 36 percent in 2008. In sub-Saharan Africa, however, the share of people in extreme poverty was 51 percent in 1981 and still 49 percent in 2008.

Finally, globalization has been associated with complex shifts in the distribution of incomes across and within countries. The World Bank's Branko Milanovic (2012) suggests that the degree of inequality among individuals across the globe has stayed roughly constant in the era of globalization, with rising inequality within most economies offsetting the success of some large emerging economies in raising their average incomes relative to those in rich countries. He also shows that the top 5 percent of the global income distribution enjoyed large increases in real income and the top 1 percent very large increases between 1988 and 2008. Those in the 10th to the 70th percentiles from the bottom also did quite well.

Two groups, however, did relatively badly—the bottom 10 percent, the world's poorest, and those in the 70th to the 95th percentiles from the bottom, who are the middle- to lower-income groups in high-income countries. Thus, a globally beneficial rise in real incomes was associated with rising inequality within many high-income countries. The explanations are complex, but globalization was surely among them.

What might lie ahead?

Technology will continue to drive integration. Soon, almost every adult and many children are likely to own a smart mobile device that offers instant access to all the information available on the World Wide Web. It will make the transmission of everything that can be digitized—information, finance, entertainment, and much else—essentially costless. An explosion of exchange is certain.

While some areas of technology are making leaps, others, such as the cost of transporting goods and people, are not falling to any significant degree. This suggests that technological advances will open up far greater opportunities for trade in ideas and information than in goods or people.

The future of institutions and policy is more doubtful.

Perhaps the most obvious institutional and policy failure has been in liberalized and globalized finance. There were

147 banking crises between 1970 and 2011 (Laeven and Valencia, 2012), some of global significance—particularly the Asian crisis of 1997–98 and the Great Recession of 2008–09—and the subsequent crisis in the euro area. These shocks have had huge economic and fiscal costs. Despite efforts to make the financial system more robust and regulation and supervision more effective, success remains uncertain.

Floating currencies

Closely related to the financial disorder is the monetary system. Since 1971, the global regime has been one of floating currencies, with the U.S. dollar dominant. This has proved workable. But it has also been quite unstable. Many complain that it has permitted the United States to adopt policies that cause unpredictable and unmanageable shifts in capital flows to and from hapless outsiders. Nevertheless, the unloved floating dollar standard is likely to endure, because no other currency and no other global arrangement have any hope of commanding the needed consent, at least in the near future.

Trade policy has been relatively robust, with backsliding into protectionism remarkably well contained in high-income economies. Yet the effort to complete the Doha Round of multilateral trade negotiations has essentially failed, and the future of ambitious (and controversial) plans for plurilateral trade agreements is uncertain. The high tide of trade liberalization may have passed. The growth of world trade in goods may also have slowed permanently.

Some governments are seeking to control the Internet. But the likelihood is that this effort will not halt the flow of commercial activity, though it may restrict the ability of citizens to access politically uncomfortable opinions. Meanwhile, restrictions on movement of people are likely to increase rather than fall in the years ahead.

While economies have become more interconnected, governments continue to supply security, implement laws, regulate commerce, and manage money. Where commerce

flows freely, more than one jurisdiction is affected and, by definition, all involved must agree to the legal and regulatory frameworks within which transactions occur.

This contrast between the economic and political dimensions of our globalizing world is a source of unpredictability. The more commerce is to flow, the more states must agree to deep coordination of their institutions and policies, as is evident in the European Union. Such integration can also cause tension, as the euro area crisis showed. For many countries today, a comparable degree of integration remains unthinkable.

For these reasons, globalization is sure to remain somewhat limited. People trade more with fellow citizens than with foreigners. This is in part a result of distance. But it is also a matter of trust and transparency. Borders matter and will continue to do so.

Ultimately, governments must consent to openness. In doing so, they will take into account the domestic political realities. In a world of sluggish growth and rising inequality in many countries, notably high-income ones, the durability of such consent cannot, alas, be assumed. Human beings remain tribal and states remain rivals.

In 1910, at the apogee of pre–World War I globalization, British politician and journalist Norman Angell wrote *The Great Illusion*, which argued that war would be economically futile. He was right. Intellectually, the leaders of almost all countries now agree: conflict cannot enhance the prosperity of their nations. Yet, as the events of 1914 proved, the fact that war is ruinous does not guarantee it will be avoided, though nuclear weapons have raised the cost of conflict to unimaginable heights.

Even if peace among the great powers is maintained, the cooperation needed to secure an ever more integrated and prosperous global economy may not be. Foremost among the challenges ahead is managing the declining power of the West and the rise of China and other emerging markets. History teaches that neither technology nor economics guarantees globalization's future in the short to medium term; only political choices do. The onus on us all is to manage the opportunities offered by globalization wisely. ■

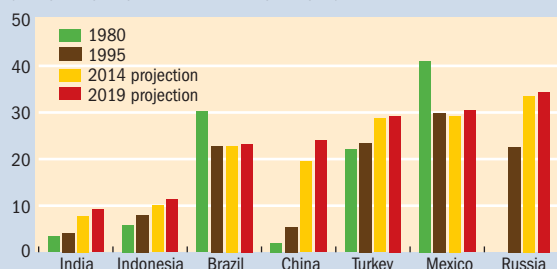
Martin Wolf is Associate Editor and Chief Economics Commentator at the Financial Times.

Chart 4

Converging living standards

Since 1980, some (but far from all) large emerging market economies have improved their GDP per capita relative to that of the United States.

(GDP per capita, percent of U.S. GDP per capita)



Source: IMF, World Economic Outlook database, April 2014.

Note: GDP is measured in terms of purchasing power parity—the rate at which currencies would be converted if they were to buy the same quantity of goods and services in each country. The order of the countries is based on the relative GDP per capita forecast for 2019—lowest (India) to highest (Russia).

References:

- Laeven, Luc, and Fabián Valencia, 2012, “Systemic Crises Database: An Update,” IMF Working Paper 12/163 (Washington: International Monetary Fund).
- McKinsey Global Institute, 2014, *Global Flows in a Digital age: How Trade, Finance, People, and Data Connect the World Economy* (Seoul, San Francisco, London, Washington).
- Milanovic, Branko, 2012, “Global Income Inequality by the Numbers: In History and Now—An Overview” *World Bank Policy Research Working Paper 6259* (Washington). <http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-6259>
- World Bank, 2014, *World Development Indicators* (Washington). <http://data.worldbank.org/sites/default/files/wdi-2014-book.pdf>

Focus, Flexibility, Service

Founded 70 years ago, the IMF will remain true to its mandate by adjusting to new challenges that directly affect the global economy



Christine Lagarde is the IMF's Managing Director.

THE uniqueness of the IMF lies in its ability to adapt and change with circumstances. Founded at the end of the Second World War, its purpose has been economic stability and prosperity through the bonds of cooperation and integration. Its “constitution”—the Articles of Agreement that emerged from Bretton Woods—has proved to be a remarkable feat of engineering: strong enough to stand the test of time and flexible enough to enable the IMF to respond to the many challenges that have faced its membership through the years.

The IMF began by contributing to reconstruction in Europe after the war. It moved on to include newly independent nations, helping them gain a foothold in the global economy after decolonization, and its membership also thrived as it assisted former communist countries in making the transition to market economies following the fall of the Iron Curtain.

The IMF helped the global economy adapt to a new and unnerving world after the original system of fixed exchange rates unraveled in the early 1970s. Since then, it has supported its members in overcoming a variety of financial crises in different regions—in Latin America in the 1980s, Asia in the 1990s, Latin America again in the 2000s, and all over the world in the wake of the Great Recession.

Unprecedented response to the crisis

The recent crisis generated unprecedented challenges, and the IMF responded in an unprecedented way—through its early call for global fiscal stimulus; through the sheer scale of its financial support; and through the creation of new tools like zero interest loans for low-income members and crisis prevention insurance for middle-income members. The IMF has also been a highly sought-after partner in capacity building: demand for its technical advice and training courses has

originated from across the entire membership in recent years.

This crisis prompted the IMF to rethink its analysis and adapt its policy advice. It became more acutely aware of the growing interconnectedness of the global economy—and conscious of how policies in one country can affect others through economic and financial “spillovers.” Analysis of risks and vulnerabilities is now front and center in the IMF’s surveillance work, and the distillation of cross-country experience remains a hallmark of its policy advice.

The road ahead

In the near future, the IMF will need to continue to help members deal with the consequences of the financial crisis, especially low growth and high unemployment.

For fiscal policy, the key is to reduce the onerous burden of public debt in a way that is attuned to the pace of growth and the impact on people’s lives. For monetary policy, the challenge is to navigate the “new normal”—easing out of highly accommodative and unconventional support with minimal disruption. For the financial sector, the goal is to urge and support the completion of reforms to make the system safer, sounder, and more service oriented.

Looking further into the future, the breathtaking advance of information and communication technology will propel financial integration toward a scale not yet quantified, and to corners of the world not yet reached. Deeper integration will fuel growth and feed risks. Experience teaches us an important lesson: greater financial integration raises the probability and size of financial crises. That calls for sharpening the IMF’s tools for crisis prevention and strengthening its support for crisis resolution.

The emergence of new economic and financial centers, linked through global trade and ever larger financial flows may eventu-

ally lead to a new paradigm in the global financial system, 40 years after a new order emerged from the demise of the gold-based Bretton Woods system.

A new multilateralism must be able to cope with a greater diffusion of economic power, and possibly the rise of limited currency arrangements providing new if yet untested anchors for regional economic stability. As the primary guardian of the global monetary system, the IMF must continue to adapt its work and emphases accordingly—focused on its mission but flexible in its approach, accommodating structural shifts in the world economy, so as to best serve its membership.

Focus, flexibility, service: these will remain the IMF's guiding principles.

Beyond the realm of finance, the IMF's member countries will have to come to grips with a number of emerging macro-critical challenges: the stark rise in income inequality, the relentless march of climate change, and—in many areas—the continued exclusion of women from economic life.

Mitigate income inequality

One of the leading economic narratives of our time is the growing disparity between rich and poor. Over the past three decades, the richest 1 percent of the population increased its share of income in 24 of the 26 countries for which we have data. Across many advanced economies in particular, inequality is edging to levels last seen during the Gilded Age.

Recent IMF research—which looked at 173 countries over the past 50 years—found that more unequal countries tend to have lower and less durable economic growth.

For the IMF to strengthen its focus on growth and stability, it needs to worry about excessive income inequality. Fiscal policy can be especially effective here, given its good record of reducing social disparities through transfers and income taxes, and expanding access to education and health care remains a universal priority. The key is to promote measures that do the most good and the least harm, both in IMF surveillance and in the design of IMF lending programs.

Address climate change

A second major 21st century obstacle to sustainable growth and prosperity is climate change. Average temperatures are rising, and with that rises the risk of more frequent natural disasters, more volatile agricultural output, and greater food and water insecurity. In the poorest countries, the effects of climate change will exacerbate their already fragile state.

Again, this has serious implications for growth and stability—and for the IMF. A big part of the solution relates to getting prices right—including the price of all externalities. This will help reduce the harm today and spur investment in the low-carbon technologies of tomorrow.

Phasing out energy subsidies is thus an important part of the solution. In many cases, the very behavior that is destroying our planet is being subsidized through bad policy choices: direct subsidies and the loss of tax revenue from fossil fuels ate up almost \$2 trillion in 2011 alone. To make matters worse, these subsidies mostly benefit the relatively affluent—so there is much that can be done to fight both climate change and poverty.

Increase the participation of women

With these looming threats to growth and stability from income inequality and environmental degradation, the global economy will need to seek other avenues of vitality in the years ahead. One such avenue involves enabling women

The crisis prompted the IMF to rethink its analysis and adapt its policy advice.

to participate more in labor markets. This is especially pertinent as demographics evolve: bringing more women into the labor force will help counteract the slower growth that comes with population aging.

Yet there is a long way to go. Women may represent half of the world's population, but they account for far less than half of measured economic activity. Gender gaps in labor force participation are worldwide—ranging from 12 percent in Organisation for Economic Co-operation and Development economies to 50 percent in some emerging market and developing regions. Eliminating these gaps in regions like the Middle East and North Africa or south Asia could lead to a jump in income per capita of about 25 percent.

This is why the IMF supports policies to level the playing field of labor for both genders. Again, it is fiscal policy that can take the lead here—including through publicly funded parental leave programs; quality, affordable child care; and tax credits and benefits for low-wage workers. For developing economies, policies often center on boosting access to decent health care, education, and financial services.

These issues—inequality, climate change, and women's exclusion from labor markets—increasingly threaten the macroeconomic health of the IMF's member countries. In that respect, these problems must become more a part of our work. We can and must cooperate more effectively with others that are engaged in these areas, and we must make the most out of the number of ways in which we can help directly.

Representation and governance

The stage is set for a world, 20 or 30 years from now, in which economic power will be far less concentrated in the advanced economies—and more vastly dispersed across all regions. The IMF must be representative of, and mirror, these shifts in order to stay relevant. As an institution owned by 188 member countries, working for the benefit of 7½ billion global citizens, the IMF's governance needs to remain representative and true to the principles set out in the Articles of Agreement.

In the short term, this means that the ratification of the 2010 IMF reform, including the 14th Quota Review, must be completed soon. This will help ensure that, over the longer term, the IMF continues on a path that provides it with the resources and legitimacy necessary to fulfill its mandate of maintaining global economic and financial stability. ■

The recent financial crisis has taught us to pay attention to dark corners, where the economy can malfunction badly



Where Danger LURKS

Olivier Blanchard

UNTIL the 2008 global financial crisis, mainstream U.S. macroeconomics had taken an increasingly benign view of economic fluctuations in output and employment. The crisis has made it clear that this view was wrong and that there is a need for a deep reassessment.

The benign view reflected both factors internal to economics and an external economic environment that for years seemed indeed increasingly benign.

Start with internal factors. The techniques we use affect our thinking in deep and not always conscious ways. This was very much the case in macroeconomics in the decades preceding the crisis. The techniques were best suited to a worldview in which economic fluctuations occurred but were regular, and essentially self correcting. The problem is that we came to believe that this was indeed the way the world worked.

To understand how that view emerged, one has to go back to the so-called rational expectations revolution of the 1970s. The core idea—that the behavior of people and firms depends not only on current economic conditions but on what they expect will happen in the future—was not new. What was new was the development of techniques to solve models under the assumption that people and firms did the best they could in assessing the future. (A glimpse into why this was technically hard: current decisions by people and firms depend on their whole expected future. But their whole expected future itself depends in part on current decisions.)

These techniques however made sense only under a vision in which economic fluctuations were regular enough so that, by looking at the past, people and firms (and the econometricians who apply statistics to economics) could understand their nature and form expectations of the future, and simple enough so that small shocks had small effects and a shock twice as big as another had twice the effect on economic activity. The reason for this assumption, called linearity, was technical: models with nonlinearities—those in which a small shock, such as a decrease in housing prices, can sometimes have large effects, or in which the effect of a shock depends on the rest of the economic environment—were difficult, if not impossible, to solve under rational expectations.

Thinking about macroeconomics was largely shaped by those assumptions. We in the field did think of the economy as roughly linear, constantly subject to different shocks, constantly fluctuating, but naturally returning to its steady state over time. Instead of talking about fluctuations, we increasingly used the term “business cycle.” Even when we later developed techniques to deal with nonlinearities, this generally benign view of fluctuations remained dominant.

This state of affairs, however, would not have developed (or at least not lasted for so long) without external factors playing a role. The state of the world, at least the economic world, provided little impetus for macroeconomists to question their worldview.

From the early 1980s on, most advanced economies experienced what has been dubbed the “Great Moderation,” a steady decrease in the variability of output and its major components—such as consumption and investment. There were, and are still, disagreements about what caused this moderation. Central banks would like to take the credit for it, and it is indeed likely that some of the decline was due to better monetary policy, which resulted in lower and less variable inflation. Others have argued that luck, unusually small shocks hitting the economy, explained much of the decrease. Whatever caused the Great Moderation, for a quarter century the benign, linear view of fluctuations looked fine. (This was the mainstream view. Some researchers did not accept that premise. The late Frank Hahn, a well-known economist who



taught at Cambridge University, kept reminding me of his detestation of linear models, including mine, which he called “Mickey Mouse” models.)

Dark corners

That small shocks could sometimes have large effects and, as a result, that things could turn really bad, was not completely ignored by economists. But such an outcome was thought to be a thing of the past that would not happen again, or at least not in advanced economies thanks to their sound economic policies.

Bank runs—in which a small shock, or indeed, no shock at all, could lead depositors to panic and withdraw their funds from banks, with major adverse effects across the entire economy—were a staple topic of macroeconomics courses. But in those courses this was often presented as an illustration of how the introduction of bank deposit insurance had largely eliminated the problem. And, if the problem recurred nevertheless, the argument went, central banks could quickly provide liquidity (that is, lend cash) to banks against good collateral, allowing solvent banks to satisfy their depositors, tamping down any panic, and avoiding disastrous outcomes.

Sudden stops—episodes when capital flows to a country dry up and all investors try to get out at once—could not be ignored either. They still happened with great regularity in emerging market economies—in Latin America in the 1980s, Mexico in the mid-1990s, and Asia in the late 1990s. But they were thought to be an issue for emerging markets, not advanced economies (this is why I wrote “U.S.” in the first paragraph of this article). As an example of the sometimes provincial character of mainstream U.S. macroeconomics, in a number of doctoral programs a student can specialize in macroeconomics without knowing what an exchange rate is, much less an emerging market economy.

In general, issues of liquidity—the potential mismatch between assets with long-term maturities and liabilities with shorter-term maturities—were not seen as central to macroeconomics. That such an asset-liability liquidity mismatch might be pervasive, affecting not only banks but other financial players and corporations as well, was not well understood. Important work on the role of liquidity was done in corporate finance, but its incorporation into macroeconomic analysis did not reach mainstream status.

The probability that central banks would want to decrease nominal interest rates below zero and be unable to do so (nominal interest rates cannot go below zero, because, if they did, people would hold cash rather than bonds—a constraint known in the jargon as the “zero lower bound”) was seen as very small. With nominal interest rates at roughly 4 percent before the crisis—split between 2 percent to account for inflation and a 2 percent real, or after inflation, rate of return—most central bankers believed that they had plenty of room to maneuver in adjusting interest rates in response to adverse shocks. And, if more was needed, the argument went, the central bank could raise inflation expectations while keeping the nominal rate at zero, thus decreasing the real component of the interest rate.

Other nonlinearities were also recognized. For example, economists recognized that bank regulatory constraints, such as the minimum amount of capital (essentially a bank’s net worth; that is, its ability to absorb losses) institutions had to hold, could force banks to react more sharply to decreases than to increases in their capital. The way credit constraints faced by firms and households led to increasingly precautionary behavior, as they came close to running down their credit lines, was worked out and used, for example, to study individual consumption

**We all knew that there were
“dark corners” . . . but we thought
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ignore them.**

behavior. But again, these nonlinearities were not seen as central to fluctuations.

In short, the notion that small shocks could have large adverse effects, or could result in long and persistent slumps, was not perceived as a major issue. We all knew that there were “dark corners”—situations in which the economy could badly malfunction. But we thought we were far away from those corners, and could for the most part ignore them. Japan sat unhappily in that picture, an advanced economy stuck in a long slump with deflation. But its situation was often interpreted as the result of misguided policies rather than a harder-to-solve problem.

Blindsided by the crisis

The main lesson of the crisis is that we were much closer to those dark corners than we thought—and the corners were even darker than we had thought too.

The Great Moderation had fooled not only macroeconomists. Financial institutions and regulators also underestimated risks. The result was a financial structure that was increasingly exposed to potential shocks. In other words, the global economy operated closer and closer to the dark corners without economists, policymakers, and financial institutions realizing it.

When the U.S. housing boom turned to bust, a complex and opaque structure of financial claims led to worries about which institution was holding which claims and which institutions were solvent. This in turn led to major liquidity runs, not so much on banks, but on many nonbank financial institutions, such as investment banks—many of which over the years operated like banks but without the regulation and protections banks received. Standard bank deposit insurance just did not cover the needs.

Providing liquidity to the relevant institutions to enable them to meet creditor demands required the use of monetary

policy on a massive scale and often in new ways. Fortunately, massive and often innovative monetary policy was undertaken. But it was not enough to avoid a large drying up of credit and a sharp decline in demand and activity.

Fiscal policy, in the form of large increases in public spending, was used to offset declining private demand. But government debt levels rose quickly and policymakers and investors became worried. Perceived sovereign risk (the possibility that a government will default on its debts), which, for advanced economies, had been close to zero before the crisis—increased in a number of countries, making it harder to use fiscal policy to sustain demand and at the same time creating risks in the balance sheets of creditors, such as banks, that held the sovereign debt.

So-called diabolical loops developed between public and private debt: weak governments weakened banks that held government bonds in their portfolios; weakened banks needed more capital, which often had to come from public funds, weakening governments.

As central banks tried to maintain economic activity by reducing the policy interest rate (for example, the overnight federal funds rate in the United States), the zero lower bound was quickly reached, and we have been stuck there now for more than five years. Policymakers did not succeed in raising inflation expectations to enable them to further decrease effective real rates. The risk of deflation is still clearly present across the euro area, and in some euro countries it is a reality. Deflation increases the real value of public and private debt, which in turn makes repayment more onerous and forces debtors to reduce spending, and that in turn decreases economic activity—another diabolical loop.

In this environment, economic policy—especially monetary policy—has taken on an element of black magic. Some policies, such as, for example, the recent shift by the European Central Bank (ECB) to charge banks a tiny

amount for deposits they maintain at the ECB (in other words, a very small negative interest rate) will have, on paper, very small mechanical effects. But if such policies are seen as representing the commitment of the central bank to do “whatever it takes”—as Mario Draghi, the head

For a long time to come, one of the priorities of macroeconomic policy will be to slowly but steadily return debt to less dangerous levels.

of the ECB, put it in a celebrated speech in 2012—to stimulate lending, they can have much larger effects. The size of this psychological effect, however, is extremely hard to predict or control.

Where does this take us?

The crisis has one obvious policy implication: Authorities should make it one of the major objectives of policy—macroeconomic, financial regulatory, or macroprudential—to stay further away from the dark corners.

We are still too close to those corners. The crisis itself led to large accumulations of debt, both public and private. For the time being, the diabolical loops have receded, but it would not take much of an adverse shock for them to reappear. For a long time to come, one of the priorities of macroeconomic policy will be to slowly but steadily return debt to less dangerous levels, to move away from the dark corners.

More needs to be done, however.

If the financial system had been less opaque, if capital ratios had been higher, there might still have been a housing bust in the United States in 2007–08. But the effects would have been limited—a mild U.S. recession at the worst, rather than a global economic crisis.

Can the financial system be made more transparent and more robust? The answer is a qualified yes. Authorities have required increases in bank capital ratios—an essential line of defense against financial system meltdown. But banks are only part of a complex network of financial institutions and markets, and risks are far from gone. The reality of financial regulation is that new rules open new avenues for regulatory arbitrage, as institutions find loopholes in regulations. That in turn forces authorities to institute new regulations in an ongoing cat-and-mouse game (between a very adroit mouse and a less nimble cat). Staying away from dark corners will require continuous effort, not one-shot regulation.

Macroeconomic policy also has an essential role to play. If nominal rates had been higher before the crisis, monetary policy’s margin to maneuver would have been larger. If inflation and nominal interest rates had been, say, 2 percentage points higher before the crisis, central banks would have been able to decrease real interest rates by 2 more



percentage points before hitting the zero lower bound on nominal interest rates. These additional 2 percentage points are not negligible. Their effects would have been roughly equivalent to the effects of the unconventional monetary policies that central banks pursued when the zero bound was reached—purchasing private sector assets and long-term government bonds to lower long-term interest rates rather than using the standard technique of manipulating a short-term policy rate. (Harvard Professor Kenneth S. Rogoff, former head of the IMF's Research Department, has suggested solutions other than higher inflation, such as the replacement of cash with electronic money, which could pay negative nominal interest. That would remove the zero bound constraint.)

Turning from policy to research, the message should be to let a hundred flowers bloom. Now that we are more aware of nonlinearities and the dangers they pose, we should explore them further theoretically and empirically—and in all sorts of models. This is happening already, and to judge from the flow of working papers since the beginning of the crisis, it is happening on a large scale. Finance and macroeconomics in particular are becoming much better integrated, which is very good news.

But this answer skirts a harder question: How should we modify our benchmark models—the so-called dynamic stochastic general equilibrium (DSGE) models that we use,

for example, at the IMF to think about alternative scenarios and to quantify the effects of policy decisions? The easy and uncontroversial part of the answer is that the DSGE models should be expanded to better recognize the role of the financial system—and this is happening. But should these models be able to describe how the economy behaves in the dark corners?

Let me offer a pragmatic answer. If macroeconomic policy and financial regulation are set in such a way as to maintain a healthy distance from dark corners, then our models that portray normal times may still be largely appropriate. Another class of economic models, aimed at measuring systemic risk, can be used to give warning signals that we are getting too close to dark corners, and that steps must be taken to reduce risk and increase distance. Trying to create a model that integrates normal times and systemic risks may be beyond the profession's conceptual and technical reach at this stage.

The crisis has been immensely painful. But one of its silver linings has been to jolt macroeconomics and macroeconomic policy. The main policy lesson is a simple one: Stay away from dark corners. ■

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Sunrise over wind turbines near Lincoln, Kansas, United States.

An array of new energy supplies is shaking up today's economic establishment, creating winners and losers worldwide

energy supplies are threatening powerful players at least as much as yesterday's energy crunches did. From a boom in fossil-fuel production to a flowering of renewable energy to the rollout of an array of contraptions and business models to cut energy waste, the new energy riches of the 21st century are doing what new riches typically do—destabilizing the old economic order.

To be sure, even as these new energy supplies emerge, the world faces fundamental energy challenges. Energy demand is rising in the developing world, particularly in China. That's squeezing global output and keeping oil prices stubbornly high—pressure that could intensify as global economic activity picks up. And global greenhouse-gas emissions continue to increase, in large part because the world fuels itself mostly from coal and other fossil fuels and is likely to do so for many years to come.

Yet, in certain places, the new resource riches are starting to remake the energy landscape. They're shifting the center of gravity of global oil production westward, to North America from the Middle East. They're reorienting the adolescent renewable-energy industry eastward, to China from the United States and Europe. They're curbing carbon emissions in some cases and exacerbating them in others, which means that their effect on today's signal environmental concern—climate change—will remain unpredictable for years to come. All the while, the proliferation of new resource riches is jeopardizing the bottom lines of long-dominant energy powers, including OPEC, leading electricity producers, and multinational manufacturers. All of them are scrambling to adapt rather than get crushed.

New Powers

Jeffrey Ball

LAST year, a minister from the Organization of the Petroleum Exporting Countries (OPEC) called surging U.S. oil production a “grave concern” to the cartel. This spring, Barclays downgraded the debt of the U.S. electricity sector, warning that the increasing popularity of rooftop solar panels “is likely to disrupt the status quo.” Meanwhile, coal producers in the West are swimming in inventory, facing flat demand at home, and forced to look far afield, to Asia, for markets.

An energy revolution is rocking the world: one triggered by an explosion of new energy technologies and supplies. It's a stark contrast to the energy shifts of the past half century, which were sparked by acute supply shocks. New resource riches are popping up spottily across the globe, and they are beginning to have profound and messy geopolitical and environmental repercussions. So far, their most striking effect is economic: today's new

Pushing ahead

Energy shifts historically have happened for two reasons. Sometimes there has been a push: a prevailing energy source has run out. Sometimes there has been a pull: a better energy source has come along. In the 1700s and 1800s, industrializing societies were both pushed and pulled to coal from wood. They were depleting their forests, and they found that coal, a more energy-rich fuel, was more efficient in factories. In the early 1900s, the British Navy was pulled to oil from coal—a decision that later prompted a similar shift in civilian transportation—because black gold is denser, cleaner, and easier to move around than the black rock.

In the second half of the 20th century, the big energy shifts were pushes: reactions to politically induced supply constraints. After their major cities were flattened by Allied bombs in World War II, Germany and Japan, both of which traditionally had to import most of the energy they consumed, rebuilt their infrastructures with energy efficiency in mind. And after the Arab oil embargoes of the 1970s, nations that at the time lacked their own known fossil-fuel supplies unleashed big national campaigns to ramp up alternative sources of power. France went nuclear, Brazil drove ethanol, and Denmark pushed wind. Necessity was the mother of invention.

As the 21st century dawned, the world appeared to be slamming up against an energy constraint far more structural than a war or an embargo: a natural-resource wall. Developing economies, particularly China and India, were slurping up massively more energy every year, and energy producers were struggling to unearth enough new fossil fuel to keep up. The trend lines pointed to a new era of energy scarcity—a fear that reached its apogee when, a decade or so ago, a geological term burst into the public lexicon: “peak oil.” The notion was that the world had consumed roughly half of all retrievable oil in the ground. Now at the top of that fateful supply curve, the theory went, humanity faced a future of rocketing pump prices and petroleum wars as it burned through the second half of Mother Nature’s petroleum gift. Many peak-oil acolytes predicted the future would be a road trip to Armageddon—a Malthusian comeuppance for a profligate world.

A new era of plenty

What a difference a few years make. The high oil prices that peak-oil disciples saw as validation of their millennial predictions spurred technological breakthroughs that have, at least in much of the world, begun to vastly expand the economically producible energy supply. Today, production of the types of oil and natural gas industry insiders call “unconventional”—in plain English, hard to get out of the ground—is surging. That’s largely because the high prices made affordable the rollout of new production techniques such as fracking and horizontal drilling. The market, aided by government research spending, worked.

The upshot is evident in a flurry of excitement about unlocking vast stores of unconventional hydrocarbons across much of the planet—from the United States to China to Europe to Latin America. Less than a decade ago, American politicians were preoccupied with the country’s increasing

reliance on Middle East oil imports, and American industrialists were warning that high domestic energy prices were pushing manufacturing offshore. Today, politicians are debating whether to export large amounts of U.S. oil and gas, and all that domestic fossil fuel is leading some companies that might have located factories elsewhere in the world to keep or build them in the United States.

The fossil-fuel boom is evident too in a striking rhetorical shift by environmental activists and other promoters of low-carbon—mainly renewable—power. After years of arguing that renewable energy was necessary in significant part because fossil fuels were running out, they now contend that

Today’s new energy supplies are threatening powerful players at least as much as yesterday’s energy crunches did.

renewable energy is necessary largely because fossil fuels are ramping up. Across the world, they’re pushing for government caps on carbon emissions tough enough to make it uneconomic to burn those buried troves. Particularly in developing economies, whose energy appetite continues to grow, that argument is going to be a tough sell.

Renewable power itself is an important component of today’s nascent energy surge. Its production is soaring off a tiny base, so it remains a small slice of the global energy pie. But that slice has expanded far more quickly than many predicted, and today, quite mainstream projections for its future range from merely bullish to positively euphoric. Solar and wind power have been growing the fastest, driven by generous government subsidies. Three things have motivated those incentives: concern about climate change, a desire by many governments to promote domestic jobs, and nationalistic bids by those same countries to win what they have concluded will be one of the 21st century’s great technological races.

Yet economic forces, once unleashed, have a way of spinning out of control. And renewable energy has snowballed from a cute green dalliance to a cutthroat global industry with a speed and intensity that has sideswiped even many of its fans. Initially, European countries rolled out subsidies that made it profitable for companies both to manufacture wind turbines and solar panels and to peddle the higher-priced electricity that those contraptions cranked out. Then, countries with low-cost manufacturing, notably China, exploited the European incentives to ramp up big, export-oriented renewable-energy industries of their own. Later, as this global rush brought economies of scale to what had been inefficient infant industries, the cost of wind and solar energy came drastically down. Today, in a handful of places around the world that have lots of wind or sun, or have very high conventional-electricity prices, or have both, the cost of power from these renewable sources is competitive with the cost of power from coal or gas.

A bright future—for some

The spread of new resource riches could be stopped by a host of technological, political, and economic barriers. But key players in the global economy are coming to believe it's a new normal they can't ignore.

OPEC is particularly worried. Last year, in widely reported remarks, the energy minister of Nigeria, an OPEC member, called surging U.S. shale oil production “a grave concern.” Facts on the ground appear increasingly to justify those jitters. This June, the International Energy Agency

Solar has grown in large part because subsidies have spurred advancements.

(IEA, 2014) projected in a report that OPEC's share of the world's “productive” oil capacity will continue to fall, to 57 percent of global capacity in 2019 from 58 percent in 2013, while the share from non-OPEC countries will rise, to 43 percent from 42 percent. Those relatively tame statistics mask scarier shifts for the cartel that long has dominated global oil production. Between 2012 and 2013, as North America's oil production jumped 1.35 million barrels a day, OPEC's fell 850,000 barrels a day, according to the IEA. And although OPEC's capacity is projected to be 2.08 million barrels a day higher in 2019 than in 2013, that expected jump assumes that more than half the growth comes from Iraq, a country that isn't on stable footing. “Given Iraq's precarious political and security situation,” the IEA warned in its report, “the forecast is laden with downside risk.” Although the decline in OPEC production thus far is due chiefly to political and geological difficulties within OPEC countries, OPEC members are expressing growing worry that, with oil production rising in the United States, there will be less demand for oil from OPEC.

OPEC isn't the only power fretting about the jump in U.S. energy production. So is European industry, which fears that falling energy prices across the Atlantic will make Europe less competitive as a producer of global goods. This February, the chief executives of more than 100 energy-intensive companies with large operations in Europe—such giants as Rio Tinto Alcan, ArcelorMittal, BASF, ThyssenKrupp, Johnson Controls, and Merck—signed a letter calling on European policymakers to boost the continent's natural gas production and ease a raft of carbon-cutting mandates it has imposed. Those two moves, asserted the industry group that organized what it called this “manifesto,” would reduce European energy prices, making European industry more competitive with factories in the United States.

The rise of renewable energy is fueling fights as intense as those raging over the resurgence of oil and gas. Solar power is a particularly fraught case in point.

Solar provides less than 1 percent of annual global electricity generation, according to the IEA. But even that rep-

resents a several-fold increase from solar's footprint just five years ago. And it masks higher penetration in certain places. Solar accounts for some 8 percent of total annual electricity generation in Italy, about 5 percent each in Germany and in Spain, and about 2 percent in Australia, according to the IEA. In California on some days, more than 6 percent of electricity comes from the sun. Globally, solar will account for more than 1 percent of annual electricity production by the end of this year, projects the IEA, which contends that, from there, solar's future will get significantly sunnier.

Solar has grown in large part because subsidies have spurred advancements that have pushed costs down. By many estimates, the average price of a solar panel has tanked 75 percent or more in the past few years. One of the main reasons for that price drop was an unexpected surge in Chinese factories making low-cost solar panels. That has infuriated the Western companies that dominated the solar industry in its early days. Several of those companies have filed complaints with international trade authorities, alleging that Chinese solar-panel makers got an illegal leg up through Chinese subsidies so generous that they violate World Trade Organization rules. China denies violating any law. Whoever is right legally, the allegations have set off a trade war pitting China against the United States and Europe, with each side slapping tariffs on solar components that it imports from the other. In July, the United States signaled it intended to ratchet up its tariffs on Chinese-made panels yet again.

Dawn of a new era?

Beyond the clash over who will profit from producing solar panels is a battle over who will win and lose from selling solar power. Around the globe, dominant electricity producers are growing concerned that the spread of cheaper solar panels will encourage more customers to produce their own power, eroding the utilities' customer base. In Germany, the big utility E.ON has blamed the rise of rooftop solar panels for disappointing quarterly earnings. In the United States, David Crane, CEO of U.S. power producer NRG Energy, has called rooftop solar power “a mortal threat” to utilities' business. In Hawaii, the dominant power company recently announced it's strictly limiting the number of rooftop solar panels it will connect to the grid.

Energy can be dangerous and unpredictable. That's true at a wall outlet, and it's true for the globe. Not long ago, the prevailing concern was that there wasn't enough energy to power the world. Now, among players from oil producers to electric utilities to multinational manufacturers, there's a new worry: that a proliferation of new energy technologies and supplies is starting to undermine world powers. ■

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Reference:

International Energy Agency (IEA), 2014, Medium-Term Oil Market Report 2014: Market Analysis and Forecasts to 2019 (Paris).



Favelas and modern skyscrapers in Fortaleza, Brazil.

Measure to Measure

Jonathan D. Ostry and Andrew G. Berg

ALTHOUGH growing economic inequality has become an important economic and political topic in recent years, its precise definition is often fuzzy. It could describe the relative fate of the middle class, or the income of the top 1 percent. It can be gauged before or after taxes and transfers. What is measured has much to do with what is concluded and with which policy responses should be considered.

Moreover, as the reality of inequality is increasingly accepted, attention has turned to what, if anything, to do about it—such as whether to redistribute income, if so how, and what the effects of redistribution might be. As with inequality, the definition of “redistribution” and how it is measured make a critical difference to analysis and policy.

What is inequality?

All economic concepts present difficult measurement and conceptual issues, but inequality perhaps more than most. Measurement of GDP, for example, is itself enormously complicated. But at least the goal is clear: calculation

of the total output of an economy. Inequality, in contrast, is more like, say, “competitive-ness”—any simple measure is an attempt to boil a complex issue down to one number.

Most inequality data come originally from surveys that typically ask households about income from various sources, taxes, and consumption. The information gleaned is highly imperfect. Surveys, which are expensive and complex, generally are undertaken only every few years at best. And there is no guarantee that the surveys are representative. The rich may be harder for the surveyors to find and may be less likely to participate when identified.

Often, researchers want to compare inequality across time and countries, which is difficult for many reasons:

- **Surveys vary in important ways.** For example, there are several ways to define income. It could include only factor remuneration such as wages from labor and profits from capital (market income), or it could also include transfers such as private gifts, government subsidies, and pensions or in-kind resources such as food stamps and tax pay-

Inequality may be a hot topic, but describing it is a difficult proposition

ments (net or disposable income). Also, surveys may report inequality in consumption rather than income.

- **The unit of analysis also varies.** A survey could look at income per person, per household, or per tax unit (which is often not the same as a household). Commonly, surveys report income per “adjusted household”—which aims to take into account that costs per family member go down as the size of the household rises.

Because of these and other problems with surveys, particularly their problems tracking the income of the rich, economists began looking to tax records as a source of income distribution data (Atkinson, Piketty, and Saez, 2011). Tax data have several advantages over survey data: the data are available for all taxpayers so the rich are better represented, and it is possible to look at small segments, such as the top 0.1 percent. Moreover, the data tend to be available annually and often as far back as the early 20th century.

But there are also important disadvantages to using tax data. First, the many poor and even middle-class people who do not pay income taxes are excluded. Second, there is generally little information on actual taxes paid and transfers received that allows the calculation of disposable income. Third, data are available only for advanced economies and a handful of emerging markets. And fourth, tax-based data have their own measurement problems related to misreporting and the use of tax avoidance strategies, many of which are perhaps particularly available to the richest.

What is measured matters

When it comes to these disparate and imperfect measurements, a key principle is to use the right measurement for the question asked.

Let’s start with a simple comparison of the United States and Germany based on data on disposable income of adjusted households (see Chart 1). Disposable income essentially is the income and transfer payments received by households minus taxes. We need to boil down the informa-

tion into something we can readily compare. There are many ways to do this, and each has its uses.

The *Gini index* is the most commonly used summary measure. It gauges the average difference in income between any two households (or individuals), randomly chosen from the entire population. It is scaled so that it varies from zero to 1: zero means that all households receive the same income and 1 means that one household gets all the income. Because it captures the entire distribution and is available for many countries, the Gini index is especially useful for understanding the overall macroeconomic implications and determinants of income inequality.

The share going to the very rich—the *top 1 percent* or *0.1 percent*—has received much attention recently because it has risen sharply in some countries since about 1980. The increase has been so concentrated at the very top of the distribution that Gini measures, which look at the entire income distribution and are survey based, have not captured it well.

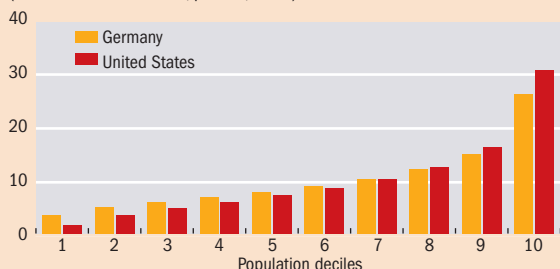
The share of the top 1 percent may be a more useful measure partly because it gauges a particularly important feature of the income distribution for some purposes, such as the ability of the fabulously rich to capture the political process. As the late U.S. Supreme Court Justice Louis Brandeis once observed: “We may have democracy, or we may have wealth concentrated in the hands of a few, but we can’t have both.” He did not have in mind general measures of inequality such as the Gini. Authors such as Joseph Stiglitz (2012) argue that the traditional focus on the Gini index has caused many analysts to miss the implications of the rise in top incomes for the evolution of political power in the United States. For some purposes, however, broader measures are more useful. For example, more unequal countries tend to have lower

Chart 1

Dividing the pie

In both the United States and Germany, income distribution is unequal.

(share of total net income, percent, 2007)



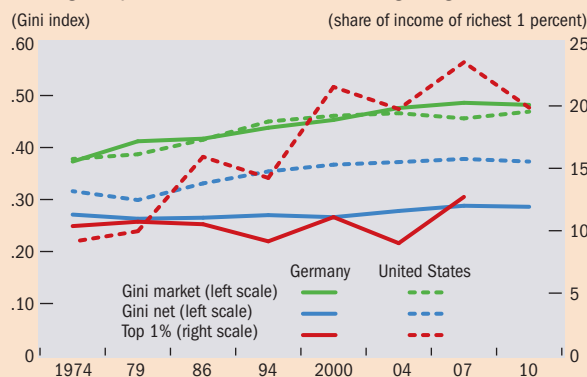
Source: UNU-WIDER, World Income Inequality Database (WIID 3.0A), June 2014.

Note: The bar pairs are ordered from the poorest tenth of the population in the United States and Germany to the richest 10 percent. The Gini index, which measures the overall level of inequality in a country, is 0.29 for Germany and 0.38 for the United States. A Gini index of zero means that every household has the same income, while an index of 1 means that a single household has all the income.

Chart 2

Measuring up

Overall inequality and the share of income going to the richest 1 percent are rising in both Germany and the United States, although they fell in the United States during the global recession.



Sources: Alvaredo and others (2014), for the richest 1 percent; and Solt (2009) for the Gini index data.

Note: Market inequality is measured before taxes and transfer payments. Net inequality takes into account transfer payments and taxes. The share of income of the richest 1 percent is measured before taxes and transfers. The Gini index measures inequality in an economy. An index of zero means that all households have the same income; an index of 1 means that one household has all the income.

intergenerational mobility when Gini is the measure, but not for the top 1 percent measure.

Chart 2 shows the evolution of the Gini index for market inequality (before taxes and transfers) and the share going to the top 1 percent in Germany and the United States. Both measures show increases in the two countries, but the increase is much sharper for the top 1 percent in the United States. Another striking result is that market income inequality—as measured by the Gini—is about equal in Germany and the United States.

Inequality and growth

In our study of inequality, we have focused on the implications of inequality for the sustainability of growth in a large sample of countries. We hypothesized that many mechanisms linking inequality and growth may be at work, including the effect of inequality on the ability of the poor and middle class to accumulate human capital; on political stability and thus incentives to invest; on social cohesion and the ability to resist and forcefully adjust to shocks; and on political pressures for redistribution, which may dull incentives and thus slow growth. Because we wanted to encompass all these channels without taking a stand on which one mattered most, and because we needed a large sample of countries and time periods, the Gini served admirably. In Berg and Ostry (2011) we added to the tentative and perhaps growing consensus among researchers by concluding that higher inequality is associated with less durable growth.

The attention that has been focused on inequality is turning to redistribution of income. Our findings on inequality and growth were ambiguous about the implications for redistribution. If more unequal countries tend to try to redistribute more, and such redistribution (higher tax rates, subsidies) weakens incentives to work and invest, then redistribution is not a “treatment” for inequality but part of the problem, at least when it comes to growth.

We faced two difficult measurement issues. First, most cross-country data sets on inequality contain mainly information on inequality of *net* (disposable) income. However, to examine whether more unequal countries redistribute more requires looking at the relationship between *market* inequality and redistribution, because net inequality confounds the effects of the underlying market inequality and of redistribution. Second, we wanted to measure redistribution itself to assess the second leg of the story: whether redistribution matters for growth, as in the big trade-off between equality and efficiency described by Arthur Okun (1975).

It turns out, though, that redistribution is even harder than inequality to measure well. Most efforts have focused on proxies for redistribution, such as government spending on health, education, and social subsidies, on the one hand, and total revenues or tax rates on the other.

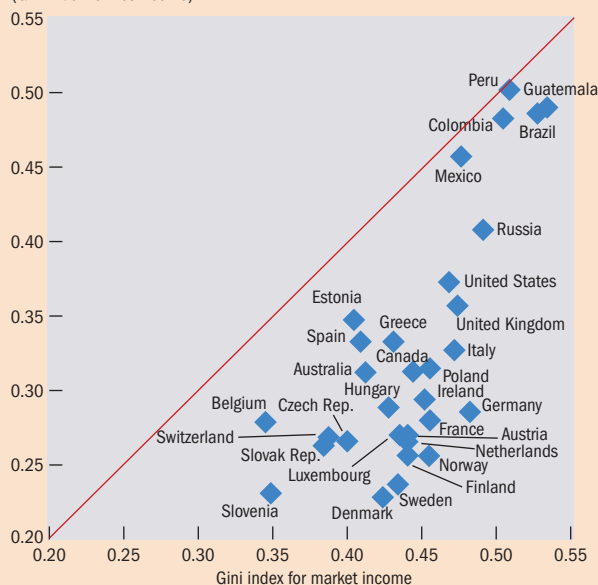
But these proxies are very imprecise. Much taxation may not be particularly progressive, such as payroll or sales taxes. Similarly, the benefits of social spending may or may not flow mainly to lower-income groups. For example, much education spending in developing economies is focused on secondary and higher education, which benefits mainly those who are better off, while much health care spending supports urban

Chart 3

Redistributing income

Inequality diminishes after taxes and transfer payments to lower-income households.

(Gini index for net income)



Sources: Solt (2009); and Standardized World Inequality Database, version 4.0.

Note: The Gini index measures inequality in an economy. A Gini index of zero means that every household has the same income, while an index of 1 means that a single household has all the income. Market income is the income received before transfers and taxes. Net income is after taxes and transfers. The farther to the right of the 45-degree line an economy is located, the greater the amount of redistribution. Data are for the most recent year available for each country and range from 2003 to 2010.

Chart 4

More equal, more growth

Higher net inequality correlates with lower growth, while redistribution of income appears to have little adverse effect on growth.

(change in growth rate, percent)



Source: Ostry, Berg, and Tsangarides (2014).

Note: The height of the first column, which descends below zero, shows the decrease in the five-year average real (after inflation) per capita income growth associated with an increase in inequality (measured as the Gini index for net income) from the 50th to the 60th percentile, with the other variables (including redistribution) held constant. The Gini index measures the overall level of inequality in a country. A Gini index of zero means that every household has the same income, while an index of 1 means that a single household has all the income. “Net income” is income after taxes and transfers. The second column shows the (barely positive) effect of a 10 percentile increase in redistribution on growth, holding net income, inequality, and other variables constant. Redistribution is measured as the difference between the Gini index for market income (income before taxes and transfers) and for net income. The third column shows the estimated positive growth effect of the same 10 percentile increase in redistribution, but including the (indirect) effect of the increased redistribution on lower net inequality and hence higher growth. This calculation assumes that the increase in redistribution has no effect on market inequality.

hospitals that may not be targeted toward poor or even middle-income citizens. When measuring redistribution using these proxies, researchers have found little evidence that more unequal countries redistribute more. But when measurement improves, results are clearer. Milanovic (2000) took advantage



Use the right measurement for the question asked.

of a high-quality data set for mainly industrial countries maintained by the Luxembourg Income Study. It provides largely comparable data on both market and net inequality. He found that redistribution is strongly related to the level of market inequality for this set of rich democracies.

Our interest has been in determinants of economic growth in all countries. Fortunately, a relatively new data set from political scientist Frederick Solt (2009) makes a strong effort to compile just the information we required. Solt *standardized* available high-quality survey-based inequality data along key dimensions. He collected information from surveys by the World Bank, the United Nations, and others on Ginis of all income definitions (such as market income and net income) and accounting units (such as per household or per capita). He then analyzed the many cases for which several measures of inequality are available for a given country and time period to estimate the typical relationship between the different measures. For example, in Latin American countries in the 1970s, inequality in consumption had a fairly predictable relationship with inequality of disposable income. From this information, and hundreds of similar relationships systematically exploited, Solt inferred standardized measures of net and market income inequality for a large number of countries and time periods.

This sort of information on net and market inequality yields some striking findings. For example, while it is common knowledge that the United States is much more unequal than Germany and that Latin America is more unequal than Europe, what is less well known is that these comparisons are mainly true with respect to net income. The outcome in terms of market inequality (income before taxes and transfers) is remarkably similar (see Chart 3).

More generally, because countries with a more unequal distribution of market income tend to redistribute more, such countries do not necessarily have a substantially more uneven distribution of net income—on average, redistribution makes up about 60 percent of the difference. The United States is an outlier among rich countries for its high inequality of net income, but this is as much because of the relatively small scale of redistribution as because of high market inequality.

New ground

In our own work (Ostry, Berg, and Tsangarides, 2014) with the Solt data we have drawn three broad conclusions. First, *more unequal societies tend to redistribute more*, not just rich

countries, but also (though to a generally lesser extent) those whose economies are just developing. Second, *lower net inequality is robustly correlated with faster and more durable growth*, for a given level of redistribution. And third, *redistribution—measured as the difference between market and net inequality—appears generally benign in terms of its impact on growth* (Chart 4 illustrates the last two conclusions). Only in extreme cases is there some evidence that it may hurt growth. Thus the combined direct and indirect effects of redistribution are on average pro-growth. Of course we need to be cognizant of the inherent limitations of the data set and of cross-country comparisons more generally. And clearly the specifics of redistribution policies matter (IMF, 2014). But based on our work we should be careful not to assume that there is a big trade-off between redistribution and growth.

Many exciting topics in this area are being actively explored. Clearly, though, a priority is the collection and analysis of more and better data, including more and better inequality and redistribution data for a larger number of countries, richer country-level examinations of fiscal redistribution (Lustig and others, 2013), and more attention to wealth—as opposed to income—inequality. We cannot wait, however, for the perfect data to arrive: we must both work to improve the data and carefully use the data we already have. ■

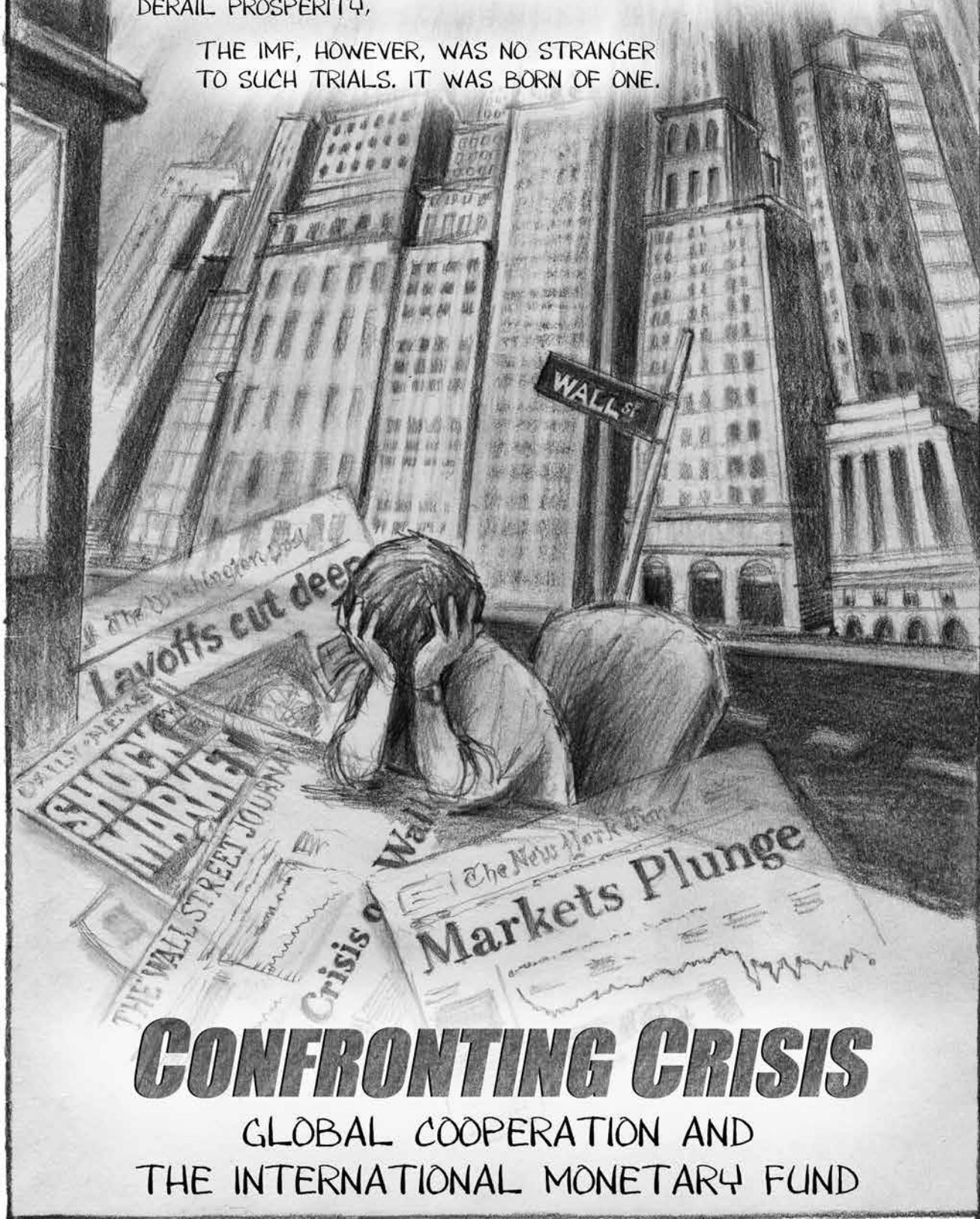
Jonathan D. Ostry is Deputy Director and Andrew G. Berg is Assistant Director, both in the IMF's Research Department.

References:

- Alvaredo, Facundo, Anthony B. Atkinson, Thomas Piketty, and Emmanuel Saez, 2014, The World Top Incomes Database. <http://topincomes.g-mond.parisschoolofeconomics.eu>
- Atkinson, Anthony, Thomas Piketty, and Emmanuel Saez, 2011, "Top Incomes in the Long Run of History," *Journal of Economic Literature*, Vol. 49, No. 1, pp. 3–71.
- Berg, Andrew, and Jonathan Ostry, 2011, "Inequality and Unsustainable Growth: Two Sides of the Same Coin?" IMF Staff Discussion Note No. 11/08 (Washington: International Monetary Fund).
- International Monetary Fund (IMF), 2014, "Fiscal Policy and Income Inequality," IMF Policy Paper (Washington).
- Lustig, Nora, and others, 2013, "The Impact of Taxes and Social Spending on Inequality and Poverty in Argentina, Bolivia, Brazil, Mexico, Peru and Uruguay: An Overview," Tulane Economics Working Paper No. 1316 (New Orleans, Louisiana: Tulane University).
- Milanovic, Branko, 2000, "The Median-Voter Hypothesis, Income Inequality, and Income Redistribution: An Empirical Test with the Required Data," *European Journal of Political Economy*, Vol. 16, No. 3, pp. 367–410.
- Okun, Arthur M., 1975, *Equality and Efficiency: The Big Tradeoff* (Washington: Brookings Institution).
- Ostry, Jonathan, Andrew Berg, and Charalambos Tsangarides, 2014, "Redistribution, Inequality, and Growth," IMF Staff Discussion Note No. 14/02 (Washington: International Monetary Fund).
- Solt, Frederick, 2009, "Standardizing the World Income Inequality Database," *Social Science Quarterly*, Vol. 90, No. 2, pp. 231–42.
- Stiglitz, Joseph E., 2012, *The Price of Inequality: How Today's Divided Society Endangers Our Future* (New York: W.W. Norton).

SOMETIMES THE PAST IS PRELUDE. BUT LITTLE IN THE 21ST CENTURY'S FIRST YEARS HINTED AT THE GALE-FORCE ECONOMIC DESTRUCTION THAT LAY AHEAD. IN 2007, THE WORLD AGAIN FACED A CRISIS THAT THREATENED TO UPEND ECONOMIES AND DERAIL PROSPERITY,

THE IMF, HOWEVER, WAS NO STRANGER TO SUCH TRIALS. IT WAS BORN OF ONE.



CONFRONTING CRISIS

GLOBAL COOPERATION AND
THE INTERNATIONAL MONETARY FUND

STORY BY JOE PROCOPIO

PICTURES BY NICK GALIFIANAKIS

WHEN THE GREAT POWERS MET
IN PARIS IN 1919, THEY WRANGLLED
OVER U.S. PRESIDENT WOODROW
WILSON'S PROPOSALS FOR RESTORING
PROSPERITY AND PEACE AFTER
WWI. BUT A SERIES OF IRRESOLUTE
HALF MEASURES LED TO A TREATY
OF VERSAILLES THAT ULTIMATELY
FAILED TO REESTABLISH ORDER.



WITHIN A DECADE,
PROSPERITY WAS LOST...

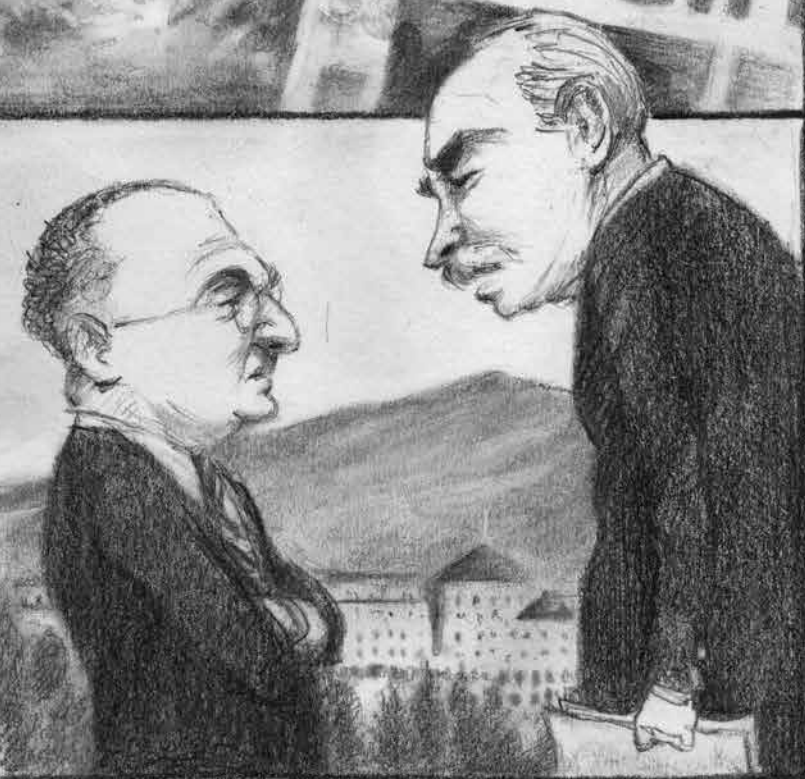


IN ANOTHER DECADE, PEACE
WAS GONE AS WELL.



WITH THE END OF WWII IN SIGHT, WORLD LEADERS RESOLVED NOT TO REPEAT THESE MISTAKES.

AT BRETTON WOODS, NEW HAMPSHIRE, HARRY DEXTER WHITE AND JOHN MAYNARD KEYNES CONVENED NEGOTIATIONS THAT QUICKLY SPAWNED THE IMF AND ITS MISSION TO PROMOTE INTERNATIONAL MONETARY COOPERATION, TRADE, AND THE SMOOTH FLOW OF GLOBAL CAPITAL.



THE IMF AND OTHER FLEDGLING INTERNATIONAL ORGANIZATIONS EMBODIED THE POSTWAR SPIRIT OF MULTILATERAL COOPERATION, AND EVENTUALLY EUROPE WAS REBUILT FROM WAR'S DECIMATION. BUT AS ECONOMIC ACTIVITY BURGEONED, THE WORLD FACED NEW CHALLENGES.

IN THE 1950S AND '60S,
NEWLY SOVEREIGN AFRICAN
NATIONS JOINED THE IMF
FULL OF PROMISE BUT
SHORT ON INFRASTRUCTURE.

THEY SOUGHT SUPPORT
IN BUILDING CAPACITY
AND POLICY EXPERTISE.

AS AFRICAN ECONOMIES EVOLVED, SO
TOO DID THE IMF'S APPROACH...

....HELPING AFRICAN LEADERS
ADDRESS ISSUES OF DEBT
AND POVERTY.

AS THE 1960S WORE
ON, INCREASED U.S.
SPENDING ON THE
VIETNAM WAR WORSENERD
THE OVERVALUATION OF
THE U.S. DOLLAR,
STRAINING THE
VIABILITY OF FIXED
EXCHANGE RATES.

BY THE 1970S, THE ORIGINAL FRAMEWORK FOR PROMOTING ECONOMIC STABILITY COLLAPSED. UNDER THE IMF'S BRETTON WOODS SYSTEM, COUNTRIES HAD TO PEG THEIR EXCHANGE RATES TO THE U.S. DOLLAR. BUT WHEN THE UNITED STATES ABANDONED THE GOLD STANDARD, MAJOR WORLD CURRENCIES BEGAN TO FLOAT AGAINST EACH OTHER.



EVEN THOUGH THE IMF DEVELOPED NEW INSTRUMENTS IN RESPONSE, OTHER CHALLENGES SURFACED. PRIVATE SECTOR CAPITAL FLOWED EVER MORE



FREELY, BUT A MORE INTEGRATED GLOBAL ECONOMY CAME WITH VULNERABILITIES, AND THE 1980S SAW A SERIES OF ESCALATING DEBT CRISES.

GLOBALIZATION'S RISKS AND DOWNSIDES BEGAN TO SURFACE, SPARKING PROTESTS. THIS WAS NOT THE FIRST TIME IDEOLOGIES HAD CLASHED.



A HISTORY OF FRACTIONOUS RELATIONS OFTEN HAMPERED INTERNATIONAL COLLABORATION. THE ORIGINAL HOPE FOR COMPREHENSIVE IMF MEMBERSHIP SHATTERED EARLY ON, WHEN POSTWAR HOSTILITY COOLED INTO COLD WAR ENMITY.



EVENTUALLY CHINA JOINED THE IMF. LATER WHEN THE BERLIN WALL FELL, MEMBERSHIP RAPIDLY EXPANDED, AND A NEW ERA OF BROADER ECONOMIC COOPERATION BEGAN.

YET WITH INTEGRATION COMES INTERDEPENDENCE, MAKING THE COMING OF THE 2007 CRISIS ALL THE MORE FORMIDABLE,...



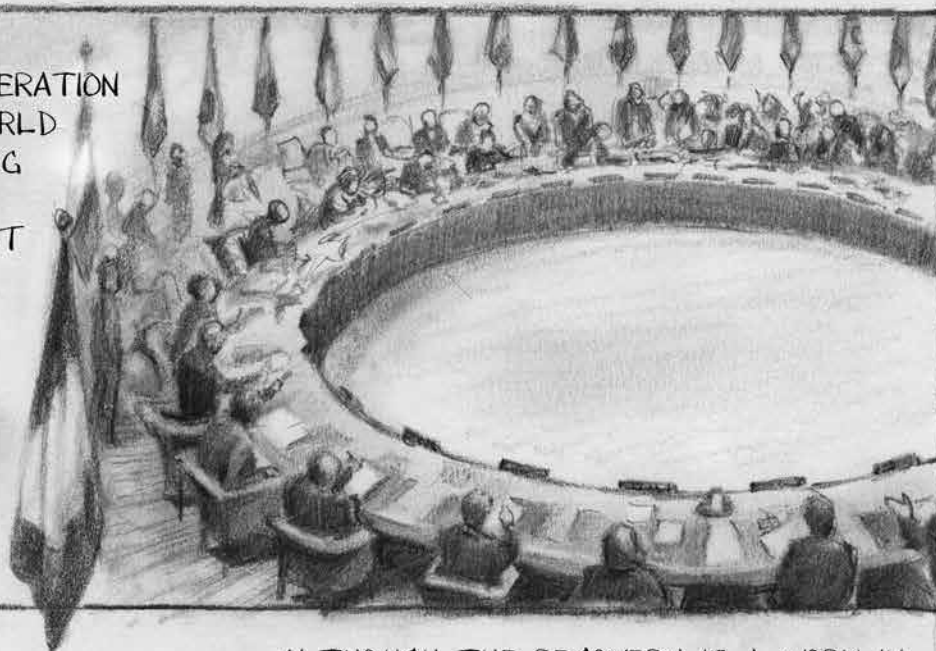
THE U.S. SUBPRIME MORTGAGE CRISIS SENT SHOCK WAVES ACROSS THE WORLD. IN 2008, PANIC SURGED, AND THE SCOPE OF THE GREAT RECESSION OVERWHELMED ANY ONE COUNTRY'S CAPACITY TO CONTAIN ITS CALAMITOUS EFFECTS. THE WOUND THREATENED TO BE DEEP AND DISFIGURING FOR THE GLOBAL ECONOMY.

THE IMF WAS BUILT TO FORESTALL JUST SUCH A DISASTER.



IN THIS MOMENT GLOBAL LEADERS FACED A CHOICE: THE COMMUNITY OF NATIONS COULD EITHER PULL TOGETHER OR APART.

FORTUNATELY, COOPERATION PREVAILED. THE WORLD COMMUNITY, WORKING THROUGH THE IMF, MOBILIZED TO AVERT A DEVASTATING SEQUEL TO THE GREAT DEPRESSION, SECURING THE BREATHING ROOM TO REGROUP AND REBUILD.



ALTHOUGH THE RECOVERY IS A WORK IN PROGRESS, THE WORLD COMMUNITY HAS REAFFIRMED THE IMF'S ONGOING MANDATE: PROMOTE GLOBAL ECONOMIC STABILITY. THE FUTURE HOLDS MANY CHALLENGES, BUT THE MODEL OF MULTILATERALISM HAS BEEN TESTED AND PROVEN INVALUABLE ONCE MORE.



50 *years of* F&D

Times change and so has the focus of *Finance & Development* over the past half century, at least as reflected in the words most commonly used in the magazine

THE 50th anniversary of *Finance & Development* magazine, whose first issue appeared in June 1964, prompted the editors to wonder how its coverage has changed over the decades. These illustrations show the 25 words that appear most frequently in *F&D* by decade. The size of each word represents its frequency relative to the other 24 words.

Late 1960s

F&D was a joint effort of the IMF and World Bank until 1998. It sought to explain how both institutions worked. Gradually the magazine shifted its focus from the institutions to global economic and financial issues.



1970s

The system of relatively fixed exchange rates tied to the U.S. dollar collapsed in 1971, spurring international currency and balance of payments crises and a move from fixed to floating exchange rates. The decade also experienced two major surges in oil prices.



1980s

A sovereign debt crisis in middle-income developing countries, most of them in Latin America, dominated the decade. Countries coped with balance of payments issues and recession as they adjusted their economies to repay debt.



1990s

Countries that were members of the Soviet Union converted from command economies to some form of market economy after the 1991 breakup. Financial crises, first in Mexico, then in major Asian countries, closed out the decade.



2000s

A decade that began with a world in relative economic tranquility, the so-called Great Moderation, ended with the largest economic and financial crisis since the Great Depression of the 1930s. The IMF grew dramatically to help the world cope.



Early 2010s

Employment and GDP recovered slowly in advanced economies after the financial crisis and central banks engaged in unorthodox policies to fight recession.



SOUND MONEY

Live music's debut as a big export earner



Preserve that parity

Maintaining fixed exchange rates placed enormous importance on the major economies' trade balances, since the hard currency earned by exports or spent on imports effectively set exchange rate levels. Britain's pound sterling was under sustained downward pressure in the mid-1960s from a persistently adverse trade balance, and the U.K. government of the day was fighting to preserve the pound's parity of \$2.80 and avoid the ignominy of formal devaluation within the Bretton Woods system.



Magical minstrels

Along came The Beatles—mere minstrels to many, but to the U.K. government a magical machine for printing U.S. dollars. Major live popular musical acts in the mid-1960s typically earned only domestic currency. U.S. singer Elvis Presley, for example, never performed outside North America and Hawaii, and his concert earnings were all in U.S. dollars apart from four appearances in Canada.

IN February 2014 a musical celebration in a drab, cavernous warehouse in central Washington, D.C., marked the first U.S. concert played by British rock band The Beatles in the same building exactly 50 years earlier. But this year's event was also the 50th anniversary of live music's debut as a serious foreign exchange earner.

In 1964, major exchange rates were fixed under the Bretton Woods system introduced—along with the IMF and the World Bank—in 1944. The IMF was formed to help keep these exchange rates stable, and the major economies also used exchange controls to maintain their currencies' value. These controls meant that corporations and private citizens had to have government permission to convert their domestic money to foreign currency and could do so only within legal limits.



The Beatles perform in Las Vegas, United States, in August 1964.

Dollars, deutsche marks, yen

The Beatles by contrast posted world-record dollar-denominated concert receipts from appearances during U.S. tours in 1964, 1965, and 1966. Media reports said they earned a net \$650 a second in today's dollars performing live in 1965. Furthermore, in 1966 the band also embarked on concert tours of Germany and Japan that raked in massive performance fees denominated in deutsche marks and yen. At the very same time, sterling was under increasing pressure from a U.K. consumption boom that was boosting imports and a prolonged seamen's strike that was blocking exports.

Tune power

By cashing in their hard-currency appearance fees, The Beatles joined an elite category of British "invisible" exporters: commercial enterprises that earned foreign currency not from the manufacture and transshipment of visible, physical goods, but from invisible credits and receipts. The U.K. current account in the mid-1960s would have been in constant deficit absent traditional British invisible exports at the time arising from financial services, insurance, patents, and copyrights. To this ledger The Beatles now added earnings from their own invisibles: ticket sales, appearance fees, music royalties, merchandise licensing, and performance rights.



The Beatles prepare to play in Tokyo, in July 1966.



The Beatles on stage in Hamburg, Germany, in June 1966.



Exporters award

Britain's prime minister in the mid-1960s was an award-winning Oxford-educated economist, Harold Wilson, whose keen professional eye quickly noted The Beatles' contribution to the balance of payments as his government struggled to defend sterling. In November 1965 Wilson duly decorated the band as Members of the Order of the British Empire, a national honor usually accorded leading industrialists, entrepreneurs, and inventors.

Sterling's secret weapon

As attendance at Beatles concerts soared and venues grew increasingly chaotic, public order was threatened and the band stopped appearing live in concert altogether in August 1966. A year later, sterling was devalued to \$2.40, and the United Kingdom requested loans from the IMF in 1967 and 1969. Today, key exchange rates float, and major governments no longer need to defend fixed parity with exchange controls or scramble for invisible exports to bolster sagging trade balances. But 50 years ago, The Beatles' historic hard-currency earnings were Britain's secret weapon in a three-year effort to fend off devaluation.

Prepared by Simon Willson, a Senior Editor on the staff of Finance & Development.



On Center Stage

Atish Rex Ghosh

The international monetary system has changed dramatically over the past seven decades, and the IMF has adapted accordingly

WHEN the delegates of 44 nations gathered 70 years ago for the United Nations Monetary and Financial Conference at Bretton Woods, New Hampshire, their purpose was to design a new international monetary system that would bring order to the interwar economic chaos—the hyperinflations and painful deflations of the 1920s, the collapse of the gold standard, and the Great Depression in the 1930s.

The challenge confronting these monetary and financial experts was to come up with a system that would let countries adjust their external imbalances without resorting to the self-defeating competitive devaluations and restrictive trade policies of the interwar period. The burden of adjustment between countries in surplus and those in deficit had to be equitable, and sufficient global liquidity was needed to foster growth of world trade and incomes. Building on extensive preparatory work (mainly by John Maynard Keynes of the British Treasury and Harry Dexter White of the U.S. Treasury), the delegates accomplished the extraordinary feat of agreeing on the postwar monetary order in just three weeks. In closing the conference, U.S. Treasury Secretary Henry Morgenthau, Jr., remarked that, while the conference proceedings may seem mysterious to the general public, the new order lay at the heart of “bread and butter realities of daily life.” What was achieved at Bretton Woods, he said, was “the initial step through which the nations

of the world will be able to help one another in economic development to their mutual advantage and for the enrichment of all.”

The linchpin of the new order—dubbed the Bretton Woods system—was a configuration of fixed but adjustable parities for currencies against the U.S. dollar, whose value would be fixed in terms of gold. The IMF was founded to help manage the system. Its Articles of Agreement, negotiated at the conference (where many countries provided valuable input), inevitably reflected the relative bargaining powers of the main protagonists. The United States, which expected to be the main surplus nation for the foreseeable future, opposed Keynes’s call for an “international clearing union.” This union would have penalized large-surplus and large-deficit countries symmetrically and, since it was based on an artificial unit of account called the “bancor,” could have been used to regulate global liquidity. But the new order at least restrained countries seeking to gain an unfair trade advantage. Devaluation was allowed only in cases of “fundamental disequilibrium,” while countries facing temporary shortfalls in their balance of payments were expected to maintain the parity, with borrowing from the IMF (“purchases” in IMF parlance) available to tide them over.

Down to—and nearly out of—business

The IMF formally debuted in December 1945 with 30 members as countries passed the necessary domestic legislation. The number was



up to 40 by the time operations started March 1, 1947, and thereafter membership grew in spurts, starting with the war-torn European countries and former Axis belligerents, then many newly independent developing economies, and finally, in the 1990s, the republics of the former Soviet Union and the countries in central and eastern Europe.

By the mid-1960s, strains began to appear in the Bretton Woods system as persistent U.S. balance of payments deficits turned the postwar dollar shortage into a dollar glut. With the dollar fixed against gold, the main problem from the U.S. perspective was getting surplus countries (at the time, mainly Germany and Japan) to adjust. For the rest of the world, the dilemma was that U.S. deficits were the system's source of liquidity, but mounting dollars in foreign central bank coffers undermined confidence in the U.S. ability to back those dollars with gold.

The IMF's solution was the Special Drawing Right (SDR)—an artificial reserve asset (somewhat akin to Keynes's *bancor*) that could provide liquidity without the need for corresponding deficits by reserve currency countries. But it proved to be too little, too late. Despite desperate measures to patch the system with central bank swap lines in the 1960s and a last-ditch effort to realign currencies with the Smithsonian Agreement in 1971 after the United States suspended the conversion of dollar reserves to gold, the Bretton Woods system disintegrated. The massive disruption of the late-1973 and 1974 oil price shocks made a return to fixed exchange rates among major currencies impossible. For the IMF, the collapse of Bretton Woods presented an existential crisis. Not surprisingly, there were questions about the relevance of an organization whose *raison d'être* was management of a system that overnight had ceased to exist. The despondent IMF staff circulated a mock requiem for the institution.

Lending a hand

But the IMF's role in lending to countries with balance of payments difficulties made it an indispensable part of the international monetary landscape, especially after the oil price shocks. Initial drawings from the IMF (the first was by France in 1947) were “out-

right purchases,” which means the country drew the money immediately. As early as 1952, however, the notion of precautionary loans—making funds available on stand-by to a country to restore confidence and catalyze private capital flows, potentially obviating the need to actually use IMF money—crystallized in the form of the Stand-By Arrangement. In 1963, recognizing that fluctuations in primary commodity prices were often the major source of balance of payments problems in developing economies, the IMF instituted the Compensatory Financing Facility. And after the first oil shock, in addition to an Oil Facility, in the continuing spirit of helping members correct payment imbalances “without resorting to measures destructive of national or international prosperity,” the IMF introduced the Extended Fund Facility (EFF) in 1974 for countries facing more protracted balance of payments problems.

These new lending instruments, especially the EFF, were a vital addition to the lending toolkit during the 1980s developing economy debt crisis, when committed IMF lending rose from SDR 2 billion in 1979 to almost 15 billion in 1983 (see

For the IMF, the collapse of Bretton Woods presented an existential crisis.

chart). Together with this expansion in its loan portfolio, the IMF had to develop, amend, and adapt its policies on arrears, conditionality, and program design. For low-income countries, the most important innovations were the Structural Adjustment Facility in 1986—precursor to the Enhanced Structural Adjustment Facility in 1987, and the Poverty Reduction and Growth Facility (now Poverty Reduction and Growth Trust) in 1999—and the Heavily Indebted Poor Countries debt relief initiative, both intended to help countries achieve more growth-friendly external adjustment—albeit often with greater structural conditionality in programs.

In times of trouble

The IMF has adapted its lending to successive economic crises, peaking during the global financial crisis.

(IMF arrangements, total amount approved, billions of SDRs)



Source: IMF, Monitoring of Fund Arrangements database.

Note: Amount is in billions of dollars from 1952 to 1971 and in billions of SDRs from 1972 to 2013.



Just as the debt crisis—and associated IMF lending—was winding down in the late 1980s and questions about the institution's relevance were reemerging, the IMF managed to return to center stage, this time helping the Soviet Union and central and eastern Europe transform into market economies. Assistance was partly straightforward macroeconomic stabilization, but program design in these countries often required the IMF to provide advice (technical assistance almost doubled between 1990 and 1996) and even impose conditions—for example, regarding pricing policy, privatization, and governance—far removed from its standard mandate.

IMF lending took another quantum leap during the emerging market capital account crises of the 1990s, epitomized by the Asian financial crises in 1997–98 but spanning much of the decade—from Mexico's December 1994 devaluation to the collapse of Argentina's currency board in January 2002. Beyond the magnitude of financing involved, these crises posed enormous analytical challenges for the IMF (indeed, for the economics profession at large). The IMF became embroiled in controversy about the appropriate policy response, and it had to develop new tools and incorporate the financial and corporate sectors into its macroeconomic analysis and technical assistance.

Firm, or not so firm, surveillance

Although Bretton Woods had ceased to exist by the early 1970s, the international monetary system still faced many of the same issues confronting the architects of the system. In its final report to the IMF Board of Governors in June 1974, for instance, the Committee of Twenty (a ministerial body established in July 1972 to consider reforms to the international monetary system) listed the “achievement of symmetry in the obligations of all countries, debtors and creditors alike,” and “the better management of global liquidity” among the key goals for the reformed international monetary system.

Again, agreement proved elusive. Instead of a return to a Bretton Woods system (but with more symmetrical adjustment), the amended Articles of Agreement called on the IMF to “oversee the international monetary system in order to ensure its effective operation . . . [and to] exercise firm surveillance over the exchange rate policies of members.” Surveillance was thus to have two components: bilateral, ensuring that individual countries fulfilled their obligations under the (amended) Articles; and multilateral, overseeing the operation of the system. This was the genesis of the IMF's *World Economic Outlook* in 1980.

Neither the amended Articles of Agreement, nor the 1977 supporting Surveillance Decision, however, provided much guidance on how surveillance was to be conducted, and the process evolved with experience. By the late 1990s, for example, it was clear that it needed to extend beyond exchange rate issues to periodic health checks on its member countries lest contagion from financial crises threaten the stability of the whole system.

The age-old problem of asymmetric adjustment came to a head with the emergence of large current account imbalances among major economies (dubbed global imbalances) in the

early 2000s. These came under the purview of IMF surveillance both because they involved the exchange rate policies of member countries and because they posed a potential risk to the stability of the system. Despite a “multilateral consultation” in 2006 and a 2007 board decision putting teeth into surveillance (subsequently folded into the 2012 Integrated Surveillance Decision), the IMF was largely unsuccessful in persuading the major players to adopt policies that would

The core challenges of the international monetary system remain much the same as 70 years ago.

narrow the imbalances. At the same time, as emerging market countries improved their macroeconomic policies and strengthened their institutions, crises became rarer, and by the mid-2000s, IMF lending fell to its lowest levels in decades. Once again, the IMF seemed headed toward redundancy—this time with the twist that its income, mostly from lending, could not cover the cost of its surveillance and technical assistance.

Full circle

The collapse of U.S. investment bank Lehman Brothers and the ensuing global financial crisis, of course, quelled any doubts about the relevance of the IMF, which was soon injecting liquidity into the global economy through an SDR allocation. It ramped up its lending—first to emerging market countries in Europe and elsewhere, then to several members of the euro area, with longer-term financing (in the form of EFFs) to deal with their more protracted balance of payments problems. Given increased global interdependence and risk of contagion, and building on the idea of the Stand-By Arrangement, the IMF established instruments that were more explicitly precautionary (such as the Flexible Credit Line) to bolster confidence. And responding to the charge that it had missed the crisis it developed a host of analytical tools to better identify, avoid, mitigate, and resolve financial crises and their cross-border spillovers.

Today, the IMF's loan portfolio and range of surveillance and technical assistance (nearly triple that of 1990)—underpinned by expanding research and analytical work—are larger than ever, and its finances are more sustainable and less dependent on lending. The core challenges of the international monetary system remain much the same as 70 years ago, but how those challenges are manifested, not least with the growth of private capital flows, has changed in ways the founding fathers could scarcely have imagined.

The real accomplishment of the Monetary and Financial Conference was not designing the Bretton Woods system, it was establishing an institution that could, and would, adapt to meet the evolving needs of its members—to benefit the bread and butter realities of daily life. ■

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What Is Keynesian Economics?

The central tenet of this school of thought is that government intervention can stabilize the economy

Sarwat Jahan, Ahmed Saber Mahmud, and Chris Papageorgiou

DURING the Great Depression of the 1930s, existing economic theory was unable either to explain the causes of the severe worldwide economic collapse or to provide an adequate public policy solution to jump-start production and employment.

British economist John Maynard Keynes spearheaded a revolution in economic thinking that overturned the then-prevailing idea that free markets would automatically provide full employment—that is, that everyone who wanted a job would have one as long as workers were flexible in their wage demands (see box). The main plank of Keynes's theory, which has come to bear his name, is the assertion that aggregate demand—measured as the sum of spending by households, businesses, and the government—is the most important driving force in an economy. Keynes further asserted that free markets have no self-balancing mechanisms that lead to full employment. Keynesian economists justify government intervention through public policies that aim to achieve full employment and price stability.

The revolutionary idea

Keynes argued that inadequate overall demand could lead to prolonged periods of high unemployment. An economy's output of goods and services is the sum of four components: consumption, investment, government purchases, and net exports (the difference between what a country sells to and buys from foreign countries). Any increase in demand has to come from one of these four components. But during a recession, strong forces often dampen demand as spending goes down. For example, during economic downturns uncertainty often erodes consumer confidence, causing them to reduce their spending, especially on discretionary purchases like a house or a car. This reduction in spending by consumers can result in less investment spending by businesses, as firms respond to weakened demand for their products. This puts the task of increasing output on the shoulders of the government. According to Keynesian economics, state intervention is necessary to moderate the booms and busts in economic activity, otherwise known as the business cycle.

There are three principal tenets in the Keynesian description of how the economy works:

- *Aggregate demand is influenced by many economic decisions—public and private.* Private sector decisions can sometimes lead to adverse macroeconomic outcomes, such as reduction in consumer spending during a recession. These market failures sometimes call for active policies by the government, such as a fiscal stimulus package (explained below). Therefore, Keynesian economics supports a mixed economy guided mainly by the private sector but partly operated by the government.

- *Prices, and especially wages, respond slowly to changes in supply and demand,* resulting in periodic shortages and surpluses, especially of labor.

Keynes the master

Keynesian economics gets its name, theories, and principles from British economist John Maynard Keynes (1883–1946), who is regarded as the founder of modern macroeconomics. His most famous work, *The General Theory of Employment, Interest and Money*, was published in 1936. But its 1930 precursor, *A Treatise on Money*, is often regarded as more important to economic thought. Until then economics analyzed only static conditions—essentially doing detailed examination of a snapshot of a rapidly moving process. Keynes, in *Treatise*, created a dynamic approach that converted economics into a study of the flow of incomes and expenditures. He opened up new vistas for economic analysis.

In *The Economic Consequences of the Peace* in 1919, Keynes predicted that the crushing conditions the Versailles peace treaty placed on Germany to end World War I would lead to another European war.

He remembered the lessons from Versailles and from the Great Depression, when he led the British delegation at the 1944 Bretton Woods conference—which set down rules to ensure the stability of the international financial system and facilitated the rebuilding of nations devastated by World War II. Along with U.S. Treasury official Harry Dexter White, Keynes is considered the intellectual founding father of the International Monetary Fund and the World Bank, which were created at Bretton Woods.

- *Changes in aggregate demand, whether anticipated or unanticipated, have their greatest short-run effect on real output and employment, not on prices.* Keynesians believe that, because prices are somewhat rigid, fluctuations in any component of spending—consumption, investment, or government expenditures—cause output to change. If government spending increases, for example, and all other spending components remain constant, then output will increase. Keynesian models of economic activity also include a multiplier effect; that is, output changes by some multiple of the increase or decrease in spending that caused the change. If the fiscal multiplier is greater than one, then a one dollar increase in government spending would result in an increase in output greater than one dollar.

Stabilizing the economy

No policy prescriptions follow from these three tenets alone. What distinguishes Keynesians from other economists is their belief in activist policies to reduce the amplitude of the business cycle, which they rank among the most important of all economic problems.

Rather than seeing unbalanced government budgets as wrong, Keynes advocated so-called *countercyclical fiscal policies* that act against the direction of the business cycle. For example, Keynesian economists would advocate deficit spending on labor-intensive infrastructure projects to stimulate employment and stabilize wages during economic downturns. They would raise taxes to cool the economy and prevent inflation when there is abundant demand-side growth. Monetary policy could also be used to stimulate the economy—for example, by reducing interest rates to encourage investment. The exception occurs during a liquidity trap, when increases in the money stock fail to lower interest rates and, therefore, do not boost output and employment.

Keynes argued that governments should solve problems in the short run rather than wait for market forces to fix things over the long run, because, as he wrote, “In the long run, we are all dead.” This does not mean that Keynesians advocate adjusting policies every few months to keep the economy at full employment. In fact, they believe that governments cannot know enough to fine-tune successfully.

Keynesianism evolves

Even though his ideas were widely accepted while Keynes was alive, they were also scrutinized and contested by several contemporary thinkers. Particularly noteworthy were his arguments with the Austrian School of Economics, whose adherents believed that recessions and booms are a part of the natural order and that government intervention only worsens the recovery process.

Keynesian economics dominated economic theory and policy after World War II until the 1970s, when many advanced economies suffered both inflation and slow growth, a condition dubbed “stagflation.” Keynesian theory’s popularity waned then because it had no appropriate policy response for stagflation. Monetarist economists doubted the ability of governments to regulate the busi-

ness cycle with fiscal policy and argued that judicious use of monetary policy (essentially controlling the supply of money to affect interest rates) could alleviate the crisis (see “What Is Monetarism?” in the March 2014 *FeD*). Members of the monetarist school also maintained that money can

Keynesian economics dominated economic theory and policy after World War II until the 1970s.

have an effect on output in the short run but believed that in the long run, expansionary monetary policy leads to inflation *only*. Keynesian economists largely adopted these critiques, adding to the original theory a better integration of the short and the long run and an understanding of the long-run neutrality of money—the idea that a change in the stock of money affects only nominal variables in the economy, such as prices and wages, and has no effect on real variables, like employment and output.

Both Keynesians and monetarists came under scrutiny with the rise of the new classical school during the mid-1970s. The new classical school asserted that policymakers are ineffective because individual market participants can anticipate the changes from a policy and act in advance to counteract them. A new generation of Keynesians that arose in the 1970s and 1980s argued that even though individuals can anticipate correctly, aggregate markets may not clear instantaneously; therefore, fiscal policy can still be effective in the short run.

The global financial crisis of 2007–08 caused a resurgence in Keynesian thought. It was the theoretical underpinnings of economic policies in response to the crisis by many governments, including in the United States and the United Kingdom. As the global recession was unfurling in late 2008, Harvard professor N. Gregory Mankiw wrote in the *New York Times*, “If you were going to turn to only one economist to understand the problems facing the economy, there is little doubt that the economist would be John Maynard Keynes. Although Keynes died more than a half-century ago, his diagnosis of recessions and depressions remains the foundation of modern macroeconomics. Keynes wrote, ‘Practical men, who believe themselves to be quite exempt from any intellectual influence, are usually the slave of some defunct economist.’ In 2008, no defunct economist is more prominent than Keynes himself.”

But the 2007–08 crisis also showed that Keynesian theory had to better include the role of the financial system. Keynesian economists are rectifying that omission by integrating the real and financial sectors of the economy. ■

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The Saga of Bretton Woods



Ed Conway

The Summit

The Biggest Battle of the Second World War—Fought Behind Closed Doors

Little, Brown, London, 2014, 863 pp., \$29.95 (cloth).

It makes for a tremendous story. A colorful cast of characters at an isolated hotel in the mountains of New Hampshire. Glorious summer weather, abundance such as many of those present had not seen in almost five years of war, and plenty of alcohol. In the two leading roles, Britain's John Maynard Keynes—brilliant, eccentric, ill, with a weak hand to play, and attended by his wife, the unconventional prima ballerina Lydia Lopokova—and Harry Dexter White of the U.S. Treasury—determined, self made, energetic, and with a backstory of contacts with Soviet intelligence. The challenge was to reach an agreement on an international monetary system that would eliminate the scourges of instability and mass unemployment. Despite the complexity of the subject matter and the chaos of the drafting sessions, an agreement was reached that remains a byword for international cooperation. If Keynes was disappointed in the result, and White came to doubt some of its main features, it nevertheless created and funded two institutions that have embedded themselves at the center of international economic cooperation for 70 years.

A great story, which Ed Conway, economics editor of Sky News, tells

with verve. He draws on the memoirs of the participants and extracts fascinating nuggets from archives across the world. If the focus is on the human drama of the conference, the reader also gets a prehistory of the issues at stake and what they meant to the participants and an account of how their agreement fared subsequently.

Conway spotlights the pressures on the negotiators from domestic politicians with an arsenal of axes to grind and an imperfect grasp of the issues involved, as well as from a financial sector jealous to preserve its many ways of making money. The subsequent ratification of the two agreements creating the IMF and the World Bank looks even more miraculous given the fate of others, such as the International Trade Organization.

The main issues of international economic and monetary cooperation discussed at the conference remain at the forefront of today's policymaking. Should both surplus and deficit countries share the burden of adjustment? What is the best way to ensure stable exchange rates without making the system too rigid and imposing unendurable burdens of adjustment? How much autonomy should domestic economic policy have and how free should capital movement be? How can a country's unsustainably large debt be managed? Conway's lively account of how participants at the conference in that Bretton Woods, New Hampshire, hotel dealt with these matters offers sharp insight into the issues of the current round of crises.

The IMF mandate in the Articles of Agreement negotiated at Bretton Woods is expressed in complicated and obscure language. This is hardly surprising, given the confusion of the negotiations. Keynes complained that the U.S. draft of the agreement seemed to be written in Cherokee, but White and his delegation strove to keep it that way. They had more experience in a legal tradition whose basic texts are construed to make them apply in circumstances far from the minds of the drafters. But the result

gave the IMF the flexibility it needed to adapt and respond to the changing needs of the world economy.

The rules of the Bretton Woods system were designed to be vague. The more astute drafters recognized that rules are likely to stick only if other countries are prepared to sanction the violators—rarely the case when the violator is a strong surplus country. The agreement might have broken down at the first challenge had the rules been more specific. As it was, enforcement was not strong, and ways emerged to circumvent inconvenient rules.

The monetary system that was designed at Bretton Woods did not even start to operate until the late 1950s, and was largely dismantled in 1971–73. But it was one of the more prosperous and stable periods in international economic history. It is hard to know how much credit to assign to the specific rules agreed at Bretton Woods and how much to other factors, such as postwar recovery or the demand impulses from the United States and its willingness to supply the needed liquidity. While the system broke down under the strains of the U.S. current account deficit and the mushrooming of financial markets, would-be reformers of the international monetary system continue to call for a new Bretton Woods.

So what was the main achievement of those weeks in the mountains of New Hampshire if the rules for an international monetary system were so short lived?

It was the creation and funding of two institutions with mandates to promote international financial cooperation and economic development. Their effectiveness in promoting the common purpose has vindicated the vision and determination Keynes, White, and their colleagues showed at Bretton Woods 70 years ago.

Mark Allen

Former Senior Regional Resident Representative for Central and Eastern Europe

Former Director of the IMF's Policy Development and Review Department



A Look inside the Fund

Liaquat Ahamed

Money and Tough Love

On Tour with the IMF

Visual Editions, London, 2014, 208 pp., \$40.00 (paper).

In *Money and Tough Love*, Liaquat Ahamed describes the professional lives of IMF economists and their international tribe, while also providing a potted history of its founding and development. It's a challenging task because the sensitivity of the IMF's work skews the institution toward discretion.

Money and Tough Love makes the IMF and its work comprehensible and accessible by profiling the quotidian activities and culture of its foot soldiers. Rather than stretching to draw drama out of the days of spreadsheet-wielding policy wonks, Ahamed explains how IMF staff members quietly contribute to the creation of a critical global public good.

In pulling back the veil on life on 19th Street, Ahamed eschews breathless fly-on-the-wall accounts of the financial crisis and fawning profiles of senior management. And as an outsider, he mercifully avoids the ersatz reconstructed conversations and false omniscience of battle-hardened memoirs. His book is less *Stress Test* and more macro-economic *Coming of Age in Samoa*.

Drawing on visits to headquarters and travel with IMF staff during late 2012, Ahamed's project is timely. After the IMF was written off in 2007 as nearly irrelevant by those who thought we had seen the end of financial crises, it came roaring back to global center stage after Lehman

Brothers collapsed in 2008. Since then, it has been in the headlines on a nearly daily basis in its 70th birthday year.

Increased exposure hasn't brought with it greater understanding of the IMF's work. Ahamed's book helps address this gap.

The monograph is organized around four facets of the IMF's activities: daily life at headquarters in Washington; the whirlwind of the October 2012 IMF–World Bank Annual Meetings in Tokyo; a “mission”—or staff visit—in October 2012 to Ireland, one of the few “advanced” economies to borrow from the IMF in recent years; and a November 2012 mission to Mozambique, a serial IMF borrower and heavily aid-dependent poor country. This mix provides Ahamed with a platform to discuss a broad range of IMF staff activities and their links to the global economy.

Ahamed strikes a balance between acknowledging the prosaic elements of the IMF's work—even when he

Learn to Grow

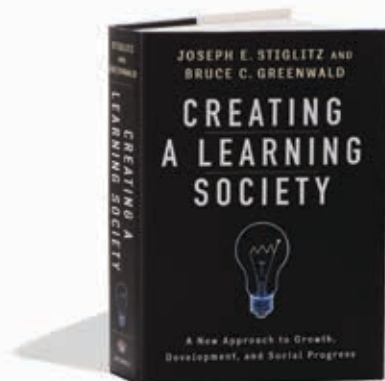
Joseph E. Stiglitz and Bruce C. Greenwald

Creating a Learning Society

A New Approach to Growth, Development, and Social Progress

Columbia University Press, New York, 2014, 680 pp., \$34.95 (cloth).

This landmark book, initially conceived as a set of lectures in honor of Kenneth Arrow (and implicitly of Bob Solow), combines Arrow's classic learning-by-doing paper with Solow's growth model. It proposes that technical change is a process of learning and that firms grow and countries develop as they learn in three ways—invention, innovation (adapting inventions to production processes), and “learning how to learn.” What differentiates successful from less successful economies, the authors say, is a process of learning that permits firms, sectors, and eventually the whole economy to achieve its true potential.



The idea that learning determines economic success ties together various strands of the literature and calls others into question. The vaguely defined “dynamic comparative advantage” is fleshed out by questioning whether the standard notion of comparative advantage, based on the factors of production, still has meaning (in a world of capital mobility). The authors propose that most firms are stuck inside a production possibility frontier; learning allows them to approach the frontier and push it out, even though some might argue

that such a frontier may itself be ill defined in a world in which firms and economies grow by learning. Perhaps most fundamentally, the book provides a fresh perspective on the role of government in stimulating growth and welfare. Knowledge is a public good and absent government intervention will be undersupplied in a competitive market economy. Yet how much government intervention yields the most learning is not clear-cut. Joseph Stiglitz and Bruce Greenwald argue that Joseph Schumpeter's view that monopolies generate innovation does not always hold, but acknowledge that the opposing view—that competition offers greater incentives for innovation—may not always be true either. Firms under competition are smaller and hence less able to bear the fixed costs of innovation. The book makes a strong case for industrial policy that spurs domestic firms to innovate and learn, and retain that learning at home. But the type of industrial policy it proposes is quite different from the recently revived

admits they bore him—and capturing the sense of purpose most IMF staff members are privileged to experience. In Ahamed's telling, the IMF's nerds sweat the details of the global economy so the rest of us don't have to.

Ahamed provides an insider's view.

If anything, Ahamed could paint the IMF staff with a little more color beyond the near-uniform standard of dark suits and ties. I yearned to see more of the stories and characters that make the IMF a richly textured place to work: to wit, the Sandinista cashier in the IMF bistro dispensing advice on markets, the Finnish mission chief who could hold his liquor better than any ex-Soviet finance minister, and the Iranian Executive Director who helped champion the extension of marriage benefits to

same-sex couples years ahead of most IMF member countries.

Ahamed notes that 150 nationalities are represented among the IMF staff, but his notion of diversity doesn't seem to go further than passports. The improving experiences of various minorities chart the evolution of the institution itself and would have made for some pithy insights into IMF culture and some occasionally tragicomic tales.

At the same time, Ahamed argues that the IMF staff embodies *e pluribus unum* on a global scale: a disciplined team with homogenous views. But he doesn't explain why: they went to the same graduate schools, studied with the same professors, and wrote dissertations on the same things. That doesn't mean they all think the same way, but it does mean they speak the same professional language and can engage deeply on complicated problems.

This sameness produces incredibly heated, if diplomatic, debate behind the IMF's smoked-glass doors. A

typical internal review often takes the form of the "Fund sandwich": it notes a research paper has been beautifully written; goes on to demolish every substantive point made; and finishes with compliments on the econometric technique employed. Where the IMF is distinct from other institutions, such as the World Bank, is that its policy blood-sports stay inside the building: once an argument's settled, the staff presents a united front to the world.

This discipline has meant that, among many banks, only one financial institution has become so central to the global economy that it's known simply as "the Fund." In *Money and Tough Love*, Ahamed provides an insider's view of how the staff works to make the IMF more than the sum of its 2,500 human parts.

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practice of "picking winners," especially winners based on comparative advantage.

These and other somewhat complex ideas are presented in an intuitive and systematic way. Occasionally, simple models (in the Arrow-Solow tradition) are introduced to sharpen intuition and clarify conclusions. Parts I and II are a model of how to present new ideas to an economically literate, but not necessarily specialist, readership. Part I starts with the importance of learning, proceeds to a description of how firms learn, takes on the issue of market structure, and ends with welfare and economy-wide considerations. Part II delves into more complicated issues, such as learning in a closed economy and long-run dynamics, but still based on intuition and simple models. Parts I and II are a tutorial in thinking like an economist—using the profession's tools to solve the most compelling problem of our time: how to help societies achieve sustainable growth. Stiglitz

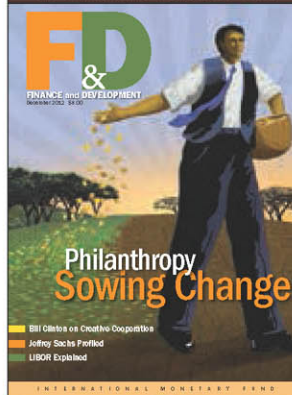
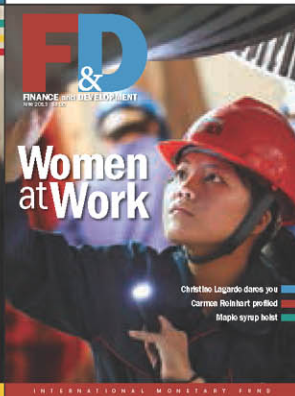
and Greenwald's enthusiasm for the subject is infectious.

Part III, "Policies for a Learning Society," is, however, a bit of a disappointment, in part because it lacks the rigor and intuition of the first two parts. This section begins with a long and rather tired critique of the Washington Consensus and full-blown trade liberalization. Whether or not this is a straw man argument, the critique does nothing to draw out the policy implications of the authors' theory of a learning society. The first two parts of the book make a solid case for government intervention to promote learning. The challenge is how to design these interventions in such a way that they don't create the kinds of government failures that accompanied previous attempts at intervention (such as the misguided industrial policies in Africa before the 1990s). Stiglitz and Greenwald allude to this challenge in their brief section on political economy. But they provide no guidance (except for the universal "it depends on country cir-

cumstances"). Yet this is the question that policymakers, especially those who have been burned by well-intentioned but ultimately damaging policy advice, are asking. It is also the challenge posed by Philippe Aghion in his discussant's comments on the original lecture, in which he asks whether the arguments for industrial policy are "stronger than the powerful political economy counter arguments" and concludes with the sensible advice to "experiment, and then make sure you can stop the intervention if it turns out not to be efficient."

This book is so powerful and well done that the disappointment with the policy section is not a criticism. Rather, it is an invitation to write a follow-up volume, one that addresses head on questions of policy design and implementation—as well as the underlying political incentives—for a learning society.

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