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Oil and water 

Stanley Fischer profiled 

Regional business cycles 



# In Our Hands

## EARTH'S PRECIOUS RESOURCES

## Finance & Development

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## FEATURES

### EARTH'S PRECIOUS RESOURCES

#### 8 Too Much of a Good Thing?

For natural resource riches to drive growth and reduce poverty, countries must balance spending now with investing in the future  
*Chris Geiregat and Susan Yang*



#### 12 A Drop in the Bucket

Successful management of water must balance development needs and economic considerations  
*Peter H. Gleick*

#### 16 On the Edge

How oil markets will adjust to high prices is unclear  
*Thomas Helbling*

#### 19 Extracting Resource Revenue

For countries with abundant oil, gas, and mineral deposits, formulating tax and spending policies can be tricky  
*Philip Daniel, Sanjeev Gupta, Todd Mattina, and Alex Segura-Ubierno*

#### 23 The Elusive Revival

The expected boost in growth from natural resource booms is not yet happening  
*Andrew Warner*

#### 26 Capital Flight Risk

Natural-resource-rich countries risk capital flight as multinational corporations seek to avoid taxes  
*Rabah Arezki, Gregoire Rota-Graziosi, and Lemma W. Senbet*



#### 29 Eurasia's Next Frontier

For the Caucasus and Central Asia, natural resource wealth holds the key to achieving emerging market status  
*Mark Horton and Jonathan Dunn*



#### 32 Picture This: Minerals of the Future

A secure, green, and innovation-filled future awaits us, but only with the help of rocks buried deep in the ground  
*Glenn Gottselig*

### ALSO IN THIS ISSUE

#### 34 A Bumpy Road Ahead

Latin America needs large and sustained productivity gains to maintain its recent strong growth  
*Sebastián Sosa and Evridiki Tsounta*

#### 40 Closer to Home

Despite all the talk of globalization, business cycles seem to be becoming more regional  
*Hideaki Hirata, M. Ayhan Kose, and Christopher Otrok*



- 44 **A Big Question on Small States**  
Can they overcome their size-related vulnerabilities and grow faster and more consistently?  
*Sarwat Jahan and Ke Wang*
- 48 **Beyond the Household**  
Remittances that migrants send home to their families also have a major impact on the overall economy  
*Ralph Chami and Connel Fullenkamp*
- 52 **Strength in Lending**  
Strong balance sheets help banks sustain credit to the economy during crises  
*Tümer Kapan and Camelia Minoiu*

## DEPARTMENTS

- 2 **Letters to the Editor**
- 3 **In Brief**
- 4 **People in Economics**  
**A Class Act**  
*Prakash Loungani* profiles Stanley Fischer, academic, IMF deputy, and central bank governor extraordinaire
- 38 **Back to Basics**  
**What Is the Output Gap?**  
Economists look for the difference between what an economy is producing and what it can produce  
*Sarwat Jahan and Ahmed Saber Mahmud*
- 56 **Book Reviews**  
*Treasury's War: The Unleashing of a New Era of Financial Warfare*, Juan C. Zarate  
*The Rise of the People's Bank of China*, Stephen Bell and Hui Feng

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## All That Glitters

**I**N my dream, I tilt the pan filled with river silt from side to side and see gold flakes, hundreds of them, glittering as they emerge from the muck. The flakes pile up. I have it made. Then the alarm clock jars me awake and, poof, my riches vanish.

Sadly, in some places, my dream's abrupt end is an all too familiar reality.

In many nations, the discovery of a precious natural resource—say, copper, oil, or a rare mineral—generates high hopes but then fails to deliver the sustained economic gains its citizens expect.

Of course, some resource-rich countries fare well, but many others struggle to capitalize on their riches. In nearly half of the countries in sub-Saharan Africa, for example, natural resources account for an important share of total exports. But many of these countries have struggled to convert their resource wealth into growth engines that work to benefit future generations.

Why isn't an abundance of precious natural resources an economic slam dunk—a sure way to sustain growth over the long haul? Partly, the answer lies in the exhaustible nature of certain resources—an oil well runs dry, a mine stops producing. Economists have explored many explanations over the years: commodity boom-and-bust cycles, weak institutions, and “Dutch disease,” whereby a booming resource sector chokes off growth in other parts of the economy.

This issue of *F&D* explores the world of natural resource management and puts forward new ideas for sustaining resource revenues over the long haul, to support steady economic growth.

Our special feature kicks off with “Too Much of a Good Thing?” by Chris Geiregat and Susan Yang, who examine the challenges facing resource-rich countries and advocate the use of a sustainable investing tool to help policymakers better allocate resource revenue. In “A Drop in the Bucket,” Peter Gleick of the Pacific Institute looks at the economics of the one natural resource we can't live without: water.

Philip Daniel, Sanjeev Gupta, Todd Mattina, and Alex Segura-Ubiergo tackle the challenges of formulating tax and spending policies in revenue-rich countries in “Extracting Resource Revenue.” Other articles cover natural resource booms, the promise of resource wealth to boost the frontier economies of central Asia, and capital flight associated with the natural resource sector. And Thomas Helbling offers a peek into the future of oil markets.

Elsewhere in the issue, Prakash Loungani profiles Stanley Fischer, whose achievements in the public, private, and academic spheres place him at the forefront of modern economics. Other articles examine whether Latin American growth can be sustained, why regional factors are trumping global factors in business cycles, and how remittances affect economies.

We hope you find this issue a veritable gold mine of ideas and analysis.

*Jeffrey Hayden*  
Editor-in-Chief

## Arab Spring a misnomer

To the editor:

The articles in the March 2013 issue of *F&D* on the future of the Middle East are thoughtful and exhaustive. But whatever is meant by the “Arab Spring,” a season for flowering and growth or a time for leaping up or forward, reality belies the title—a monumental misnomer confusing popular upheaval, spontaneous and unorganized, with the need for drastic root-and-branch societal change. The articles’ ideas for economic, political, and other reforms are destined to lead nowhere not for lack of trying but for landing on barren, toxic, and unreceptive ground. Living for centuries under a perverted time warp, the countries and people of the region need *first and foremost* a rebirth not unlike the European Renaissance of centuries ago, which, in the words of a recent commentary in *The Economist*, “broke through the carapace of medieval



thought to rediscover ancient learning . . . . The movement placed man, rather than God, at the centre of the universe.” To change the human condition in the region, politicians and opinion leaders should sort out the relationship of their people *not only to nature but to heaven as well.*

**Mehdi AlBazzaz**  
formerly of the World Bank

## Battling on Bretton Woods

To the editor:

Since Eric Rauchway’s review of my book *The Battle of Bretton Woods* in your March issue I have been obliged to console

myself with accolades from the *New York Times* (“should become the gold standard on its topic”), the *Financial Times* (“a triumph of economic and diplomatic history”), and the *Wall Street Journal* (“a superb history”). I confine myself here to the two substantive charges in his article.

First, he writes of my account of Harry Dexter White’s role in the crafting of the U.S. ultimatum to Japan in 1941 that “The 2002 history [the Schecters’ book] Steil uses to support the case relies, itself, on documentation that historians John Earl Haynes and Harvey Klehr have determined to be fake.” Only Rauchway’s charge is fake. Haynes and Klehr themselves published the following response in the *Times Literary Supplement* (TLS) on April 26: “our account does not, as Rauchway suggests, undermine Steil’s story of White’s treachery or imply that he was bamboozled by fake documents. In fact, Steil cites the Schecters only once in his whole book.”

Second, Rauchway, who is not an economist, thinks that I don’t understand the gold standard or the Bretton Woods system. Interested readers can find my full response, with graphical representations of historical economic relationships that Rauchway denies, on the Web: <http://on.cfr.org/steilresponse>. I note here only that Rauchway’s rhetorical device of founding arguments on nonexistent quotes leaves something to be desired. He quotes me, for example, not once but *twice*, as saying that the Bretton Woods system guaranteed an “economic apocalypse.” Compare this to what I actually wrote on p. 334: “Harry White’s creation, in Triffin’s rendering, was an economic apocalypse in the making.” To paraphrase Oscar Wilde, once looks like carelessness, twice looks like an agenda.

**Benn Steil**  
Council on Foreign Relations

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## Female friendly

Chile, Peru, Colombia, Mexico, and Uruguay provide the best environments for female entrepreneurs in Latin America and the Caribbean, according to the Women's



Business owner in San Miguel de Allende, Mexico.

Entrepreneurial Venture Scope, a new index released by the Multilateral Investment Fund, a member of the Inter-American Development Bank Group, and developed by the Economist Intelligence Unit.

The index examines and scores 20 countries in the five areas that most affect women's entrepreneurship: business operating risks; the entrepreneurial business environment; access to finance; capacity and skills; and social services, including the availability of family support programs, such as child care.

Chile received the region's highest overall ranking for its low macroeconomic risk, strong supplier diversity initiatives, and social service offerings. Peru, with robust business networks and technical support programs for small and medium-sized enterprises (SMEs), ranked a close second. Colombia rounds out the top three for its well-developed SME training programs and broad access to university-level education for women.

## Reducing trade barriers

While reducing trade barriers between the continent's countries, African governments should take vigorous measures to boost their private sectors, or gains from this streamlined trading system will benefit foreign firms more than African firms, says a new report from the United Nations Conference on Trade and Development.

*Economic Development in Africa Report 2013* notes that intraregional trade in Africa holds great promise if African firms can supply the goods.

In recent years, the share of intra-African trade in total African trade fell from 22.4 percent in 1997 to 11.3 percent in 2011. This statistic may be an underestimate, given the prevalence of informal cross-border trade on the continent, but it is nevertheless low when compared with

other parts of the world. For example, during 2007–11, the average share of intraregional exports in total exports was 11 percent in Africa, compared with 50 percent in Asia and 70 percent in Europe.

The report argues that the elimination of trade barriers will not have the desired impact unless it is complemented by governments' efforts to increase the variety and sophistication of the goods that their economies produce—the process that economists call expanding productive capacity.



Kora workshop in Senegal.

## Events in 2013

**September 17–19, Dili, Timor-Leste**  
Harnessing Natural Resource Wealth Conference

**September 17–30, New York**  
68th Session of the UN General Assembly

**September 25–27, Sopot, Poland**  
European Forum for New Ideas

**October 1–2, Kiel, Germany**  
Global Economic Symposium

**October 11–13, Washington, D.C.**  
Annual Meetings of the World Bank and the IMF

**October 18–19, Panama City, Panama**  
Ibero-American Summit

**November 7–8, Washington, D.C.**  
IMF Fourteenth Annual Jacques Polak Research Conference

**November 13–14, Amsterdam, Netherlands**  
World Pension Summit

## The 'missing middle'

Social protection systems in many fast-growing middle-income countries in Asia and the Pacific are failing to support large numbers of poor and vulnerable people, leaving them exposed to risks and unexpected difficulties like unemployment, ill health, and natural disasters, says a new Asian Development Bank (ADB) study, *The Social Protection Index: Assessing Results for Asia and the Pacific*.

The study, which analyzes government programs that provide social insurance, social assistance, and labor market support in 35 countries across Asia and the Pacific, shows varied spending patterns across income groups and subregions.

A few countries—Japan, the Republic of Korea, Mongolia, and Uzbekistan—have social protection indexes that are higher than 0.200, meaning that they are already investing 8 percent of their GDP in social protection programs. However, spending in most middle-income countries—including Armenia, Fiji, India, Indonesia, Pakistan, the Philippines, and Samoa—remains below 3 percent of GDP.

"Government social protection programs need to be expanded to cover this unprotected 'missing middle,'" said Bart Édes, Director in the ADB's Regional and Sustainable Development Department.



# A CLASS ACT

*Prakash Loungani*  
profiles **Stanley Fischer,**  
academic, IMF deputy, and  
central bank governor  
extraordinaire



**I**N 2012, the magazine *Global Finance* gave Stanley Fischer, then central bank governor of Israel, an A for his handling of the economy during the financial crisis. It was the fourth year in a row that Fischer had received an A. It's a grade the former professor—who taught both Federal Reserve Board Chairman Ben Bernanke and European Central Bank (ECB) President Mario Draghi—cherishes: “Those were some tough tests we faced in Israel.”

Fischer stepped down as central bank governor in June this year after eight years in the job, bringing the curtain down on an extraordinary third act of his career. The second act was as the IMF's second-in-command during the tumultuous period of financial crises in emerging markets from 1994 to 2001. This role as policymaker came after a rousing opening act in the 1970s and 1980s, during which Fischer established himself as a preeminent macroeconomist, one who defined the contours of the field through his scholarly work and textbooks. It speaks to Fischer's success that stints as the World Bank's chief economist in the 1980s and as vice chairman at Citigroup in the 2000s—which would be crowning achievements of many a career—come across as interludes between the main acts.

## Prelude

Fischer grew up in Mazabuka, a town in Northern Rhodesia, now Zambia, where his family ran a general store. The house in which he was raised was behind the store; it had no run-

ning water and was lit with hurricane lamps. When he was 13, his family moved to Southern Rhodesia, now Zimbabwe.

Fischer became active in a Jewish nationalist youth movement and first visited Israel in 1960 on a program for youth leaders. For both Fischer and Rhoda Keet—then his girlfriend and later his wife and mother of their three sons—the trip marked the beginning of a lifelong commitment to Israel. When he was appointed governor of the Bank of Israel several decades later, many in Israel recalled the person they had grown up with in southern Africa. “We always knew he was bright, but he must have been a hell of a lot brighter than even we thought he was,” said Judy Dobkins, who was in the same youth program in 1960.

An economics course in high school and an introduction to the work of John Maynard Keynes set Fischer on the road to specializing in economics. He says he was “hooked by Keynes's use of language” and by the knowledge that, during the Great Depression, the “world as we knew it had nearly collapsed” and Keynes's ideas had saved it. The London School of Economics (LSE) was a natural choice for an undergraduate degree: “For us, England was the center of the universe,” Fischer has said. Of his professors at LSE, Fischer remembers one who predicted in 1963, based on a study of past patterns, that the United Kingdom would have a balance of payments crisis in 1964: “The crisis took place on the appointed date, and I was very impressed.”

Fischer went on to graduate school at the Massachusetts Institute of Technology (MIT), drawn by the presence there of Paul Samuelson and Robert Solow, famous economists who would both go on to receive the Nobel Prize. MIT was then at the forefront of the development of a mathematically rigorous approach to macroeconomics. Fischer has said that his “MIT experience was truly formative,” marked by great professors and “a remarkable group of fellow students”—among them Avinash Dixit (“he could do the [New York] *Times* crossword puzzle in about 10 seconds”), Robert Merton, and Joseph Stiglitz, who later became a fierce critic of Fischer (see box).

Fischer’s first job was at the University of Chicago, which was then at the cutting edge of applying economics to policy problems. Fischer says he made the choice because Chicago “was the best place that made me an offer” and because he felt that he had learned a lot of economics but “didn’t know much about the economy.” Chicago enabled Fischer “to combine MIT’s analytics and the policy relevance that [Chicago professor] Milton Friedman typified.”

### Uniting the wings

Bridging the worlds between MIT and Chicago was good training for the role Fischer was to play in the 1970s, which was to broker a peace between warring wings of classical and Keynesian macroeconomists.

The Keynesian school advocated an active role for monetary policy—that is, actions by the central bank—to smooth out fluctuations in the economy. If unemployment was higher than its long-run average, the central bank could try to nudge it back down by increasing the growth rate of the money supply. In the Keynesian model, the ability of the central bank to lower unemployment came about because prices and wages were assumed to be difficult to change in the short run—in the jargon of macroeconomists, prices and wages were “sticky.”

The classical wing objected that if unemployment could be lowered simply by printing more money, the economy would be getting what Friedman—a leading proponent of classical views—called a “free lunch.” He predicted that repeated attempts by the central bank to lower unemployment would lead to prices and wages starting to adjust instead of remaining sticky. Once that happened, Friedman said, inflation would rise and unemployment would go back to its long-run average. The economy would thus eventually end up with higher inflation and no long-run benefit in terms of reduced unemployment.

As events in the United States and other economies in the 1970s started to mirror these predictions—the drop in unemployment proved short lived and inflation crept up—the balance of power started to shift toward the classical school. Classical economists now went a step further and started to assume that, far from being sticky, prices and wages would adjust quickly to any attempts by the central bank to affect unemployment. Under that assumption—known as “rational expectations”—the central bank would be ineffective in smoothing out fluctuations in the economy, even in the short run.

Enter Fischer. In a 1977 paper—he had by then been lured back to MIT from Chicago—he combined the assumption

### Defending the Washington Consensus

It is not surprising that Fischer, as someone of Latvian-Lithuanian descent who grew up in southern Africa, has always been interested in issues of the economic development of nations. His tenure as the World Bank’s chief economist gave him a chance to leave his imprint on these issues. According to economist Brian Snowdon, Fischer’s work “emphasizes the importance of establishing a stable macroeconomic environment and sound financial institutions for achieving the key long-run goals of growth and economic development.” Fischer also emphasized, Snowdon writes, that “poverty reduction occurs fastest where there has been rapid growth, and also that openness to the international economy is a necessary, though not a sufficient, condition for sustained growth.”

Many of the policies that Fischer championed became known as the “Washington Consensus.” Despite criticism of the policies, and the term itself, over the years, Fischer says he still has “faith in the set of policies” but that the label attached to them was an unfortunate one. “It was a mistake to call it ‘Washington Consensus’ because it was at that time a global consensus.” He says the importance of openness to trade, sound macroeconomic policies, and a market orientation has been “proven over and over again.” He defends the move to open capital markets to foreign capital, arguing that the experience has shown, not its undesirability as a long-term goal, but rather the need to manage this capital account liberalization carefully.

Fischer was also associated with the advice given to transition economies—the economies of the former Soviet bloc—on the pace and nature of the reforms they should undertake. This advice too has come in for criticism, not least from Joseph Stiglitz, for pushing for too much, too soon. Stiglitz has said that the transition economies should have followed a more gradualist path, learning from the “enormous success of China, which created its own path of transition rather than use a blueprint or recipe from Western advisors.” The advice given by Fischer and others has its defenders. Harvard University’s Ken Rogoff (previously IMF chief economist) endorses the need for speed: “It is unlikely that market institutions could have been developed in a laboratory setting and without actually starting the messy transition to the market.” Rogoff notes that the transition economies had already tried “a Chinese-style approach of limited reform”—for instance, under Gorbachev in the Soviet Union, Kadar in Hungary, and Jaruzelski in Poland—and it was the failure of these attempts that “led to more aggressive efforts towards a market economy.”

that people had rational expectations with the key features of Keynesian models. Fischer made the realistic assumption that wages are set in advance through an implicit or explicit contract between employers and their workers. This renders wages—and, through this channel, prices—temporarily sticky. As long as the central bank can act more frequently than contracts can be renegotiated, it can have an impact on unemployment in the short run, as in Keynesian models. But this is not an option in the long run because, over time, con-



tracts would take into account the inflation that the central bank has generated. Thus, the economy would behave in the long run according to the classical models.

Fischer's paper marked the beginning of New Keynesian Economics, which now draws support from both the classical and the Keynesian camps and provides a synthesis in which the economy has Keynesian features in the short run and classical features in the long run. Chris Erceg, a senior official at the Federal Reserve—and a Chicago graduate who made important contributions to New Keynesian Economics in the 1990s—says that Fischer's paper is now seen as a “critical turning point” in scaling back the “internecine warfare” of the two wings.

### From theory to policy

Over the course of the 1980s, Fischer continued to contribute to scholarly work while also becoming active in the policy arena. As a scholar, his most famous work was in the form of two textbooks—coauthored with his MIT colleagues—which played a key role in charting the changing landscape of macroeconomics. One was a textbook for undergraduates written with Rudi Dornbusch, and the other for graduate students, coauthored with Olivier Blanchard, currently the IMF's chief economist. Blanchard says that writing the book with Fischer “was one of the most exciting intellectual adventures of my life. We both felt there was a new macroeconomics, more micro founded and full of promises. . . . While we had not thought of it as a textbook, it quickly became one, and it is nice to know that it still sells surprisingly well today.”

Fischer first tried his hand at policymaking when George Shultz, then U.S. secretary of state, called on him and Herbert Stein, a former chairman of the U.S. Council of Economic Advisers, to help Israel's government deal with triple-digit inflation, dwindling foreign exchange reserves, and slow growth. Fischer and Stein concluded that Israel needed to come up with a firm plan to reduce the excessive government spending that was the source of the other problems. Without such a plan, Fischer told the U.S. Congress in April 1985, “the likelihood is strong that two years from now, she [Israel] will still be growing slowly, still fighting high inflation, and more than ever reliant on outside aid.” Fischer and Stein also recommended that milestones be set to measure Israel's progress toward reducing its budget deficit and that the flow of U.S. aid to the country be conditional on the attainment of those milestones.

Shimon Peres, Israeli prime minister at the time, later recalled that he didn't know enough about economics to argue with Fischer. But he followed Fischer's advice and was

“amazed” to discover that it worked. Inflation fell from a peak of 450 percent to 20 percent in the course of a year. “No one could have advised us better,” says Peres.

Fischer soon got a chance to tackle a much broader range of policy issues as the World Bank's chief economist from 1988 to 1990. He then returned to MIT but found that “it was hard readjusting” to academic life: “I remember going to theory seminars and saying to myself, what difference does it make whether this guy is right or wrong?” Harvard's Greg Mankiw—former chair of the U.S. Council of Economic Advisers and another famous Fischer student—recalls that he “got the sense [Fischer] was a little impatient with academics.” Even becoming chairman of the economics department at MIT “was only partly inspiring,” says Fischer, likening the role to Alfred Kahn's description of a dean's role: the dean is to the faculty as the fire hydrant is to the dog.

### Bring on the crises

Fischer's turn on the policymaking stage came in 1994 when he was appointed the IMF's first deputy managing director, the institution's number two spot. Over the next seven years, Fischer dealt with crises in Mexico, Russia, several Asian countries, Brazil, Argentina, and Turkey—and that list still leaves out quite a few.

During the Mexican crisis of 1994–95, Fischer was content to “leave the driving” to Michel Camdessus, who was IMF managing director from 1987 to 2000. Fischer thought he had not yet fully earned Camdessus's trust and that he didn't know enough yet about how to steer through a financial crisis. By early 1995, it became clear that the resolution of the crisis required a large and swift injection of money, \$20 billion from the U.S. Treasury and \$20 billion from the IMF. The IMF Executive Board balked at making such a huge loan. It took, says Fischer, “the most dramatic board meeting I have seen [and for] Camdessus to challenge the board to fire him” to win approval for the loan.

In mid-1997, a financial crisis hit Thailand and spread quickly to many other Asian countries, including Indonesia, Korea, Malaysia, and the Philippines. By now, Fischer had gained Camdessus's confidence and was ready to cocaptain with him in navigating through the crises. But their initial advice turned out to be a misstep. The IMF advised Thailand and the other Asian countries to tighten fiscal policy even though—unlike the situation in Israel in 1985—government profligacy was not the root cause of the crisis. Fischer now says that “the tightening of fiscal policy was mistaken. That is why the IMF quickly reversed that policy [in Thailand] by the end of 1997 and in Korea by the beginning of 1998. So I do not think that the initial fiscal mistake had a big impact on what happened later.”

The IMF's advice to the Asian economies regarding monetary policy also came under fire, particularly from Stiglitz, then the chief economist at the World Bank, who advocated lowering interest rates to help the domestic economy. But Fischer has stuck to his guns and steadfastly argued that this “criticism of monetary policy was not correct.” Fischer says



the IMF “argued that a short period of interest rate tightening was necessary to stabilize the currency, after which interest rates would be reduced to normal levels. And that is what happened.” Fischer also notes that many Asian countries had foreign-denominated debt; a further depreciation of their currency, the likely consequence of lowering interest rates, would have increased the burden of that debt.

Thailand and Korea quickly recovered from the crisis, but Indonesia entered a long period of economic turmoil. Fischer blames this on politics rather than on inappropriate economic advice: “I don’t think people understood, us [the IMF] or anybody else, that a regime that looked so stable was not. It soon became clear that [former Indonesian president] Suharto had no intention of delivering [on agreed reforms]. And that was sort of how the thing got out of control.”

Many have remarked on how in control Fischer stayed despite the crises raging around him. Blanchard says that “from the peeks I got of [Fischer] during those times, what strikes me most is how he remained the same he had been at MIT: calm, careful about the facts, analytical, using macroeconomic theory even in the middle of the most intense fires.” Horst Köhler, former IMF managing director, adds that in the midst of crisis it was reassuring “to hear Stan Fischer’s sonorous, calm, balanced, unexcited voice. That voice restrains you from panicking and encourages you by itself to a considered and systematic way of thinking.”

### “The responsible adult”

Fischer left the IMF in 2001 when his term as deputy expired—his bid to win the IMF’s top job had failed—and started at Citigroup the following year, drawn by the fact that he “had never been in the private sector.” He says he enjoyed the work at Citi; the intellectual challenges, and the organizational challenges of working in an institution with 280,000 people, were as tough as what he had faced in other jobs. But the chance to be the governor of the Bank of Israel drew him back into the public sector.

The situation Fischer faced in 2005 was significantly better than in 1985 when he had last actively advised the Israeli government. The low-inflation environment had persisted and the economy was on its way to recovering from a recession. But there were challenges nonetheless. Fischer had to resolve a long-standing labor dispute involving the staffs of both the central bank and the treasury. He also had to shore up the political will to make changes to the central bank law to give it an explicit mandate for “flexible inflation targeting,” a system under which the central bank targets price stability while keeping other objectives in mind; in the case of the Bank of Israel, these other objectives were employment and growth as the second objective and financial stability as the third. The law also set up a monetary policy committee so that the central bank governor was no longer the sole decision maker. “This was the advice we gave central banks when I was at the IMF,” says Fischer, “and so it was only fitting that I take it myself.”

## Throughout the crisis, Fischer stayed ahead of the curve.

Then the global crisis struck. On October 6, 2008, Fischer cut policy interest rates, a day before similar policy moves by the U.S. Federal Reserve, the Bank of England, and the ECB. Throughout the crisis, Fischer stayed ahead of the curve, making the needed policy changes—such as launching a program of quantitative easing by buying long-term bonds—before markets had anticipated them. *Bloomberg News* found that among central bank governors of the Organisation for Economic Co-operation and Development,

Fischer’s policy actions during the crisis surprised markets more than those of any other governor.

Fischer also had to take strong and prompt actions to keep Israel’s exports competitive. As the crisis engulfed first the United States and then many countries in Europe, foreign capital started to flow into the relatively safe haven of Israel. As a result, the shekel appreciated 20 percent against the dollar, a problem in a country where exports constitute 40 percent of GDP. After Fischer started buying \$100 million a day in foreign currency in 2008, the shekel started to fall, and Israeli exports remained robust. Noted author and economist David Warsh credits Fischer with “having steered Israel’s economy with barely a scrape through the worst [global] crisis since the Great Depression.”


No wonder then that Fischer’s announcement in January 2013 that he would step down on June 30 led to much breast-beating in Israeli press and policy circles. The newspaper *Haaretz* said it marked the departure of a “superhero,” named “the responsible adult,” who had served admirably not just as central bank governor but also, at times, as the “unofficial foreign minister of the Israeli economy: it was Fischer who calmed foreign investors and assured them that the economy was in good hands.” Fischer says he has been touched by the response: “I cannot tell you how gratifying—and moving—it is for Rhoda and me to be walking along the beach and have someone stop us and thank us for our service to Israel.”

### Encore, encore

Fischer’s announcement that he was stepping down provoked much speculation about his next act. *Haaretz* said Fischer was holding out for a job as Israeli foreign minister or even president. In the United States, there was talk that he would succeed his student Ben Bernanke as chairman of the Fed. In academia, there was hope that Fischer would turn to a reconstruction of textbook macroeconomics to incorporate what had been learned from the experience of the Great Recession.

Fischer remained tight lipped, saying only that “he was not ready to leave the stage. We always feel younger than we are: when I jog, I realize that I run more slowly than I used to, but I don’t feel I’ve lost speed in other regards.” ■

*Prakash Loungani is an Advisor in the IMF’s Research Department.*



For natural resource riches to drive growth and reduce poverty, countries must balance spending now with investing in the future

# Too Much of a GOOD THING?

Workers unloading coal in Halong Bay, Vietnam.

Chris Geiregat and Susan Yang

*This article is based on the 2012 IMF Board paper “Macroeconomic Policy Frameworks for Resource-Rich Developing Countries,” by an IMF staff team led by Dhaneshwar Ghura and Catherine Pattillo, and on the IMF Economic Review article “Public Investment in Resource-Abundant Developing Countries,” by Andrew Berg and others.*



**U**GANDA discovered 3.5 billion barrels of oil in the past few years. And Mozambique recently confirmed huge amounts of coal and natural gas reserves, with further discoveries expected in the near future. Will these countries be able to reap the benefits from their newfound natural resource wealth? Or are they bound to fall prey to the same failed policies that have too often plagued other resource-rich developing countries? Those failures underscore a hard reality: without good policy frameworks, especially for taxing and spending, resource-rich countries can easily squander their natural riches. Many developing countries are endowed with exhaustible natural resources—such as oil, gas, minerals, and precious gems—that, if properly managed, could help them reduce poverty and sustain growth.

In some countries, like Nigeria, oil extraction has been a source of economic activity and fiscal revenues for several generations, while others, like Timor-Leste, rich in oil and gas, are relative newcomers to the prac-

tice. Yet others have recently discovered resources, such as Uganda, or will soon see an increase in extraction, for example, of iron ore in Guinea and Liberia. In some countries extraction will decline significantly within a couple of decades as the resource is exhausted, while in others the current rates could continue for many generations.

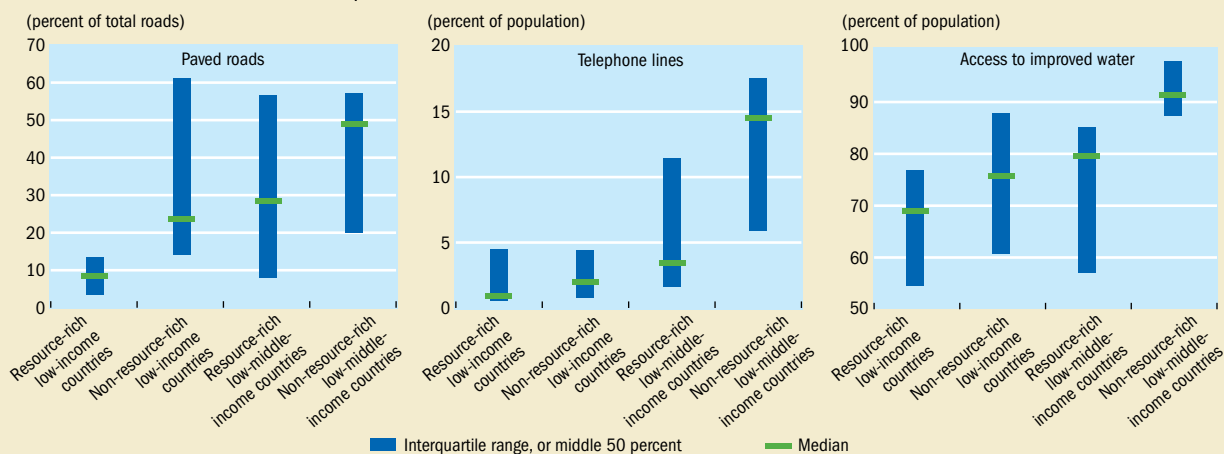
Natural resources are a critical component of many countries' export and government revenues. For example, they account for an important share of total exports in nearly half of the countries in sub-Saharan Africa (IMF, 2012a). But, despite their resource abundance, these countries' economic growth performance has been mixed.

Various arguments have been made to explain the disappointing performance in some countries with abundant natural wealth. One is that the natural resource sector chokes off other export sectors by driving up prices and undermining competitiveness (this is known as the Dutch disease effect; see “Dutch Disease: Wealth Managed Unwisely,” in *F&D's* compila-

Chart 1

### Less support

Resource-rich countries tend to have poorer infrastructure than non-resource-rich countries.



Sources: IMF, *World Economic Outlook*; and IMF staff estimates.  
Note: Latest available data since 2000.

tion of Back to Basics columns—[www.imf.org/basics](http://www.imf.org/basics)). Another is that the economy's exposure to volatile prices exacerbates the difficulties of economic policymaking. Yet another explanation is that easy money from the natural resource sector creates governance challenges and could contribute to weak institutions, a risk of conflicts, and an adverse investment climate.

The fundamental goal of resource-rich economies should be to transform their exhaustible natural resources into assets—human, domestic, and private capital and foreign financial assets—that will generate future income and support sustained development. But the record is mixed. Several of these countries lack such basic infrastructure as roads, railways, ports, and electricity as a result of insufficient and inefficient investment spending (see Chart 1). And a number of resource-rich countries have saved relatively little of the income from their natural resources and, after adjusting for the depletion of these resources, may indeed have negative net saving rates. Partly as a result of low savings, investment, and growth, many resource-rich developing countries face endemic poverty. Indeed, they often do less well than non-resource-rich developing countries when assessed against standard poverty and other social indicators (see Chart 2).

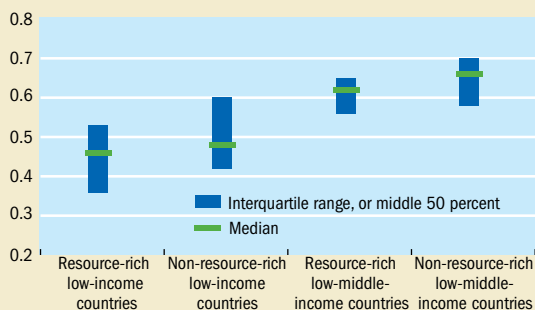
In addition, countries that export natural resources, particularly oil, must deal with considerable volatility in export prices. The transmission of these swings to the local economy can be averted through good fiscal frameworks (such as Chile's fiscal rule), hedging instruments, well-developed domestic financial markets, and access to international financial markets. Absent these conditions, fiscal policy tends to swing in sync with commodity prices. The result is that government revenues have, on average, been 60 percent more volatile in resource-rich countries, and spending volatility has been even greater.

Chart 2

### No advantage to riches

Resource-rich countries perform more poorly on the human development index than do non-resource-rich countries.

(human development index, range from zero to 1, median and interquartile range)



Sources: World Bank; United Nations Development Programme; and IMF staff estimates.  
Note: Latest available data since 2000.

Recently, however, the growth rate of natural resource exporters in the developing world has caught up with that of their non-resource-rich counterparts, reflecting the boom in commodity prices, new discoveries, and improved economic policies (see Chart 3).

### Spend or save?

New approaches to resource management—using the revenues to boost domestic savings and investment, and avoiding boom-bust cycles by smoothing spending from volatile revenues—can help countries avoid the policy mistakes of the past. Recent improvements in macroeconomic management, combined with fresh analytical thinking that takes account of the specific circumstances of developing countries, offer hope that natural

resource revenues can drive poverty reduction and growth.

The decision of how much of their resource revenue flow to consume and how much (and where) to save and invest saddles resource-rich developing countries with difficult trade-offs.

For advanced economies rich in natural resources, it may be optimal to save or invest resource revenues in financial assets abroad and then to consume a constant portion of resource wealth each period, equal to the implicit return (permanent income) on their total resource wealth. This is known as the “permanent-income” approach.

This approach has at times been prescribed to developing countries, even though their large investment requirements and

But it may be unwise for these countries to boost domestic spending rapidly because doing so could lead to macroeconomic instability. The increase in domestic demand from higher consumption and investment spending may create short-term supply bottlenecks that in turn push up domestic prices, with the inflationary pressures hurting overall competitiveness.

Ramped-up investment spending may also exacerbate bottlenecks at the microeconomic level. Weaknesses in project selection, implementation, and budgeting may make investment spending less efficient and lead to wasted resources. Therefore, a more gradual increase in spending may be advis-

## Prudent policymakers may wish to curb spending somewhat to build up a rainy-day liquidity fund in good times.

lack of access to international capital markets for loans make it less suitable for them. For those countries, a new analytical approach to managing natural resource revenues is called for.

On the one hand, these countries’ pressing development needs, which make it difficult for them to overcome endemic poverty, call for spending more up front, including on such immediate needs as school and hospital supplies, malaria nets, and vaccination campaigns. On the other hand, to ensure sustained growth, these countries must save and invest a substantial portion of their resource revenues. Poor countries also have large unmet investment needs, and with capital scarcity come high potential returns to domestic investment. Although it may be optimal to increase current spending somewhat to alleviate pressing poverty needs, experts say poor countries should save the bulk of their resources and invest them in the domestic economy (Collier and others, 2010).

able, with an initial focus on investing resources to remove existing bottlenecks—a process sometimes called “investing in investing”—for example, expanding teaching centers to train teachers and nurses or hiring civil service staff with the technical expertise necessary to select and manage complicated infrastructure investment projects. While this investment is under way, resource flows could be parked temporarily in external financial assets, even if the yields are relatively low.

Countries rich in natural resources also face the challenge of managing their economy when resource flows are highly volatile. Because commodity price swings can be large and long lasting, it is hard to forecast prices and decide whether to ride out changes in prices by smoothing spending or adjusting spending plans. In countries where market-based instruments such as commodity hedges are not readily available or are too costly, prudent policymakers may wish to curb spending somewhat to

build up a rainy-day liquidity fund in good times that can be tapped when revenue inflows fall short. The optimal size of such a safety net is larger in countries whose resources will not be depleted for a long time (because such countries are likely to consume more of their resource revenues), where revenue volatility is greater and more persistent, and where the general public is more averse to swings in consumption. However, it may be impossible (or at least too costly, when weighed against development needs) to insulate spending fully from price swings. In practice, policymakers need to make a decision based on a tolerable degree of uncertainty (see “Extracting Resource Revenue,” in this issue of *F&D*).

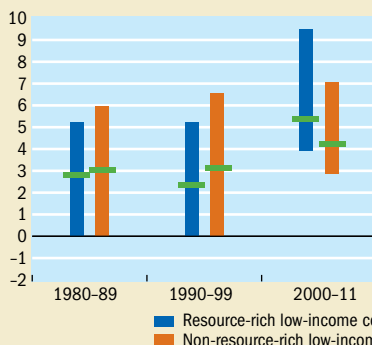
The IMF has developed a set of tools for practical policy analysis that takes into account the specific characteris-

Chart 3

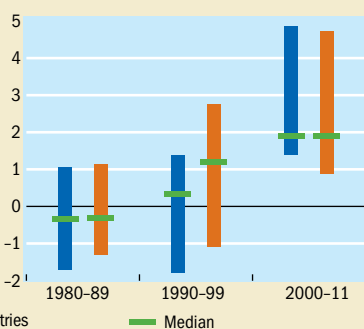
### Catching up

Recently, natural resource exporters’ growth has caught up to that of non-resource-rich countries.

(growth in real GDP, percent)



(growth in per capita real, GDP percent)



Sources: IMF, *World Economic Outlook*; and IMF staff estimates.  
Note: Bars show interquartile range, or middle 50 percent.

## Opening the toolbox

In a pilot project, IMF staff used the sustainable investing tool to design a strategy that aims to close Angola's infrastructure gap by investing its abundant oil-generated wealth (Richmond, Yackovlev, and Yang, 2013). They used two oil price projections to compare the macroeconomic outcomes of a spend-as-you-go policy, Angola's practice before 2009, to the outcomes of a policy of more gradual investment. The results showed that when oil prices are less volatile, non-oil GDP under a spend-as-you-go policy can outperform GDP under a policy of a more gradual scaling up of investment in the short and medium term. If, however, a large negative oil price shock hits the economy—similar to that of 2008–09—both the pace of public investment and non-oil GDP growth could be seriously disrupted under a spend-as-you-go policy.

A gradual scaling up of investment gives economies with limited absorptive capacity time to improve that capacity. Meanwhile, a stabilization fund can be built up to prevent the need for sizable investment cuts when large negative oil price shocks hit. Although growth benefits are more visible when investment is increased more rapidly, the historical volatility in commodity prices means that a fiscal buffer is essential to avoid the boom/bust cycles often observed in resource-rich developing countries and to maintain steady and sustained growth in nonresource economies.

tics of resource-rich developing countries (IMF, 2012b). These tools take into account the use of fiscal rules that help smooth revenue volatility and assess long-term fiscal sustainability, the impact of natural resource flows on a country's balance of payments, and the macroeconomic implications of saving-investment scaling-up scenarios. These implications include the growth- and revenue-enhancing effects of public investment, movements in the real exchange rate—especially the real appreciation (or Dutch disease) associated with spending or investing natural resource windfalls domestically—and the effects on other key macroeconomic variables, such as private consumption, investment, and traded-sector output.

## Sustainable investing tool

One tool, designed to help policymakers determine how much and how quickly to scale up public investment, is the “sustainable investing tool” proposed by Berg and others (2013). The tool takes into account the linkage between investment and growth and makes such assumptions as the rate of return on public capital.

By analyzing alternative policy scenarios for planned public investment—using both optimistic and pessimistic projections of expected resource revenues—policymakers can make more informed decisions about how to allocate those revenues between external savings and domestic investment. Because long-lasting development gains are a central policy goal of resource revenue investment, the tool can also help assess whether planned public investment is sustainable in the long run or whether it will

require too much expenditure to maintain capital built with the resource revenues.

This tool captures the key macroeconomic issues facing resource-rich developing countries by weighing several factors that can undermine the growth benefits of public investment. First, it assumes that one dollar of investment expenditure can translate into much less than one dollar of installed capital if the investment process is inefficient. Second, if investment spending is ramped up too quickly, the process will be even less efficient as a result of “absorptive capacity constraints” caused by supply bottlenecks, limited management capacity, and weak institutions. Third, given that volatile flows of resource income may lead to stop-and-go investment spending, which could cause recurrent maintenance and operating requirements to suffer, installed public capital may depreciate faster and thus be less durable.

The sustainable investing tool has been applied in several countries, including Angola, Azerbaijan, Kazakhstan, Mozambique, and Turkmenistan. Although the tool is designed to capture country-specific characteristics, the results can inform general policy discussions on macroeconomic stability while countries are investing volatile resource revenues (see box for the Angola example). The purpose of the tool is to help resource-rich developing countries avoid the pitfalls of investing resource revenues and, ultimately, escape the “natural resource curse” that has plagued many resource-rich developing countries.

As countries like Uganda and Mozambique develop their new discoveries, they can learn from other countries' challenges managing the volatile revenues generated from abundant natural resources. Policymakers can spur growth and fight poverty by ramping up investment spending as long as they are mindful of their economy's capacity to absorb such investment. And spending carefully combined with saving part of resource windfalls can avert future drastic spending cuts and instability. ■

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# A DROP in the BUCKET

## Successful management of water must balance development needs and economic considerations

strategies to reduce poverty and promote economic development around the world. Prior development policies focused on trade, agriculture, energy, transportation, and industrial strategies, with only limited attention to water. And in the rare instances when water was integrated into development approaches, it was typically only in the context of building large infrastructure or to satisfy urgent unmet needs for safe water and basic sanitation.

That focus is beginning to change, but only slowly. Among academics, there is growing acknowledgment that water challenges are closely tied to other resource and economic development challenges. But there is still great uncertainty about how best to implement practical development policies that cut across traditional institutional, political, and geographic boundaries.

Water is tied to nearly everything we care about: human and ecological health, industrial and agricultural production, international trade, climate change, and both domestic and international politics. Until we manage water in an integrated fashion, there is a risk that we will continue to miss opportunities for more effective and efficient development strategies. Some of these opportunities involve new technology, different forms of institutional management, or a rethinking of the economic tools we use in the water sector, including pricing, subsidies, markets, and financing mechanisms.

### A water crisis

Today's water challenges take many forms. In some parts of the world, the problem continues to be inadequate access to safe water and sanitation—the prime focus for the water effort of the United Nations Millennium Development Goals (MDGs). In other regions, there is growing competition for limited water resources among agricultural, industrial, domestic, and ecological users. The misalignment of political borders and watershed boundaries has long complicated the effective management of water systems, and, in many parts of the world, these political challenges are getting worse, not better, leading to a growing risk of conflict. Finally, climate changes are increasingly affecting water availability, quality, and demand in ways that most water managers are not prepared for, and new efforts are needed to identify future climate-related risks and opportunities (see map).

*Peter H. Gleick*

**I**N mid-2013, Ethiopia began construction on the Grand Renaissance Dam on the Blue Nile just upstream from Sudan and Egypt. In many ways this massive dam is a symbol of the water challenges faced by billions of people around the world, with multiple meanings, interpretations, and implications.

For Ethiopians, it represents their first major attempt to control and use the waters of the Nile for economic development in the form of hydropower generation and perhaps agricultural production. For Egyptians, it represents potential interference with their own water systems and strategies because of the risks that water flows in the Nile—considered their lifeblood—will be reduced or subject to the political control of governments and institutions outside their borders. To some in the water policy community, the dam represents tangible evidence that efforts to develop joint and comprehensive management of the entire Nile River basin have failed. To others, it is a symbol of the 20th-century approach to water management—that is, to build large-scale centralized infrastructure without understanding or addressing true environmental, social, and political costs and without looking at more comprehensive integrated options for economic development. In reality, the project represents, to some degree, all of these things.

For the last several decades of the 20th century, fresh water played a small but growing role in comprehensive

As we approach the 2015 target date for achieving the MDGs, it is time to reassess progress and priorities. In the water sector, several shortcomings are already apparent. At the most basic level, there remain unacceptable gaps in our knowledge because of inconsistencies in and uncertainties about measuring and evaluating access to basic water services. It would be wonderful if we knew with any degree of accuracy how much water, and of what quality, was actually available and used by everyone on the planet, but such data are not available.

On the positive side, international agencies report that substantial progress has been made in meeting the MDG for access to safe water, though hundreds of millions of people remain underserved. On the other hand, even optimistic observers have acknowledged the overall lack of progress in meeting the MDG targets for access to adequate sanitation, as well as regional failures to meet safe water needs, especially in parts of Africa and Asia. New and expanded efforts are required to satisfy, once and for all, basic human needs for fundamental water services and to eliminate the scourge of preventable water-related diseases and deaths.

Because of the vital role that water plays in serving both human and environmental needs, there is growing competition among these sectors for increasingly limited water resources. Major rivers such as the Colorado, the Nile, the Yellow, and the Ganges are increasingly overused or suffer from severe pollution. Groundwater resources in India, northern Africa, the central United States, parts of China, and the Middle East are increasingly pumped out faster than nature recharges them. By some estimates, 30 to 40 percent of agricultural production relies on unsustainable water resources. Recent work to define and evaluate peak water constraints for renewable, nonrenewable, and ecological water systems has highlighted the need to improve water management (Gleick and Palaniappan, 2010).

### Integrated strategies

Water is essential to meeting the food needs of the planet's growing population. Seventy percent of the water humans use goes to agriculture. But water is also vital to basic ecological functions that support humans, including fisheries production; natural water quality treatment; and the health of rivers, lakes, and marshes. Twentieth century water policies that favored one sector over another, or ignored the needs of ecosystems, must be replaced by more integrated strategies that maximize the productive use of water while minimizing the adverse consequences of that use. Among other things, this new approach requires setting and enforcing minimum water requirements to support healthy ecosystems, improving the efficiency and productivity of water use, expanding water treatment and reuse systems, and integrating surface and groundwater management rather than continuing to treat these water sources as unconnected and independent. It also means seeking innovative sources

of supply, such as rainwater harvesting, desalination, wastewater reuse, and more.

### Cooperation over conflict

There is a long history of conflicts over freshwater resources, going back 4,500 years to ancient Mesopotamia. The Pacific Institute's Water Conflict Chronology is a comprehensive list of water conflicts, including the nature of water disputes, the location and actors involved, and strategies for reducing those conflicts. Most potential water disputes are resolved peacefully, through cooperative negotiations and agreements. The task is to make more international tools available to encourage water cooperation, but also to address the growing connections between inadequate or unsuccessful development strategies and the risks of regional, subnational, and local water disputes. The international community can help reduce the risk of water conflicts such as those on shared international rivers by encouraging negotiations and agreements among the parties sharing a water basin and helping provide data and scientific support for water management. But the current dispute over the Grand Renaissance Dam on the Nile highlights the difficulty of reaching comprehensive agreements over shared

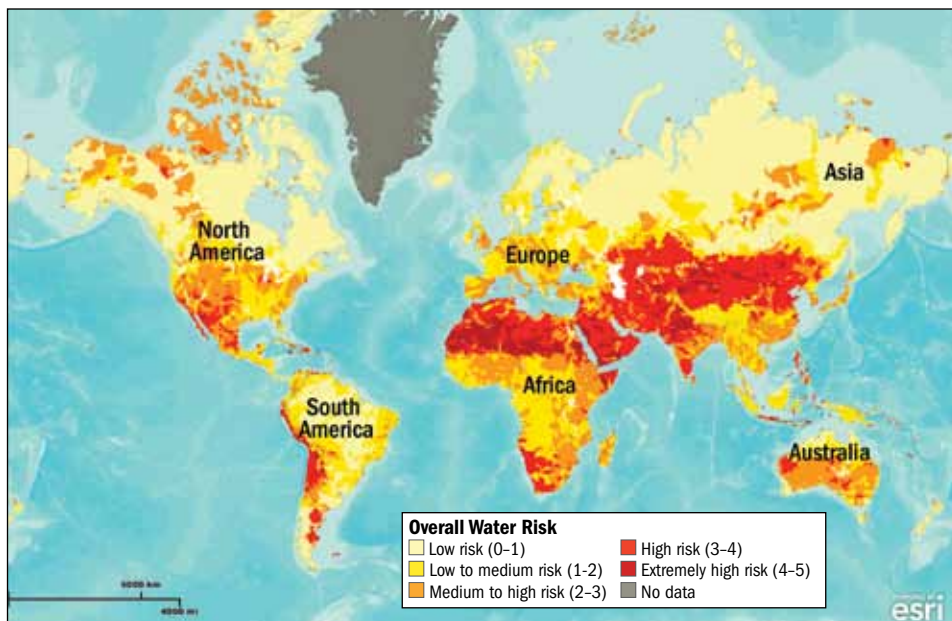
river basins when competing interests fail to agree. Even more difficult, however, is the development of useful tools and mechanisms for resolving both growing subnational disputes, many of which have their roots in ethnic, economic, and social competition, and disagreements over how to allocate scarce water resources among different users.

On top of these more traditional water problems, a new complex threat faces 21st century water planners and managers: the growing impact of climate changes on water resources and systems. As climate changes accelerate, they will alter evaporation rates, water demands, rainfall patterns, snowfall and snowmelt conditions, glaciers, storm frequency and intensity, and the sea level. While water managers have developed tools to address the natural variability of climate, some of the new threats will either be different in their very nature or fall outside of the range of extremes for which we currently plan, design, and build. Thus, current strategies to address the consequences of floods and droughts, for some regions or water systems, may prove unequal to the task of managing new extremes imposed by climate changes. Climate change adaptation is absolutely essential in water management and should start now. As part of that work, new efforts to understand and then adapt to unavoidable climate changes must be part of any long-term strategy to improve our development policies and approaches.

### Economics of the right to water

There are many approaches to managing water resources, including the construction and operation of large-scale infrastructure in the form of dams, aqueducts, and central-

**Climate change adaptation is absolutely essential in water management and should start now.**



Source: World Resources Institute/Aqueduct, <http://aqueduct.wri.org/atlas>

ized water treatment and distribution plants; the imposition of regulations and standards for monitoring water quality or designing water-using appliances; educational strategies to encourage new water policies and behaviors; and the use of the diverse tools of economics and markets.

The role of smart economics in addressing water problems is indisputable, but economics alone can provide only part of the answer. Complex mixes of strategies are in use around the world, all of which have a role to play. Just as there is no single water crisis, there is no single water solution. This presents a problem for funders, development advocates, technology companies, venture capital firms, and potential donors or investors seeking quick, scalable, high-return solutions.

### Setting a price

Perhaps the most useful—and most misunderstood—economic tool for managing water is price. For all natural resources (or indeed any good or service), setting a proper price is key to efficient allocation and use of resources, equity, environmental protection, and innovation. But for water, pricing has proved to be especially complicated and controversial. Part of the problem is the contradictory perception that water is both an economic good and a human right. Indeed, in late 2010 after decades of discussion, analysis, and debate, the United Nations declared access to safe, adequate water and sanitation to be a formal human right (United Nations). Yet that same discussion and debate acknowledged that pricing, markets, and other economic approaches can be used to help satisfy the right to water and to provide sustainable water-related services.

There need not be conflict between these two points of view, at least for the relatively small amount of water required to satisfy basic needs and because there are successful strategies to provide water and sanitation for the poorest populations. In some regions, for example, basic water services can

be provided at lifeline rates, or even for free, to meet social objectives.

For larger water users, proper pricing is an integral part of a comprehensive approach to successful water management. For most uses, water is often grossly underpriced. In the basket of utilities that a typical consumer buys, including energy, communications/telephony, Internet, and transportation, water is usually by far the cheapest. And even where sophisticated water utilities provide water supply and wastewater services, the full economic cost of those services, including the ecological externalities—the cost to the environment borne by others—associated with obtaining water or discharging wastewater, is rarely charged to consumers. The failure to properly price water leads to inefficient use, overconsumption,

environmental degradation, inadequate investment to maintain and expand services, and inappropriate subsidization of some users at the expense of others.

Some also argue that raising prices for water runs the risk of inappropriately and inequitably hurting the poor, who often use the least water for only basic needs. This is a real risk. The human right to water is especially protective of the modest amounts of water required for minimal basic needs such as drinking, cooking, sanitation, and cleaning; the poor must not be deprived of basic services because of inability to pay. Moreover, study after study has shown that the poorest are often willing to pay for decent water services or already often pay more—both directly and indirectly—than the wealthier segments of society: they are forced to buy water from private vendors, pay extra for energy to boil or treat water, spend hours in backbreaking labor (by children or women) collecting water of often dubious quality from distant sources, or fall ill from exposure to unsafe, contaminated water. These real “costs” are rarely factored into traditional pricing strategies or discussions.

So proper pricing of water requires the factoring in of a complex set of requirements to ensure that basic human needs can be met, the human right to water is respected, appropriate infrastructure and operation and maintenance costs for water services are covered, and the right signals are sent to markets and consumers. Recent work on innovative utility rate design that encourages efficient use and still supports utility solvency, financing strategies, and equity considerations should be expanded and more widely publicized by water agencies, intergovernmental organizations, and utilities (Donnell and Christian-Smith, 2013).

### Markets for water

There are vast global markets for all kinds of goods and services, and, as a result, some economists have tried to argue



that developing one for water might also make sense. There is a growing interest in the ability and limitations of such a market to solve water problems, especially local or temporary scarcity. However, markets for water—one exception being “virtual water,” discussed below—will always be extremely limited, local, and controversial.

Even though water is in many ways our most important, priceless natural resource, critical for basic survival, it is not very valuable in a market economy. The biggest barrier to comprehensive large-scale water markets is the low cost of water, even when it is properly and fully priced, compared with the high cost of moving it from one place to another. Because water is extremely heavy (one kilogram a liter), it is expensive to move unless that can be done with gravity. It is no accident that the first large-scale transfers of water from one watershed or region to another were all gravity-fed systems, such as the ancient irrigation systems of Mesopotamia and the Indus Valley and the more sophisticated aqueducts of ancient Rome.

Proposals from private entrepreneurs to market and move water from water-rich to water-scarce regions are largely unrealistic simply because of the energy costs involved. Unless the net energy requirements of a water system are zero or low because it relies on gravity, water quickly becomes uneconomic compared with the cost of sophisticated desalination systems that can provide high-quality, reliable water. Although desalination is expensive, it is competitive compared with shipping water long distances. When one adds to the mix local opposition to sending water to distant users, as with transfer proposals in Canada and elsewhere, and legal problems raised by local water rights laws and policies, large-scale markets for water—except for commercial bottled waters, which have their own economic, environmental, and political implications (Gleick, 2010)—are unlikely to ever develop.

The one exception is the vast quantities of water used to produce market commodities, such as food products that are moved all over the world. In recent years, this water has come to be called virtual water (Allan, 1998). If water is properly priced at its point of origin, meaning the full ecological and social costs of obtaining and using water are factored in, then global trade in goods and services can be an appropriate and viable way of indirectly trading water. Even today, about 20 countries do not have sufficient natural endowments of freshwater to grow all the food they consume. Thus, food grown in more water-rich parts of the world and moved to these water-scarce regions is a form of water trade. Such innovative economic tools are important components of any sustainable water future.

### Full speed ahead

Traditional approaches to finding, developing, delivering, and using water have served many people well over the past two centuries. But new strategies are needed to address the remaining unmet needs for water and water services and to tackle new complex issues, such as the effects of climate changes and resource-related conflicts.

New traditional infrastructure is still required in much of the world, including large-scale storage, treatment, and distri-



Tis Issat waterfall at Blue Nile near Lake Tana, Ethiopia.

bution systems. As is evident in the Nile River basin, pressure and demand for such infrastructure remain high. But these projects must be built to higher ecological, social, cultural, and community standards that limit population dislocations, protect fisheries and downstream flows, and respect international principles of water sharing. It remains to be seen if these principles and standards will be adequately applied.

We also need to create a “soft-path” approach that uses nontraditional sources of water such as treated wastewater, focuses on satisfying water demands through improved water-use efficiency and productivity, applies innovative economic approaches such as smart pricing and appropriate markets for water and virtual water, and includes improved institutions that pursue integrated regional water planning and management (Gleick, 2003). Above all, listening to an array of voices and concerns and accepting that water, energy, food, and climate challenges are integrated issues could finally make it possible to solve our global water problems. ■

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# On the Edge

Thomas Helbling

**How oil markets will adjust to high prices is unclear**



**O**IL prices adjusted for inflation have almost tripled over the past decade. But high prices typically bring an end to booms in commodity markets. That's what happened in the oil market in the early 1980s. Could the end of the current boom be near?

At a superficial level, the current situation is reminiscent of the early 1980s, when a turnaround in market conditions presaged the oil price collapse of 1986 (Adelman, 1996). Similarly to the early 1980s, global economic growth today has slowed markedly (after a strong postcrisis rebound in 2009–10), and downside risks to global growth dominate. This overall picture is reflected in weaker growth in oil consumption at the same time that new oil supplies in North America are expanding rapidly (see “On the Rise,” in the March 2013 issue of *F&D*). New supplies also appeared in the early 1980s—from nations that were not members of the Organization of the Petroleum Exporting Countries (OPEC).

What is not clear is whether the similarities between today's global oil market and that of the early 1980s are real or merely superficial.

## An old story

The demand-side story of the early 1980s is simple. After oil prices doubled following the 1979 revolution in Iran, global oil consumption declined through 1983 (see Chart 1). It then grew slowly, but not at the high rates of the 1960s and 1970s. Only in 1987 did global oil consumption return to the 1979 peak; in that eight-year time frame, global real GDP rose 26 percent.

Several factors explain the slump and subsequent shift in global oil consumption in a period of high prices: substitution, a global recession, and increased efficiency. Substitution occurred—primarily in the electric power sector, where the more expensive, crude oil-based

fuels were replaced by cheaper alternatives, such as coal. In the United States, for example, consumption of heavy residual fuel oil by utilities fell by two-thirds between 1970 and 1983—accounting for 15 percent of the global decline in oil consumption. The high prices, largely driven by OPEC policies at the time, also led to reductions in consumption that were amplified by recessions in many advanced economies in 1980–82. Petroleum fuel consumption in the

**These declines in consumption in the early 1980s occurred only in advanced economies.**

transportation sector in the United States, for example, fell by 15 percent between 1979 and 1983. The lower trend growth in oil consumption after 1983 largely reflected greater efficiency, notably in automobiles. Because of the greater fuel efficiency of new cars, much of that improvement was permanent.

But these declines in consumption in the early 1980s occurred only in advanced economies. Consumption continued to grow rapidly in emerging market and developing economies. Today, emerging market economies are the dominant oil consumers, and, at least in the near future, there does not appear to be the type of structural break in their oil consumption patterns that occurred in advanced economies in the early 1980s. Because emerging market economies generally use more oil per unit of output than advanced economies, their rapid growth since the early 1990s has led to an acceleration in their oil consumption. Advanced economies have been using less oil since 2006. As a result, emerging market and developing economies' share in global oil consumption has risen rapidly—to about

Alaska oil pipeline between Prudhoe and Port of Valdez, North Slope, Alaska.

57 percent of world petroleum liquids in 2012, compared with 44 percent in the early 1990s. Even in the advanced economies, the decline in oil consumption has not been as dramatic as it was in the early 1980s.

There are important differences between the early 1980s and today that militate against dramatic changes in consumption. The potential to substitute other energy sources for oil seems more limited. In the power sector 30 years ago, changing the fuel source was easy because existing technologies could handle different types of fuel without many cost implications. But today, utilities are less important users of crude oil-based fuels than 30 years ago—except in Middle East oil-producing countries, where substitution is hampered by the unavailability of domestic natural gas and other fuels are generally not a feasible option. In the global transportation sector, which accounts for more than half of crude oil consumption, the technology for substitution is still limited, and the much higher cost of most alternatives impedes large-scale substitution. In particular, electric cars are still much more expensive than those powered by internal combustion engines. Nevertheless, smaller engines and technological improvements are having some effects. The average fuel efficiency of new cars has started to increase again, although it will take several years to be reflected in the fuel efficiency of the overall car stock.

Fuel subsidies also limited the pass-through of higher oil prices to end users in some economies—and reduced the demand impact of those higher prices. Recent calculations by IMF staff suggest that fuel subsidies in 2011 amounted to about 0.3 percent of global GDP. While this amount is small from a global perspective—less than 10 percent of the value of global oil consumption—in some countries the subsidies represent a large portion of domestic consumption. Moreover, the subsidy systems are often designed in a way that insulates consumers from oil price spikes, which reduces the impetus for substitution that such events should provide.

### Demand holds firm

In the short term, then, a significant drop in the global demand for oil is likely only if global economic conditions get much worse. But, over the longer run, things could be different because there is potential for substitution and further efficiency increases in the transportation sector. In a number of countries, relatively cheaper natural gas could become an alternative fuel source. Batteries could be improved so much that vehicles powered by electricity become more attractive. And the fuel efficiency of internal combustion engines is likely to continue to increase, spurred by recent or pending legislation in the United States and the European Union. In addition, carbon taxes on end users of fossil fuels could make it more attractive to use other energy sources instead. Compared with the early 1980s, however, changes in oil consumption are likely to be more gradual.

On the supply side, there also are important similarities and differences between the present and the early 1980s. The expansion of supplies in the oil-producing countries outside

OPEC is a common feature of both the early 1980s and the past few years (see Chart 2).

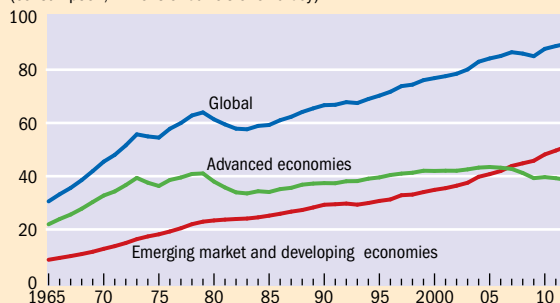
The context, however, is different now. In the early 1980s, rapid increases in non-OPEC production in response to

Chart 1

### Burning oil

Rising oil prices in the late 1970s sharply moderated consumption in advanced economies, but oil use continued to grow in emerging market and developing economies.

(consumption, millions of barrels of oil a day)



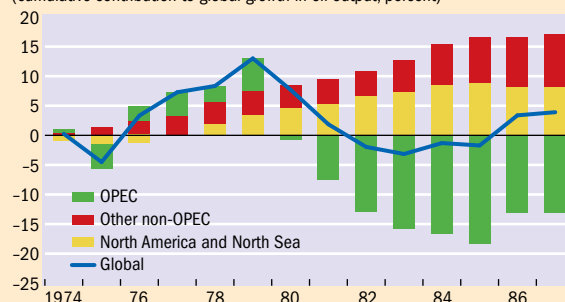
Source: BP, *Statistical Review of World Energy*, 2013.

Chart 2

### Adding oil output

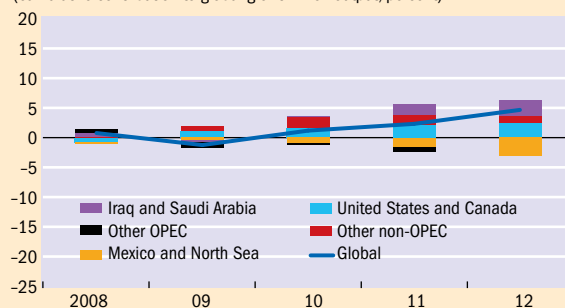
OPEC producers cut production substantially to maintain prices in the 1980s as non-OPEC producers expanded their output.

(cumulative contribution to global growth in oil output, percent)



But production increases from recent investment have been small since prices peaked in 2008.

(cumulative contribution to global growth in oil output, percent)



Source: BP, *Statistical Review of World Energy*, 2013.

Note: OPEC = Organization of the Petroleum Exporting Countries.

high prices undermined OPEC's pricing power when oil consumption started to slump. Lack of production capacity was not an issue then. In fact, the decline in OPEC sales led to abundant spare capacity in member countries. Today, the critical question on the supply side is whether the recent expansion of non-OPEC production will be sufficient to alleviate the supply constraints that arose in the current oil

## Developing new resources is more difficult than it was three decades ago.

boom. These constraints became obvious when global crude oil production stagnated during the global economic boom in the mid-2000s.

Many of these supply problems are related to the growing number of maturing large oil fields that have experienced declines in production. While maturation is part of the normal life cycle of oil fields, the fact that it started to affect major producing countries, beginning with fields in the North Sea and Mexico, was new. The resulting pressure on non-OPEC production became evident in the early 2000s, when oil demand from emerging market and developing economies increased and declining spare capacity limited OPEC's ability to increase production.

Renewed growth in total global oil production requires increased production from newly discovered reservoirs and known but undeveloped reservoirs, as well as through increased recovery from current reservoirs (IEA, 2008). While pessimists doubted that renewed growth was possible, recent experience suggests otherwise. High oil prices have spurred exploratory activity and the discovery of new, sometimes large, oil fields; increased development of both newly discovered and known fields; and elicited more investment in enhanced recovery. Investment projects under consideration in the oil sector could, in principle, more than offset the projected decline from fields now in operation.

### Production increase modest

Nevertheless, the increase in global oil production since oil prices peaked in 2008 has been small compared with what occurred when non-OPEC producers boosted output in the late 1970s and early 1980s. Except for increases from OPEC producers such as Saudi Arabia, the most noticeable new production in recent years has come from the development of shale oil or light tight oil in the United States and Canada—which has taken the market by surprise because development took only a few years. Elsewhere, new capacity has been slow to emerge. That partly reflects the time it takes to develop a new field, which can be 10 years or longer—depending on the complexity of the project and the field's proximity to the sea or existing pipeline networks. The technical challenges involved in developing some of the new resources discovered in deep-sea oil fields (such as in

Brazil) and in the Arctic are formidable. The development of light tight oil has been relatively easy in comparison.

A surge in investment costs and unexpected bottlenecks in firms that provide oil investment services, such as drilling wells, and in other industries that supply parts, such as drilling rigs, have also hampered development. As a result, the ratio of the market value of additional reserves to the costs of obtaining them rose by less than what oil prices alone would indicate, suggesting relatively weaker investment incentives. The recent global recession provided some relief, but investment costs remain high and some bottlenecks in oil investment services remain.

Constraints on oil investment capacity increases have also held back capacity increases. In many regions with favorable prospects for exploration and development, foreign investors are restricted or excluded from participation in the domestic oil sector. Such "resource nationalism" has hindered oil investment. Some national oil companies have ramped up capital expenditure in response to higher prices, while others have not because of political interference. The limitations are particularly relevant if the development of new oil sources requires foreign know-how and experience. Barriers to foreign direct investment typically mean that the needed oil investment will not be forthcoming.

Security concerns have hampered exploration and development in some areas—one reason production increases in Iraq, for example, have fallen short of expectations.

Still, the experience of the past few years suggests that extreme supply pessimism does not seem justified either. High prices have spurred new investment and efforts to increase production from existing sources. At current prices of \$100 a barrel or higher, the incentives to invest remain fundamentally intact—most new oil projects require oil prices of at least \$60 a barrel, in constant 2013 dollars, to be profitable. Nevertheless, as discussed above, developing new resources is more difficult than it was three decades ago.

Against this backdrop, total net production capacity will build only gradually. International Energy Agency forecasts, for example, suggest modest increases in new net capacity over the next five years. Because capacity increases are the main drivers of supply growth, supply increases will likely be equally modest.

Although, over time, the cumulative effect of both supply and demand changes could be large, any dramatic change in oil market conditions and prices in the near term would almost surely be due to dramatic changes in global economic activity or geopolitical developments. ■

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Workers at rare earths mine in Baotou, China.

# Extracting Resource Revenue

*Philip Daniel, Sanjeev Gupta, Todd Mattina, and  
Alex Segura-Ubiergo*

**B**EING well endowed with resources may be beneficial for a developing country, but an abundance of resources can make it difficult for policymakers to design and implement spending and tax policies.

Authorities in these resource-rich economies must contend with several issues:

- Nonrenewable resources—including oil, gas, and minerals—are exhaustible and, as a result, so are the exports on which the countries depend.
- The prices of the commodities they export are unpredictable, so a large proportion of their revenues is often volatile, which can cause swings in government spending.
- Policy frameworks are often not strong enough to support the implementation of sound tax and expenditure (that is, fiscal) policies. The countries may have limited capacity to undertake long-term revenue forecasts and implement high-quality public investment projects.

These issues affect the design of appropriate fiscal policy, including ensuring sound decision making so that any increase in public spending is productive.

## **Resource horizon**

Before making decisions about fiscal policies, a country's authorities should assess the number of years that natural resources can be expected to generate revenues. Calculating a resource horizon for these extractive industries can be difficult, however, because new discoveries can be made and technological changes can affect the market value of natural resources by making them easier to extract or by increasing the portion that can be recovered.

But a reasonable estimate of whether resources are likely to be long lasting (say, for more than 30 to 35 years) is important because exhaustibility should play a key role in the determination of fiscal policy. While sustainability is an important concern for all countries, adjusting fiscal policy to an environment without resources is less

**For countries with abundant oil, gas, and mineral deposits, formulating tax and spending policies can be tricky**



of an immediate worry for those with long resource horizons. For them, the main challenge is likely to be how to manage revenue volatility as the price of the resource fluctuates. This is the case, for example, for Saudi Arabia and Russia—countries with very long resource horizons, given their enormous oil reserves. In contrast, countries whose more limited oil reserves give them a shorter resource horizon—such as Cameroon and Yemen—should focus on how government expenditures can be sustained once resource revenues end.

Thus, managing resource price volatility is the most important objective of fiscal policy in countries that have long resource horizons and that depend heavily on revenue from those resources. To ensure that spending and tax policies reflect long-term average revenues, the authorities can adopt rules to account for year-to-year fluctuations in resource prices. Such smoothing in estimating the structural (or normal) revenues that can be anticipated in an average year allows the authorities to determine how much of their resource revenues they can safely spend through the annual budget. Estimates of structural resource revenues use both a price-smoothing formula and production forecasts and are based on past, current, and expected future prices. Chart 1 shows how different variations of the rule (such as the number of years given to past, current, and expected prices to calculate structural revenues) produce different projections for primary expenditure growth and the accumulation of financial assets.

The choice of a price formula reflects a trade-off a country makes between a preference for smoothing expenditures and adjusting to changes in price trends. Budgets that rely on price formulas with a short backward-looking horizon will better track changes in prices, but the formulas may result in more volatile spending that could fuel an unwelcome tightening in fiscal policy when commodity prices are weak. In contrast, budgets that rely on price rules with long backward-looking formulas will have smoother expenditure paths but might systematically under- or overshoot actual revenues if the price trend changes.

Even under smoothing rules, however, structural revenues may still jump sharply following large and abrupt changes in resource prices. For instance, the oil price spikes in 1974 and 1979 would have increased structural oil revenues by more than 15 percent with a price-smoothing rule that included forward-looking prices (such as the one represented by the red line in Chart 1). This can lead to a corresponding large increase in government expenditures despite the price-smoothing rule, which may be difficult for an economy to absorb. To control spending volatility

further, the smoothing framework can be complemented by a rule that puts additional restrictions on spending growth from one year to the next (see Chart 2). The green line shows a much smoother expenditure path once this complementary rule is added.

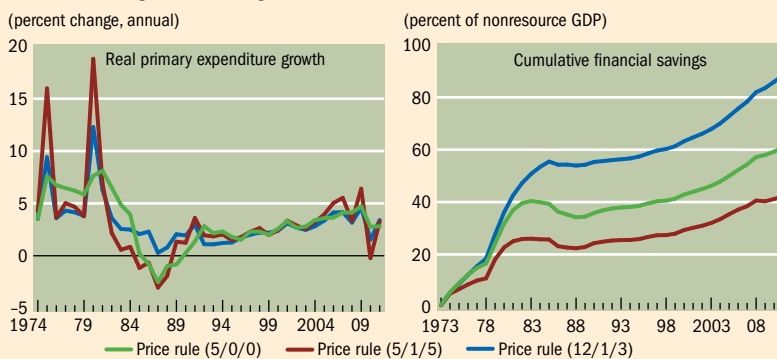
In practice, price smoothing formulas vary. Mongolia, for example, uses a 16-year moving average of mineral prices (prices of the past 12 years and projected prices for the current and the next three years). The formula attaches a large weight to previous prices, providing stability in the revenue forecast while allowing for a gradual incorporation of forward-looking price expectations. Mexico adopts a smoothing rule based on the 10-year historical average of oil prices (25 percent weight), the short-term futures price of oil (50 percent weight multiplied by a “prudence” factor), and medium-term oil futures prices (25 percent weight). This specification is more responsive to changes in expected price trends, but the revenue forecasts it generates are less smooth. The prudence factor reduces the structural fiscal balance, which makes the rule more conservative and tamps down the spending level.

In countries with shorter resource horizons and greater uncertainty about production volumes, an alternative approach to control for resource price volatility is to base the pattern of government expenditures on a target of the fiscal balance that excludes resource revenues. The level of the nonresource fiscal balance is based on the capacity of the economy to absorb the resource revenues without causing inflation and a large current account deficit. This approach provides a direct link to fiscal sustainability by setting the target on the nonresource fiscal balance at a level that can be maintained after resource revenues run out. Because the nonresource fiscal balance gradually converges to the

Chart 1

### Smoothing it out

To avoid a boom-bust cycle in government spending, resource-rich countries can adopt rules to account for year-to-year fluctuations in commodity prices. Spending based on such smoothing also allows governments to save.



Source: IMF staff calculations.  
 Note: The chart simulates expenditure paths that different price-based rules would have generated over the past 35 years based on actual prices and estimates of future prices. The numbers in parentheses refer, in order, to the number of years in the past, present, and future used in the calculations. The price rule 5/0/0, for example, uses prices for the past five years only to calculate the smoothed resource revenues; the rule 12/1/3 uses prices for the past 12 years, the current price, and price forecasts for the following three years. Real primary expenditure is noninterest spending adjusted for inflation.

overall balance as resource revenues decline, calibrating fiscal policy in this way avoids the need for abrupt breaks in government expenditures or tax increases after the natural resources have been depleted. The fiscal policy design under

be affected when natural resources run out and structural revenues gradually decline.

One option for ensuring sustainability is to save the resource revenues and spend only the return generated by

## The effectiveness of public investment depends on institutional factors, such as the capacity to select, implement, and evaluate projects.

these conditions is similar to what a country dependent on foreign aid must plan for when aid is expected to taper off in the medium to long term.

When resource revenues are higher than budgeted, the excess is saved rather than spent. Similarly, the government can draw down its financial assets when budgeted revenues are lower than expected. The fiscal frameworks in Norway, Timor-Leste, and Papua New Guinea are broadly based on this approach. In this way, governments can avoid boom-bust swings in spending driven by fluctuations in global commodity prices.

### Ensuring government solvency

While sustainability issues are important for all countries, running out of resources is less of a concern in countries with a long resource horizon, because their governments are not immediately confronted with the question of whether government spending can be sustained. As noted earlier, in these countries, structural resource revenues tend to be a large and lasting share of overall government revenues. In contrast, in countries with relatively short resource horizons, it is crucial to assess how government budgets might

those savings—the so-called annuity approach. In Norway, for example, the government budget every year receives about 4 percent of the value of the saved oil revenues. The approach has served Norway well, but it is not necessarily optimal for developing countries with large development needs.

One alternative to the annuity approach is to use oil wealth to buy physical assets and to improve the health care and education of citizens (in economic parlance, to invest in human capital). In countries with massive infrastructure and human capital needs, the rate of return of productive public expenditures is likely to be substantially higher than the rate of return on financial assets. In the case of infrastructure, for example, the government increases public investment for, say, 10 to 15 years by drawing down its financial savings. If the government uses resource revenues for high-quality public investment projects, economic growth is likely to increase, thereby producing an increase in nonresource revenues. Of course, this outcome requires effective public spending. If spending is poorly directed, the country and its future generations will be worse off. This underscores the importance of extensive public discourse on the choice of public projects and how they will affect growth and nonresource revenues.

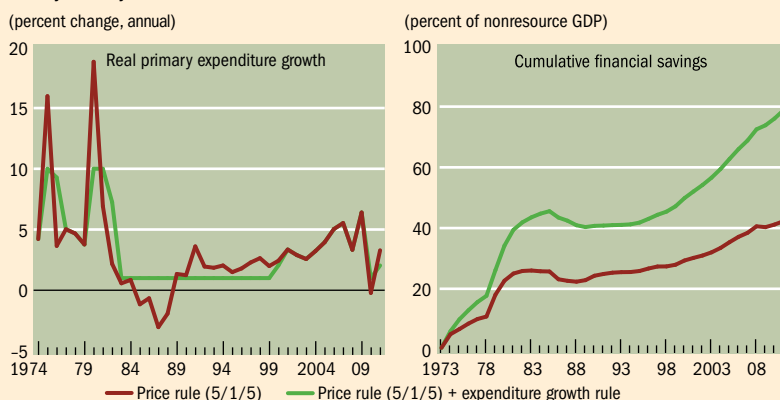
The effectiveness of public investment depends on institutional factors, such as the capacity to select, implement, and evaluate projects. It is essential, then, to have strong public financial management systems, including the ability to provide reasonable forecasts of resource revenues; the capacity for medium-term budgeting; good cash and liability management; and transparency in the collection and utilization of natural resource revenues through appropriate accounting, reporting, and auditing. There is also a need for indicators to track the use of resource wealth. Two possible indicators are the share of public investment in total spending and the ratio of the increase in public investment to the increase in resource revenues.

Fiscal transparency and good governance through strong fiscal institutions should be a priority in resource-rich developing countries. Scaling up government expenditure entails a decision

Chart 2

### Prudent smoothing

Sometimes countries want to be more conservative in spending resource revenues than would be dictated by a price rule alone, so they add restrictions on spending growth from year to year.



Source: IMF staff calculations.

Note: The chart simulates the expenditure paths from a price rule 5/1/5 that relies on prices for the past five years, the current year, and the coming five years in calculating the smoothed resource revenues. Annual spending can be further modulated by putting a limit on expenditure growth no matter what the price rule yields. In this example, spending is subject to a 10 percent cap and there is a 1 percent floor in the growth of real primary expenditures. Real primary expenditure is noninterest spending adjusted for inflation. Policymakers can choose a lower cap if they want real expenditures to grow by less than 10 percent.

about the use and allocation of a country's resource wealth. For countries to achieve fiscal transparency, it is important that they follow good practices, including a clear assignment of roles and responsibilities of different government entities, establishment of an open budget process, publicly available information, and assurances of data integrity.

### Revenue policies

Revenues from extractive industries are important for financing productive expenditures on infrastructure and social spending. However, resource revenues are often disappointing in practice because the accompanying revenue and fiscal policies are not effectively designed and implemented. Recent discoveries in many developing countries, such as Ghana and Sierra Leone, lend new urgency to the design of such fiscal policies.

The policies must maximize resource revenues without creating disincentives for production. Moreover, while revenue objectives are important, other factors—such as generating employment in related activities and environmental and social effects of the industries—must also be weighed.

Still, revenue is often the main benefit to the resource-rich country, and, because investors can earn returns that far exceed what they require to stay in business (so-called economic rents), these industries are especially attractive as a potential revenue source. That is, governments can extract a large share of the economic rents, and investors will still do well.

Fiscal regimes around the world offer governments, on average, about half of the rents generated by mining, and two-thirds or more from petroleum—perhaps because petroleum usually generates more rent. Actual collections may be lower if there are loopholes or inefficiencies in collection. Fiscal policies that raise less than these benchmark averages may be cause for concern.

Governments have a variety of tax instruments at their disposal to extract resource rents, including competitive

bidding, royalties, explicit rent taxes, and state participation through national resource companies. Some of the key considerations in the mix of these tax instruments are the desired timing of tax receipts; the extent to which the government wishes to take a larger share of resource rents as prices increase, which enhances revenue volatility; and the capacity to administer taxes and ensure compliance. Country circumstances vary, but policies that combine a royalty and an explicit tax on excess profits (along with the standard corporate income tax) have appeal for many developing countries. The combination ensures that some revenue (such as that from royalties) begins with the start of production and that the government's revenue rises as excess profits increase with higher commodity prices or lower costs.

Many countries have made, or are making, major changes in the design of their fiscal approach to extractive industries, ensuring a steady flow of revenue from royalties compatible with continued investment and also targeting excess profits. Examples are Guinea, Liberia, and Sierra Leone in their mining industries.

### Resource funds

As we discussed, when resource revenues are higher than budgeted, they should be saved. They could be saved in resource funds—which go by such names as sovereign wealth funds, stabilization funds, and funds for future generations. But resource funds should complement fiscal policy; their funding should come from actual fiscal surpluses and not from borrowing. They should be integrated into the broader budget process to enable governments to ensure effective resource allocation when setting spending priorities. Resource funds should not, consequently, have independent spending authority. While resource funds can have different mandates—such as stabilizing government expenditures or providing a vehicle for intergenerational savings—countries whose institutional capacity is weak should have just one resource fund.

The resource horizon and the volatility of natural resource prices influence the design of fiscal frameworks in resource-rich developing countries. Frameworks should be sufficiently flexible that they can be adapted to the varying institutional capacities and preferences of the resource-rich countries. Using the flexible framework outlined above, these countries can scale up public spending financed from rising natural resource revenues and facilitate an effective and transparent use of natural resource revenues without jeopardizing macroeconomic stability and sustainability. ■

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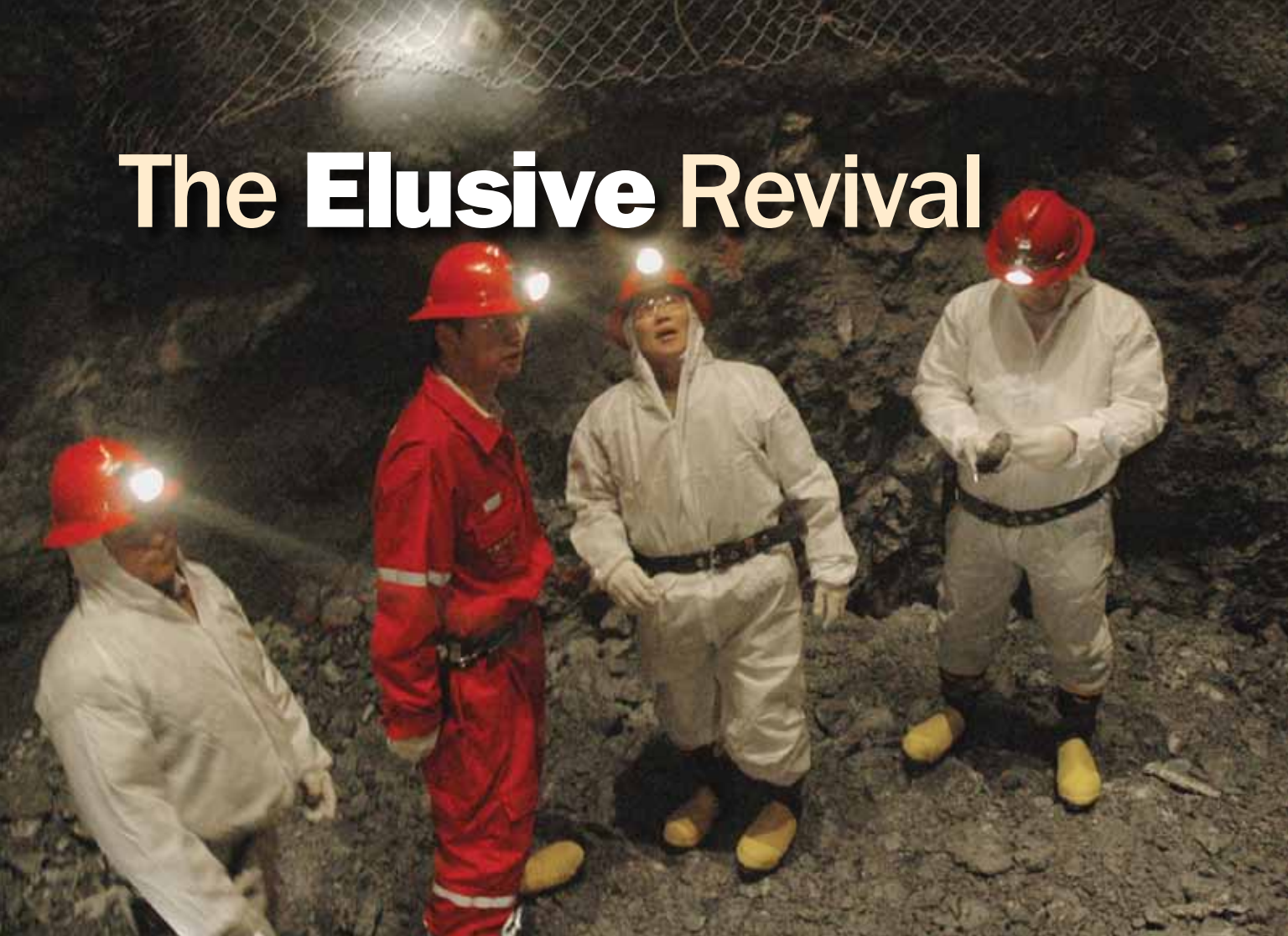
*This article is based on two IMF board papers issued in 2012: "Macroeconomic Policy Frameworks for Resource-Rich Developing Countries" and "Fiscal Regimes for Extractive Industries: Design and Implementation."*



Iron ore sample.



# The Elusive Revival



Workers in Oyu Tolgoi copper-gold mining complex, Khanbogd Soum, Mongolia.

*Andrew Warner*

**G**LOBAL prices of crude oil, hydrocarbon products, and minerals have surged over the past decade. Metals are up 66 percent, crude oil 159 percent. Major deposits of natural resources have been discovered in developing countries: gold in Burkina Faso; offshore petroleum in Ghana; and copper, gold, and coal in Mongolia. Many expect growth to follow. If institutions in these countries are sound and the resources are invested at home in infrastructure and health and education, the assumption is that growth will happen.

But the old natural-resource curse—the paradox that countries and regions with an abundance of natural resources tend to have less economic growth and worse development outcomes than those with fewer natural resources—casts a shadow over this optimism. Expectations were also high in the 1970s, yet countries rich in resources experienced significantly lower growth than other countries during the 1970s and 1980s.

However attractive the vision of a resource-led revival, it is unfortunately proving elusive. The key to understanding the longer-term trends is to look at the economy outside the natural resource sector. Although overall growth rates are positive, underlying nonresource growth rates are much lower.

Nevertheless, pessimism is not the right conclusion. Sure, some problems associated with resource riches are rooted in basic economic forces over which countries have little control. But there is much over which they do have control, principally public investment decisions. Given the continued poor performance and inefficiency of public investment in both resource-rich and resource-poor economies, there is probably great scope for improvement and an opportunity to counteract whatever other dark forces are associated with great natural resource wealth. But to do so governments must fundamentally change how they make these decisions.

**The expected boost in growth from natural resource booms is not yet happening**



## The curse continues

There is a lively debate about whether the natural-resource curse still exists. Some claim it is over, pointing to the fast growth of mineral-rich economies: Ghana grew 7.1 percent in 2012; Mongolia, 12.3 percent; Burkina Faso, 6.4 percent; and the United Arab Emirates, 4.4 percent.

But these numbers are distorted by the booming resource sector. A better metric of whether an economy is developing the ability to grow after a boom is activity in the rest of the economy.

Over the past five years, real per capita growth in Mongolia's nonresource sector has been essentially nil, at 0.23 percent a year. Ghana's is doing better, at 4.2 percent, but the United Arab Emirates (-3.4 percent) and Burkina Faso (1.9 percent) saw negative or unremarkable growth.

This phenomenon of slow growth in the nonresource part of the economy, even during boom periods, is not unusual. In my research, I examined boom periods in 20 economies other than those mentioned above and found that only 3 of 20—Angola, Equatorial Guinea, and Mozambique—achieved significant positive growth. Of the rest, 13 suffered negative growth in the nonresource part of the economy.

These results challenge commonly used economic models that assume countries will automatically grow whenever public capital investment increases. There has certainly been a rise in public capital investment in booming economies, yet the GDP growth data hint at negative returns. Despite huge resource revenues and significant domestic investment outside the natural resource sector, growth has been disappointing in resource-rich countries.

Some will argue that we need to give it more time, but the record in countries that had booms many years ago is no less disappointing. After large windfall booms in oil or gas revenues in the 1970s in Algeria, Gabon, Kuwait, Libya, and Saudi Arabia, growth in the nonresource sector was not impressive (see table).

Chile, Indonesia, Norway, and Botswana are often cited as counterexamples to the proposition that resource intensity

harms growth. But Chile, Indonesia, and Norway are not in the same league as the mineral-rich economies of the Middle East and Africa. Chile's and Norway's shares have fluctuated around 10 percent, and although Indonesia's resource share temporarily reached 20 percent in the 1980s, it was still a far cry from the shares of Saudi Arabia (68 percent in 1976), Qatar (62 percent), and Libya (71 percent in 2006).

Botswana is a special case. Through the mid-1990s, growth outside the mineral sector was not especially rapid. Diamond production increased so much that, between 1970 and 1996, 70 percent of Botswana's increase in GDP was thanks to the increase in diamond-generated GDP alone. Since 1996, the economy has continued to grow rapidly, becoming one of the few mineral-rich countries to show fast growth after a resource boom.

The two major explanations for slow growth in resource-intensive economies are poor institutions and "Dutch disease"—the harmful consequences of large increases in a country's income (see "Dutch Disease: Wealth Managed Unwisely," in *F&D's* compilation of Back to Basics columns—[www.imf.org/basics](http://www.imf.org/basics)). Neither explanation, however, is particularly helpful for suggesting solutions.

One problem with the first is that the concept of institutions is too broad. Poor institutions can mean anything from inadequately articulated or enforced laws to lax administration, weak safeguards against corruption, or poor economic policies. So the policy advice is too general. And although many have in mind inadequate safeguards against corruption when they cite poor institutions, straightforward seizure of resource wealth cannot alone explain the negative growth in economic activity observed in some resource-intensive economies.

Dutch disease—a second, well-supported explanation for the slow growth of resource-intensive economies—occurs when resource booms increase demand, pushing up prices and undermining the growth of firms that use those products as inputs for exportation. Few resource-intensive economies have managed to grow their nonresource exports; and few developing countries have grown rapidly without significant growth in exports outside the natural resource sector. Although countries can mitigate the demand surge at the root of Dutch disease—for example, by spending the resource revenues on foreign goods—they are unlikely to escape it completely. Dutch disease will probably continue to plague resource-rich countries.

Aside from mitigating the effects of Dutch disease through spending restraint, two oft-proposed policy options to confront the resource curse and bolster growth are to invest in offshore assets or to invest in public capital goods in the domestic economy.

The choice between the two depends critically on the real returns to domestic public investment. The higher the returns to public capital in terms of domestic economic growth, the more attractive this option is compared with offshore investment. But this assessment cannot be made on the basis of wishful thinking and unexamined assumptions. Too often, advocates simply assert that returns to public investment must be high because the needs are great in

### Slow growth

Despite natural resource sector booms, little growth is enjoyed outside the sector.

	Mineral or hydrocarbon production (estimated revenue as percent of the economy in 1970)	Average annual growth in real per capita GDP in rest of the economy (1970–2011, percent)
Libya	73	-3.4
Kuwait	70	-0.8
Gabon	59	1.0
Saudi Arabia	46	0.0
Algeria	20	0.7
Chile	12	2.6
Indonesia	7	3.7
Norway	6	2.0
Botswana	4	5.3

Sources: IMF, World Economic Outlook database; COMTRADE; and author's calculations.

Note: Mineral or hydrocarbon production in 1970 is estimated using export revenues, a good proxy for value added. Growth in the rest of the economy is estimated by subtracting this value from total GDP.

developing countries. Yet evidence to this effect is surprisingly mixed.

The use of public investment to bolster growth has been tried many times, with limited success. A number of countries mounted major public investment drives in the 1970s. For example, in the Philippines, public investment rose from 1.6 percent of GDP to 7.2 percent between 1972 and 1982, and

## The use of public investment to bolster growth has been tried many times, with limited success.

in Mexico public investment rose from 4.9 percent of GDP to 10 percent between 1971 and 1980. And virtually all countries with natural resource booms increased public capital investment. A notable example is Saudi Arabia, which expanded seaport capacity, electricity generation, paved highways, and construction of major new international airports.

Whatever else the investments accomplished—in Saudi Arabia, for example, health and education indicators improved markedly—they failed to boost economic growth over the long term. Saudi per capita GDP outside the hydrocarbon sector has not grown rapidly. And the Mexican and Philippine public investment drives in the 1970s were followed by economic slumps in the 1980s.

Some argue that state investments in infrastructure accelerated development in fast-growing economies such as Korea and Taiwan Province of China. But, in both these cases, public investment drives did not lead the growth process but rather commenced once growth was already under way. In Korea, President Park Chung-Hee announced a major expressway program in 1967, after the country had begun to grow rapidly in the early 1960s. And in Taiwan Province of China, the “Ten Major Construction Projects” campaign commenced in 1973, more than a decade after that economy first experienced rapid growth.

### Making it work

Overall, it is hard to find clear-cut evidence that public investment drives will yield positive payoffs. There are many examples of countries that enjoyed natural resource booms and embarked on public investment drives but had little to show for it over the long run. There are also examples of public investment drives not financed by resource booms that had little impact. Clearly, either positive investment returns are absent, despite claims to the contrary, or governments are failing to identify efficient investments and implement effective policies.

What might underpin poor public investments and policy choices in resource-rich countries? The descriptions of public investment drives in Mexico, Bolivia, and the Philippines by Buffie (1990), Morales and Sachs (1990), and Dohner and Intal (1990) reflect, no doubt, the experiences of many other countries.

Morales and Sachs cite the near absence of rational economic decision making during Bolivia’s public investment drive. They point to universally overoptimistic assumptions and assessments of benefits, little serious cost-benefit analysis, and pervasive use of noneconomic objectives such as prestige or national security to justify investments. The Bolivian government was fragmented, each faction protecting its own favored investment, with little in the way of a central body to compare alternative investments and select the most effective.

It is clear from these accounts where the threats to good policy originate. When there is a lot of money on the table, government investment policy is especially vulnerable to capture by interest groups. The influential groups—construction firms, consultants, and almost any commercial interest associated with the investments—are those that profit from simply implementing investments regardless of their social value. Political and regional interests aggressively press their case for their favored investments. A culture of advocacy emerges that distorts objective analysis and a rational decision process.

Although more evidence would always be helpful, these accounts hint at how government could truly improve public sector decision making. They could, for example, focus specifically on the public investment decision process: create structures that can resist the distorting influence of vested interests, analyze alternatives rationally, measure the outcomes rigorously, and adjust policy if warranted. This would provide a much-needed focus to the general call to improve institutions in resource-rich countries.

Once an accurate picture of the scope for boosting growth through domestic public investments emerges, governments of resource-rich countries will be able to make better choices on other policy options, including investments in sovereign funds, welfare-enhancing social investments, and provision of natural resource dividends to the population. ■

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*This article is based on two forthcoming IMF Working Papers by the author: “Economic Growth during Natural Resource Booms” and “Public Investment as an Engine of Growth.”*

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# Capital Flight Risk

Rabah Arezki, Gregoire Rota-Graziosi, and Lemma W. Senbet

**Natural-resource-rich countries risk capital flight as multinational corporations seek to avoid taxes**

**T**HE Democratic Republic of the Congo, widely considered among the world's richest countries in terms of mineral deposits, also regularly sits high on various lists of the world's poorest countries. Each year, it loses billions of dollars in tax revenue as wealthy individuals and multinational corporations take advantage of weak tax legislation and enforcement to funnel profits abroad, including to foreign financial centers. A similar situation plays out repeatedly in many countries in Africa and other parts of the world.

Natural resources are indeed a window of opportunity for economic development. In principle, revenues derived from their exploitation can help alleviate the binding constraints that governments in developing countries often face when attempting to transform their economies, boost growth, and create jobs. The experiences of resource-rich countries (especially those rich in hydrocarbon and minerals), however, suggest that resource wealth is not always a blessing. It can, in fact, be a curse. Over the past few decades, economic growth in resource-rich countries has, on average, been lower than in resource-poor ones (Frankel, 2012).

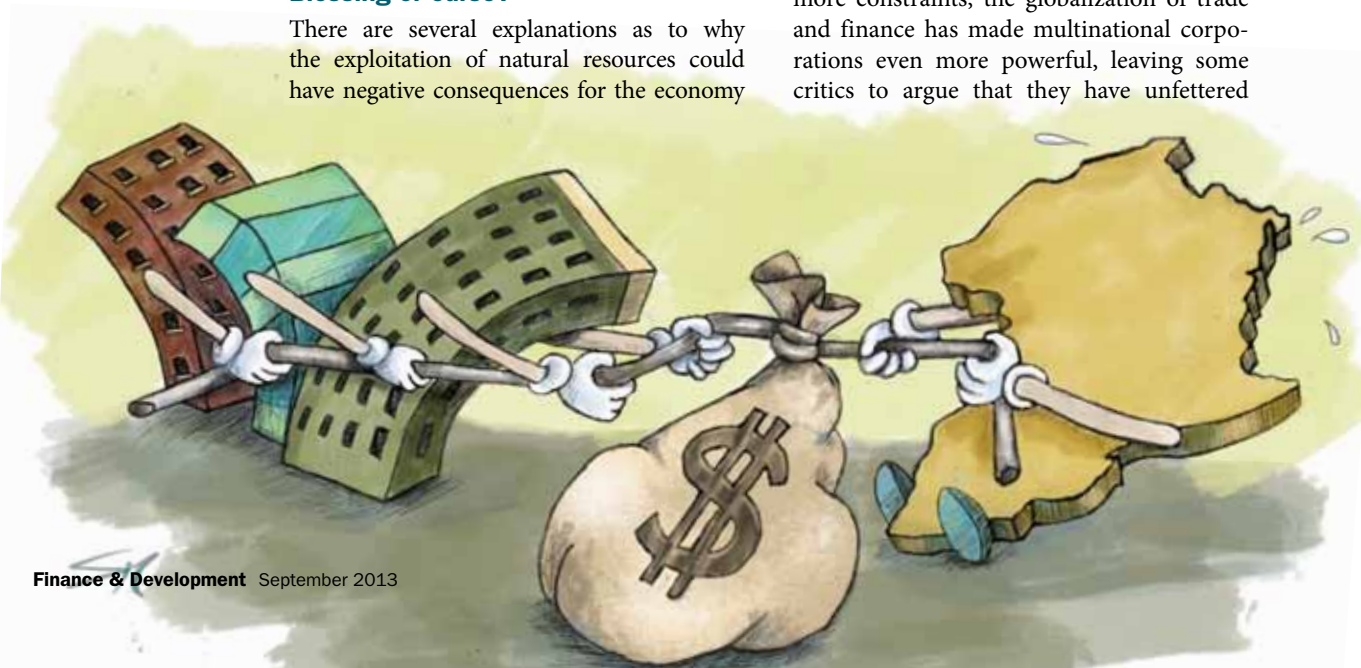
## Blessing or curse?

There are several explanations as to why the exploitation of natural resources could have negative consequences for the economy

(Frankel, 2012). One is the corruption of political and public administration elites. Because revenues derived from natural resources in many cases flow directly through the government's coffers, these elites may be able to take advantage of weak checks and balances to misappropriate those riches for themselves and channel them abroad.

Capital flight, here defined broadly as money or securities flowing out of a country, can take several forms. One form of capital flight for good reason has received a lot of attention in both academic and policy circles: illicit financial outflows. Global Financial Integrity, a research and advocacy organization working to curtail such flows, estimates that those from developing countries amounted to \$5.9 trillion from 2001 to 2010. In comparison, major donors disbursed \$677 billion in net official development assistance over the same period. Over the past decade, the democratization process in developing countries and the subsequent increase in transparency and accountability suggest that illicit financial outflows may be on the decline.

But while governments may be seeing more constraints, the globalization of trade and finance has made multinational corporations even more powerful, leaving some critics to argue that they have unfettered



access to capital, labor, and natural resources at the expense of the citizenry. In contrast to illicit financial flows instigated by political elites, the form of capital flight brought on by multinational corporations that manipulate prices and take advantage of loopholes in tax codes has received less attention. However, the latter may have far-reaching consequences for developing countries—especially the resource-rich ones whose wealth is concentrated in one sector.

In response to mounting criticisms, the Group of Twenty advanced and emerging economies (G20) has placed tax avoidance and profit shifting in general at the top of its agenda. In July 2013, the group adopted an action plan to rein in tax avoidance by multinational corporations, drawing from recommendations in a report by the Organisation for Economic Co-operation and Development (OECD, 2013). The IMF is now engaged in a major effort to monitor the macroeconomic implications of cross-country spillovers from national tax design and practices (IMF, 2013).

### Movers and shifters

Because multinational corporations operate in different countries and sometimes on different continents, they can readily pick and choose from varying regulations and tax laws across countries to avoid paying taxes both in the countries where they extract the wealth and where their headquarters are located. Specifically, some multinational corporations practice what is known as “transfer pricing” or “profit shifting,” which involves attributing a corporation’s net profit or loss before tax to opaque jurisdictions where taxes are low—so-called tax havens. Tax havens serve as domiciles for more than 2 million companies and thousands of banks. Some analysts estimate the wealth in those tax havens to be on the order of \$20 trillion (*The Economist*, 2013)—yet it is hard to know with certainty given the secrecy prevailing in tax havens.

Multinational corporations can shift profits in a variety of ways. One of the most widely used methods is through “thin capitalization,” when a company chooses to be more indebted than similar independent entities. Indeed, companies are typically financed (or capitalized) through a mixture of borrowing (debt) and stock issuance (equity). The way a company structures its capital will often significantly lower the amount of profit it reports for tax purposes, because tax rules typically allow a deduction for interest paid, but not for remuneration of equity (dividends). This debt bias is exacerbated for multinational corporations, which are able to structure their financing arrangements in such a way that their affiliates in high-tax countries pay deductible interest to their affiliates in low-tax countries, or tax havens, thereby minimizing their global tax burden.

### What’s at stake?

The resource sector is the main game in town in many developing countries. Governments should thus try to collect as much revenue as they possibly can from the hefty profits generated in this sector while remaining attractive to investment (see “Extracting Resource Revenue,” in this issue). But strik-

ing the right balance to generate the most economic gains is often fraught with peril not least because the exploitation of natural resources, particularly minerals, oil, and gas, requires much technical expertise, which multinational corporations are not keen on sharing.

Tax avoidance, including through profit shifting by multinational corporations, is a serious problem for many developing countries, especially those rich in natural resources. For example, the Zambian government estimates that it loses \$2 billion a year—15 percent of GDP—to tax avoidance by corporations operating copper mines within the country. Profit shifting erodes the tax base in the countries in which multinational corporations operate but also in the countries where they are headquartered.

An important aspect of profit shifting is the loss of positive spillovers that natural resource exploitation can bring to a country, including through the development of the domestic financial system. Preventing capital flight that stems from multinational corporations operating in the resource sector would help the development of a domestic financial system, particularly an equity market with its attendant benefits in risk sharing and liquidity provision. This in turn would aid in the financing and development of the nonresource sector to diversify their economies and avoid economic growth supported only by nonrenewable natural resources.

The historical development of South Africa’s stock market illustrates the potential benefits from discoveries of natural resources. In 1886, the discovery of gold was rapidly followed by the establishment of the Johannesburg Stock Exchange. The stock exchange helped raise money for the then-booming mining and financial industry. Today, the Johannesburg Stock Exchange has a capitalization of more than \$800 billion and 411 listed companies, including an overwhelming majority in the nonresource sector.

### Policy response

It is legitimate for developing countries endowed with natural resources to require affiliates of multinational corporations involved in the exploitation of their resources to pay a fair amount of tax and to avoid manipulating their capital structure for tax purposes. To prevent such practices, several countries have put in place a so-called thin capitalization rule, which essentially specifies a “safe haven” debt-to-equity ratio that limits the amount of deductible interest for tax purposes. It is designed to counter cross-border shifting of profit through excessive debt and thus aims to protect a country’s tax base. The rule was first introduced in 1972 in Canada and is now in place in about 60 countries. It is often implemented in countries with large resource sectors in which multinational corporations operate and was most recently introduced in resource-rich developing countries in Africa, including Sierra Leone, Uganda, and Zambia.

But trade-offs exist. Although the rule is designed to prevent excessive tax avoidance, the potential negative impact on foreign direct investment is the price countries may have

to pay to avoid the erosion of their tax base and help their domestic financial system to develop. The implementation of the rule affects the financing of company operations by increasing their cost, because it limits the tax benefit resulting from deducting the interest paid on borrowed funds. In addition, in the absence of a well-functioning domestic financial

## Profit shifting erodes the tax base in the countries in which multinational corporations operate.

system, the company's domestic cost of equity capital would be higher. In that regard, the thin capitalization rule may, to some extent, deter foreign direct investment. However, these multinational corporations are likely to generate large internally generated funds from domestic profits, and they can channel them to investments at a lower cost of capital rather than shifting profits to foreign affiliates.

### A thin line

Establishing whether the thin capitalization rule promotes more equity finance in the resource sector can also help determine if it improves the prices of countries' natural resource assets (and therefore helps with the development of a domestic stock market). Of equal interest is whether the sensitivity of host countries' external debt to the resource tax rate is altered by the presence of such a rule. To get some answers, we conducted an event analysis using cross-country variation in the timing and size of large oil, gas, and mineral discoveries for more than a hundred countries during 1970–2012. Our empirical framework controls for time-invariant factors, including the quality of institutions, that can play an important role in the development (or the lack thereof) of a stock market.

Results suggest that following a resource discovery, stock market capitalization decreases. This result is consistent with the work of Beck (2011), who found evidence that resource-rich countries tend to have less developed financial systems. However, our findings show that the presence of a thin capitalization rule allows countries to reverse the negative effect on capitalization of the resource discoveries. That effect is large in terms of its impact on the economy. Our results hold for mineral, oil, and gas discoveries, although the timing varies by the type of discovery. Following a large discovery, stock market capitalization increases by up to 20 percent of GDP in the presence of a thin capitalization rule, and the sensitivity of countries' external debt to the resource sector tax rate decreases. This occurs because the tax subsidy provided to corporations paying interest on their foreign debt is lower in the presence of the rule.

### Changes afoot

The thin capitalization rule is a unilateral response to one of the main practices in aggressive tax optimization behavior by multinational corporations and looks to be the most viable option right now. It not only protects the tax base of resource-

rich countries, but also helps link the financial development of these countries with the exploitation of their resources.

Yet other alternatives have been floated. Based on the U.S. experience, Nobel laureate Joseph Stiglitz recently proposed taxing the global profits of multinational groups and redistributing a proportion of those tax receipts to the country in which the value is created. This would be analogous to converging to a source-based tax system, which many multinational corporations are vehemently lobbying against. While Stiglitz's proposal is conceptually appealing, it might be impractical given the limited level of disclosure now required of such corporations, not to mention the difficulty in coordinating all the actors involved, including tax havens.

Several recent initiatives have contributed to the increase in the level of disclosure of multinational corporations operating in the resource sector. More disclosure is certainly an important step in the right direction. It will help make multinational groups more accountable to tax authorities in the countries where they operate and to the broader public. However, increasing transparency is only a first step toward tax base protection and does not deter tax avoidance through such tax optimization methods as thin capitalization.

Overall, the concern over massive capital flight from developing economies, particularly those rich in resources, should go well beyond illicit financial flows and consider the seemingly legitimate behavior of corporations and their growing ability to shift profits and minimize the tax base. Thus, effective mechanisms, such as a thin capitalization rule, should be in place to deter massive outflows stemming from tax avoidance schemes. ■

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# Eurasia's Next Frontier

Mark Horton and Jonathan Dunn

**T**WENTY years ago, following the collapse of the Soviet Union and amid heavy fighting over the disputed Nagorno-Karabakh region, the Republic of Azerbaijan faced difficult circumstances. A political crisis saw the abrupt departure of the country's president in mid-1993. Output declined by a staggering 23 percent in 1993, 20 percent in 1994, and 13 percent in 1995. Inflation raged, reaching 1,350 percent in 1993, 1,800 percent in 1994, and 500 percent in 1995. One bright note: oil exports brought \$200 million to Azerbaijan in 1994.

By 2003, the situation in Azerbaijan had improved considerably. Growth had rebounded, averaging 7½ percent annually during 1996–2003. Per capita income increased fivefold, and inflation was at or below 3½ percent annually after 1997. In 2003, Azerbaijan's oil exports reached \$2.25 billion.

Now, Azerbaijan's headline figures look even better. Growth averaged 13½ percent during 2003–12, and per capita income increased from \$900 in 2003 to \$8,000 this year. Central bank reserves stand at \$14 billion—the equivalent of eight months of imports—and assets of the state oil fund, SOFAZ, add another \$32 billion. SOCAR, the state oil company, has made major acquisitions throughout the Black Sea region and Europe in fuel retailing, petrochemicals, and media. Azerbaijan's oil exports are now \$30 billion a year.

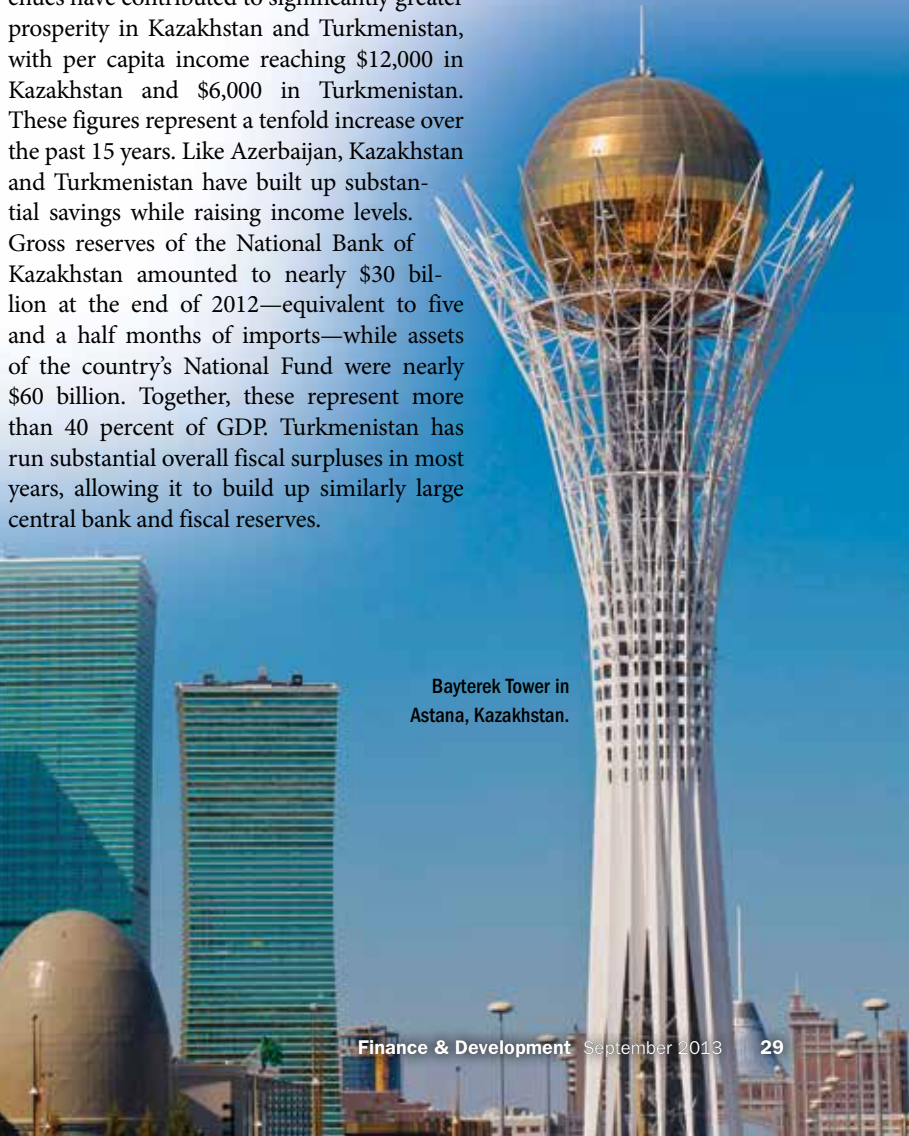
Azerbaijan is one of the eight countries of the Caucasus and Central Asia, the region bordered by China, Russia, Turkey, Iran, and Afghanistan. If the region's countries were merged into one, its land area would make it the world's seventh largest—more than four times larger than France and Germany combined. The aggregate GDP of the eight countries—approaching half a trillion dollars annually—would rank the region in the top 25 globally.

## Role of natural resources

The countries of the Caucasus and Central Asia have significant natural resource endowments. Azerbaijan and Kazakhstan are among the world's 25 largest oil exporters and, together with Turkmenistan and Uzbekistan, are among the world's 25 largest exporters of gas. The region's other countries—Armenia, Georgia, the Kyrgyz Republic, and Tajikistan—do not produce oil or gas, but do benefit from the transshipment of these and exports of other commodities.

As in Azerbaijan, higher oil and gas revenues have contributed to significantly greater prosperity in Kazakhstan and Turkmenistan, with per capita income reaching \$12,000 in Kazakhstan and \$6,000 in Turkmenistan. These figures represent a tenfold increase over the past 15 years. Like Azerbaijan, Kazakhstan and Turkmenistan have built up substantial savings while raising income levels. Gross reserves of the National Bank of Kazakhstan amounted to nearly \$30 billion at the end of 2012—equivalent to five and a half months of imports—while assets of the country's National Fund were nearly \$60 billion. Together, these represent more than 40 percent of GDP. Turkmenistan has run substantial overall fiscal surpluses in most years, allowing it to build up similarly large central bank and fiscal reserves.

**For the Caucasus and Central Asia, natural resource wealth holds the key to achieving emerging market status**



Bayterek Tower in Astana, Kazakhstan.

What explains the success of the Caucasus and Central Asia's oil and gas exporters? Favorable oil and gas prices over the past decade have certainly played a role. But western, Russian, and Chinese oil and gas companies have also brought expertise and capital to Azerbaijan, Kazakhstan, and Turkmenistan, taking an active part in the development of their hydrocarbon sectors. The three countries have also worked with other countries in the region to develop new transportation routes for oil and gas exports.

### Wealth begets wealth

In addition to these factors, Azerbaijan, Kazakhstan, and Turkmenistan have also generally followed good practices in managing their resource revenues. The three countries follow fiscal rules (that is, formal or informal constraints on fiscal policy through numerical limits on budget figures) and have established savings funds to help insulate their domestic economies from volatile oil and gas revenues. These funds accumulate substantial savings when oil and gas prices and exports are high, and help ensure that the spending of commodity revenues is relatively smooth and stable when oil and gas prices decline or when other shocks hit (see "Extracting Resource Revenue" in this issue of *F&D*). To ease the impact of the 2008–09 global financial crisis, for example, these savings were tapped.

In Kazakhstan, the savings fund receives 90 percent of income taxes, royalties, and shares from production-sharing agreements directly from the oil sector. The savings fund is managed abroad by the National Bank of Kazakhstan on behalf of the Kazakh government, with annual spending capped at \$8 billion (about 4 percent of GDP), all of which goes through the budget. Other fiscal indicators are subject to legislative requirements or rules. These include a floor on the minimum balance of the savings fund (20 percent of the current year's GDP) and on the budget deficit net of its transfers, as well as a rule that caps interest payments on government debt at the interest earnings of the savings fund.

Azerbaijan follows an ad hoc rule to save about half of its oil revenues abroad in its state oil fund. In 2005, Azerbaijan and its savings fund became the first in the world to issue a report under the Extractive Industries Transparency Initiative (EITI), a global standard that promotes revenue transparency and accountability in the extraction sector. Azerbaijan's savings fund operations are fully consolidated with the state budget, which is key to ensuring full coordination of fiscal policy. (In some countries, spending of oil revenues is not aligned with budgetary spending, giving the finance minister little control over fiscal policies.) Regular audits of the savings fund's operations by leading international audit companies are made public.

### Twenty years of transition

Besides improving resource management, the region has had other achievements since independence. This year marks 20 years since the countries of the Caucasus and Central Asia introduced their own national currencies, and more than two decades of transition from the Soviet planned economy. After an initial period of sharp dislocation and turbulence, growth in the region has averaged 7 percent a year since 1996, faster than in virtually any other region of the world. The oil and gas exporters

grew by an annual average rate of nearly 8 percent, compared with 6½ percent a year in the region's four other countries.

In all eight countries, inflation fell sharply and has remained in the single or low double digits. Fiscal deficits and debt levels were reduced significantly in the decade leading up to the 2008–09 global financial crisis, reflecting natural resource revenues but also improvements in fiscal institutions, especially public expenditure management and control systems. Income levels increased rapidly, and poverty was reduced.

However, there are also gaps in these countries' track records and major challenges going forward.

With the development of the hydrocarbon sector, dependence on oil and gas exports has grown over the past decade. Hydrocarbons now account for 45 percent of Azerbaijan's GDP and more than 90 percent of its total exports, up from 60 percent 15 years ago. Oil and gas exports also constitute more than 90 percent of Turkmenistan's exports. Kazakhstan is more diversified, with oil and gas amounting to 10 percent of GDP and 60 percent of exports. This dependence has increased vulnerability to swings in global oil prices, such that the region's growth and inflation rates have been among the most volatile in the world. Savings funds have helped moderate this volatility, but not fully.

Rapid growth over the past 15 years has also helped raise overall incomes, but it has not generated significant increases in employment or reduced inequality. This phenomenon reflects the fact that the oil and gas sectors—the main drivers of high growth—are highly capital intensive and do not require much labor. Generally difficult business climates have also constrained non-oil investment and job creation. Moreover, high oil revenues have not translated into improved indicators for health and education, as public spending in these areas remains relatively low, and outcomes lag other countries with similar per capita income levels. In addition, significant infrastructure gaps (for example, roads, water, and communications) have not been fully addressed.

### Revenue management issues

While the Caucasus and Central Asia's oil and gas exporters have followed some good practices in managing their natural resource revenues, there are also shortcomings.

The non-oil fiscal deficit, which excludes hydrocarbon-related revenues, is quite large in Azerbaijan, at more than 40 percent of non-oil GDP. This is a source of concern, given the country's relatively short expected duration of large-scale oil and gas production before output begins to decline. This means that Azerbaijan will need to find sources of revenue that are not linked to oil and gas or reduce spending—or both. The non-oil fiscal deficit is also large in Turkmenistan, but the country's reserves are significantly larger than those of Azerbaijan, giving it more of a cushion.

Moreover, while Azerbaijan and Turkmenistan have not significantly strengthened social indicators or resolved infrastructure gaps, domestic spending levels have contributed to stronger real exchange rates, putting pressure on other exporting sectors. And wages have increased faster than productivity.

Recent IMF consultations with Azerbaijan and Turkmenistan have raised concerns about high levels of investment spending



and the need to improve the planning, evaluation, and efficiency of these outlays. In Kazakhstan, significant expenditures are carried out through public-private partnerships and extrabudgetary institutions, notably the giant state investment holding company Samruk Kazyna. This raises questions about the coordination of fiscal policy with the budget, as well as about transparency and potential contingent liabilities. Finally, the transparency of Turkmenistan's oil- and gas-related funds—and, indeed, of Turkmenistan's economy more generally—is quite limited.

Some of the factors that have contributed to the successful development of natural resources in the Caucasus and Central Asia have been much less evident in other sectors. Foreign direct investment and involvement by major global firms have been limited outside the resource sector (except in telecoms).



Foreign investment is important to help drive diversification and bring technology, management practices, and nondebt financing to sectors outside the realm of natural resources, but stronger business environments are needed in the region to attract foreign investment and spur domestic investment.

In addition, although exports of oil and gas have relied on major investments in cross-border pipelines, regional cooperation has been less visible in other sectors. Over the past decade, trade between most countries in the Caucasus and Central Asia and other countries in the region has declined as a share of total trade, and there are few signs of intraregional cross-border investment.

The low levels of regional cooperation stem in part from the fact that, although major roads in the Caucasus and Central Asia are being upgraded and maintained, many corridors are characterized by inefficient border crossings and detours around disputed areas. Regional infrastructure for electricity trade has also deteriorated, and water management systems have become less efficient. These problems highlight the need to improve public expenditure management, increase the efficiency of spending, and tackle corruption.

### The road ahead

While the region has generally performed well over the past 20 years, further progress is needed to sustain strong growth and make it more diversified, inclusive, and resilient to shocks. An ambitious-but-realistic vision is that the region's countries can use their natural resources to become dynamic emerging market economies over the next decade.

Cross-country evidence suggests that diversification is strongly associated with sustained improvement in living standards, and the region's energy-rich countries should aim

to use their resource wealth to diversify their economies. Of course, diversification is a major challenge for hydrocarbon exporters, not only in the Caucasus and Central Asia but also worldwide, and there are few clear success stories or formulas to follow. A starting point is to make clear the challenges that energy exporters should tackle and the mistakes they should avoid.

At a minimum, these governments must address the efficiency of resource use and spending and the transparency with which such spending choices are made. While some of the region's countries adhere to international standards like the EITI, the efficiency of public spending and its transparency are not up to international standards. This is seen in the limited progress the countries have made in addressing infrastructure gaps, despite high investment spending. Public spending should also be supported by stronger mechanisms to evaluate efficiency, ensure effective implementation, and limit corruption.

Making sure that growth is strong, diversified, inclusive, and resilient will require action in other policy areas. It is critical to improve access to finance for the nonresource sectors, including small and medium-sized enterprises. In the fiscal sector, actions include limiting inefficient activities (such as the provision of energy subsidies) and bringing public financial management and revenue administration practices closer to international best practices. In the monetary and financial area, actions should target reduced government intervention and ownership, stronger central bank independence and communications, and greater exchange rate flexibility. Across the board, major efforts are needed to reduce administrative barriers and corruption that stifle competition and lead to the inefficient use of public resources.

The experience of the past decade underscores, however, that it is far easier to come up with a to-do list of measures than it is to see them implemented. Obstacles—and risks—to achieving the vision of becoming dynamic emerging market economies over the next decade are significant.

They include external vulnerability to commodity price movements, weak regional integration, and geopolitical challenges, such as tension between countries in the region and the withdrawal of western forces from nearby Afghanistan in 2014. Finally, there are serious domestic issues, such as vested interests, weak institutions, and limited political channels for voice, accountability, and policy debate.

The potential payoff is large and would see the countries of the Caucasus and Central Asia moving beyond their success in natural resources to greater and more diversified success. Only then can they take full advantage of their considerable human capital resources and their strategic location at the crossroads of Europe, Asia, and the Middle East. ■

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*This article is based on a May 2013 conference in the Kyrgyz Republic on the lessons of the post-Soviet transition and future challenges (see [www.imf.org/external/np/seminars/eng/2013/cca/](http://www.imf.org/external/np/seminars/eng/2013/cca/)).*

# MINERALS OF THE FUTURE

A secure, green, and innovation-filled future awaits us, but only with the help of rocks buried deep in the ground

**N**EW forms of energy, more mouths to feed, and exciting innovations in technology—all are part of the future, and all will depend on minerals we extract from the earth. Some of these minerals are well known for their more common uses—while others lack widespread notoriety.

## CLEANER AND GREENER



### SILVER

Silver is known for its use in coins and jewelry, but it will be important in the future because it's also needed to harness solar energy. Silver is the primary ingredient in solar panels used to catch the sun's rays and transform them into energy.

But it doesn't stop there. Silver ions are starting to be added to water purifica-

tion systems used in hospitals, community water systems, and pools, replacing chlorine as the element of choice for filtration. Ongoing research suggests that silver could be instrumental in addressing the issue of clean drinking water across the planet.

**100** MILLION OZ.

Amount of silver projected for use by solar energy in 2015



**90%**

Proportion of crystalline silicon photovoltaic cells (the most commonly used solar cell) using silver paste



**50%**

### COPPER

Another mineral well known for its use in coins is copper, but its properties make it extremely useful as a conductor of heat and electricity, so for many years it has remained the preferred compound in most electrical wiring.

Copper is vital to the electrical grounding system for wind turbine

farms. Given frequent lightning strikes, the grounding system is needed to channel lightning to the ground to prevent it from damaging the turbines. In all the years leading up to 2011, 714 kilotons of copper had been used in wind energy systems—and, in 2011 alone, 120 kilotons were used, with more expected to be needed in the coming years.

About half of all copper mined is used to manufacture electrical wire and cable conductors



# FOOD SECURITY

## POTASH

Potash is the common name for naturally occurring water-soluble potassium salts, the most common of which is potassium chloride.

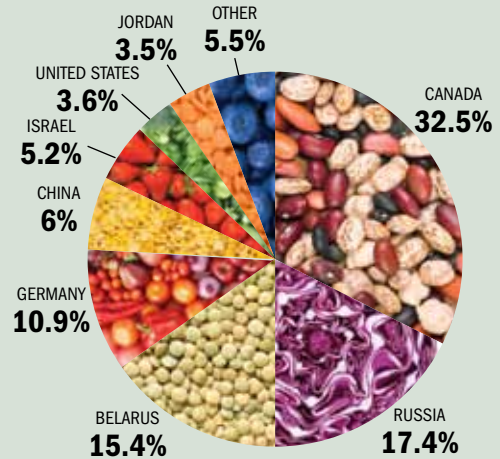
Potash is used in many countries as a fertilizer to grow rice, wheat, sugar, corn, soybeans, and various fruits and vegetables. In India, for example, 70 percent of soils have low to medium potassium content, and potash must be added so crops will produce enough food to feed the growing population.

With the world's population expected to reach 9.5 billion by 2050, arable land per person will decrease, and more crops will need to be grown on less land—and, at the same time, feed more people.



### Where is it?

Potash is produced in only 12 countries. Saskatchewan, Canada, is the largest potash-producing region, accounting for about a quarter of world production.



Source: Mineral Commodity Summaries 2013, United States Geological Survey Mineral Resources Program.

# TECHNOLOGICAL INNOVATION

# RARE EARTHS

## RARE EARTHS

Rare earths are a set of 17 related metals, currently mined predominantly in China.

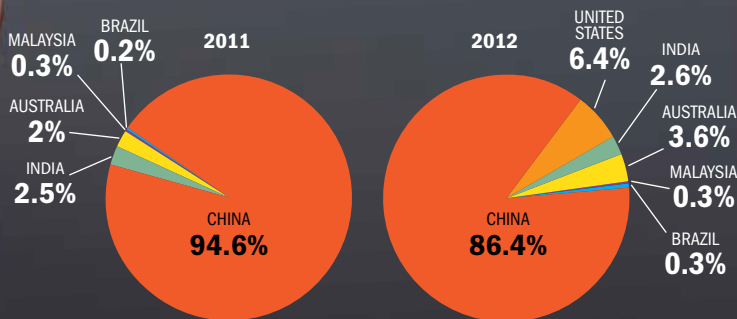
Rare earths are needed for everything from televisions and smartphones to power generators for wind turbines. They have unique chemical properties that allow them to combine with other elements to produce results that neither element could on its own.

Lanthanum is the second most abundant rare-earth element, and every Prius hybrid car on the road carries 10 pounds of this element in its nickel-lanthanum battery.

Another rare earth, europium, first brought the color red to color televisions back in the 1960s, and it now looks to be the missing ingredient for white LED lighting to illuminate homes and offices as naturally as sunlight—and more energy efficiently than incandescent and fluorescent lighting.

China's share of rare-earths production is likely to decrease in coming years, as higher prices and new technologies to help clean up the mining process spur investment in the sector.

### Top Rare Earths Producers



Source: Mineral Commodity Summaries 2013, United States Geological Survey Mineral Resources Program. Note: Percentages may not total 100 due to rounding.



Latin America needs large and sustained productivity gains to maintain its recent strong growth

# A Bumpy Road Ahead



Truck transporting sugarcane near São Paulo, Brazil.

Sebastián Sosa and Evridiki Tsounta

**L**ATIN America has enjoyed strong GDP growth in the past decade. The region grew 4 percent a year, almost twice the rate it recorded in the 1980s and 1990s. The strong growth was accompanied by declining inequality, poverty, and public debt levels. The improvement in the region's living standards was unprecedented—in the past decade, real GDP per capita increased by more than 30 percent, about two times faster than in prior decades.

The strong growth, however, masks important differences within the region (see Chart 1). The net commodity exporters—that is, the South American countries, which exhibited increasing commodity dependence and an export base highly

concentrated in primary goods—have grown, on average, 4.5 percent a year since 2003. But the rest of the region—Mexico, Central America, and the Caribbean—was much less buoyant, growing only about 2.5 percent a year.

South America benefited from an unprecedented improvement in its terms of trade because of the commodity boom of the last decade. Moreover, the financially integrated economies of this group—Brazil, Chile, Colombia, Peru, and Uruguay—which have close links to international financial markets, also benefited from the favorable external financial conditions. Large capital inflows in search of higher returns entered these countries in recent years as monetary policies in advanced economies flooded global financial markets with large amounts of liquidity.

The more northern countries, however, had stronger links to the advanced economies and were hit hard by the global financial crisis and the subsequent lackluster performance in the United States and the euro area. These links include tight commercial ties, in both goods and services (mainly related to tourism), and heavy dependence on remittances from the advanced economies. Moreover, this part of the region includes mostly net commodity importers; the surge in commodity prices added to their problems.

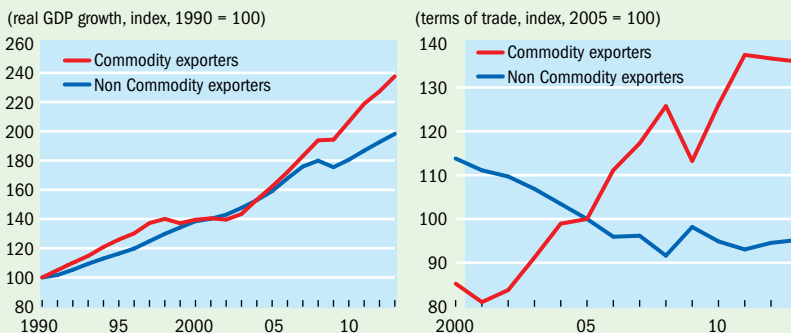
## Cooling off

Recent data, however, suggest that growth in the region as a whole is cooling off, in some cases quite rapidly. Current conditions raise a number of questions. Is the

Chart 1

### Regional differences

Economic growth was far stronger among South American commodity exporters over the past decade than it was in the rest of Latin America, mainly the result of higher prices that resulted in sharply improved terms of trade.



Sources: IMF, World Economic Outlook, April 2013; and IMF staff calculations.

Note: Commodity exporters are Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela.

Non-commodity exporters are Costa Rica, El Salvador, Honduras, Mexico, and Nicaragua. Terms of trade represents the value of exports relative to imports—essentially the buying power of exports.

slowdown a sign of a bumpy road ahead for the region, or is it temporary? As global financial conditions normalize and commodity prices stabilize—or even decline—will South America continue to enjoy the recent brisk growth rates, or will it revert to its past, subdued growth performance? Why have Central America, Mexico, and the Caribbean performed worse than the South American countries, and will they start to catch up?

The signs that an economic slowdown is emerging in China add to the rising concerns about growth prospects in Latin America. The region is now China's second-largest trading partner and second-largest foreign investment destination.

A useful first step is to identify the proximate causes of Latin America's recent strong growth performance and to estimate potential growth rates—using a simple accounting framework that breaks down output growth into the contributions from capital and labor (factor accumulation, as economists call it) and changes in productivity. Indeed, although there is a consensus that the robust growth performance in Latin America in recent years has been driven largely by favorable external conditions that fueled external and domestic demand, the main supply-side drivers are harder to identify. Has the region taken advantage of the tailwind from benign external conditions to increase its productive capacity?

### Engines of growth

Among the commodity exporters of the region, labor accumulation has been the main driver of growth since 2003, along with growth in the capital stock (Sosa, Tsounta, and Kim, 2013). Labor and capital accumulation together accounted, on average, for 3¾ percentage points of annual GDP growth in the last decade, or 80 percent of the growth in output (see Chart 2).

Employment gains explain the high labor contribution to growth, consistent with near-record-low unemployment rates in many countries. The strong employment growth reflects both a cyclical increase in demand for workers as the economies grew and structural factors, including the dynamism of such labor-intensive sectors as services. Employment gains in services have been impressive, with this sector now accounting for more than half of the employed population in the region. In Brazil, for example, private employment in the services sector increased by almost 13 million between 2004 and 2012, out of a total employment increase of 16 million.

Large amounts of capital have also been flowing into South American commodity exporters amid abundant external liquidity and a tripling in commodity prices during the past decade. The financially integrated economies have benefited the most. For example, the capital stock in Chile has increased by 60 percent since the end of 2002, more than doubling in the mining sector.

While factor accumulation has been the main driver of growth over the past 10 years, the recent pickup in output growth is explained largely by higher productivity—or, more precisely, total factor productivity (TFP)—which essentially measures how efficiently economic resources are used in the production process and includes both technological progress and the efficiency of markets. After declining in most of the

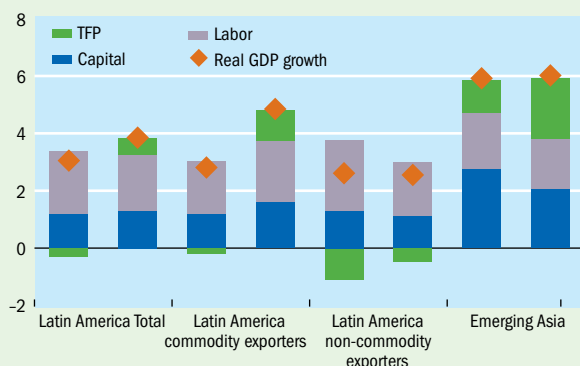
region in previous decades, TFP has recently been on the rise (see Chart 3). Such a rise usually occurs during the type of good economic times that South America has been experiencing. Changes in productivity are highly correlated with changes in output.

Chart 2

### Sources of growth

Additional workers and capital accounted for most of the increase in real (after-inflation) GDP in Latin America for most of the past decade, with rest due to higher total factor productivity (TFP). Most of the superior growth in emerging Asia is explained by the TFP differential.

(annual average, percent)



Sources: Penn World Table 7.1; IMF, World Economic Outlook, 2013; and authors' calculations. Notes: Commodity exporters are Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela. Non-commodity exporters are Costa Rica, El Salvador, Honduras, Mexico, and Nicaragua. TFP is total factor productivity which essentially measures how efficiently economic resources are being used in the production process, and include both technological progress and the efficiency of markets.

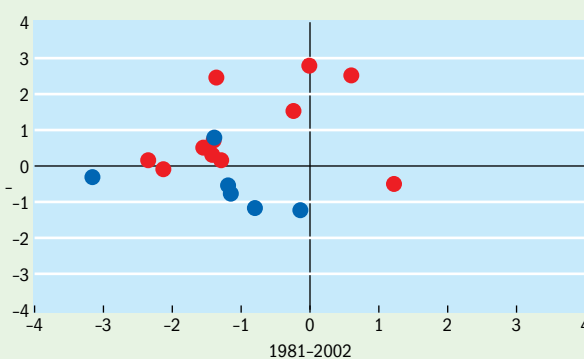
The first stacked column of each group is for the period of 1990-2002 and the second stacked column of each group is for the period of 2003-13.

Chart 3

### On the rebound

After declining in most of Latin America from 1981 to 2002, total factor productivity has recently been on the rise.

(total factor productivity growth, annual average, percent, 2003-12)



Sources: Barro-Lee (2010); IMF, World Economic Outlook, 2013; Penn World Tables 7.1; and IMF staff calculations.

Note: Commodity exporters—ARG=Argentina, BOL=Bolivia, BRA=Brazil, CHL=Chile, COL=Colombia, ECU=Ecuador, PRY=Paraguay, PER=Peru, URY=Uruguay, and VEN=Venezuela. Non-commodity exporters—CRI=Costa Rica, SLV=El Salvador, HND=Honduras, JAM=Jamaica, MEX=Mexico, and NIC=Nicaragua. Total factor productivity essentially measures how efficiently economic resources are being used in the production process, and include both technological progress and the efficiency of markets.

But improvements in TFP also reflect some structural (that is, permanent) factors, such as the movement of economic activity away from the less efficient informal sector. For example, half of the salaried workers in Peru are currently employed in the informal sector, according to the Socio-Economic Database for Latin America and the Caribbean—a large decline from the early part of the century when three-fourths of total employment was informal.

### Underperformers

While growth in non-commodity exporters was similar to that in commodity exporters in previous decades, non-commodity exporters underperformed in the last decade. There are several reasons for the disparity.

First, capital accumulation has been higher among commodity exporters. This reflects, in part, high local and foreign direct investment in the primary sector (mainly agriculture and mining), associated with the commodity price boom. But it also reflects the easy global financing conditions. With the exception of Mexico, non-commodity exporters could not fully benefit from these favorable foreign factors because of their limited links to international financial markets.

Second, and more important, the worse performance reflects lagging TFP in Mexico, Central America, and the Caribbean. In fact, with the exception of Costa Rica—a country with relatively strong institutions and one of the first in the region to introduce economic reforms—TFP performance in these economies has been disappointing over the past 30 years. The large informal sector, the large number of small firms, and barriers to competition—for example, in the telecommunications sector—are often cited as reasons for Mexico's weak TFP performance (Busso, Fazio, and Levy, 2012). In most Central American countries and in the Caribbean, the absence of well-developed domestic financial markets and barriers to competition in the agriculture and electricity sectors also are at play (Swiston and Barrot, 2011).

To understand productivity growth differentials, one has to look beyond productivity in the manufacturing sector, which tends to be the focus of most studies in the literature. In fact, what differentiates labor productivity in South America from that in the rest of Latin America in the last decade is the performance of the services sector (Sosa and Tsounta, forthcoming). In the past, declining labor productivity in services dragged down all of Latin America. But in the past decade, service sector productivity has been on the rise in South America, growing three times faster than in the rest of the region. Important factors behind the better performance in South America are the decline in informality—most notably in services, which partly reflects the ease of finding jobs in the formal sector during the boom—and improvements in policies and institutions.

### The challenge of sustaining growth

Our analysis suggests, however, that the more recent slowdown in the growth performance of commodity exporters could be more than a blip: sustaining high growth rates in these countries will be difficult. Estimates of potential growth rates for 2013–17 are generally lower than those for recent years (see Chart 4). While these economies grew, on average, at 4½ percent a year during 2003–12, Sosa, Tsounta, and Kim (2013) estimate that the average potential GDP growth rate in 2013–17 will be closer to 3¾ percent. The growth outlook appears to be particularly disappointing for the region's largest economy, Brazil, where GDP growth is expected to hover around 3 percent over the next few years. That projected slowdown reinforces rising concerns about a regional economic deceleration—especially because of potential spillovers to smaller neighboring economies (Adler and Sosa, 2012).

Several factors are at work in the anticipated slowdown. First, growth of physical capital is expected to moderate, as the low global interest rates that facilitated large capital flows to the region start to rise and commodity prices stabilize. In addition, the contribution of labor will likely be

limited in the coming years by such natural constraints as an aging population. Record-low unemployment rates, typically well below the rates considered sustainable over the long run (known as the natural rate), also make it unlikely that employment will grow strongly in the future.

In other words, as the impact of favorable external conditions on growth dissipates and some supply constraints kick in, the strong growth South American commodity exporters experienced over the past 10 years is unlikely to be sustained unless TFP performance improves significantly. Indeed, despite its recent improvement, when compared with emerging Asia, TFP performance remains weak in these economies. In fact, most of the superior growth in emerging Asia is explained by the TFP differential.

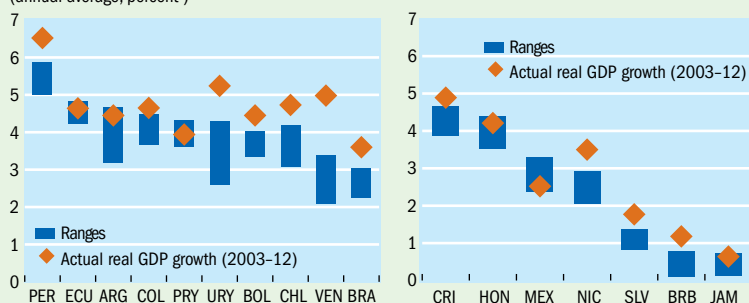
Among non-commodity exporters, the disappointing growth performance appears to be in line with their production capacity. For these

Chart 4

#### Future shock

Estimates of potential growth rates for 2013–17 are generally below those of recent years.

(annual average, percent)



Sources: Penn World Table 7.1; IMF World Economic Outlook, 2013; United Nations Population Projections database; and authors' calculations.

Note: Commodity exporters—ARG=Argentina, BOL=Bolivia, BRA=Brazil, CHL=Chile, COL=Colombia, ECU=Ecuador, PRY=Paraguay, PER=Peru, URY=Uruguay, and VEN=Venezuela. Non-commodity exporters—CRI=Costa Rica, SLV=El Salvador, HND=Honduras, JAM=Jamaica, MEX=Mexico, and NIC=Nicaragua.

countries, potential GDP growth is estimated at an annual average of about 2¼ percent for 2013–17.

Significant efforts will be needed to unlock this region's growth potential, especially policies that foster investment and productivity growth. The good news for the non-commodity exporters is that they are unlikely to be badly hurt by the fading effects of external liquidity and strong com-

## Mobilizing higher domestic savings could, for instance, help increase investment in infrastructure.

modity prices, given their limited financial integration (with the notable exception of Mexico) and the fact that they are mostly net importers of primary goods. It is also good news that these economies are, for now at least, less constrained by population aging and have a lot of room to improve productivity levels, including by shifting resources to the more productive formal sector. However, the lukewarm growth outlook projected in the United States and the euro area—economies to which non-commodity exporters are strongly linked—will continue to affect their growth potential.

### TFP to the rescue?

The Latin American and Caribbean countries could improve their growth potential by increasing domestic savings—and, in turn, investment levels, which remain low by international standards. Domestic saving rates in Latin America are less than 20 percent of GDP, compared with more than 40 percent in emerging Asia. Mobilizing higher domestic savings could, for instance, help increase investment in infrastructure—such as roads, ports, and airports. Inadequate infrastructure has constrained growth in the region. Improvements in infrastructure will not only help increase the contribution of capital to growth but will also enhance TFP. Improvements in the quality of the workforce (so-called human capital) can also increase potential growth in the region. In fact, there is ample room for improvement in the quality of education, as the region generally underperforms on standardized international tests.

But improving TFP performance will be pivotal to sustaining growth in the region. Although improvements in infrastructure and human capital would help increase productivity, by themselves they would be insufficient. Despite the recent improvements in South American commodity exporters, raising TFP has proved a challenge. Higher productivity growth is crucial, however, for the whole region and would also increase incentives to invest further in human and physical capital.

Achieving faster productivity growth entails more than fostering innovation and technological development. Low productivity has many causes. It is often the unintended result of market distortions (such as labor market rigidities that impede hiring or tax regimes that induce poor decisions) and bad policies (for example, inadequate regulation and supervision of the financial sector or unsustainable fiscal policies). These distortions weaken incentives for innova-

tion, discourage competition, and prevent efficient allocation of resources from the less productive to the more efficient firms. Thus, designing a policy agenda to unleash productivity is a difficult task and entails country-specific measures.

The authorities should consider such policies as

- strengthening the business climate, for example, by simplifying the tax system;
- improving the enforcement of contracts and access to credit information;
- strengthening entry and exit regulation to facilitate the reallocation of resources to new and high-productivity sectors; and
- improving infrastructure.

In Central America and the Caribbean, efforts are also needed to tackle high debt levels and weak competitiveness, which are other factors behind the lukewarm growth performance there.

The road ahead will be bumpy for the economies of Latin America and the Caribbean. As the stimulus from an extraordinary external environment dissipates and some supply bottlenecks (associated with natural constraints on labor) kick in, the growth momentum in the region is unlikely to be sustainable unless TFP performance improves significantly. Thus, fostering productivity remains a key priority for the whole region: for commodity exporters to prevent a return to growth lower than they achieved in the past decade and for non-commodity exporters to overcome their historically low growth potential. These difficulties may actually open up opportunities for better policies and structural reforms that could lead to refreshingly new periods of higher economic growth and better living standards. ■

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## What Is the Output Gap?

**Economists look for the difference between what an economy is producing and what it can produce**

*Sarwat Jahan and Ahmed Saber Mahmud*

**D**URING economic downturns an economy's output of goods and services declines. When times are good, by contrast, that output—usually measured as GDP—increases (see “Back to Basics: What Is Gross Domestic Product?” *F&D*, December 2008).

One thing that concerns economists and policymakers about these ups and downs (commonly called the business cycle) is how close current output is to an economy's long-term potential output. That is, they are interested not only in whether GDP is going up or down, but also in whether it is above or below its potential.

The output gap is an economic measure of the difference between the actual output of an economy and its potential output. Potential output is the maximum amount of goods and services an economy can turn out when it is most efficient—that is, at full capacity. Often, potential output is referred to as the *production capacity* of the economy.

Just as GDP can rise or fall, the output gap can go in two directions: positive and negative. Neither is ideal. A *positive output gap* occurs when actual output is more than full-capacity output. This happens when demand is very high and, to meet that demand, factories and workers operate far above their most efficient capacity. A *negative output gap* occurs when actual output is less than what an economy could produce at full capacity. A negative gap means that there is spare capacity, or slack, in the economy due to weak demand.

An output gap suggests that an economy is running at an inefficient rate—either overworking or underworking its resources.

### Inflation and unemployment

Policymakers often use potential output to gauge inflation and typically define it as the level of output consistent with no pressure for prices to rise or fall. In this context, the output gap is a summary indicator of the relative demand and supply components of economic activity. As such, the output gap measures the degree of inflation pressure in the economy and is an important link between the real side of the economy—which produces goods and services—and inflation. All else equal, if the output gap is positive over time, so that actual output is greater than potential output, prices will

begin to rise in response to demand pressure in key markets. Similarly, if actual output falls below potential output over time, prices will begin to fall to reflect weak demand.

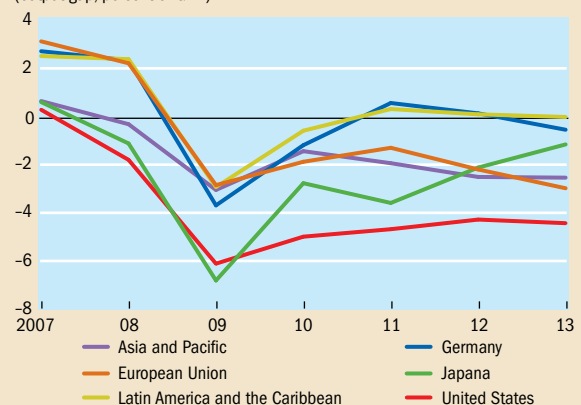
The *unemployment gap* is a concept closely related to the output gap. Both are central to the conduct of monetary and fiscal policies. The nonaccelerating inflation rate of unemployment (NAIRU) is the unemployment rate consistent with a constant rate of inflation (see “Back to Basics: What Constitutes Unemployment?” in the September 2010 issue of *F&D*). Deviations of the unemployment rate from the NAIRU are associated with deviations of output from its potential level. Theoretically, if policymakers get the actual unemployment rate to equal the NAIRU, the economy will produce at its maximum level of output without straining resources—in other words, there will be no output gap and no inflation pressure.

The output gap can play a central role in policymaking. For many central banks, including the U.S. Federal Reserve, maintaining full employment is a policy goal. Full employment corresponds to an output gap of zero. Nearly all central

### Wasted potential

The severe recession caused most economies to go from a positive output gap, exceeding long run potential, to a negative output gap in which GDP was below potential.

(output gap, percent of GDP)



Source: IMF, World Economic Outlook, 2013.



banks seek to keep inflation under control, and the output gap is a key determinant of inflation pressure.

Because the output gap gauges when the economy may be overheating or underperforming, it has immediate implications for *monetary policy* (see “Back to Basics: What Is Monetary Policy?” *F&D*, September 2009).

Typically during a recession, actual economic output drops below its potential, which creates a negative output gap. That below-potential performance may spur a central bank to adopt a monetary policy designed to stimulate economic growth—by lowering interest rates, for example, to boost demand and prevent inflation from falling below the central bank’s inflation rate target.

In a boom, output rises above its potential level, resulting in a positive gap. In this case, the economy is often described as “overheating,” which generates upward pressure on inflation and may prompt the central bank to “cool” the economy by raising interest rates.

Governments can also use *fiscal policy* to close the output gap (see “Back to Basics: What Is Fiscal Policy?” *F&D*, June 2009). For example, fiscal policy that is expansionary—that raises aggregate demand by increasing government spending or lowering taxes—can be used to close a negative output gap. By contrast, when there is a positive output gap, contractionary or “tight” fiscal policy is adopted to reduce demand and combat inflation through lower spending and/or higher taxes.

Some policymakers have recently suggested that, in an increasingly integrated world economy, the global output gap can affect domestic inflation. In other words, all else equal, a booming world economy may increase the potential for inflation pressure within a country. For example, stronger global demand for computers raises the price U.S. producers can charge their foreign customers. But because all computer producers are facing a stronger global market, U.S. producers can charge more for their output at home as well. This is known as the “global output gap hypothesis” and calls for central bankers to pay close attention to developments in the growth potential of the rest of the world, not just domestic labor and capital capacity.

But there is so far no conclusive evidence to support the notion that a global output gap influences domestic prices. Still, the global output gap may become increasingly important if the world’s economies continue to integrate.

### Hard to measure

Measuring the output gap is no easy task. Unlike actual output, the level of potential output and, hence, the output gap cannot be observed directly. Potential output and the output gap can only be estimated.

Various methodologies are used to estimate potential output, but they all assume that output can be divided into a trend and a cyclical component. The trend is interpreted as a measure of the economy’s potential output and the cycle as a measure of the output gap. The trick to estimating potential output, therefore, is to estimate trends—that is, to remove the cyclical changes.

A common method of measuring potential output is the application of statistical techniques that differentiate between the short-term ups and downs and the long-term trend. The Hodrick-Prescott filter is one popular technique for separating the short from the long term. Other methods estimate the *production function*, a mathematical equation that calculates output based on an economy’s inputs, such as labor and capital. Trends are estimated by removing the cyclical changes in the inputs.

## In a boom, output rises above its potential level, resulting in a positive gap.

Any estimate of potential output will have its shortcomings. Estimates are based on one or more statistical relationships and therefore contain an element of randomness. Moreover, estimating the trend in a series of data is especially difficult near the end of a sample. That means, of course, that the estimate is the most uncertain for the period of greatest interest: the recent past.

To circumvent these issues, some economists use surveys of producers to infer the extent of excess demand or supply in the economy. But surveys are also imperfect because firms may interpret questions differently, and there is no guarantee that responses will be indicative of demand pressure. Moreover, most surveys have a limited response base.

Regardless of the method used, estimating the output gap is subject to considerable uncertainty because the underlying relationships in the economy—that is, its structure—often change. For example, when the economy is emerging from a deep recession there may be much less spare capacity than anticipated because of such developments as

- unemployed workers who leave the labor market and become economically inactive;
- firms that close, leaving depressed areas and regions; and
- banks that lose money in a recession and become very strict with their lending.

### Minding the gap

Because of the difficulties of estimating potential output and the output gap, policymakers need several other economic indicators to get an accurate reading of overall capacity pressure in the economy. Among those indicators are employment, capacity utilization, labor shortages, average hours worked and average hourly earnings, money and credit growth, and inflation relative to expectations.

These alternative measures of capacity can help policymakers enhance their measurement of the output gap. Even though it is difficult to estimate, the output gap has guided and will continue to guide policymakers. ■

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# Closer to HOME

*Hideaki Hirata, M. Ayhan Kose, and Christopher Otrok*

**Despite all the talk of globalization, business cycles seem to be becoming more regional**

**T**HE inexorable forces of globalization and regionalization have reshaped the world economic landscape over the past quarter century. While international trade flows have been growing at a much faster rate than global output, trade flows within regions of countries have been playing an even more prominent role in world trade. Economic linkages within regions have also become much stronger with the proliferation of regional trade agreements. Moreover, while the volume of global financial flows has reached unprecedented levels since the mid-1980s, overshadowing the increase in global trade over the same period, financial flows within regions have also been on the rise for the past 15 years, especially in Europe and Asia.

These developments appear to have affected the evolution of global and regional business cycles in unexpected ways. For example, despite the presence of strong global trade and financial linkages, there has been significant variation in growth performance across different regions since the 2008–09 financial crisis (Kose and Prasad, 2010). Some regions—such as Asia, Latin America, the Middle East and North Africa, and sub-Saharan Africa—exhibited surprising resilience during the worst of the financial crisis and rapidly returned to growth, whereas others—mainly North America and Europe—experienced deep and prolonged contractions that were followed by sluggish recoveries or double-dip recessions.

This behavior has raised the question of whether regional factors have become more important in driving business cycles in an

era of globalization. On the one hand, globalization of trade and finance is expected to translate into stronger linkages across national business cycles and eventually lead to a situation in which business cycles move together simultaneously across the world. On the other hand, if the effects of regional linkages are stronger than those of global linkages and regionwide shocks—that is, unexpected events affecting an entire region—influence activity more than global ones, then one would expect business cycles to be increasingly regional.

Economic theory is unable to provide definitive guidance concerning the impact of increased international trade and financial linkages on the degree of synchronization of global and regional cycles. As a result, we turn to a novel empirical approach that has the potential to provide a comprehensive perspective on the importance of global and regional business cycles (Hirata, Kose, and Otrok, forthcoming).

Specifically, we employed a newly developed methodology to study the roles played by global and regional factors in driving national business cycles. We end up with the surprising conclusion that regional, rather than global, factors play an increasingly prominent role in explaining national business cycles.

## **Studying regional cycles**

The methodology allowed us to consider fluctuations in three major macroeconomic variables for each country: output, consumption, and investment. It is critical to isolate business cycle fluctuations that are accounted for by regional factors (for example, common regional cyclical movements due to regional trade and financial linkages, regional shocks,

## Where they are

The study included 106 countries that were divided into 7 regions.

Region	Countries
North America (3)	Canada, Mexico, United States
Europe (19)	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom
Oceania (2)	Australia, New Zealand.
Latin America and the Caribbean (22)	Argentina, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, Venezuela
Asia (15)	Bangladesh, China, Korea, Hong Kong SAR, India, Indonesia, Japan, Malaysia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan Province of China, Thailand
Sub-Saharan Africa (37)	Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Chad, Comoros, Dem. Rep. of Congo, Rep. of Congo, Côte d'Ivoire, Equatorial Guinea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Niger, Nigeria, Rwanda, Senegal, Seychelles, South Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe
Middle East and North Africa (8)	Algeria, Egypt, Iran, Israel, Jordan, Morocco, Syria, Tunisia

Note: The number of countries in each region is in parentheses.

and regionwide policies) or by global factors (that are worldwide cyclical movements due to global linkages or worldwide shocks). Our methodology separates out the factors driving national business cycles into global, regional, and country-specific factors. The global factor represents fluctuations that are common to all countries and to all three variables in each country. The regional factor captures fluctuations that are common to a particular region of countries. The country-specific factor accounts for the fluctuations that are common across all three variables in a given country.

We used this methodology on a data set that contains 106 countries and covers the period 1960–2010. We divided our sample of countries into seven regions (see table): North America, Europe, Oceania, Asia, Latin America and the Caribbean, Middle East and North Africa, and sub-Saharan Africa. The groupings of countries by region are especially useful in identifying the regional factors, because countries that are geographically close to one another tend to have stronger economic linkages and, therefore, are likely to be affected by similar types of (region-specific) shocks. The relatively long time span of the data enabled us to consider distinct subperiods and to analyze the changes in business cycles that took place during the recent era of globalization (1985–2010) relative to the earlier period.

## Sources of business cycles

We first explored the relative importance of different factors for business cycle fluctuations over the period 1960–2010. Rather than showing the results separately for each country, we show the averages for each region or, when we looked at a specific variable, the average across all countries for that variable.

The common factors—the global factor and the respective region-specific factors—account for a significant share of business cycle fluctuations (see Chart 1). Together, on average, they account for about 25 percent of output fluctuations. The global factor, on average, accounts for 10 percent of output growth variation among all countries in the sample, while the regional factor, on average, plays a slightly more important role than the global factor. The global and regional factors also explain roughly 15 percent of the volatility in the growth rates of consumption and investment.

To examine how global and regional cycles have evolved, we divided our sample into two periods: 1960–84 and 1985–2010. There are roughly equal numbers of observations in each period, but there was a substantial increase in global trade and financial flows in the latter period. In addition, regional linkages became much stronger during the second period—as evidenced by the rapid increase in the number of regional trade agreements (from 5 in 1985 to more than 200 in 2010). The beginning of the second period also coincides with a structural decline in the volatility of business cycles in both advanced and developing economies (the so-called Great Moderation era) that lasted until the financial crisis of 2008–09.

The average contribution of the global factor to output fluctuations declined sizably in the second period—from 13 percent to 9 percent for the full sample of countries. The same pattern held for consumption fluctuations, while the importance of the global factor's role in explaining fluctuations in investment slightly increased (see Chart 2, top panel). These patterns also held up and were, in fact, stronger in most cases when we evaluated the contributions of different factors in explaining business cycles in different regions (see Chart 2, bottom panel). The global factor appeared to play a smaller role in explaining business cycles in the second period in five out of seven regions.

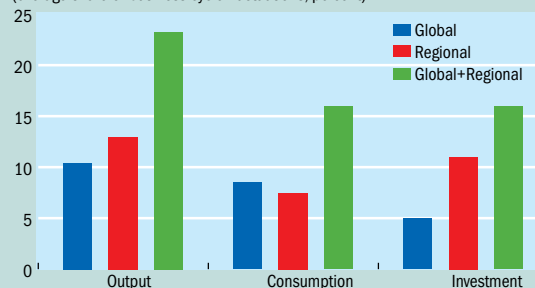
In contrast to the global factor, the regional factor, on average, played an increasingly important role in explaining busi-

Chart 1

### Sources of cycles

Regional and global factors account for a substantial portion of business cycles—including fluctuations in output, investment and consumption.

(average share of business cycle fluctuations, percent)



Source: Hirata, Kose, and Otrok (2013).

Note: The global factor is associated with common cyclical movements due to global linkages or worldwide shocks.

ness cycles over time (see Chart 3, top panel). For example, in the earlier period the regional factor accounted for about 11 percent of output fluctuations and rose to about 19 percent during the second period. This result was more pronounced in North America, Europe, Oceania, and Asia (see Chart 3, bottom panel). In particular, in the second period,

## The level at which business cycles occurred simultaneously has shifted from the global to the regional level.

the regional factor accounted for roughly one-third of output fluctuations in North America and Asia, 40 percent in Europe, and 20 percent in Oceania. The regional factor also played a more important role in the second period for the sub-Saharan Africa and Middle East and North Africa regions, but the increase in the fluctuation attributed to the regional factor is much smaller.

Have the global and regional factors together become more important? A useful measure of the extent of business cycle synchronization around the world is the combined contributions of the global and region-specific factors to business cycles. The overall importance of these two common factors in explaining output variation increased only slightly. However, even this small change was the consequence of a substantial increase in the relative importance of the regional factor. These findings imply that the level at which business cycles occurred simultaneously has shifted from the global to the regional level.

We conducted a wide range of experiments to check the sensitivity of our results. First, we arrived at very similar conclusions with respect to business cycles in consumption and investment. Second, we analyzed the sensitivity of our results to make sure that they were not driven by episodes of crises (such as the 1997 Asian financial crisis or the 2008–09 global financial crisis) that could temporarily amplify the roles played by different types of factors. We also experimented with alternative break points for the two periods of the sample. In addition, we checked individual country results to ensure that the averages we presented also reflected the sources of business cycle variation at the country level.

### The evolution of cycles

To explain the results, we looked at the changes in the roles played by both global and regional factors.

First, there has been, on average, a decline in the importance of the global factor. This change supports the interpretation that the strong business cycle synchronization observed during the 1970s and early 1980s reflected large common disturbances—the two oil price shocks—and the effects of correlated disturbances in the major advanced economies, notably the disinflationary monetary policy stance of the early 1980s.

Although the latest financial crisis was also a massive global shock, its full impact on the contribution of the global factor has probably yet to be fully realized—we have only three years of observations associated with the crisis. However, when we extended our sample to 2015 using forecast values of the three macroeconomic variables, we ended up with similar conclusions that supported our key findings. We also checked the sensitivity of our findings by considering a sample that ended in 2007. Those results were also in line with our key findings.

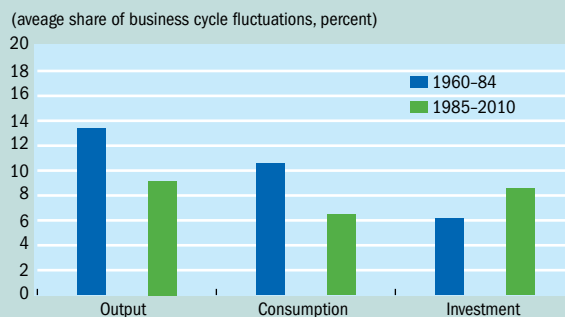
Second, there has been, on average, an increase in the importance of regional factors in explaining business cycles in the latter period. This is an intuitively appealing finding because regional linkages have become much more significant in areas in which intraregional trade and financial flows have increased substantially since the mid-1980s: North America, Europe, Oceania, and Asia.

These regions took substantial steps to strengthen intraregional economic linkages during the second period. For example, intraregional trade and financial linkages grew significantly over the past quarter century in North America, where the process of economic integration started in the mid-1980s and culminated with the ratification of the North American Free Trade Agreement (NAFTA) in 1994. During the past decade, intraregional trade flows accounted, on average, for nearly 55 percent

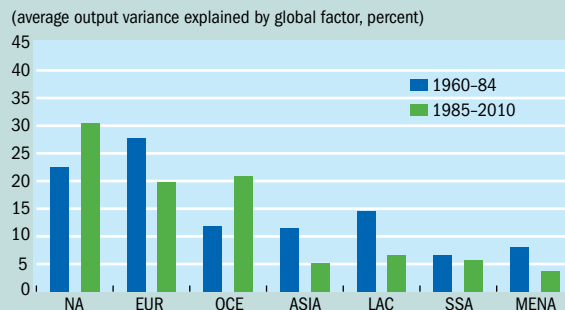
Chart 2

### Global factors retreat

Global factors have become less important in explaining business cycles overall . . .



. . . and in five of the seven regions we have identified.



Source: Hirata, Kose, and Otrok (2013).

Note: NA = North America, EUR = Europe, OCE = Oceania, LAC = Latin America and the Caribbean, SSA = Sub-Saharan Africa, MENA = Middle East and North Africa. See accompanying table for more details.

of total trade, while intraregional financial assets were about 20 percent of total assets in the North American region.

One of the greatest regional integration projects of history, of course, took place in Europe, with the eventual establishment of the European Union and the creation of the euro area. Intraregional trade flows constituted roughly 75 percent of total trade in Europe during the past decade. Intraregional asset holdings rose from 55 percent to roughly 75 percent of total assets over the same period.

Regional integration in Asia has been driven largely by the Association of South East Asian Nations but has also been complemented by a number of bilateral regional arrangements. The region has seen a rapid increase in intraregional trade and financial flows, especially over the past decade. For instance, the share of intraregional trade flows has been about 55 percent over the past decade.

The nature of trade has also changed in these four regions. One of the major driving forces of the rapid growth in regional trade flows has been the acceleration of trade within industries, which often makes business cycles more synchronized. During the second period, countries in these regions also increased the pace of diversification of their industrial and trade bases. This facilitated an

increase in the degree of sectoral similarity across countries within regions, further contributing to the convergence of business cycles.

Regional business cycles can occur because of correlated shocks—such as those associated with the implementation of similar policies, or cross-border spillovers of shocks that originate in a large economy. It is easy to see how these types of shocks and spillovers have been influential in some of the regions that have experienced more pronounced regional cycles. For example, the implementation of similar policies has contributed greatly to the convergence of national cycles in Europe since 1985. Cross-border spillovers originating in the United States and China have probably been important in explaining regional cycles in North America and Asia, respectively.

### Regionalization rises

Our results indicate that regional business cycles have increasingly become more pronounced, especially in those regions where intraregional trade and financial linkages have registered rapid growth since the mid-1980s. Surprisingly, the importance of the global factor has declined over time.

These results present a different interpretation of the impact of globalization on the degree of synchronization of business cycles. Most commentators argue that the globalization of trade and finance has led to the globalization of business cycles. We find to the contrary that regional factors have become increasingly more important as the driving forces of business cycles during the recent era of globalization—leading to the emergence of regional business cycles.

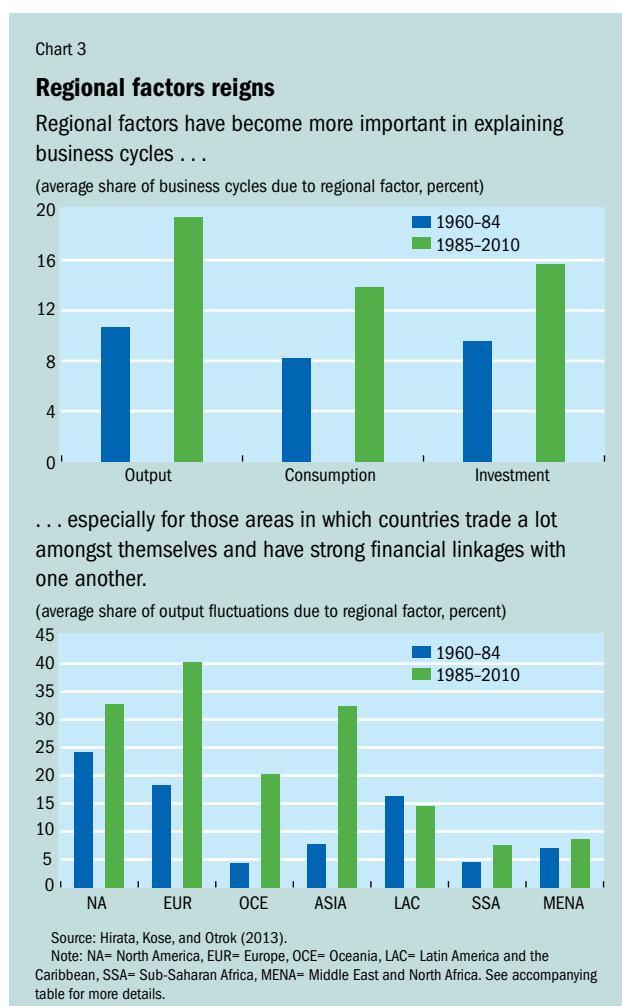
The number of regional arrangements with the objective of greater trade and financial integration is likely to increase in the coming years. These arrangements can generate economic benefits, but, as recent developments in Europe have clearly demonstrated, regionwide policies can also have serious consequences for growth and stability at the country level. These developments, along with the emergence of regional business cycles we documented here, call for a better understanding of the design and implications of regional policies. ■

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Schooners crossing the Seychelles.

# A BIG QUESTION on Small States

**Can they overcome their size-related vulnerabilities and grow faster and more consistently?**

*Sarwat Jahan and Ke Wang*

**F**OR every large country like China, India, and the United States, there is a small state like Suriname, Tuvalu, and Seychelles. And just as big states are a diverse lot, so are states with populations of less than 1.5 million.

Some are rich. Some are poor. In fact, small states span the spectrum of income levels (see table). There are high-income fuel-exporting countries, such as Bahrain. There are also countries in the low-income group, such as Djibouti.

Similarly, social indicators reflect a wide range of development. Some small states, such as Luxembourg, rank among the highest in the latest United Nations Human Development Index, while others, such as Bhutan, rank among the lowest (see Chart 1).

Most of the small states are islands or widely dispersed multi-island states; others are landlocked. Some are located far from major markets. The smallest of these, known as microstates, have populations below 200,000. About one-fifth of the IMF's member countries are small states.

Small they may be. But the middle-income and lower-income small states we analyze here face complex problems. The Pacific island of Tuvalu, for example, with a land area of 10 square miles, is roughly one-seventh the size of Washington, D.C. That makes it difficult to grow crops. Its neighbor, Kiribati, in contrast, has a population of 100,000 people spread over 3.5 million square kilometers of ocean—an area about the size of the Indian subcontinent. That makes for a country extraordinarily difficult to administer.

Most Pacific island countries consist of hundreds of small islands scattered over an area in the Pacific Ocean that occupies 15 percent of the globe's surface. This dispersion causes many problems, not the least of which is high trade costs. For example, the Pacific states of Samoa and Palau are about as far apart as the east coast of the United States and England.

## Small is everywhere

Small states, with various income levels, are located in many regions of the world.

	Upper-middle-income		Lower-middle- and lower-income	
<b>Small states</b>	The Bahamas	Maldives	Bhutan	Belize
	Barbados	Mauritius	Fiji	Guyana
	Suriname	Montenegro	Solomon Islands	Cape Verde
	Trinidad and Tobago		Timor-Leste	Comoros
		Vanuatu	Swaziland	
			Djibouti	
<b>Microstates</b>	Antigua & Barbuda	Palau	Kiribati	São Tomé and Príncipe
	Dominica	Tonga	Marshall Islands	
	Grenada	Tuvalu	Micronesia	
	St. Kitts and Nevis	Seychelles	Samoa	
	St. Lucia			
	St. Vincent and the Grenadines			

Legend: Africa (green), Asia and the Pacific (red), Europe (blue), Middle East and Central Asia (purple), Western Hemisphere (yellow)

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

Note: The list is limited to developing economies that are members of the IMF. Small states have populations less than 1.5 million, while microstates have fewer than 200,000 people. Upper-middle-income countries have per capita annual incomes of between \$4,086 and \$12,615; lower-middle-income countries of between \$1,036 and \$4,085; lower-income countries \$1,035 or less based on the World Bank Atlas method. The table does not include high-income and advanced-economy small states, which include Bahrain, Brunei Darussalam, Cyprus, Estonia, Equatorial Guinea, Iceland, Luxembourg, Malta, and San Marino.

## A common problem

Small states have one common problem: they face constraints because of their size.

For starters, because they have tiny populations, the states cannot spread the fixed costs of government or business over a large number of people—that is, they cannot achieve economies of scale in the same way that larger states can. The result of these diseconomies of scale, as economists call them, is high costs in both the public and private sectors.

Their small size also seems to be reflected in a number of macroeconomic characteristics:

- **Narrow production base:** Although their economies are not uniform—some are commodity exporters, others are service based (mainly tourism or financial services)—all of them face problems establishing a competitive economic base. And where they do compete, it is typically in one or two goods or services, leaving them vulnerable to ups and downs in a handful of industries. Tourism accounts for more than half the foreign earnings for many of the Caribbean islands. Similarly, many small states in the Pacific depend on one product for most of their export earnings. In the Solomon Islands, for example, about half of export earnings come from logging.

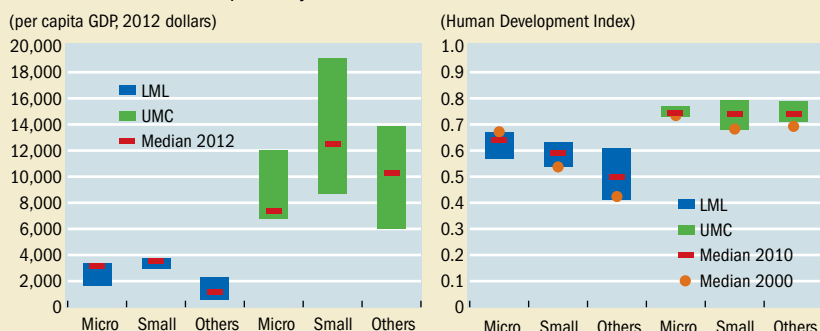
- **Big government:** Measured by the ratio of government expenditures to GDP, small states tend to have bigger governments than do larger states. This is partly a reflection of the diseconomies of scale that make the provision of public goods and services more costly than in larger states. In addition, a large share of expenditures is relatively inflexible—such as those directed to all-too-common natural disasters—or hard to reduce, such as the public wage bill. The high level of expenditure has often led to high levels of debt (see Chart 2).

- **Poorly developed financial sector:** About half of the small states have gained prominence as offshore financial centers. But financial institutions in offshore financial centers typically serve nonresidents. In general, the domestic financial sectors lack depth, are concentrated, and do not provide their citizens with adequate access to finance. The financial sectors are dominated by banks, whose high lending rates often hinder investment. Also, because the private sectors in small states are so tiny, commercial banks often end up financing the government—risking their soundness by becoming heavily exposed to one borrower. This has also complicated economic policy actions meant to lower the debt. In the highly indebted Caribbean countries, for example, commercial banks and nonbank financial institutions hold two-thirds of domestic public debt. In bigger countries, government debt is usually owned by a variety of individuals and by financial and nonfinancial institutions.

Chart 1

### At a par

Small states and microstates are at comparable levels of development with larger states with similar incomes—whether measured by per capita GDP or human development indicators, such as life expectancy and education.



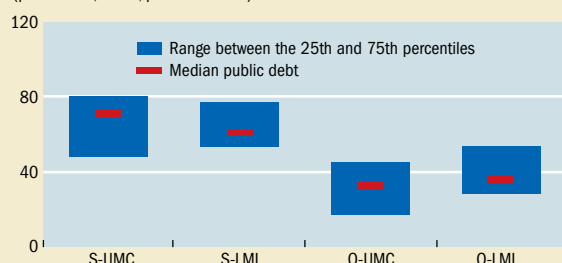
Sources: IMF World Economic Outlook database; World Bank, World Development Indicators database.  
 Note: Microstates have populations of less than 200,000 and small states less than 1.5 million. The "Others" category is for states with populations of more than 1.5 million. LML = lower-middle- and lower-income countries, which have per capita annual incomes of less than \$4,085. UMC = upper-middle-income countries, which have per capita annual incomes of between \$4,086 and \$12,615. In both panels, the bars show the range between the 25th and 75th percentiles for each grouping of states. In the Human Development Index the circle represents the median index in 2000, and the horizontal bar, 2010. The 2000 index contains data for 16 small states.

Chart 2

### Big borrowers

Compared with their larger peers, small states have higher levels of public debt.

(public debt, 2011, percent of GDP)



Sources: IMF World Economic Outlook database; World Bank, World Development Indicators database and Financial Development and Structure database; and IMF staff calculations.  
 Note: S-UMC = upper-middle-income small states; S-LML = lower-middle- and lower-income small states; O-UMC = larger upper-middle-income countries; O-LML = larger lower-middle- and lower-income states. Lower-middle- and lower-income states have per capita annual incomes of less than \$4,085. Upper-middle-income states have per capita annual incomes of between \$4,086 and \$12,615.

- **Fixed exchange rates:** Small states are more likely than larger ones to peg their exchange rates to another currency. Many of these small states are closely tied to a handful of larger economies that account for most of their export earnings. The peg eliminates exchange rate volatility, which helps smooth export earnings. At the same time, small states need to hold higher reserves than their larger brethren—not only to defend their currencies but also to insulate themselves from adverse outside events that can have a large negative effect on their well-being. Yet most have fewer reserves than considered optimal. The small states also have more limited ability to conduct monetary policy. Five of 13 small states in the Asia-Pacific region, for example, do not have a central bank.

- **Trade openness:** Small states are also more open to trade. Trade-to-GDP ratios are much larger in smaller economies than in larger ones with similar policies. Small states also seem to have somewhat lower trade barriers. A high degree of trade openness often leaves the small states vulnerable to shocks from terms of trade (the prices of exports compared with the prices of imports).

Small states face other common issues as well. Many are located in the open ocean, which makes them prone to natural disasters (such as earthquakes and hurricanes), and, because they are so small, typically the entire population and economy are affected by such disasters.

Natural disasters annually cost microstates in the Caribbean and the Pacific the equivalent of 3 to 5 percent of GDP. At the same time, many are islands that face particular challenges from climate change. Kiribati, for example, could be the first country to see its entire territory disappear under water as a result of global climate change that causes ice to melt at the polar caps, raising sea levels.

Moreover, the remoteness of many of these countries can be a problem because the paucity of arable land makes them dependent on imported foodstuffs, which can be very expensive.

### Volatility reigns

For the most part, small states have not shared in the improved economic growth of their larger peers since the late 1990s (see Chart 3). Large states have grown substantially faster in the 2000s than they did in the last two decades of the 20th century, outperforming smaller states. There are many reasons that explain why small states lag their larger peers—among them, a “brain drain,” as the best and brightest seek wider opportunities available in larger economies. The erosion of trade preferences in the exports of goods such as bananas and sugar also hold back small states.

But perhaps the most telling problem these states face is volatility. Small states have been plagued by highly erratic economic growth, which in the long run impedes growth, worsens income inequality, and increases poverty. During the 2000s, small states have had noticeably higher growth volatility than their larger counterparts—and lower growth rates. Their current accounts—mainly the difference between what the small states export and what they import—are considerably more volatile than those of larger states with similar income levels. This may reflect higher terms-of-trade volatil-

## Small states have not shared in the improved economic growth of their larger peers.

ity, which has a greater effect on small states because of their greater trade openness. In the fiscal sector, greater volatility is seen in both revenue and expenditures. Revenue volatility is typically linked to greater reliance on trade taxes, which wax and wane as trade rises and falls. Expenditure volatility is often associated with “lumpy” capital spending, spending responses to natural disasters, and a lack of discipline related to weak governing capacity.

### Making the best of it

Small states can, however, compensate for their size-related problems by taking steps to exploit their advantages and offset their disadvantages. In general, these states should pursue the following:

- **Sound economic policies:** The best cure for volatility is prevention—through strong policies. For example, revenue volatility can be lessened by reducing dependence on trade taxes. Small states have begun to look at other sources of revenue, and many have successfully adopted value-added taxes. Their introduction in the microstates of the Caribbean has reshaped the revenue structure and eased revenue collection. Expenditure volatility can sometimes be reduced through public sector reforms that seek to improve governance and make fundamental structural reforms in the economy. Volatility in the external sector can be reduced by diversifying exports and trading partners. Although a tiny state, Samoa has successfully diversified its export products and markets—after a taro leaf blight in the 1990s showed the importance of reducing dependence on one crop.

In addition to reducing volatility, small states must foster stability. Steps to increase financial services should be paired with careful supervision by the appropriate legal and supervisory authorities to ensure financial stability. Given their greater exposure to external shocks, small states should accumulate adequate reserves or budget extra spending for potential disasters as well as explore insurance coverage.

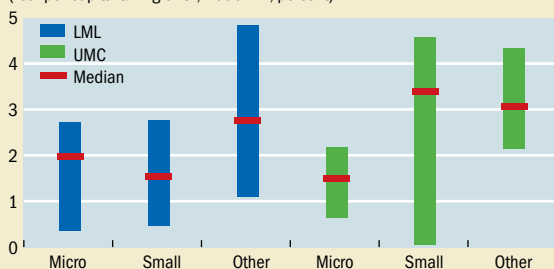
- **Regional integration and cooperation:** One way to offset the size disadvantage is to create bigger markets through regional integration. Such initiatives are most advanced in

Chart 3

### How they grow

Most microstates and small states lagged their larger peers in per capita GDP growth.

(real per capita GDP growth, 2000–11, percent)



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

Note: Microstates have populations of less than 200,000 and small states, less than 1.5 million. The “others” category is for states with populations of more than 1.5 million. LML = lower-middle- and lower-income countries, which have per capita annual incomes of less than \$4,085. UMC = upper-middle-income countries, which have per capita annual incomes of between \$4,086 and \$12,615. The vertical bars show the range of GDP growth between the 25th and 75th percentiles for each grouping of states.



the Caribbean. For example, the Eastern Caribbean Currency Union's Regional Government Securities Market aims to integrate existing national securities markets into a single regional market, helping to exploit economies of scale in financial markets. Similarly, the Eastern Caribbean Central Bank uses a reserve account of contingency funds to assist member countries facing economic difficulties, including those caused by natural disasters.

- **Involvement of the international community:** Small states can also involve international institutions and development partners in identifying common solutions to regional problems. The World Bank, for example, has helped to set up a multicountry risk pool and an insurance instrument for damages caused by natural disasters. Similarly, the World Trade Organization's Aid for Trade initiative has encouraged trade-related regional infrastructure. Internationally agreed debt-restructuring and -relief mechanisms, such as the Heavily Indebted Poor Countries Initiative and the Multilateral Debt Relief Initiative, have helped some small states reduce their debt burden. Financial assistance is often crucial for small states. To weather natural disasters and other external shocks, small states have used a number of IMF financing instruments—including the Rapid Credit Facility, a type of emergency assistance. Perhaps most important, international institutions can provide technical assistance and training tailored to the needs of individual states.

## Policies matter most

Size does create constraints, but effective policies can help small states overcome them. For example, Mauritius—a small, remote island state off the coast of eastern Africa—was deemed a strong candidate for failure by Nobel Prize-winning economist James Meade in the 1960s. It depended on one crop, sugar; was prone to terms-of-trade shocks; had high levels of unemployment; and lacked natural resources. But the country proved Meade wrong. It progressed to a well-diversified middle-income economy that earns revenues from tourism, finance, textiles, and advanced technology—as well as sugar. Whether measured by per capita income, human development indicators, or governance indicators, Mauritius is among the top African countries. The prudent policies Mauritius adopted fueled its transformation. For example, it attracted foreign direct investment to help spur its industries and built strong institutions to support growth.

Small states can, in fact, tackle their vulnerabilities. ■

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*This article draws from an IMF Board paper issued in 2013, "Macroeconomic Issues in Small States and Implications for Fund Engagement." The paper had two supplements: "Asia and Pacific Small States—Raising Potential Growth and Enhancing Resilience to Shocks" and "Caribbean Small States—Challenges of High Debt and Low Growth."*



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People in a money transfer center in Port-au-Prince, Haiti.

# Beyond the HOUSEHOLD

*Ralph Chami and Connel Fullenkamp*

**Remittances that migrants send home to their families also have a major impact on the overall economy**



**R**EMITTANCES—private income transfers from migrants to family members in their home country—are good news for the families that receive them. Often sent a few hundred dollars at a time, the remittances increase disposable income and are generally spent on consumption—of food, clothing, medicine, shelter, and electronic equipment. They have been growing for decades (see Chart 1). Remittances help lift huge numbers of people out of poverty by enabling them to consume more than they could otherwise (Abdih, Barajas, and others, 2012). They also tend to help the recipients maintain a higher level of consumption during economic adversity (Chami, Hakura, and Montiel, 2012). Recent studies report that these flows allow households to work less, take on risky projects they would avoid if they did not receive this additional source of income, or invest in the education and health care of the household. In other words, remittances are a boon for households.

But what is good for an individual household isn't necessarily good for an entire economy. Whether remittances are also good for the economies that receive them is an important question because remittances are one of the largest sources of financial flows to developing countries. In 2012, workers sent home

an estimated \$401 billion or more through official channels, and it is likely that billions more were transferred through unofficial ones. These flows are often large relative to the economies that receive them. In 2011, for example, remittances were at least 1 percent of GDP for 108 countries; and 5 percent of GDP or more for 44 countries. For 22 countries, remittances represented 10 percent or more of GDP (see Chart 2). Moreover, remittance flows are typically stable and, from the perspective of the recipient, countercyclical—helping offset a turn of bad luck.

It is not only important to examine whether remittances have a positive or a negative impact on the overall (or macro) economy. Because policymakers and international organizations have come to view these flows as a possible source of funding for economic development, it is also important to examine whether remittances do, indeed, facilitate economic development and, if so, how. For example, have some countries that receive a great deal of remittances been able to develop faster as a result? This article assesses the macroeconomic effects of these flows, highlighting issues in managing their effects and providing policy advice on how to harness their developmental potential. Finding answers is not straightforward,

because remittances affect an economy in many different ways. And, ultimately, their net effect depends on how they are used by the recipients.

### A source of government revenue

Besides households, there is one other economic actor that benefits from remittances and whose actions are important to the economy—the government. Recently, Abdih, Chami, and others (2012) showed that remittances spent on the consumption of both domestically produced goods and imports increase the tax base, which in turn increases revenues from sales taxes, value-added taxes, and import duties. In other words, remittances can provide much-needed fiscal space—which allowed some countries to increase spending, lower taxes, or both, to fight the effects of the recent global recession.

As we have suggested, the economic impact of remittances depends in part on how governments choose to use them. For example, Chami and others (2008) showed that governments can sustain higher levels of debt when the ratio of remittances to domestic income is high—which reduces country risk. Indeed, the IMF and the World Bank (2009) recently recognized the increased significance of remittances as a stable and countercyclical source of external financing in its assessment of how much debt low-income countries can safely handle. Remittances enable countries to borrow more, which permits them to use that extra borrowing power to fund investments that facilitate economic growth.

On the other hand, Abdih, Barajas, and others (2012) have found evidence that remittances hurt the quality of institutions in recipient countries, precisely because they increase the ability of governments to spend more or tax less. By expanding the tax base, remittances enable a government to appropriate more resources and distribute them to those

in power. At the same time, remittances mask the full cost of government actions. Remittances can give rise to a moral hazard problem because they allow government corruption to be less costly for the households that receive those flows. Recipients are less likely to feel the need to hold the authorities accountable, and, in turn, the authorities feel less compelled to justify their actions. This reduces the likelihood that the fiscal space created by remittances will be used for productive social investments. In other words, the interactions that determine the impact of remittances on the overall economy are complex, which is why it is difficult to make generalizations regarding their net effects.

### The business cycle

The complex effect of remittances on the economy is also apparent when the business cycle is taken into account. Because remittances increase household consumption, fluctuations in remittance flows can cause changes in output in the short term. But a shock that reduces economic output is also likely to induce workers abroad to send more remittances home, which then has the effect of reducing output volatility (Chami, Hakura, and Montiel, 2012).

However, the increase in remittances is also likely to weaken the incentive to work, which could lead to a more volatile business cycle.

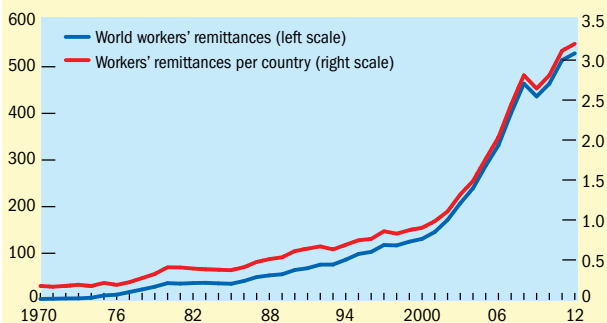
Recipient countries also are affected by economic conditions in the countries that are the sources of remittances. Barajas and others (2012) showed that remittance flows increase the simultaneous occurrence of business cycles in remittance-sending and remittance-receiving countries. This effect is likely to be especially pronounced during economic downturns in the sending countries, which tend to be wealthier than the recipient countries.

Chart 1

#### Funds from abroad

Remittances have grown over the four past decades, increasing sharply from 2002 to 2008.

(billions of dollars)



Source: World Bank, 2013.

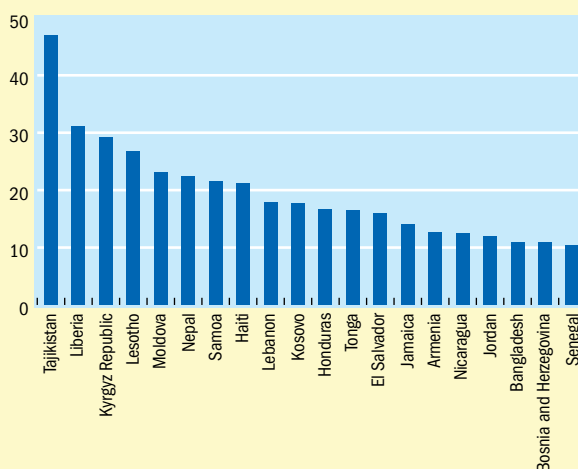
Note: World workers' remittances adds up workers' remittances across all countries for which data are available for the year specified. Per country figures divide this amount by the number of countries reporting data in that year. Most of the growth in remittances in this period was due to increased migration, but some is due to an increase in easier-to-measure transmission of remittances through formal channels such as banks.

Chart 2

#### Remittance dependent

For a number of countries, remittances account for 15 percent or more of GDP.

(remittances, percent of GDP)



Source: World Bank, 2013.

So, again, the evidence is mixed. Remittances do stimulate consumption, which for some economies will help reduce the size of the swing between recession and growth by putting a floor under total demand. But for other economies, remittances may increase the severity of business cycles, by inducing workers to stay home when the economy turns down, as well as by linking the business cycles of some developing economies more strongly to the business cycles of remittance-sending countries.

## Remittances and growth

Over the past decade, the most studied aspect of remittances has been their impact on economic growth, partly because of the policy importance of this issue and partly because of the many and complex ways remittances might affect economic growth. A useful way to organize the large and diverse body of findings on this question is to use a growth-accounting approach in which the effect of remittances on capital accumulation, labor force growth, and total factor productivity (TFP) growth is studied. TFP is essentially growth that is not accounted for by increases in traditional inputs such as labor and capital and encompasses such things as technology and finance.

**Capital accumulation:** Worker remittances can affect the rate of capital accumulation in recipient economies in various ways. First, they can directly finance investment. Remittance inflows can also facilitate the financing of investments by improving the creditworthiness of households, effectively augmenting their capacity to borrow. Remittances may also reduce the risk premium that lenders demand, because they reduce output volatility.

But if remittances are perceived to be permanent income, households may spend them rather than save them—significantly reducing the amount of flows directed to investment. And, in fact, the amount of remittances devoted to investment tends to be low. For example, remittance flows into the Middle East and North Africa region fuel the consumption of domestic and foreign goods, with very little going to investment. In addition, many households save part of the remittances by purchasing assets such as real estate, which generally doesn't increase the capital stock.

Remittances could stimulate increases in so-called human capital by enabling younger members of a household to continue schooling rather than having to work to contribute to household income. For example, evidence from the Philippines and from Mexico suggests that receiving remittances leads to increased school attendance. However, that extra education would likely have little effect on domestic economic growth if it simply makes it possible for the recipients to emigrate.

**Labor force growth:** Remittances may also influence growth by affecting the rate of growth of labor inputs. One channel through which remittances could affect labor inputs is in labor force participation—the percentage of the population that is working or seeking work. But as has been noted, those effects can be negative. Remittances enable recipients to work less and maintain the same living standard, regardless of how the distant sender intended them to be used (say, to increase household consumption or investment). Anecdotal evidence of this negative labor effort effect is abundant, and

academic studies have detected such an effect as well. Thus, remittances appear to serve as a drag on labor supply.

**Total factor productivity:** Researchers have identified two main ways through which remittances may affect the growth of TFP. First, remittances may enhance the efficiency of investment by improving domestic financial intermediation (channeling funds from savers to borrowers). That is, they may affect the ability of the recipient economy's formal financial system to allocate capital. For example, remittances may help GDP growth when the financial markets are relatively underdeveloped because remittances loosen the credit constraints imposed on households by a small financial sector. In addition, regardless of the state of the financial sector's development, remittances are likely to increase the amount of funds flowing through the banking system. This, in turn, may lead to enhanced financial development and thus to higher economic growth through increased economies of scale in financial intermediation.

## The business cycle

A second way remittances may affect TFP growth is *through the exchange rate*. Barajas and others (2011) have shown how remittances can lead to real exchange rate appreciation, which in turn can make exports from remittance-receiving countries less competitive. The industries or companies that produce the exports may be transferring know-how to the rest of the economy or providing opportunities for other local companies to climb up the value chain. This is often the case, for example, with manufacturing. Therefore, if these companies become less competitive owing to exchange rate changes (which are themselves caused by remittances), then these firms must scale back or close, and their beneficial impact on productivity is reduced.

There have been many attempts to estimate the impact of remittances on growth. The earliest such study—by Chami, Fullenkamp, and Jahjah (2005)—found that whereas domestic investment and private capital flows were positively related to growth, the ratio of workers' remittances to GDP either was not statistically significant or was negatively related to growth. Since then, many studies have been performed, and their main findings vary widely. Some find remittances help growth and others find they hurt growth—and some find no discernible effects. When a positive effect of remittances on growth is found, it tends to be conditional, suggesting that other factors must be present for remittances to enhance economic growth. For example, some studies have found that remittances tend to boost economic growth only when social institutions are better developed.

Perhaps most disappointing is the lack of a remittances-growth success story: a country in which remittances-led growth contributed significantly to its development. Given that in some countries remittances exceeded 10 percent of GDP for long periods of time, one would have hoped to find at least one example of remittances serving as a catalyst for significant economic development. It is worth noting, however, that researchers have also failed to find clear and consistent evidence that other financial flows, such as capital flows and official aid, enhance economic growth and development.

## Whither remittances?

The mixed evidence regarding the macroeconomic impact of remittances reflects a number of underlying truths about their role in an economy. First, they are unequivocally good for recipient households because they alleviate poverty and provide insurance against economic adversity. Second, there are many different paths through which remittances affect an economy. Third, none of these paths is necessarily active

## Remittances tend to boost economic growth only when social institutions are better developed

at any given time—that is, many economic and social conditions determine whether any given path is active or significant. And, finally, many of these paths have opposing or conflicting economic effects.

These realities shape the challenge faced by policymakers who wish to maximize the development potential of remittances. To make the most of remittances, governments will have to strengthen or facilitate the channels through which remittances benefit the overall economy while limiting or weakening others. This task is challenging not only because economists still do not fully understand all the ways that remittances affect the economy, but also because this task may put policymakers in conflict with households, which are used to utilizing remittances in particular ways. Nonetheless, there are several promising approaches for policy.

Each country wishing to make better use of remittances must study how the recipients actually use them. This is essential to ensuring that policymakers understand the specific obstacles that prevent remittances from being used to facilitate development, and the kinds of development-friendly activities (such as education, business formation, or investment) remittance recipients would be most likely to engage in. Obstacles to using remittances for development and opportunities for such use are likely to vary with the particular economic, social, and legal environment of each country.

Policymakers must take advantage of the fiscal space created by remittance flows by investing more in social institutions and public infrastructure. For example, the increased tax revenues that remittances generate can finance initiatives to increase the professionalism of civil servants and improve the enforcement of rules and regulations. Likewise, the government can take advantage of its increased borrowing capacity to finance improvements in infrastructure. One potential use would be to upgrade a country's financial system at all levels, including improvements in the payment system, availability of banking services, and financial literacy.

Policymakers must design programs that are responsive to the needs of individual households and that give recipients the proper incentives to use remittances productively. Promoting the acceptance of remittance income as collateral for private loans used to finance productive investments is one way to direct remittance income into growth-enhancing

investments. In addition, governments could subsidize education or business loans for which remittances are pledged as collateral. Policymakers will have to work closely with remittance recipients—and senders—to make these efforts work.

Increasing globalization and demographic changes, such as the aging of developed-economy workforces, mean that remittances are likely to increase in size and importance in the future. It is clear that remittances improve the welfare of households that receive them and, as such, should be encouraged. But, to be more helpful to recipient economies, governments must design policies that promote remittances and increase their benefits while limiting or offsetting any counterproductive side effects. Getting the most value possible out of remittances will require significant, thoughtful effort from national governments and the assistance of international organizations. For example, a review of governance and institutional quality is routinely undertaken as a part of the IMF's annual consultations. The incentive effects of remittance flows suggest that such reviews are of particular importance in remittance-receiving economies. Efforts like these enable countries to tailor their development strategies to the role that remittances actually play, which in turn increases the chance that they can be utilized to enhance development and growth. ■

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# STRENGTH in Lending

**Strong balance sheets help banks sustain credit to the economy during crises**

*Tümer Kapan and Camelia Minoiu*

**P**ERHAPS the most enduring legacy of the recent global financial crisis is a wave of financial regulation efforts that repeal old rules and implement new ones.

Many of the newly proposed rules, often still in the proposal stage, are rooted in a widespread concern that before the crisis, banks in developed economies appeared healthy when assessed on the basis of the indicators that were then part of the regulatory framework. For example, most banks had more than enough capital—which serves as the buffer that absorbs a financial institution's losses to prevent it from failing—to meet the old regulatory standard. This gave the impression that the banking system would be able to withstand an unfavorable turn in the economic environment, which events proved to be false.

The financial crisis forced many banks with seemingly strong balance sheets into bankruptcy, takeovers, or government bailouts. As uncertainty rose and consumers reduced their demand for goods and services, the banking system curtailed the amount of credit it would grant. Because businesses require credit to operate and grow, their inability to borrow exacerbated the economic downturn that was caused by the global financial crisis.

If standard monitors of bank health, such as regulatory capital, did not sound alarm bells before the crisis, does that

mean that policymakers, supervisors, and economists were monitoring the wrong indicators? If so, what should they have been looking at? What should be the new regulatory definitions for a strong bank balance sheet? To shed light on these questions, we looked at some of the new regulatory proposals, many of which are embodied in the so-called Basel III regulatory framework that was proposed in 2010 by an international committee of banking supervisors (BCBS, 2010). We then linked several measures of bank health to banks' lending behavior during the recent financial crisis.

## **A new stance**

The Basel III framework takes a new stance on how to diagnose bank health. It revises the old definitions of bank capital and proposes new soundness indicators, especially those that reflect a bank's liquidity position—that is, a bank's ability to come up with cash quickly. The regulators' hope is that next time a negative shock affects the financial system, banks will be much more resilient. That means that their intermediation function—to transform depositors' savings into credit to businesses and other borrowers—would be less impaired. The result would be economic downturns that are shorter and less painful.

There is heated debate in academic and policy circles over whether the steps proposed in Basel III are the right ones

(for example, see Hanson, Kashyap, and Stein, 2011; and Blundell-Wignall and Atkinson, 2010). Ideally, economists and regulators would like to know whether banks would have better withstood the recent crisis if the new Basel III regulations had been in place. Unfortunately, a confident answer to this question is elusive because it involves assessing something that did not happen—what economists call a counterfactual.

A more modest question that we can ask, though, and one to which we *can* provide an answer is whether assessing pre-crisis bank health through the lens of the new Basel III regulations can help distinguish between banks that were better able to maintain credit to the economy and those that were not. We recently explored the link between bank health measures prevalent *before* the crisis and the supply of bank credit *during* the crisis (Kapan and Minoiu, 2013).

The Basel III framework tackles many facets of a bank's operations, but to assess a bank's strength we focus on the new regulatory standards for capital and liquidity, reviewing several measures of bank health that are under scrutiny by regulators and that capture the degree of a bank's vulnerability (or resilience) to the 2007–08 financial market turmoil. Our goal is to link these measures empirically to the supply of bank loans during the recent crisis.

We examine two aspects of liquidity—the stability of a bank's funding sources and the market liquidity of the assets it holds. It is widely acknowledged that traditional deposits are a more stable funding source than are funds obtained through borrowing in the market. Such wholesale funds, as they are called, can evaporate quickly when markets come under stress and lenders either stop making new loans or refuse to renew old ones (Ivashina and Scharfstein, 2010). Wholesale funds were not regulated under Basel II.

This suggests that one measure of a bank's vulnerability to financial market shocks is the amount of its nondeposit liabilities (expressed as a share of total liabilities)—a rough measure of the bank's dependence on market-based funding. Prior to the global financial crisis, banks became increasingly dependent on wholesale funding (see Chart 1, top panel) and, hence, increasingly vulnerable to a sudden rise in the cost or availability of funding, as happened during 2007–08 (see Chart 1 bottom panel). Our first measure of bank balance sheet strength is its reliance on sources of funding other than deposits.

### Resilience to turmoil

In the Basel III framework, one way to assess banks' resilience to periods of turmoil in funding markets is the net stable funding ratio (NSFR), a sophisticated measure of liquidity that combines elements from the asset and liability sides of a bank's balance sheet. This is our second measure of bank health. The NSFR gauges the stability of a bank's funding sources not in general terms, like the earlier measure, but in relation to the market liquidity profile of its assets. For instance, a bank that holds lots of highly liquid securities (those that can be easily converted to cash) can rely more heavily on market funds because during times

of stress it can easily get the cash it may need. However, a bank whose assets are mostly illiquid (such as term loans and complex securities) should rely more on deposits than on volatile market funds. As an indicator of balance sheet soundness, the NSFR can alert regulators to a potential buildup of vulnerabilities in the banking system that stems from the market liquidity of banks' assets and the funding liquidity of their liabilities.

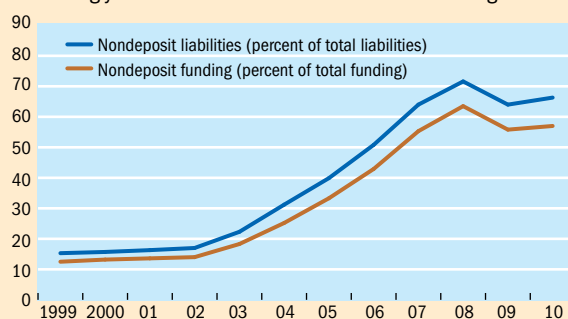
The third measure of balance sheet strength we consider relates to a bank's capital—especially the so-called capital ratio, which measures the amount of capital relative to the value of a bank's assets. The higher the ratio, the more resilient the bank should be—that is, the better able to continue making loans and the less likely to fail.

Regulators have always considered the most fundamental form of bank capital to be shareholders' equity, the funds that stockholders (the ultimate owners of the bank) have invested and that can be used to offset losses. However, Basel II was

Chart 1

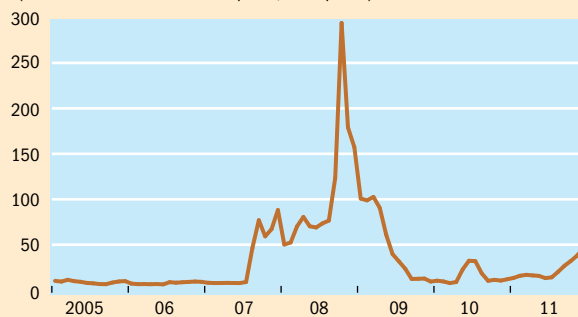
### Funding flees

In the run-up to the recent global financial crisis, banks became increasingly reliant on market-based sources of funding.



But these funds became prohibitively expensive, or even unavailable, after markets came under stress following the collapse of the investment bank Lehman Brothers in 2008.

(three-month dollar LIBOR-OIS spread, basis points)



Source: Authors' calculations based on Dealogic's Loan Analytics, Bankscope, and Bloomberg. Note: The top panel shows average wholesale funding in the authors' sample of banks during 1999–2010. The bottom panel shows the monthly average of the spread between the three-month dollar London interbank offered rate (LIBOR) and the overnight indexed swap (OIS) as a proxy for stress conditions and availability of funds in money markets during 2005–11 (higher values indicate higher stress and lower availability of funds). The dollar LIBOR is the rate major banks doing business in London say they would have to pay to borrow short term in dollars. The OIS is based on a central bank policy rate, such as the U.S. Federal Reserve's federal funds rate.



permissive in defining regulatory capital. For example, it allowed banks to count goodwill, a somewhat nebulous concept that is the difference between a bank's value on the books and what would be obtained if the bank were sold. High estimates of goodwill inflate a bank's capital and, hence, the numerator of the capital ratio, but goodwill cannot be used to write off losses. Regulators also tried to assess the potential losses a bank would face if it had to sell an asset and weighted those assets to reflect any losses expected to be incurred during times of stress. But Basel II was permissive here too. Just as the value of capital could be inflated, so could the denominator of the ratio by underestimating the riskiness of the assets—for example, by treating some assets, such as securities with a triple-A rating, as riskless, something the crisis proved to be untrue.

Basel III reforms capital regulation in two major ways. While it does not abandon the risk-weighting approach, it redefines the risks associated with different types of assets by taking into account their behavior during the global financial crisis. Furthermore, fewer capital instruments now qualify for the numerator of the ratio, and components that earlier could artificially inflate the capital ratio, such as goodwill, have been removed. Basel III proposes not only to clean up the definition of capital by restricting it to capital instruments that have a high ability to absorb losses, but also to raise the minimum required level, which enables banks to better withstand large financial shocks. Basel III also introduces a very simple measure of capital adequacy—often referred to as the simple leverage ratio—that is, the inverse of the share of shareholders' equity to total (non-risk-weighted) assets. This measure refers only to high-quality capital and is free from the complications associated with weighting assets according to their riskiness.

In our analysis, we used both traditional and new capital ratios, spanning different capacities for loss absorption relative to unweighted or risk-weighted assets.

To examine the relationship between the strength of a bank's balance sheet and bank credit, we gathered lending and balance sheet information for a large number of banks operating in the syndicated loan market. Syndicated loans—those made by groups of banks to firms and governments—represent a significant source of cross-border funding, especially for borrowers in emerging market countries. Our data set comprises 800 banks from 55 countries that extended loans to firms and public agencies in 48 countries during 2006–10. We aggregated lending to individual borrowers at the country-specific industry level. Examples of country-specific industries in our data set are metal and steel for Germany, construction and building for Spain, telecommunications for Turkey, and health care for the United States.

### Before and after

We focused on the change in bank credit before and after the 2008 collapse of the investment bank Lehman Brothers, the event that is widely perceived as the most important trigger of the global financial crisis. Specifically, we compared, for each country-specific industry, the change in loan amounts received from a number of banks with varying degrees of reliance on wholesale funding. This approach allowed us to account for the fact that borrowers may have reduced their demand for bank credit at the same time that banks were reducing the supply of loans. We found that banks that were less reliant on wholesale funding, and therefore less vulnerable to the financial sector shocks of 2007–08, managed to maintain the supply of credit better than other banks (see Chart 2, top panel). Specifically, we found that a 1 percentage point increase in the share of nondeposit funding led to a decrease in the supply of syndicated credit by between 0.7 and 0.9 percent.

A similar pattern emerged when we investigated the relationship of NSFR with the supply of bank credit: banks with a higher NSFR before the crisis—that is, banks with more stable funding sources—had a higher growth rate of bank loans during the crisis (see Chart 2, bottom panel). We found that each percent increase in the NSFR increased lending by close to half a percent during the crisis.

We also found that the negative link between dependence on market funding and the supply of loans is weaker for well-capitalized banks. Banks that were more vulnerable to liquidity shocks reduced credit supply less than other banks if they had more capital in the form of shareholders' equity relative to total assets—that is, more of the highest-quality capital.

We estimated that every percentage point increase in the ratio of nondeposit funding to total funding reduced the supply of credit by 0.7 to 0.8 percent. But that reduction was partially offset if a bank had a higher level of quality capital. The capital of the average bank in the sample was 6.9 percent of assets. For each percentage point increase above that the adverse effect on credit was reduced by 10 percent. This suggests that capital plays a bigger role than safeguarding banks against failure. Rather, among banks that survived



the recent financial crisis, those that were better capitalized before the crisis also continued lending to businesses. Importantly, this mitigating effect of capital is present only when capital is measured with variables closest to the Basel III definition (such as the simple leverage ratio) and not when the measures of regulatory capital are based on the Basel II definition.

Our finding that bank capital played a mitigating role in the transmission of financial sector shocks to the real economy helps put in perspective the recent debate on the costs and benefits of banking regulation. In particular, many argue that the new regulatory requirements, including those on capital, will hurt banks' intermediation func-

tion, reducing their ability to extend credit. Were that the case, the new requirements could have a perverse economic effect by slowing the recovery. But our analysis suggests that a credit crunch is less severe when the banking system is

## The negative link between dependence on market funding and the supply of loans is weaker for well-capitalized banks.

well capitalized. As a result, the regulations may be costly during normal times, but they can pay off during crises, much as insurance contracts do.

### The next crisis

The recent global financial crisis showed that assessing the financial soundness of banks and their resilience to economic shocks is not a simple matter. In the aftermath of the crisis, to better monitor and supervise the banking system, regulatory efforts are focusing on rethinking the definition of a strong bank. However, the efficacy of the newly proposed measures of bank health will remain unproved until the next financial crisis.

We have examined the link between bank balance sheet strength and the supply of bank loans during a crisis through the prism of both old and new measures. We found that the measures proposed in the Basel III framework for bank regulation are helpful in distinguishing the healthier banks—those that maintained lending to businesses after the 2007–08 financial turmoil—from the less healthy ones, namely, those that curtailed lending. This gives us confidence in the new regulations' ability to create a safer and more resilient banking system. ■

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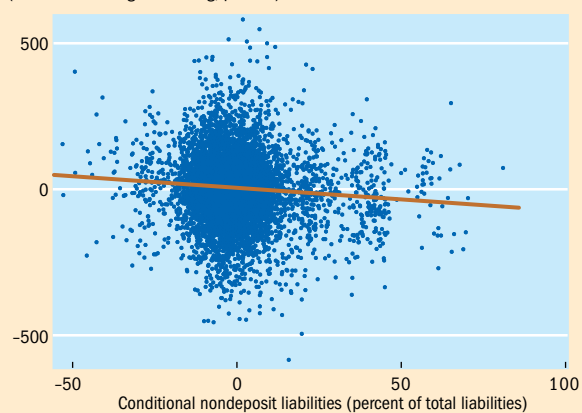
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Chart 2

### Funds and loans

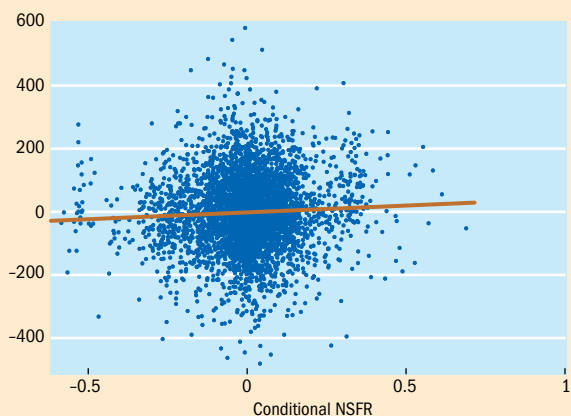
The more a bank relies on market funding, the less it lends to businesses.

(conditional change in lending, percent)



Conversely, the more stable a bank's sources of funding, such as traditional deposits, the more credit it extends.

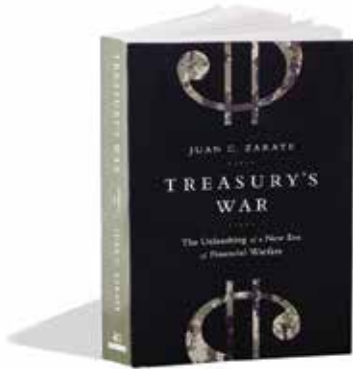
(conditional change in lending, percent)



Source: Authors' calculations based on Dealogic's Loan Analytics and Bankscope.

Note: The two panels show correlations between banks' reliance on nondeposit funding (top panel) and NSFR (bottom panel) on the one hand, and the change in banks' lending before and after the collapse of the investment bank Lehman Brothers in 2008. NSFR is the net stable funding ratio, which measures liquidity by combining elements from the asset and liability sides of a bank's balance sheet. The variables are labeled "conditional" because they account for the impact of borrower and lender characteristics.

## The Continuation of Policy by Other Means



Juan C. Zarate

### Treasury's War

#### The Unleashing of a New Era of Financial Warfare

PublicAffairs, New York, 2013, 336 pp., \$27.99 (cloth).

**T**reasury's War offers a guided tour of a decade of the U.S. government's efforts to wield its financial and economic power to achieve its strategic interests and alter the balance of various conflicts. Juan Zarate is well positioned to tell this story: he joined the George W. Bush administration's Treasury Department as a young, gregarious former prosecutor with antiterrorism credentials just months before the terrorist attacks of September 11, 2001, and eventually rose to become deputy national security advisor.

Zarate was personally involved in many of the developments recounted in the book, including the "war on terror," the U.S. invasion of Iraq, and efforts to contain the nuclear ambitions of North Korea and Iran and to undermine the Qaddafi and Assad regimes in Libya and Syria.

Following 9/11, financial and economic sanctions and the role of financial intelligence became increasingly important and effective tools in the U.S. national security arsenal. Zarate attributes this to several factors, including the globalization of financial markets and the central role played by the dollar in international trade transactions.

He implies but doesn't state that many of the Treasury's legal authorities had been developed during prior administrations, but he makes quite clear that the U.S. government was willing, after 9/11, to take risks and pursue initiatives that previously would have been considered too controversial. Early on, Treasury Secretary Paul O'Neill directed his subordinates to impose sanctions even in cases where the factual basis was slim: one such case involving Somali Swedes working in the remittance business resulted in human rights protests by the Swedish government, and another in an adverse ruling by the European Court of Justice.

But perhaps the best example of the newly aggressive posture was the secret issuance of targeted subpoenas for the records of the Society for Worldwide Interbank Financial Telecommunication (SWIFT)—the global provider of secure financial messaging services. This program of subpoenas, which was entirely legal and carefully managed, nevertheless has proved difficult to defend and maintain following its public disclosure in 2006.

Many observers have noted that, short of military action, sanctions programs are one of the relatively few options available to contain North Korean and Iranian nuclear ambitions. Although Zarate makes a persuasive case that these measures have had a real impact on the targeted regimes, the question of whether and the extent to which sanctions programs are ultimately effective in changing their calculus is a debatable, second-order one that Zarate's book does not fully address.

Rather, Zarate presents a human, first-person narrative that helps the reader understand how policy decisions were made, what motivated the actors, and how they felt. He recounts how he and a group of Treasury policy officials wearing suits and carrying briefcases felt oddly out of place flying into Kabul on a military jet shortly after the U.S. invasion of Afghanistan, to help the U.S. military

and intelligence communities take advantage of the ancient *hawala* system of money exchange.

Following the creation of the Department of Homeland Security, which stripped the Treasury Department of the Customs Service and the Secret Service, Zarate and his Treasury enforcement colleagues were pressed to prove their relevance to the national security agenda. They set about doing so through the application of sanctions on a few select "rogue" banks that were involved in laundering money for sanctions evaders, drug traffickers, and terrorist organizations. Later, the Treasury's strategy emerges, validated and victorious, with President-elect Obama's decision to retain Treasury Under Secretary Stuart Levey, the public face of the Bush Treasury's Iran sanctions program.

*Treasury's War* assumes that most people are unaware of the Treasury Department's role and its powers to implement sanctions, extract and analyze financial intelligence from banks, and negotiate global norms for financial regulation and information sharing, or how these activities have helped the United States achieve its objectives. Zarate usefully opens with a brief history of economic sanctions, from the Peloponnesian War in 432 B.C. to the Clinton administration's targeted sanctions against the Milosevic regime, Colombian drug traffickers, Hezbollah, and Al Qaeda in the 1990s.

By book's end, Zarate ponders some of the broader implications of the policies that he and his colleagues pursued during the post-9/11 decade. In particular, he suggests that *Treasury's War* has opened a Pandora's Box and that the U.S. economy and financial sector may themselves be vulnerable to similar steps taken by its financial and economic rivals. If *Treasury's War* has been as effective as Zarate says it has been, then his warnings may well be taken seriously.

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## Evolving with the Times



Stephen Bell and Hui Feng

### The Rise of the People's Bank of China

Harvard University Press, Cambridge, Massachusetts, 2013, 384 pp., \$55.00 (cloth).

The People's Bank of China, the central bank of the People's Republic of China, is by some measures the largest central bank in the world. At the end of 2012, its balance sheet was valued by the U.K. Standard Chartered Bank at \$4.5 trillion, higher than that of the European Central Bank (\$3.5 trillion) and the U.S. Federal Reserve (\$3 trillion). Compared with these and other major central banks, such as the Bank of England and the Bank of Japan, China's central bank stands out in many ways. Founded only in 1948, it is relatively young but has presided over the fastest structural transformation of a large economy in world history. And, most significantly from the point of view of the authors of this book, it has evolved in an economy that has implemented market-based economic reforms while retaining an authoritarian political system.

In *The Rise of the People's Bank of China*, Stephen Bell and Hui Feng tell two distinct stories: first, how the bank has evolved within the Chinese political system and, second, how its relationship with the Chinese and global economies has evolved over time. It's easy to forget how much China's financial system and economy have changed, and how different the chal-

lenges of the Asian financial crisis and the beginning of the post-1978 reform and opening period are from those of today. The second section's discussion of Chinese asset prices and exchange rate policy, to cite two currently significant issues that occupy the central bank, is presented in a clear historical time line. But the goal of this section is to show how the bank has addressed successive challenges, rather than to assess how good its performance was, or what might have been.

An institutional, descriptive focus dominates the first half of the book, which could be tough going for the general reader. But it raises useful insights: Chinese economic liberalization required not only a retreat of the state from central planning, but also a forward movement by the state into regulation. The need to assemble a proreform coalition in China was one reason for the devolution of economic decision making to the provinces, a process that has now become such a crucial component of China's economic strategy that its provenance is generally unquestioned. And the (to economists, settled) question of whether and why central banks should be independent is also presented in an interesting framework.

However, with this institutional rather than macroeconomic focus, the authors occasionally overstate how far China's central bank has evolved and cite as evidence of flexibility, or as consequences of China's political system, bank policies that are more likely to be tools of exigency. For example, the bank's monetary operations set quantitative targets for credit and money aggregates as well as interest rates, in contrast to advanced-economy central banks, which in normal circumstances focus on a single policy rate that affects the short-term money market.

But the Chinese central bank's approach is common in countries with heavily liquid financial systems, regardless of their political orientation. And in an economy such as China's, where bank interest rates

remain regulated, it would be almost impossible to achieve monetary policy goals using only a central bank lending rate. Here, the experiences of other emerging markets would have been useful for the purpose of comparison and, given that China's financial system remains more tightly controlled than that in almost other large emerging markets, would show how far China still has to go. Similarly, the authors' characterization of China as a transition economy rather than an emerging economy feels outdated or, perhaps more

## China's central bank stands out in many ways.

accurately, suggests a pedantic focus on its political rather than economic circumstances. Twenty years ago, China's economic peer group may have been the similarly reforming countries of Europe and central Asia, but now that 11 of those countries have joined the European Union while China has become the hub of global industrial production and trade, this characterization seems less appropriate.

The rising global profile of the People's Bank of China naturally reflects growing interest in the world's second-largest economy. Those looking for a forward-looking assessment of where the Chinese economy is going, and how the bank will continue to define its role in an increasingly influential China, may be disappointed. However, given China's unusual history and the dynamic challenges facing it, those looking for a book that lays out the evolution of its central bank within the context of China's unique institutional structure will welcome *The Rise of the People's Bank of China*.

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