GOLDEN GROWTH

Restoring the lustre of the European economic model

Overview

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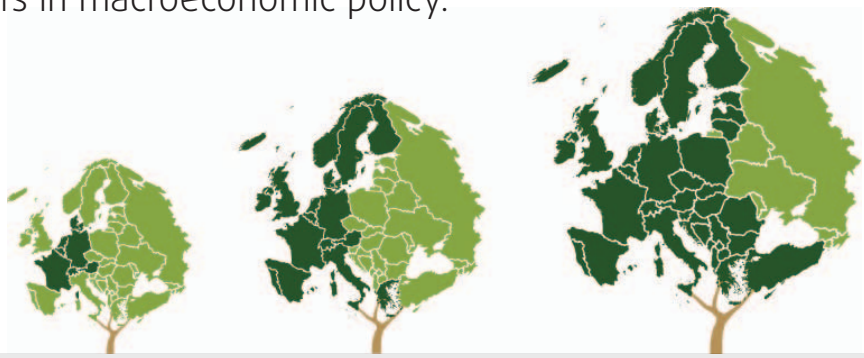
Overview

Restoring Europe's lustre

Fifty years ago, the American Economic Review published a short article titled "The Golden Rule of Accumulation."[1] In it, Edmund Phelps, an American economist, proposed a simple rule for a nation's wealth to grow and provide the highest standard of living for its citizens—present and future. The rule essentially specified how much people had to work, save, and invest today so that future generations could be at least as well off as they were. The golden rule had European origins as well. The paper used the insights of economists from France, Hungary, the Netherlands, and the United Kingdom.[2] And just a few months before Phelps's article was published, a German economist, Christian von Weizsäcker had submitted a dissertation that proposed the same rule.[3] In 2006, the Nobel Committee awarded the prize to Phelps for "his analysis of intertemporal tradeoffs in macroeconomic policy."



Many economists still consider the golden rule the most basic proposition of optimum growth theory. It is the inspiration for the title of this report, and forms the roots of its policy prescriptions. Following the golden rule means that today's Europeans work and consume just so much that future generations do not resent them for consuming too much, nor pity them for consuming too little. Keeping to the rule is perhaps the most telling sign of a country's—or a continent's—economic maturity.

Europe's growth is already different from other economies' in two aspects, reflecting its cultural and demographic maturity. Perhaps more than others around the world, Europeans want economic growth to be smarter, kinder, and cleaner, and they are willing to accept less for "better" growth. The single word that summarizes these ideals might be "golden."

Europe's growth will have to be golden in yet another sense. Economic prosperity has brought to Europeans the gift of longer lives, and the continent's population has aged a lot over the last five decades. Over the next five, it will age even more: by 2060, almost a third of Europeans will be older than 65 years. Europe will have to rebuild its structures to make fuller use of the energies and experience of its more mature populations—people in their golden years.

These desires and developments already make the European growth model distinct. Keeping to the discipline of the golden rule would make it distinguished. This report shows how Europeans have organized the six principal economic activities—trade, finance, enterprise, innovation, labor, and government—in unique ways. But policies in parts of Europe do not recognize the imperatives of demographic maturity and clash with growth's golden rule. Conforming growth across the continent to Europe's ideals and the iron laws of economics will require difficult decisions. This report was written to inform them. Its findings: the changes needed to make trade and finance will not be as hard as those to improve enterprise and innovation; these in turn are not as arduous and urgent as the changes needed to restructure labor and government. Its message: the remedies are not out of reach for a part of the world that has proven itself both intrepid and inclusive.

A distinctive model

It is common these days to hear Europeans calling for a "new growth model." The public debt crisis has shaken confidence not just in the euro but in Europe.[4] Aging Europeans are being squeezed between innovative Americans and efficient Asians, it is said. With debt and demographics weighing down European economies, the argument runs that they will not grow much unless they discover radically new ways.

The end of complacency among Europeans is good, because developments in and outside the continent have made changes necessary. But loss of confidence could be dangerous. The danger is that in rushing to restructure and restart growth, Europe may throw out the attractive attributes of its development model with the weak ones. In fact, the European growth model has many strong points and enviable accomplishments.

Between 1950 and 1973, Western European incomes converged quickly toward those in the United States. Then, until the early 1990s, the incomes of more than 100 million people in the poorer southern periphery—Greece, southern Italy, Portugal, and Spain—grew closer to those in advanced Europe. With the first association agreements with Hungary and Poland in 1994, another 100 million people in Central and Eastern Europe were absorbed into the European Union, and their incomes increased quickly. Another 100 million in the candidate countries in Southeastern Europe are already benefiting from the same aspirations and similar institutions that have helped almost half a billion people achieve the highest standards of living on the planet. If European integration continues, the 75 million people in the eastern partnership will profit in ways that are similar in scope and speed.

It is no exaggeration to say that Europe invented a "convergence machine," taking in poor countries and helping them become high-income economies. Over the last four decades, the countries in Europe experienced a convergence in consumption levels that is unmatched (figure 1). Annual per capita consumption in the poorer parts of Europe grew by 4 percent while in the wealthier countries it increased at a still-impressive 2 percent. The rest of the world—except for East Asia—has seen little or no convergence. That is why the European model was so attractive. That is why European growth is unique.

Given Europe's diversity, it is not easy to identify a single "European growth model." There are big differences in how Italy and Ireland regulate work and enterprise, and how Greece and Germany balance fiscal policies and social objectives. There are big differences in what Spain and Sweden export, and how they regulate commerce. There are differences in how Portugal and Poland have regulated their banks, and not just because one of them shares a common currency while the other has one of its own. And there are differences in how Finland and France provide government services such as education and health.

But these differences in specifics do not rule out the existence of a common approach to economic growth and social progress. This approach consists of policies and institutions that govern trade and finance, enterprise and innovation, and labor and government that have common elements. Together, these elements define an economic and social model distinctly European (chapter 1).

These elements have been associated with Europe's biggest successes since World War II: unprecedented regional integration, global economic power, and the attainment of the highest quality of life in human history.

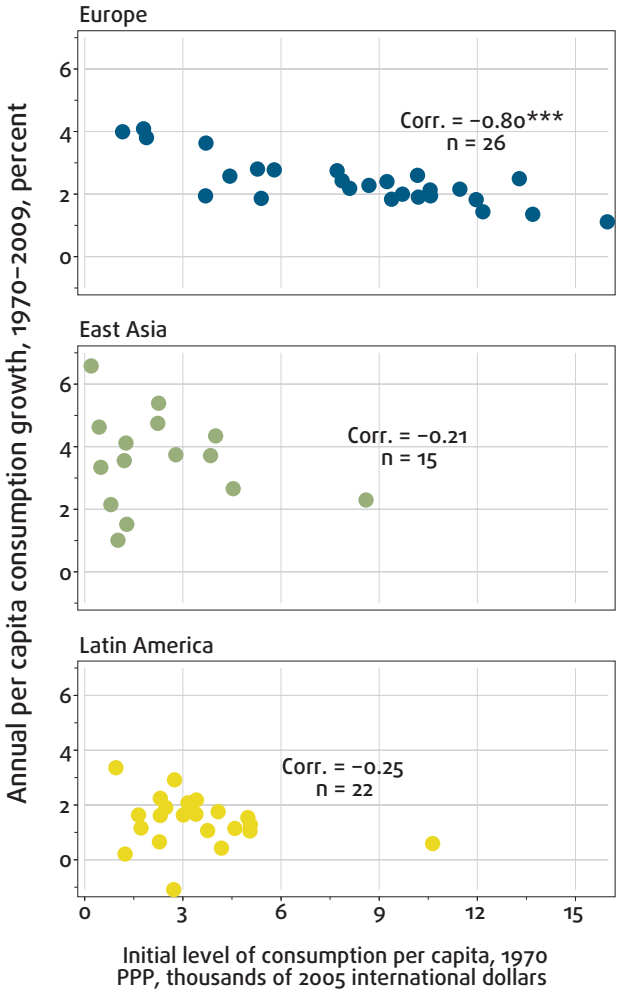
- **Trade, finance, and unprecedented regional integration.** Europe's rich and poorer economies are more integrated through trade in goods and services than in any other part of the world, resulting in quicker convergence in incomes and living standards. Private capital in all its forms—foreign direct investment (FDI), financial FDI, and portfolio funds—has flowed from richer to poorer countries, and from low- to high-growth economies. Trade and finance —facilitated by the single market instituted by the European Union and its forebears—have fueled convergence in incomes and living standards.

Figure 1: In Europe, a rapid convergence in living standards—not much elsewhere

(annual growth of consumption per capita between 1970 and 2009, by level of consumption in 1970)

*** Statistically significant at 1 percent.
Note: n = number of countries.

Source: World Bank staff calculations, based on Penn World Table 7.0 (Heston, Summers, and Aten 2011); see chapter 1.



- **Enterprise, innovation, and global economic influence.** Private enterprises are held accountable for profits by shareholders, but are also more socially and environmentally responsible than companies in most other parts of the world. Research and development and tertiary education, recognized around the globe for their economic spillovers, are seen as a responsibility not just of firms but also the state. Enterprise and innovation—aided by deep and comprehensive regional economic integration—enable Europe to account for about a third of world gross domestic product (GDP) with less than one-tenth of its population.
- **Labor, government, and high living standards.** Workers in Europe are accorded strong protection against abuse by employers, and have unprecedented income security after job loss and in old age. European governments are the most decentralized and representative of local interests,

and Europe has developed the most effective institutions for regional coordination in human history. Europe's model of labor and government—facilitated by the growing consensus for continental cohesion and made affordable by its economic heft—has made the European lifestyle admired and envied around the world.

What has Europe accomplished that other parts of the world could not? Which aspects of the model are no longer sustainable, either because of unanticipated changes in Europe and elsewhere or because some European countries have transformed themselves too fast? Which changes are needed now, and which can wait? These are the questions that this report asks.

The short answers: Europe has achieved economic growth and convergence that is unprecedented (table 1 and spotlight one). Most countries in Europe are doing well in trade and finance, many in enterprise and innovation, but far fewer are doing well in labor and government. So Europe needs many changes to make its governments and labor markets work better, fewer to foster innovation and productivity growth in enterprises, and fewer still to reform finance and trade. These deficiencies are rooted in how some activities are organized—and they will need to be reorganized. Stalled productivity, declining populations, and growing fiscal imbalances have made some changes urgent.

But in addressing these shortcomings, Europeans should not forget the singular successes of their growth model. By fostering a regional economic integration unique in both depth and scope, Europe has become a "convergence machine."

Table 1: Relentless growth in the United States, revival in Asia, and a postwar miracle in Europe

(average annual compound growth rates, GDP per capita, 1820–2008, US$ 1990 Geary-Khamis PPP estimates)

Year	Western Europe	Southern Europe	Eastern Europe	Former Soviet Union	United States	Japan	East Asia	Latin America
1820–1870	1.0	0.6	0.6	0.6	1.3	0.2	–0.1	0.0
1870–1913	1.3	1.0	1.4	1.0	1.8	1.4	0.8	1.8
1913–1950	0.8	0.4	0.6	1.7	1.6	0.9	–0.2	1.4
1950–1973	3.8	4.5	3.6	3.2	2.3	7.7	2.3	2.5
1973–1994	1.7	1.9	–0.2	–1.6	1.7	2.5	0.3	0.9
1994–2008	1.6	2.7	4.0	4.2	1.7	1.0	3.9	1.6

Note: Regional aggregates are population-weighted; see spotlight one for details.

Source: Maddison 1996; Conference Board 2011.

By engineering entrepreneurial dynamism in the countries that balanced market forces and social responsibility, it has made "brand Europe" globally recognized and valued. And by allowing a balance between life and work, it has made Europe the world's "lifestyle superpower." To continue the progress of the last five decades, Europeans now have to do three progressively tougher tasks: restart the convergence machine, rebuild Europe's global brand, and recalibrate the balance between work and leisure to make their lifestyles affordable.

The convergence machine

An increasingly vigorous flow of goods, services, and finance over the last five decades has fueled European growth. Europe's economies are the most open in the world. Before the global crisis of 2008–09, half of the world's approximately $15 trillion trade in goods involved Europe (figure 2). Two-thirds of it was among the 45 countries discussed in this report. Financial flows have been equally vigorous. In 2007, for example, annual FDI in Europe exceeded $1 trillion. Big and growing trade and financial links facilitated by the single market form the core of the European convergence machine.

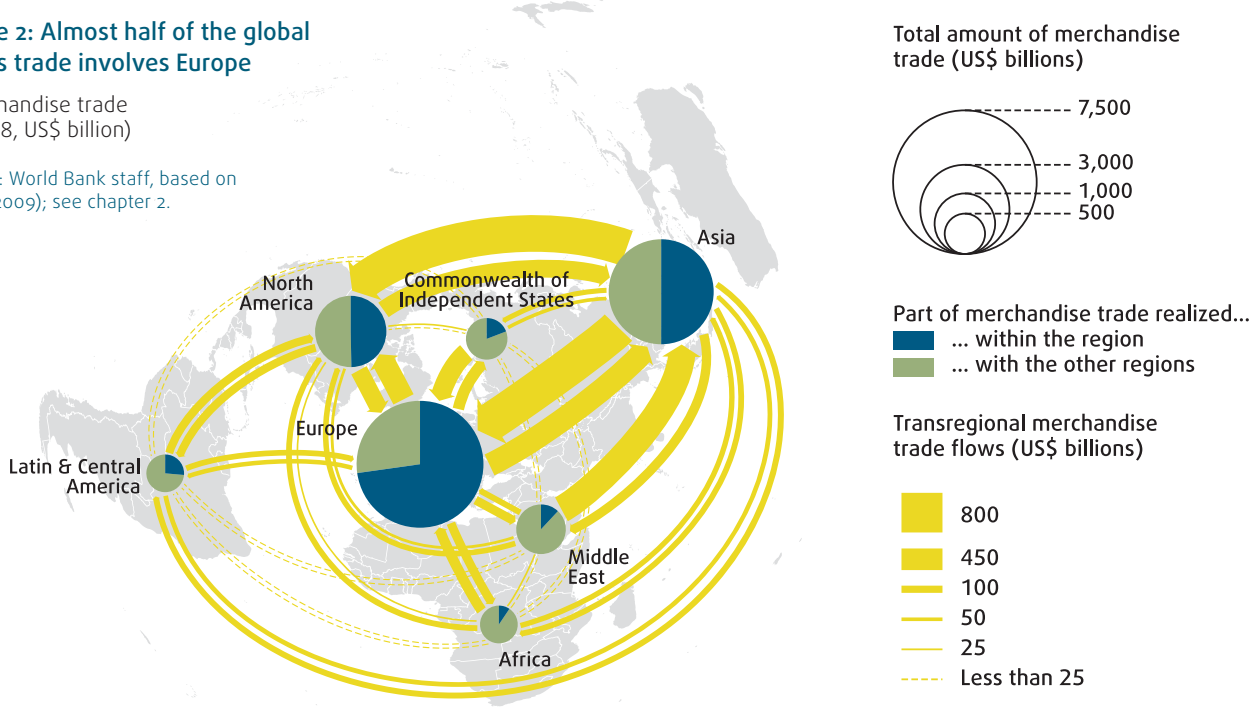
Increasingly sophisticated trade

During the last two decades, the new member states of the European Union have done especially well at taking advantage of the opportunities offered to them, integrating westward by trading goods and modern business services.

Figure 2: Almost half of the global goods trade involves Europe

(merchandise trade in 2008, US$ billion)

Source: World Bank staff, based on WTO (2009); see chapter 2.



During the last decade, the candidate countries of Southeastern Europe have been doing it through trade in merchandise and more traditional services such as travel and transport. This has helped enterprises in Western Europe too. With FDI and offshoring, enterprises in Western Europe such as Fiat, Renault, and Volkswagen have made themselves and eastern enterprises like Yugo, Dacia, and Škoda more efficient and sophisticated. Simpler tasks are being given to countries outside Europe; advanced Europe is getting emerging Europe to do more difficult things, and both regions are benefiting (chapter 2).

The goods trade between advanced and emerging Europe has grown rapidly since the mid-1990s—when the European Union signed its first association agreements with Hungary and Poland—and this does not appear to be injuring trade with other parts of the world. Europe does a brisk goods trade with North America, Asia, the former Soviet Union, and Africa (figure 2). But trade within the region has grown much more sophisticated over the last decade, aiding quick convergence in productive capacity and living standards. It is helping to create a bigger and stronger economic union between the European Free Trade Association (EFTA), the EU15, the new member states, the EU candidate countries, and even the eastern partnership economies.

Factory Europe may not be expanding as fast as Factory Asia, but it has become smarter. And it could expand a lot too. With economic recovery and better trade facilities—especially information and communications infrastructure in the European Union's new member states and the candidate countries—regional goods trade could double over the next decade.

The trade in modern services in Europe is increasing too, but not fast enough for many Europeans. The benchmark for merchandise trade is East Asia, a developing region, but the European Union gauges the Single Market for Services against the United States, a developed country. Trading services is not easy: it often requires movement of people across borders, ease in establishing a local presence, and harmonious home–host regulations. Given all this, Europe's trade in services does not seem stunted (figure 3). But progress is mixed: travel and financial services have done well but transport and other business services—especially those involving new technologies and the Internet —have not. With reforms that make adopting newer technologies easier, better regulations, and greater mobility of workers, Europe's trade in services could triple in size over the next decade. More important, productivity in the general services sector—which is about 70 percent of GDP in Europe—would increase.

The opportunity that Europe might really be missing involves regional trade in agriculture. The European Union pays for its agricultural trade policies not just with the roughly €50 billion a year the European Commission spends on agriculture and rural development and their large indirect efficiency costs, but also through missed opportunities for closer economic integration with eastern partnership countries. In Georgia and Ukraine, a third of all workers still depend on agriculture for a living. Allowing better access to European farm markets would aid their development, win friends, and influence policies in the countries of the eastern partnership.

Despite these weaknesses, the overall assessment of European trade is positive. In 2009, Europe's merchandise trade was worth about $4.5 trillion,

Figure 3: More trade in services in Europe, but apparently in more traditional activities

(services exports in the European Union, United States, and Japan, 2008)

Note: The numbers in parentheses refer to the sum of traditional and modern service exports as a percentage of GDP.

Source: World Bank staff calculations, based on IMF BOPS; see chapter 2.

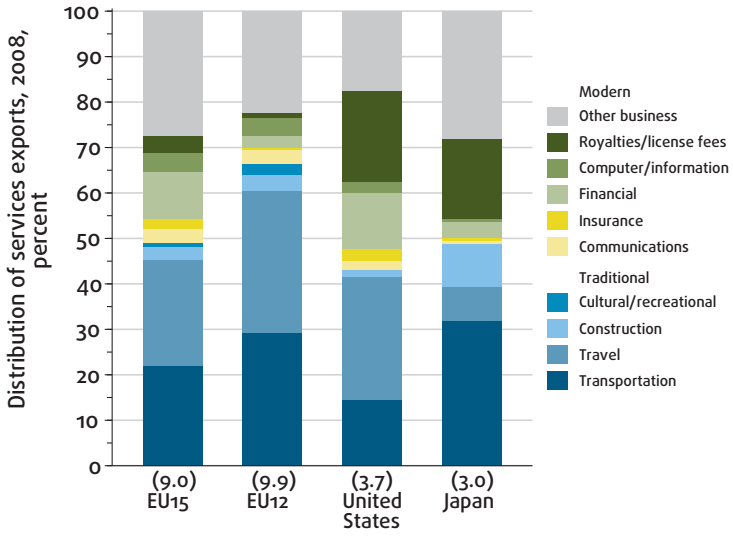
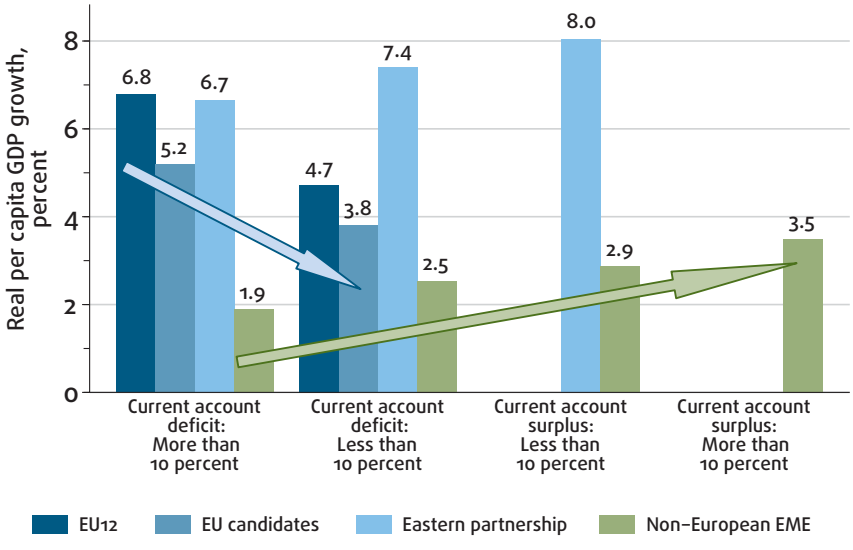


Figure 4: In Europe, foreign capital has boosted growth in emerging economies

(current account deficits and per capita growth, 1997-08, by groups of countries, percent)

Note: Average growth rates calculated using 3 four-year periods in 1997–2008.

Source: World Bank staff calculations, based on IMF WEO; see chapter 3.



more than East Asia's and North America's combined. Its trade in services was worth $2.25 trillion, more than that of the rest of the world combined. Trade is the mainstay of the European economic model and its most attractive attribute.

Finance that flows downhill

Financial integration is the second part of the convergence machine. Finance has served Europe well. This may come as a surprise to those who blame the current crisis in the eurozone on banks that lent money to spendthrift governments. But European finance has a desirable attribute: capital of all

types flows from richer to poorer countries, from low- to high-growth countries. Financial FDI—big investments by Austrian, French, Italian, and Swedish banks in Central and Eastern Europe—is a unique feature of Europe. In the east, it has helped (chapter 3).

Figure 4 shows the relationship between economic growth and current account deficits in the new member states of the European Union, its candidates, the eastern partnership countries, and other emerging economies. An upward sloping arrow means that countries that ran smaller deficits or larger external account surpluses grew faster. In other words, a country grew faster if it lent rather than borrowed abroad. And for emerging economies outside Europe, this is indeed what we see: capital flows from poorer, high-growth countries to richer, low-growth countries (green arrow). Call this the "China syndrome."

In Europe, capital behaves the way it should: it flows from richer to poorer economies, and countries receiving more capital grow faster. The laws of economics have held in Europe. They hold more firmly the more institutionally integrated the economies have become with Western Europe—by membership in the European Union or by signaling the intention to join. Belarus and Ukraine, for example, have done neither, and they look a lot like emerging market economies outside Europe, growing faster when they have external account surpluses (capital outflows) or smaller current account deficits.

In 2008, when the financial crisis hit, people who were familiar with earlier crises in Asia and Latin America expected a massive pullout by western banks. It did not happen: foreign banks stayed, renewing 90 percent of the loans they had made, a much higher proportion than in previous crises. Of course, during the preceding boom some governments, enterprises, banks, and households abused the opportunities provided by this model of financial integration. And today, as western banks face pressures to offset losses in Southern Europe, they may have to sell their profitable businesses in Eastern Europe. But the benefits have been greater than the excesses, and some reforms can make the flows more stable and their benefits even greater: better management of public finance during booms in both advanced and emerging Europe, and more adept regulatory structures to crisis-proof private finance. To grow at high and steady rates, economies in emerging Europe have not had to "become Asian." Nor should they have to now.

Restarting the convergence machine

In the early 2000s, an important debate took place. For two decades, economists had been puzzled by the finding that a country was able to invest only as much as what it could itself save. In theory, capital flows should allow savers in wealthier, or low-growth, countries to finance investment in poorer, or high-growth, economies. They would get a higher return on their money, and these financial flows would allow the people in developing nations to save less and consume more, and invest more and grow faster. Unfortunately, it did not seem to happen; instead, there was a strong correlation between saving and investment across countries (Feldstein and Horioka 1980). But in the European Union between 1992 and 2001, especially the eurozone, research showed that something had changed. Greece and Portugal had run large current account

deficits financed by foreign capital inflows; their savings had fallen, investment had increased, and their economies had grown (Blanchard and Giavazzi 2002). The question was whether policymakers—national governments, the European Union, and the European Central Bank—should welcome these growing imbalances, or worry about them.

With the benefit of hindsight the answer is, of course, both. The capital inflows were the result of trade and financial integration, and they were supposed to make Greece and Portugal more productive and richer economies. Until about 2001, they did, and their living standards converged to those of more advanced European economies. But since 2002, labor productivity in Europe's southern countries has been falling. The sheer volume of flows meant that inflows replaced domestic saving. Increasingly, though, they did not fund productive investment. Obviously, the borrowed money had not always been used well. It had flowed in on the belief that Greek and Portuguese debts would be serviced or repaid. By 2009, it was clear that this was going to be difficult.

In the new member states, the same story was being played out, but with many more happy endings than sad. In countries such as the Czech Republic and Poland, foreign savings flowed into productive uses, and both Western European savers and Eastern European investors benefited. In some others, ever larger flows began to finance consumption, sometimes by the government but more often by households. In these countries, economic growth went into reverse during the global financial crisis.

Restarting the convergence machine will not be difficult. The Single Market for Services is becoming more efficient, and national governments can accelerate the process by fully implementing the European Union's Services Directive. For many services, measures to increase mobility of labor among countries will help greatly. For other more modern services that can be sold digitally, harmonious regulations may be much of what is needed. New member states of the European Union and the candidate countries in Southeastern Europe will have to continue easing the bottlenecks in transport and communication infrastructure and modern services, so that trade in manufactures can facilitate the production networks that have been growing in size and sophistication. The European Union can also help millions of people in the eastern partnership countries—whose combined GDP is less than $0.5 trillion—by giving better access to its $1 trillion market for food and other farm products.

A lot of this is happening. It is finance, the fuel for the machine, which needs more attention. Europe's convergence machine needs a better regulator of financial flows. Finance flows in the right direction in Europe—proof positive of the soundness of the system. But the flows are erratic, flooding Europe's less advanced economies when finance is plentiful, and starving them of finance when savers and investors in advanced countries become skittish. Financial flows could be made steadier through conservative fiscal policies and prudential regulations, so that they do not suddenly stop when growth slows. Canada, the Czech Republic, Croatia, and Poland showed what can be done during good times, and Sweden and the Republic of Korea have shown ways to quickly get firms and households out from under a debt overhang when boom-time finances fuel excesses and cause busts (Iwulska 2011).

"Europe"—a global brand

As convergence has slowed and even gone into reverse in parts of Europe, the entire region is getting a bad press. Europe's best days are behind it, it is now said. High unemployment among young people, stagnant worker productivity, unsustainable public finances, and archaic social protection and innovation systems that are unsuited for a globalized economy are all presented as symptoms of economic decay. But the heart of an economy is neither labor nor government—it is enterprise. Since the mid-1990s, during a period when Asia had a huge financial crisis and bigger recovery, and the United States had a spectacular technology boom and a massive financial crisis, European enterprise has quietly flourished.

This is no mean achievement, because Europe expects much from its enterprises. Their shareholders expect them to add value and turn a profit, workers expect them to create jobs, and governments want them to bring in export earnings. Remarkably, over the last decade and a half, European enterprises have delivered all three (figure 5). Between 1995 and 2009, job growth in advanced Europe outstripped that in the United States. The new member states of the European Union and the candidate countries engineered productivity increases that outstripped those in East Asia and Latin America. Exports of goods and services in advanced and emerging Europe rose faster than output, and exceeded the growth rates even of the heralded BRIC economies (chapter 4). German and Swedish manufactures, produce from France and the Netherlands, and British and Italian banks have global reach and reputation; Czech engineering, Estonian information technology, and Turkish construction companies are quickly acquiring them. These are not the signs of a region in decay.

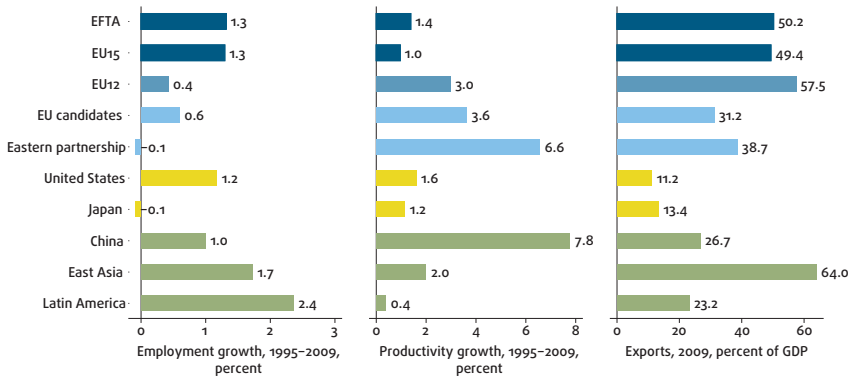
With Asian enterprises becoming more active globally, the next few decades might well require European enterprises to make changes in how and where they do business. For now, the numbers show that in aggregate, European enterprise has been a reliable component of the economic model.

Southern enterprise falters

But not all is well. Employment growth in the EU12 could have been quicker, productivity growth in the EU15 should have been faster, and EU candidate and eastern partnership countries should raise exports to levels seen in the rest of Europe (see top five bars in figure 5). Perhaps most worrisome are the productivity patterns since 2002, which show that parts of Europe have been faltering (figure 6). Northern countries such as Finland, Sweden, and the United Kingdom—and later the Baltic economies—have done well, and continental economies such as Austria, France, Luxembourg, and Germany—and later the Czech Republic, Poland, and others—have been doing well too. But Southern Europe—Greece, Italy, Portugal, and Spain—have not. From 2002 to 2008, they created jobs, but mainly in cyclical activities like construction or in less productive enterprises (like micro and family firms). And the productivity of their workers has been falling.

Figure 5: European enterprises have delivered jobs, productivity, and exports

(performance of European subregions and benchmark countries, 1995–2009)

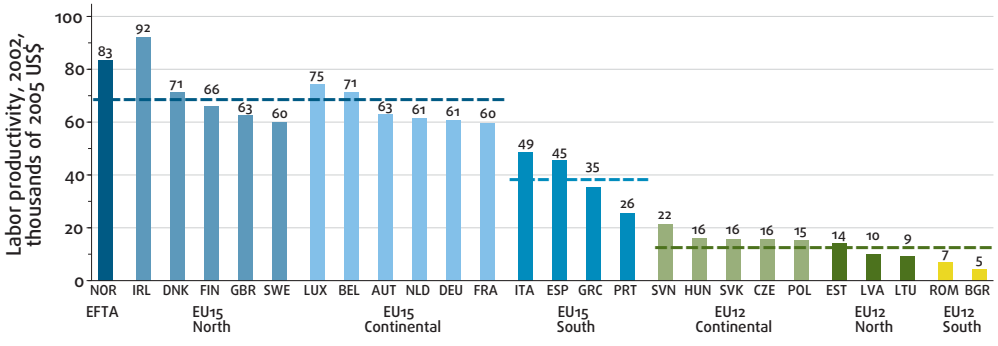


Note: Growth rates in employment and productivity are compound annual growth rates. Average values by group are shown. China and Japan are also included in the calculation of East Asia's regional average.

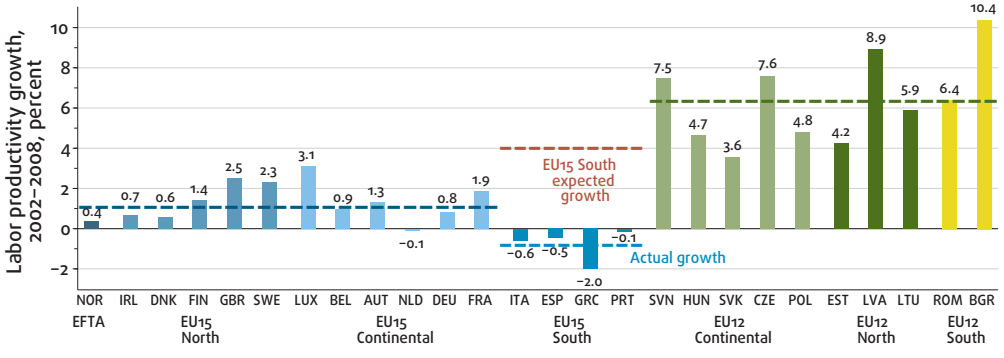
Source: World Bank staff calculations, based on WDI and ILO (2010b); see chapter 4.

Figure 6: Much of Europe is becoming more productive, but the south has fallen behind

(labor productivity levels in 2002, thousands of 2005 US$)



(labor productivity growth, 2002–08, annual percentage increase)



Note: For Belgium, Greece, and Norway, productivity levels refer to 2003 (top panel). In the bottom panel, the period considered varies: Belgium and Norway (2003–08); Greece (2003–07); and the Czech Republic, France, Latvia, Romania, and the United Kingdom (2002–07). The three lines in each panel show average values for countries covered by each line. Expected growth for EU15 South is obtained by computing gaps in productivity levels between EU15 South and each of the other two groups and then applying these shares to the difference in growth between the first (that is, EFTA, EU15 North, and EU15 Continental) and the third (EU12) groups.

Source: World Bank staff calculations, based on Eurostat; see chapter 4.

A premature adoption of the euro by southern economies is sometimes blamed for this reversal of fortune. Others say that letting the formerly communist countries into the European Union so soon did not give the south enough time to become competitive. But perhaps the most likely explanation is that of all the economies in Europe, the entrepreneurial structures of Greece, Italy, Portugal, and Spain were least suited for the wider European economy. For one thing, a sizable part of net output in southern economies is generated in small firms —almost a third of it in tiny enterprises (with fewer than 10 workers; figure 7). This is not an entrepreneurial profile suited for a big market. Unsurprisingly, with the expansion of the single market in the 2000s, foreign capital from the richer economies of Continental Europe quickly changed direction, going east instead of south as it had done in the 1990s (figure 8).

Did the south need more time to adjust, or did it squander opportunities? The latter seems more plausible. Ireland has shown that EU institutions and resources can be translated quickly into competitiveness. The Baltic economies are now doing the same. The chief culprits for the south's poor performance were high taxes and too many regulations, often poorly administered. While these mattered less when its eastern neighbors were communist and China and India suffered the least business-friendly systems in the world, they are now crippling southern enterprise (figure 9).

But there are reasons to be optimistic. The sovereign debt crisis has led to a resumption of regulatory reform in these countries, and the experience of countries such as Latvia and Lithuania shows that the necessary improvements can be done over years, not decades. And they need to be done quickly. From 2003 to 2006, Europeans who felt that globalization was an opportunity for their enterprises fell from 56 to 37 percent (Morley and Ward 2008). By 2006, the share of people who felt it was a threat to European enterprises and employment was almost half. The Danes, Swedes, Dutch, and Estonians were the most positively disposed to globalization; the French, Greeks, Belgians, and Cypriots the least. It is not a coincidence that the countries where people are wary of competition have the worst business climate in Europe.

Europe would get even more from its enterprises if it made doing business easier. Southern Europe must start doing this now, and Central and Eastern Europe should continue improving the investment climate. Otherwise, enterprises will remain small and unproductive—increasingly unable to attract foreign investors, incapable of taking advantage of a pan-European market that will only get bigger and more competitive, and progressively uncompetitive in global markets, where they have to contend with enterprises from East Asia and North America. A better business climate will help to stem the growth of imbalances within Europe, restart the convergence machine, and make European enterprises globally competitive. Countries such as Denmark, Germany, Finland, Ireland, Sweden, and the United Kingdom show how it can be done (Iwulska 2011).

The north innovates

But making it easier to do business will not be enough on its own. When productivity gaps were growing within Europe, the gap between the advanced

Figure 7: Smaller firms contribute half of value added in the EU15 South, but just a third elsewhere

(contributions to value added by size of enterprises, 2009)

Note: The numbers in parentheses are the total value added expressed in billions of constant 2005 U.S. dollars. The EU15 comprises Denmark, Finland, Sweden, and the United Kingdom (North); Austria, Belgium, France, Germany, and the Netherlands (Continental); and Greece, Italy, Portugal, and Spain (South). The EU12 comprises Estonia, Latvia, and Lithuania (North); the Czech Republic, Hungary, Poland, the Slovak Republic, and Slovenia (Continental); and Bulgaria and Romania (South).

Source: World Bank staff calculations, based on Eurostat; see chapter 4.

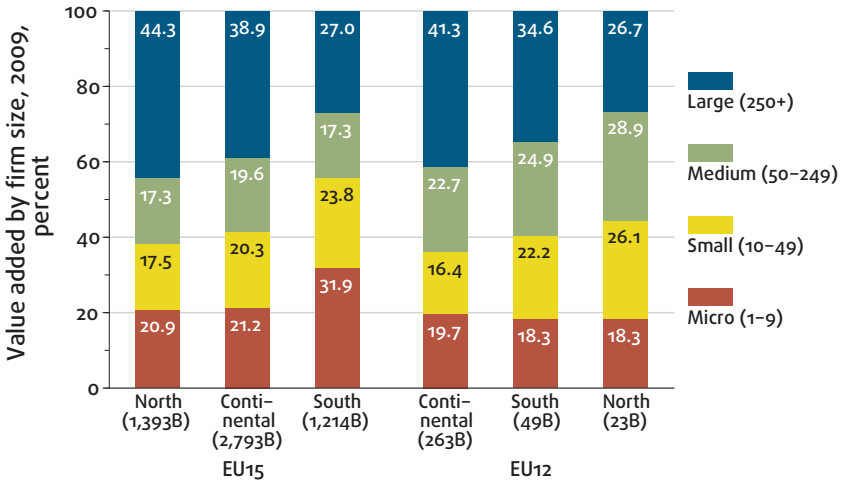
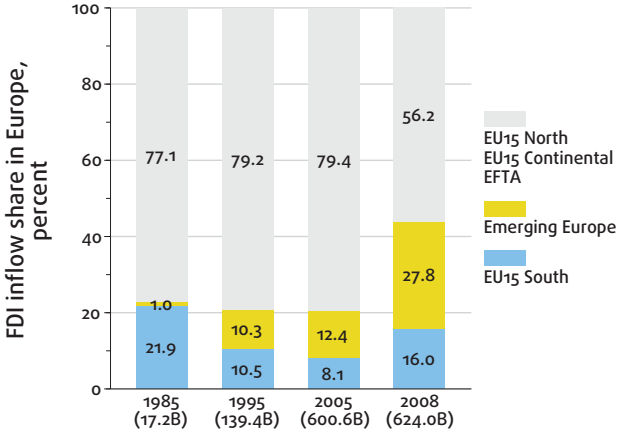


Figure 8: Western European investors have been looking east, not south

(foreign direct investment inflows in Europe, percent, 1985, 1995, 2005, and 2008)

Note: The numbers in parentheses are the amount of inflows expressed in billions of U.S. dollars.

Source: World Bank staff calculations, based on UNCTAD (2010); see chapter 4.



economies of Europe and the United States started to widen after almost disappearing in the mid-1990s. Indeed, the 2000s were a decade of declining productivity in the EU15 relative to both the United States and Japan, the world's next two largest economies after the European Union during that time (figure 10). Between 1995 and 2009, labor productivity in the United States grew at 1.6 percent annually, in Japan at 1.2 percent, and in the EU15 at just 1 percent (see figure 5).

Reassuringly, productivity in Northern Europe grew at 1.7 percent per year during the same period. What has the north done to encourage enterprise and innovation? Much of its success has come from creating a good climate for doing business. All the northern economies are in the top 15 countries of 183 in the World Bank's Doing Business rankings; at 14th, Sweden is the lowest-ranked among them. They have given their enterprises considerable economic

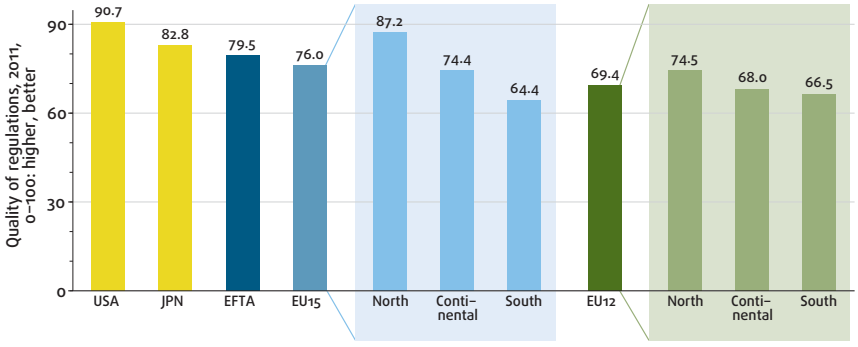


Figure 9: Southern and Eastern Europe must make it easier to do business

(principal components index of the ease of doing business in 2011, scaled from 0 [poor] to 100 [excellent])

Note: Averages are computed using principal component analysis. EFTA here comprises Iceland, Norway, and Switzerland. The EU15 comprises Denmark, Finland, Ireland, Sweden, and the United Kingdom (North); Austria, Belgium, France, Germany, Luxembourg, and the Netherlands (Continental); and Greece, Italy, Portugal, and Spain (South). The EU12 comprises Estonia, Latvia, and Lithuania (North); the Czech Republic, Hungary, Poland, the Slovak Republic, and Slovenia (Continental); and Bulgaria, Cyprus, and Romania (South).

Source: World Bank staff calculations, based on Doing Business; see chapter 4.

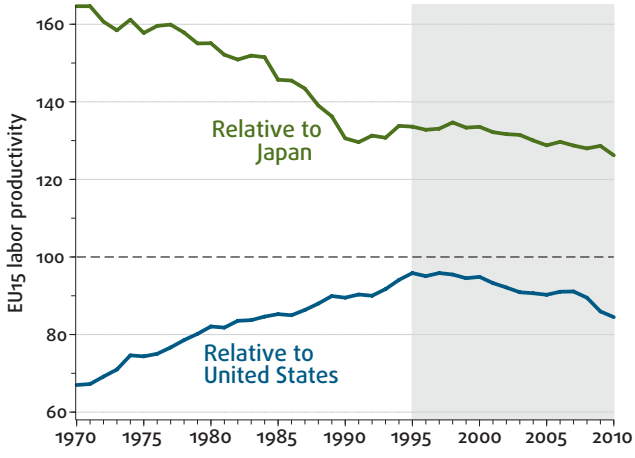


Figure 10: Productivity growth in Europe's larger economies has slowed down since the mid-1990s

(EU15 labor productivity, indexed to the United States and Japan)

Source: World Bank staff calculations, based on the OECD Productivity database; see chapter 5.

freedom. Their governments are doing a lot more. They have speeded up innovation by downloading the "killer applications" that have made the United States the global leader in technology: better incentives for enterprise-sponsored research and development (R&D), public funding mechanisms and intellectual property regimes to foster profitable relations between universities and firms, and a steady supply of workers with tertiary education. Tellingly, Europe's innovation leaders perform especially well in areas where Europe as a whole lags the United States the most. These features make them global leaders; combining them with generous government spending on R&D and public education systems makes their innovation systems distinctively European (chapter 5).

For Europe's larger continental economies that have reached or exceeded U.S. standards in physical, financial, and human capital, R&D and other innovation

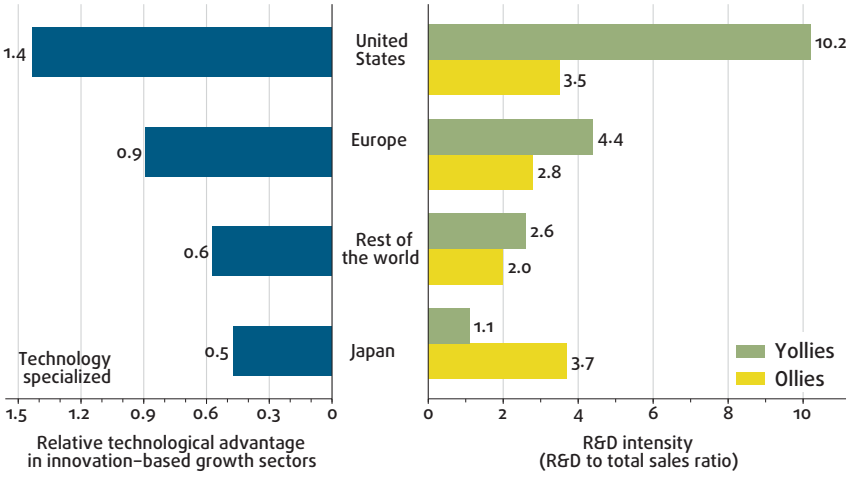
deficits are likely to be growth inhibitors. In dynamic Eastern Europe, countries need not invest much more in R&D and the production of knowledge. But they must still innovate through osmosis: they have considerable scope for the quick adoption of existing technologies, using FDI and trade links as conduits. The south is becoming slower in importing new technologies: FDI inflows and outflows have been falling since the economies in emerging Europe integrated with Continental and Northern Europe. For these increasingly service-oriented economies, reform of domestic regulations—not more R&D spending—may be the best way to speed up innovation.

What has been more perplexing is Europe's generally poor performance in the most technology-intensive sectors—the Internet, biotechnology, computer software, health care equipment, and semiconductors. Put another way, Korea; Taiwan, China; and the United States have been doing well in sectors that are huge now but barely existed in 1975. Europe has been doing better in the more established sectors, especially industrial machinery, electrical equipment, telecommunications, aerospace, automobiles, and personal goods. The United States has young firms like Amazon, Amgen, Apple, Google, Intel, and Microsoft; Europe has the older like Airbus, Mercedes, Nokia, and Volkswagen.

Europe's young leading innovators (called "Yollies" for short) are as R&D-intensive as those in the United States. Europe just has a lot fewer Yollies. As a result, while more than a third of U.S. R&D spending is by Yollies, it is less than one-fifteenth in Europe. The United States focuses its R&D efforts on innovation-based growth sectors (figure 11). Europe specializes in sectors with medium R&D intensity. Japan is showing other East Asian countries how productivity growth can be maintained in established industries such as automobiles and electronics, and Germany may be doing the same. With the size and diversity of the European economy, productivity growth will likely

Figure 11: The United States specializes in younger, more R&D-intensive products

(relative technological advantage and R&D efforts by young and old innovation leaders in the United States, Europe, and the rest of the world)



Note: R&D intensity is measured as the ratio of R&D spending to total sales, for firms established after 1975 (young leading innovators or "Yollies") or before 1975 ("Ollies"). The relative technological advantage is calculated as the share of each region or country (say, Europe) in the R&D of a particular sector (say, the Internet) relative to the share of Europe in world R&D; values greater than one indicate the region is technology-specialized in the sector.

Source: Bruegel and World Bank staff calculations, based on the European Commission's Institute for Prospective Technological Studies R&D Scoreboard; see chapter 5.

come both from doing what Japan has done and adopting parts of the American innovation system. But to do either, the common market will have to become more of a single economy.

All European countries should have the friendly business climate that Denmark, Ireland, and Norway have. It is not a coincidence that the only large European economies that rival the United States and Japan in innovation are Germany and the United Kingdom, which were both ranked in the top 20 countries for ease of doing business in 2011. Many more European countries should have the universities like those in the United States and Japan, where more than one out of two people ages 30–34 have completed college; in Europe, only Ireland, Denmark, Norway, Luxembourg, and Finland exceed 45 percent. More countries will have to improve their business–science links to rival those in the United States and Japan; currently, only Switzerland and Scandinavia do as well.

Burnishing the brand

Perhaps the simplest and most reliable way to assess the innovation performance of a country is to see how much more productive its enterprises become every year—that is, how much better they are in buying, producing, and selling. During the last decade, two things have happened that should worry Europeans. The first is that since the mid-1990s, labor productivity in Europe's advanced economies has been falling relative to that of the United States (and Japan). The second is that productivity in Southern Europe has been falling compared with that in both the advanced countries in Western Europe and the less well-off countries in emerging Europe. How can these gaps be closed?

It depends on the gap. For reducing that between the south and the north, the most important steps involve improving business regulations. Countries in the EU12 South—notably Bulgaria—and Georgia have been showing that this can be done even in the poorest parts of Europe. For closing the transatlantic productivity gap, more is necessary. Leading European economies such as Switzerland, Sweden, Finland, Denmark, and Germany are showing what works. Following their example would mean giving up the fixation on public R&D spending targets, and focusing instead on improving competition among enterprises, increasing the private funding of universities, changing the way research is funded so that business-university linkages become stronger, and making the single market work for services so that Europe's entrepreneurs view the entire continent as their domestic economy.

There are reasons to be optimistic. During the last two decades, countries in the EFTA—Iceland, Norway, and Switzerland principally—have actually done better in improving productivity than the United States. Northern parts of the EU15—especially Denmark, Finland, Ireland, and Sweden—have also been doing well. The trouble is that their economies add up to less than $1.5 trillion in purchasing power terms, roughly the GDP of Spain or Texas and just a tenth of the European Union's economy (see the Selected Indicators tables). If the rest of Europe could benefit from the dynamism of northern economies—by learning from them or leaning on them—Europe's innovation goals might quickly be reached.

Chapters 4 and 5 make it clear that preserving Europe's global brand will be more difficult than restarting convergence. To stay competitive on world markets, Europe will have to make trade even more vigorous and finance more durable so that the region eventually becomes a single economy. To help redress the continent's growing productivity gaps, governments in Southern Europe will have to quickly improve the climate for doing business. The more dynamic countries in Eastern Europe will have to do all this as well as invest in infrastructure. To close the growing transatlantic productivity divide, continental countries must give their enterprises more economic freedom. Enterprises in the northern and EFTA economies—already among the world's most innovative—will need fuller access to markets in the rest of Europe. Europe will have to become the top destination for those seeking higher education and the opportunity to become entrepreneurs. Only then can European enterprises stay globally competitive, and Europe become the place of choice of entrepreneurs from around the world.

The lifestyle superpower

In 2008, Europe was already the place of choice for tourists: of the busiest 20 international tourist destinations, more than half were in Europe. The United States had the might and China the momentum, but Europeans had the highest standard of living. Millions of people from around the world visited Europe to see and experience it firsthand. In the 1990s, Japan's Prime Minister Kiichi Miyazawa had promised he would make his country the "lifestyle superpower." With average incomes still a quarter short of those in the United States, Europe had become one.

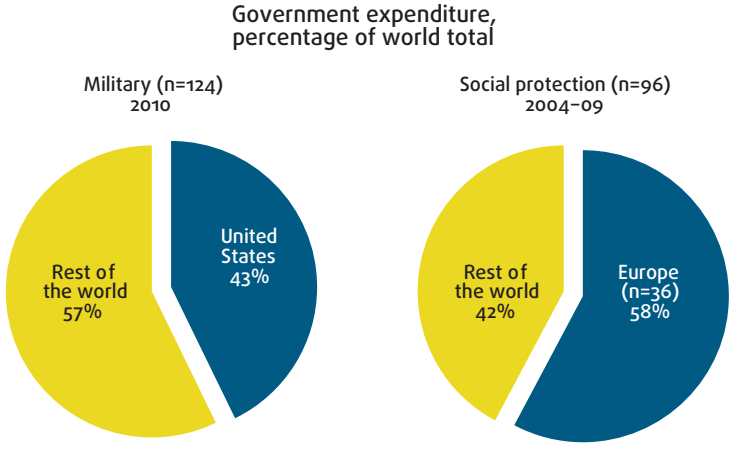
Superpowers tend to spend a lot to protect their interests and project influence. To remain the political superpower, the United States spends almost as much on defense as the next 15 countries do together. To keep its status as the lifestyle superpower, Europe spends more on social protection than the rest of the world combined (figure 12).

Figure 12: Outspending the rest of the world

(general government spending on defense [United States] and social protection [Europe], 2004–09, share of total world spending)

Note: For social protection spending, due to the data availability, averages over 2004–09 by country are used. Data cover general government but, if unavailable, refer to central government only. n = the number of countries included in the calculations.

Source: World Bank staff calculations, based on Stockholm International Peace Research Institute (2011); IMF GFS; WDI; World Bank ECA Social Protection Database; and Weigand and Grosh (2008).



The decline of work

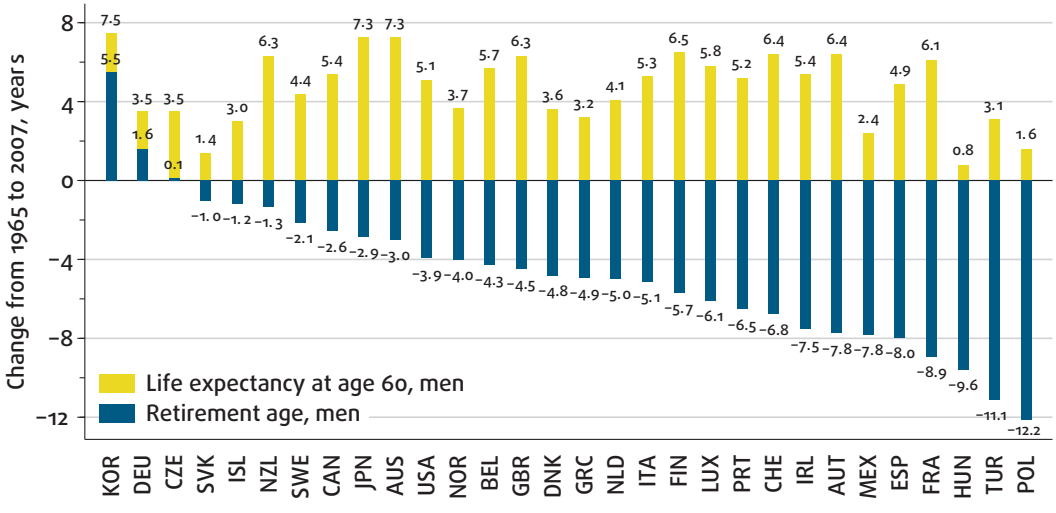
The hallmark of the European economic model is perhaps the balance between work and life. With prosperity, Americans buy more goods and services, Europeans more leisure. In the 1950s, Western Europeans worked the equivalent of almost a month more than Americans. By the 1970s, they worked about the same amount. Today, Americans work a month a year more than Dutch, French, Germans, and Swedes, and work notably longer than the less well-off Greeks, Hungarians, Poles, and Spaniards (chapter 6).

Europeans have also cut the years they work during their (ever-lengthening) lives. Today, men in France, Hungary, Poland, and Turkey effectively retire more than eight years earlier than in the mid-1960s. The average European can also expect to live four years longer. By 2007, Frenchmen expected to draw pensions for 15 more years than in 1965, and Austrian, Polish, Spanish, Swiss, and Turkish men for more than a dozen. In Organisation for Economic Co-operation and Development countries, only Korean, German, and Czech men work more years today than they did 50 years ago (figure 13).

American, Australian, and Canadian men also retire about four years earlier than they used to. But their countries have more favorable demographics than the typical European country (figure 14). On current immigration and work participation trends, the 45 countries covered by this report will lose about 50 million workers over the next five decades, and have a workforce of about 275 million by 2060. In the 2030s alone, the labor force will fall by 15 million

Figure 13: Europe's pension systems have to support people for many more years

(changes in life expectancy at 60 and effective retirement age, 1965–2007)



Source: OECD (2011a); updated data from OECD (2006).

Figure 14: Europe's labor force will shrink, while North America's will grow by a quarter

(projected cumulative change in working-age population, 2010–50, percent)

Note: North America is Canada and the United States and North-East Asia includes China; Hong Kong SAR, China; Japan; Macao SAR, China; the Republic of Korea; and Taiwan, China.

Source: U.S. Census Bureau, International Data Base; see chapter 6.

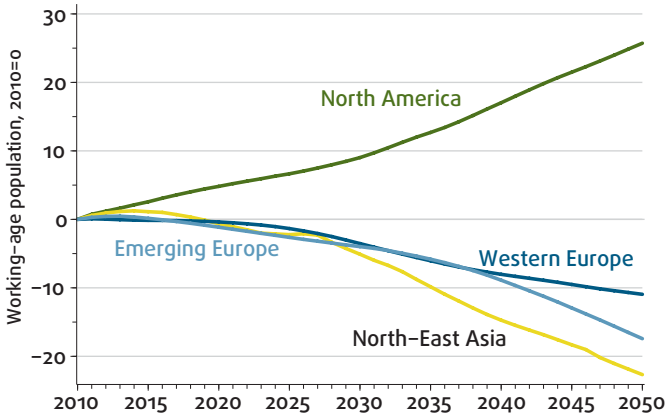
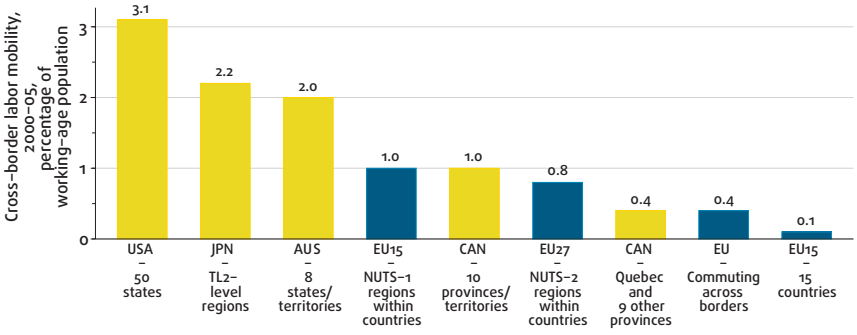


Figure 15: Europeans are less mobile, even within their own countries

(labor mobility, share of working age population that has moved, 2000-05)

Source: Bonin and others (2008); OECD (2005 and 2007); see chapter 6.



people. The decline will be most severe for the European Union (countries such as France, which have high fertility rates today, do better), but candidate and neighborhood countries will also lose workers. The exception is Turkey, where the labor force is projected to increase until 2060.

Only with radical changes can Europe counteract the shrinking of its labor force. If participation rates in all countries were to converge with those seen in Northern Europe, or if the retirement age were to increase by 10 years across the board, the European labor force would increase marginally over the next 50 years. If female labor force participation converged with men's, the labor force would still decrease by 5 percent. But none of these changes would completely offset the loss of young workers. For that, Europe will need to integrate Turks into the European labor market and attract talented young workers from around the world. In one plausible scenario, Turkey could contribute 40 percent of the gains in the European labor force, and almost all of the increase in young workers.

Fixing the European labor market will require a lot: increasing the competition for jobs, improving labor mobility within Europe, fixing how work and welfare interact, and rethinking immigration policies. These changes will not happen without a new social consensus, which has yet to be built.

Perhaps the best way to start is to accelerate internal labor mobility in Europe. Mobility in the European Union is the lowest in the developed world (figure 15). There are natural barriers to greater labor mobility associated with language and cultural differences, but there are also policy-induced obstacles. In most of the older EU member states, there are restrictions on the movement of workers from the new member states. Housing markets in many European countries can be inefficient and make moving expensive: the transaction costs of buying or selling a house can be high. Despite measures to ensure the portability of social benefits across the European Union, including pensions and unemployment insurance, in practice it is limited because of cumbersome rules. Generous unemployment benefits discourage workers from seeking jobs. Labor market signals can be muted by collective bargaining agreements that limit territorial wage differentiation. To make the single market work better, making labor more mobile should be a priority. For the countries that share the common currency, it is a prerequisite (box 1).

Then, Europe has to make changes in how work is regulated and social security provided. Many countries in Western Europe had started to reverse the decline in work participation during the late 1990s and early 2000s; many in Central, Eastern, and Southern Europe now must do the same. The main attribute of the European economic model that needs to be reassessed is employment protection legislation, which is lowering participation and reducing employment in many countries. In countries such as Spain, it may be responsible for youth unemployment rates as high as 40 percent. Paradoxically, Europe has impending shortages of young workers and high joblessness among its youth.

Denmark and Germany have shown how this can be remedied (Iwulska 2011). Other countries like Croatia, Moldova, Poland, Romania, and Turkey may have to learn quickly and carefully implement the lessons. The countries in emerging Europe will also have to decide—based on their cultural and political antecedents—whether to move toward greater job security and join countries such as Belgium and France, or toward greater flexibility and become more like the North Americans and East Asians. To have both as in Denmark, they will have to consider the greater fiscal costs of "flexicurity." At the moment, most countries have neither.

While all this is being done, Europe's policymakers could get people to appreciate the need for a new approach to immigration. Europe needs an immigration policy that is more driven by economic need. Today the debate is about how to best manage migration from North Africa. Tomorrow's debate should be about the policies and practices that will make Europe a global magnet for talent. Countries like Sweden and the United Kingdom have been doing this, but not quite as effectively as Canada and the United States (Iwulska 2011).

The precipitate promise of social protection

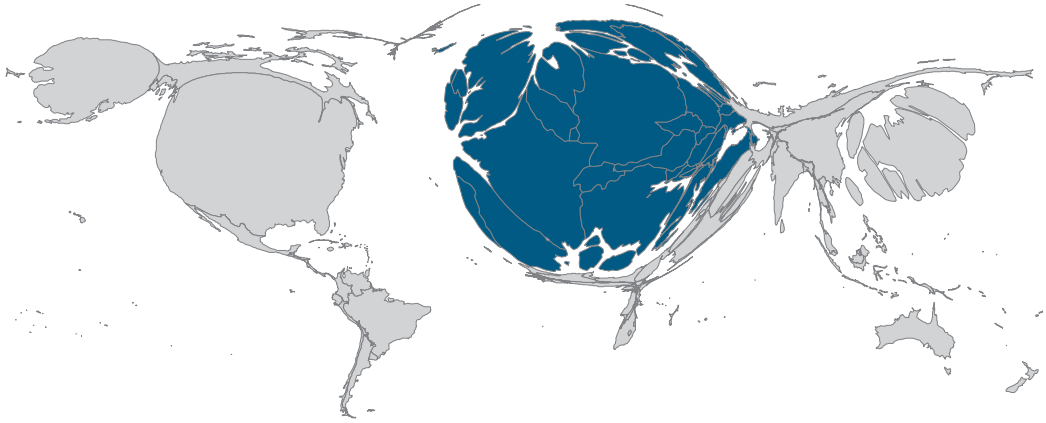
Europe will have to make big changes in how it organizes labor and government. The reasons are becoming ever more obvious: the labor force is shrinking, societies are aging, social security is already a large part of government spending, and fiscal deficits and public debt are often already onerous.

In dealing with government spending, deficits, and debt, it is sensible to start by asking whether European governments are too big; that is, whether they spend too much. They are obviously bigger than their peers. In the EU15, governments spent 50 percent of GDP in 2009; in much of the rest of Europe, this share was about 45 percent—versus less than 40 percent in the United States and Japan, 33 percent in Latin America, and about 25 percent in emerging East Asia. A map of the world resized to reflect government spending instead of land area shows how Europe might look to outsiders (figure 16).

Figure 16: Governments in Europe are big

(the world resized by government spending in dollars, 2009)

Source: World Bank staff, using IMF WEO.



Governments in Europe spend between 7 and 10 percent of GDP more than their peers elsewhere—that is, countries at similar levels of per capita income. The difference is mostly the spending on social protection. For example, Western European governments spend about 10 percent of GDP more than the United States, Canada, Australia, and Japan. The difference in social protection spending is 9 percent of GDP (figure 17).

There can be good reasons for having bigger governments. If governments are good at supplying essential social services, and if European society wants to redistribute more to protect the welfare of the elderly, infirm, or unfortunate, they should provide these amenities. If European populations are older and social security systems have to be bigger, that may be another good reason for high-spending governments. European societies have been more redistributive and to good effect—look at the impressive declines in poverty in Western Europe since World War II and in Eastern Europe since the end of the Cold War.

But social services, social welfare, and social security have to be financed by taxes, and tax rates in Europe are the highest in the world. For example, the tax wedge in Korea—the amount that Korean employers pay besides wages when hiring workers—is about a third of what Belgian enterprises pay and half of the taxes paid by businesses in Greece and Turkey. The question that such numbers provoke: is big government a drag on growth in Europe? It appears it is. Over the last 15 years, a 10 percentage point increase in initial government spending in Europe has lowered annual growth by 0.6–0.9 percentage points. Countries with government spending-to-GDP ratios above 40 percent grow by 2 percentage points of GDP less than those with lower ratios (chapter 7).

Of course, size is not the only feature that matters. What government does and how it finances its activities is as important. European governments regulate the largest economic area in the world; encourage a vigorous exchange of goods, services, and capital; promote voice and accountability; provide or enable the provision of public goods; and redistribute wealth. Bigger governments are often better at doing these things, especially when social trust ensures that everybody plays by the same rules. As countries like Sweden show, such big governments can go together with thriving, dynamic economies.

But it is not easy being like Sweden. What does it take? Make it so easy to register property, trade across borders, and pay taxes that the World Bank ranks the country one of the top 15 for doing business. Create the conditions that get four out of every five people of working age into jobs, and get almost everybody who works to pay taxes. Have an efficient government that provides high-quality social services, so taxpayers get their money's worth. Institute the pension rules that make it difficult to retire before 65 and impossible until you reach your 60s. Cultivate the social trust that allows both a generous social safety net and a transparency in government so that abuse is minimal. The list is long. If a country can do all this, big government will not hurt growth.

Europe's governments will have to become more efficient, or become smaller. Fortunately, governments that have grown prematurely big have done so for just one reason: social protection. Europe's states are not big spenders on either health or education. The variation among countries stems from a difference in spending on pensions and social assistance. Europe's countries also differ in how they tax these benefits; Northern European countries tax the social security benefits of people with high incomes more than others in Europe do. After taxes are considered, the southern periphery is the biggest social spender in Western Europe. But the reason why Europe spends more than its peers on public pensions is the same in the north, center, and south. This is not because Europe has the oldest population (Japan's is much older) nor because of higher pension benefits (annual subsidies per pensioner are about the same in Greece as in Japan). It spends more because of easier and earlier eligibility for pensions (figure 18).

Fiscal consolidation should be a top priority in Europe during the next decade, and controlling the public expenses related to aging will remain the policy imperative over the next 20 years. Calculations done for this report suggest that Western Europe has to improve its primary balance—adjusted for the business cycle—by about 6 percent of GDP during this decade to reduce public debt to 60 percent of GDP by 2030 (figure 19). Among the countries of Western Europe, the need for consolidating public spending is greatest in the south and lowest in the north. Among Europe's emerging economies, with a lower public debt target of 40 percent of GDP, the adjustment needs are about 5 percent of GDP. They are lowest in the European Union's new member states. Bigger adjustments will be needed in candidate countries and the economies of the eastern partnership, because many of them have not begun seriously reforming their social protection systems—pensions, unemployment insurance, and social assistance.

Public spending related to aging includes the ever-increasing costs of providing health care for the elderly. Without comprehensive reforms to pensions and long-term health care, these costs could add more than 3 percent of GDP to

the governments' fiscal imbalance during the next two decades. Governments in Europe that spend more than 10 percent of GDP on such benefits may be risking underinvestment in activities that help economic growth—education, infrastructure, and innovation. Countries such as Serbia and Ukraine that already spend 15 percent or more on social security alone may be jeopardizing the welfare of generations.

Recalibrating the work–life balance

The European model of work provides income security more than any other, and some countries such as Austria, Denmark, Ireland, and Switzerland have adapted it to combine security with flexibility in hiring and firing to foster both efficiency and equity in labor market outcomes. But for much of Europe,

Figure 17: Social protection explains the difference in government size between Europe and its peers

(government spending, percentage of GDP, 2007–08)

Note: "Social protection" includes benefits related to sickness and disability, old age, survivors, family and children, unemployment, and housing. Western Europe comprises Denmark, Finland, Iceland, Norway, and Sweden (North); Austria, Belgium, France, Germany, Ireland, Luxembourg, the Netherlands, Switzerland, and the United Kingdom (Center); Greece, Italy, Portugal, and Spain (South).

Source: World Bank staff calculations, based on IMF GFS and IMF WEO.

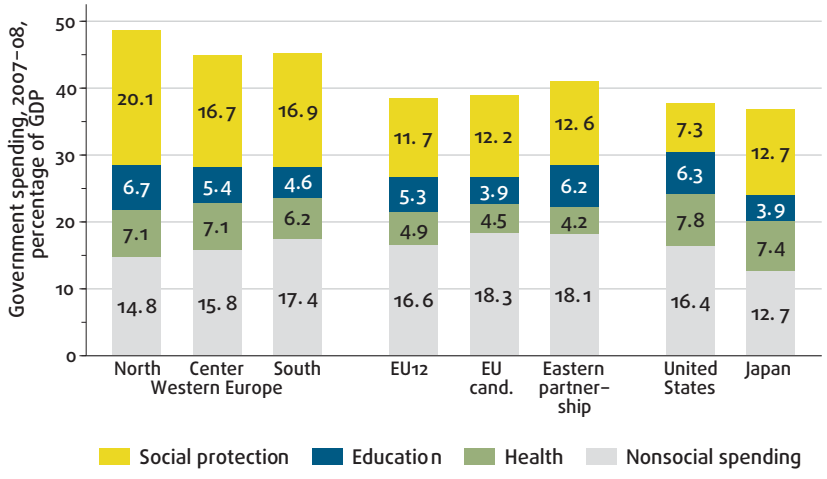
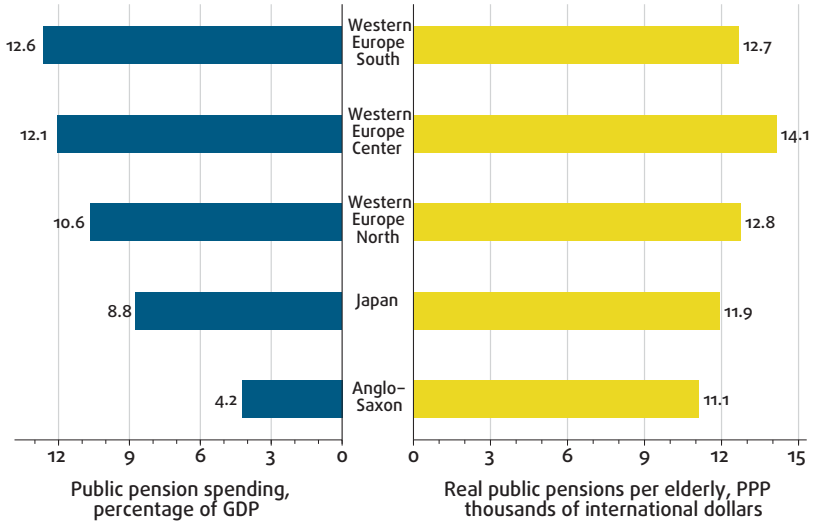


Figure 18: Small differences in annual pensions per beneficiary, big in overall public pension spending

(public pension spending in 2007)

Note: Median values by group are shown. Western Europe comprises Denmark, Finland, Iceland, Norway, and Sweden (North); Austria, Belgium, France, Germany, Ireland, Luxembourg, the Netherlands, Switzerland, and the United Kingdom (Center); Greece, Italy, Portugal, and Spain (South). Anglo-Saxon comprises Australia, Canada, New Zealand, and the United States.

Source: World Bank staff calculations, based on Eurostat and the OECD Pensions Statistics; see chapter 7.



the imbalances between work and life need to be mitigated, as do the fiscal imbalances that have emerged as a result of public spending to protect societies from the rougher facets of private enterprise.

Since the mid-1980s, a billion Asian workers have entered the global marketplace. Over the same period, Europeans have been working fewer hours per week, fewer weeks per year, and fewer years over their lifetimes. It is worrisome that their productivity is not increasing as quickly as it should. In the European Union's southern states, for example, productivity during the last decade fell by 1 percent each year, when—given productivity levels relative to those in Continental and Northern Europe—it should have increased by about 4 percent annually. It is also worrisome that in many parts of Europe, taxes bring in less than what governments spend. France and Germany, for example, have not had a fiscal surplus since the 1970s; Greece expected a budget deficit of about 10 percent of GDP in 2011; and Hungary, Serbia, Ukraine, and many others have been struggling to contain budgetary imbalances.

This will have to change. The reform of pensions and disability allowances will have to be the highest priority now, with costs of long-term health care soon becoming a pressing problem. Europe already spends twice as much on social security as Japan and the United States. There are some countries in Europe that are showing how to address these problems. Some such as Sweden are well known; others like Iceland could be studied more (Iwulska 2011). European societies will also have to modernize social welfare systems so that the disincentives to work are minimized. Denmark, Germany, and Ireland may inspire others how this can be done. But what needs to be done is not hard to see: Europeans will have to work for more years.

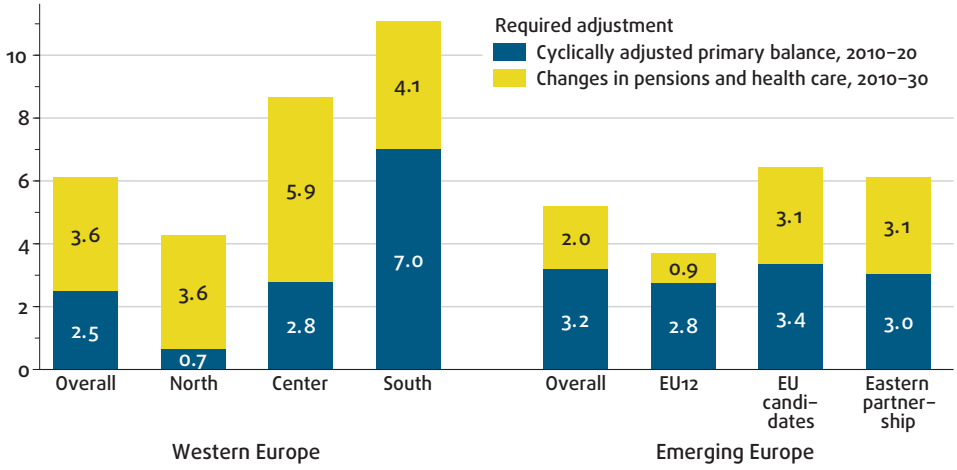
From distinct to distinguished

In 2007 An East Asian Renaissance, a report by the World Bank, introduced the notion of the "middle-income trap" (Gill and Kharas 2007). It was about why countries seem to easily grow from low per capita income levels to middle income, but find it difficult to become and remain high-income economies. Later research identified about two dozen countries that have grown from middle income to high income since 1987. Some had discovered oil, like Oman and Trinidad and Tobago. But this can hardly be a development model for others to emulate, because it is a matter more of providence than policy. Some, like Hong Kong SAR, China; Singapore; and Republic of Korea, had translated peace into prosperity through export-led strategies that involved working and saving a lot and sometimes postponing political liberties for later. They had to be aggressive, like tigers, looking out only for themselves.

But of the countries that have grown quickly from middle-income to high-income, half—Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Malta, Poland, Portugal, the Slovak Republic, and Slovenia—are in Europe. If you can be a part of the formidable European convergence machine, you do not need to be extraordinarily fortunate to become prosperous nor—like the East Asian Tigers—do you have to be ferocious. You just have to be disciplined.

Figure 19: Western Europe has to reduce fiscal deficits by 6 percent of GDP, emerging Europe by less

(illustrative fiscal adjustment needs, 2010–30, percentage of GDP)



Note: The fiscal impacts of aging on pensions and health care systems are missing for EU candidate and eastern partnership countries. For this exercise, the sum of adjustment in health care spending is assumed to be the same as for the new member states. The adjustment in pension related spending is assumed to be the same as that for Southern Europe. Western Europe comprises Denmark, Finland, Iceland, Norway, and Sweden (North); Austria, Belgium, France, Germany, Ireland, Luxembourg, the Netherlands, Switzerland, and the United Kingdom (Center); Greece, Italy, Portugal, and Spain (South). Overall Western Europe contains all the countries belonging to these three groups. Overall emerging Europe includes all countries from EU12, EU candidates, and eastern partnership.

Source: Calculations by staff of the Institute for Structural Research in Poland and the World Bank, based on IMF WEO; see chapter 7.

The inability of this convergence machine to continue to deliver rapid growth and an improved quality of life in the advanced economies of Western Europe has been recognized for some time. Europe's policymakers have put together protocols and commitments to encourage innovation and dynamism. Policies that were a core component of Europe's postwar growth model—or those that evolved from it—are not giving European economies enough flexibility to take advantage of new technologies that have led to high productivity growth in Asia and North America during the last 15 years. It is not that European product market regulation and employment protection became more stringent over time; they just became more costly.

The Western European model that so effectively enabled catch-up has created "afterglow" institutions that are hindering growth in a different age—an era of greater competition abroad and big demographic shifts at home. These institutions now need updating. In the states aspiring to become part of the machine, notably the candidates, potential candidates, and the Eastern Neighborhood, the afterglow structures will probably not preclude the benefits that come from greater economic union. In the new member states too, these institutions may not yet prevent productivity gains if their ties with advanced Europe become stronger and sophisticated. In the western economies, the structures must quickly be made more flexible. Convergence to a rigid core may soon become unappealing.

The European Union has a growth strategy, Europe 2020, which recognizes this imperative. Not all of the 45 countries covered by this report are in the European Union, but most share the aspirations of Europe 2020: economic development that is smart, sustainable, and inclusive. Europe's way of life—and its growth ambitions—put a premium on combining economic dynamism with environmental sustainability and social cohesion.

Europe's economic model is already more environment-friendly than most. It has made production cleaner than any other part of the world except Japan, and will become the lowest per capita emitter of carbon dioxide by 2020. But it is still the largest importer of emissions (embedded in imported products—figure 20), polluting not as much through production as by proxy. Europeans will need to do more on the consumption side to be considered truly green. It is a testament to European ideals that Europe is willing to pay the most to avert global warming while it is likely to be damaged least. There is reason to believe that Europe's economic model can become greener without unduly sacrificing growth: Germany, France, and Sweden may already be showing the way.

Social cohesion is the cornerstone of Europe's economic model, but this aspiration must be realized in ways consistent with sound economic principles. It can be, because Europe has three priceless assets: the European Union's single market, a momentum for regional integration, and the global influence that comes from being the generator of one-third of the world's annual output. Inclusive development will be a natural outcome of measures to deepen the single market, expand the scope of regional economic integration, and preserve Europe's global influence (chapter 8).

This will require adjustments in all of the European economic model's six components. The rules to guide policymakers—adapted from Phelps (1966)—might look something like the following:

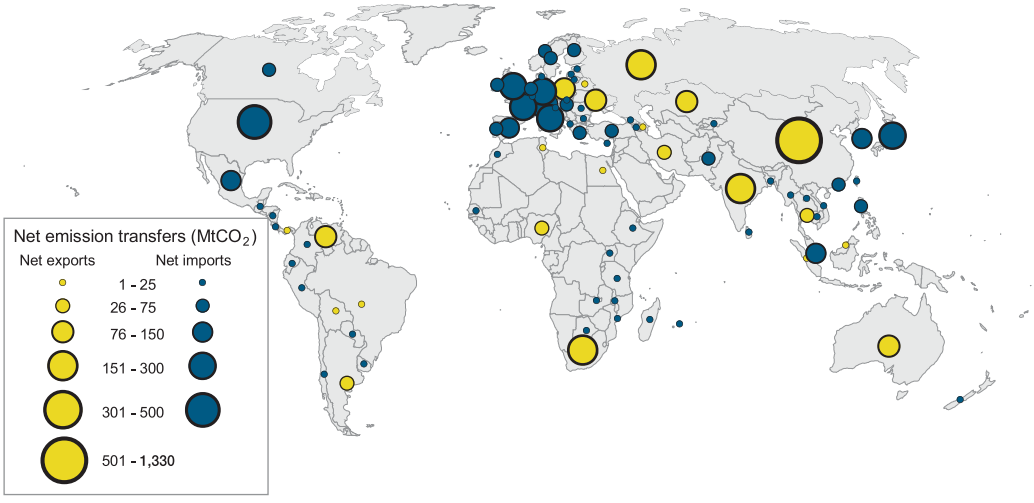
- Extend the benefits of freer trade to those outside the European Union. Enlargement has made Europe stronger, and economic integration should be continued toward the east. The single market can be made deeper and wider at the same time.
- Borrow from abroad only for investment. In Europe, where foreign finance has been used for private investment, it has fueled growth and convergence. But relying on foreign capital to finance consumption makes economies everywhere more vulnerable than dynamic.
- Provide enterprises with the freedom to start up, grow, and shut down. Efficient regulation of enterprise trusts but verifies, makes compliance easy but punishes violation, and assesses risks and concentrates resources where risks are highest.
- Use public money to catalyze private innovation, not substitute for it. Effective innovation policy sets the table for innovators to thrive by supporting inventions, mobilizing finance, and bringing the power of choice and the resources of business into Europe's universities.
- Design labor laws to treat insiders and outsiders more equally. Regulations should not favor either those with jobs or those without. Seeing labor as a fixed lump to be divided among workers leads to poor rules for regulating work.
- Consider government debt mainly as a way to finance public investment. With high debt levels and modest growth prospects, public finance should be premised on the expectation that future generations will not be much wealthier than today's. Social protection, social services, and public administration should be financed with taxes and contributions, not sovereign debt.

Figure 20: Greening production but not consumption

(net CO_2 emission transfers [territorial minus consumption emissions], 2008)

Note: $MtCO_2$ = million tons of carbon dioxide.

Source: World Bank staff, using data from Peters and others (2011); see spotlight 2.

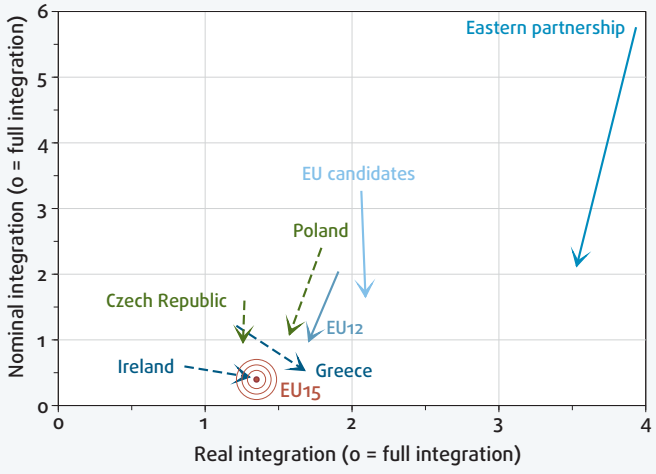


European economies do not have to become North American or East Asian to keep to these rules. But Europe might learn a few lessons from them. From North Americans, Europe could learn that economic liberty and social security have to be balanced with care: nations that sacrifice too much economic freedom for social security can end up with neither, impairing both enterprise and government. To get this balance wrong could mean giving up Europe's way of life and its place in the world. From the Japanese, the Koreans, and the Chinese, Europe might learn that while the gifts of prosperity and longevity arrive together, they have to be unbundled: being wealthier means that Europeans do not have to work as hard as before, but living longer means having to work more years, not fewer. To do otherwise unjustly burdens future generations, and violates growth's golden rule.

Europeans can of course learn the easiest and most from each other. The countries in Europe that have instituted policies manifesting both cultural maturity and economic discipline have shown how a distinct growth model can be made distinguished (table 2).

Box figure 1: More monetary and financial than real integration in Europe during the last decade

(arrows begin in 1997 and end in 2008; the origin indicates complete nominal and real integration)



Note: The figure shows the extent of economic integration, using the theory of optimum currency areas (Mundell 1961). The vertical axis combines in one index of dissimilarity three indicators of nominal integration—volatility of exchange rates, convergence in inflation rates, and convergence in interest rates. The horizontal axis does the same with three indicators of real integration—extent of synchronization in business cycles measured by indices of industrial production, trade integration, and per capita income. The origin in the figure represents perfect economic integration, and the arrows show the integration path of each country or group of countries in 1997–2008. EU candidates are represented by Croatia and Turkey; the eastern partnership countries by Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine; and the EU's new member states by Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia.

Source: Sugawara and Zalduendo 2010.

Box 1: The unmet precondition of the common currency—labor mobility

The September 1961 volume of the American Economic Review might well be the most influential issue of an economic journal ever. A dozen or so pages after the article on optimum growth paths by Phelps is a short communication from Robert Mundell that outlines a theory of "optimum currency areas." It states the conditions that the countries in a monetary union had to have—or quickly institute—to share a single currency profitably. In practical terms, it meant ensuring that the single currency should not lead to persistently high unemployment rates in some parts of the monetary union, nor to unacceptably high rates of inflation in others. In 1999, Mundell was awarded the Nobel Prize for "his analysis of monetary and fiscal policy under different exchange rate regimes and his analysis of optimum currency areas."

The conditions for a successful monetary union identified in the 1961 article can be distilled to mobility of labor and capital among the member states. To understand why, imagine a fall in economic activity in one part of the union (say the south) and a rise in another (say the north). This would cause unemployment to rise in the south, and inflationary pressures and balance-of-payments surpluses to increase in the north. If the central bank increases the money supply, it might help the south but would aggravate inflation in the north. If it does not, high unemployment in the south would cause suffering. But if capital and labor were quick to move within the monetary union, the dilemma would disappear.

For a practical application of his ideas, Mundell chose Western Europe, presaging today's debates about the euro. "In Western Europe the creation of the Common Market is regarded by many as an important step toward eventual political union, and the subject of a common currency ... has been much discussed. One can cite the well-known position of J. E. Meade, who argues that the conditions for a common currency in Western Europe do not exist, and that, especially because of the lack of labor mobility, a system of flexible exchange rates would be more effective in promoting balance-of-payments equilibrium and internal stability; and the apparently opposite view of Tibor Scitovsky who favors a common currency because he believes that it would induce a greater degree of capital mobility, but further adds that steps must be taken to make labor more mobile and to facilitate supranational employment policies."

The introduction of the euro undoubtedly increased capital mobility in the eurozone; one can reasonably expect a single currency to greatly facilitate financial integration. The single currency undoubtedly also facilitated the exchange of goods. But a single currency cannot by itself increase people's mobility. This requires states to harmonize labor regulations, education and training arrangements, and social security and welfare systems. Growing goods trade in the eurozone may reduce the need for labor mobility, but trade in services—now three-quarters of Western Europe's output—itself often requires movement of people. So does keeping manageable unemployment differences among countries.

In the decade before the global financial crisis, European economic integration showed impressive progress. But for many countries, the progress was unbalanced (box figure 1)—more rapid in financial areas (interest rates and inflation) than in real sectors (trade and incomes). It was more balanced for the new member states. Poland, for example, became more integrated in financial and real terms. The EU candidate countries (represented here by Croatia and Turkey) experienced just financial integration. But while integrating in monetary and financial aspects, Greece became less integrated within the EU15 in real terms.

Labor mobility in Europe is the lowest in the developed world. Mundell's communication 50 years ago suggests that this will be a serious problem for the eurozone. Increasing labor mobility may be a privilege in Europe, but it is a prerequisite in the eurozone. Countries that integrate their labor markets will be able to share a single currency profitably. Others will have to deal with stressful tradeoffs between inflation and unemployment.

Source: Mundell 1961; Sugawara and Zalduendo 2010.

Notes

1 Phelps, Edmund. 1961. "The Golden Rule of Accumulation: A Fable for Growthmen," The American Economic Review, Vol. 51, No. 4. (September, 1961), pp. 638-643.

2 Among the economists were Maurice Allais, Tjalling Koopmans, Joan Robinson, John von Neumann, Robert Solow, and Trevor Swan.

3 von Weizsäcker, Carl Christian. 1962. Wachstum, Zins und optimale Investitionsquote, Tübingen (Mohr-Siebeck), 96 pages.

4 The report covers 45 countries: the 27 member states of the European Union, 4 countries in the European Free Trade Association (Iceland, Liechtenstein, Norway, and Switzerland), 8 candidate and potential candidate countries (Albania, Bosnia and Herzegovina, Croatia, Kosovo, the former Yugoslav Republic of Macedonia, Montenegro, Serbia, and Turkey), and 6 eastern partnership countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine).

Table 2: 30 questions, 30 answers

Chapter 1: The European growth model

What makes the European economic model unique?

- The principal components of Europe's growth model—trade, finance, enterprise, innovation, labor, and government—are organized in unique ways.

Have changes in Europe and the rest of the world made a new economic model necessary?

- Sluggish productivity growth, a declining workforce, and growing fiscal imbalances have revealed weaknesses of the European economic model, and the entry of a billion Asian workers into the global market is adding to the stress.

Which parts of the European model should be preserved, and which changed?

- Many changes are needed in how governments and labor markets are organized. Fewer changes are needed to foster innovation, productivity growth, and job creation by enterprises, and fewer still to improve finance and trade in Europe.

Chapter 2: Trade

Is "Factory Europe" as dynamic as "Factory Asia"?

- Factory Asia is growing faster, but goods trade in Europe is more sophisticated.

Is the Single Market for Services underachieving compared with the United States?

- The single market is working quite well for traditional services such as travel and transport, but it is underperforming in modern services such as insurance, information technology, and other business services.

Is the Common Agricultural Policy compromising Europe's global leadership?

- The European Union's agricultural policies hobble the extension of the single market to its neighbors, and Europe is missing an opportunity to improve the lives of 75 million people in the eastern partnership countries.

Chapter 3: Finance

Why is finance in emerging Europe different from other regions?

- The prospect of membership in the European Union exerts a powerful policy and institutional pull, making Europe unique and strengthening the link between foreign savings and economic growth.

How did some European economies benefit more from international financial flows than others?

- European economies that managed to "boom-proof" public finances and "crisis-proof" private financing without resorting to the costly self-insurance seen in Asia benefited from foreign financial flows.

Is there evidence of a "debt overhang" in emerging Europe that reduces growth and justifies government intervention?

- In emerging Europe, treasuries, enterprises, and households do not face a debt overhang, but in the eurozone's periphery this problem is acute, posing a danger for banks everywhere.

Chapter 4: Enterprise

What does Europe expect from its enterprises?

- Workers expect enterprises in Europe to create jobs, shareholders to generate value added, and governments to bring in sizable export earnings.

How have European firms done in an enlarged Europe?

- In most parts of Europe, firms have taken advantage of greater regional integration to decentralize production, attract foreign investment, and expand the markets for their products.

Why did some parts of Europe do better than others?

- In Western and Eastern Europe, industrial structures were better suited for a single market; Southern European enterprises have been slower to offshore activities and to attract foreign investors.

Which government policies help enterprises do better?

- In advanced European economies, many governments have to streamline regulations to make doing business easier; in emerging Europe, most have to improve infrastructure and credit as well.

Chapter 5: Innovation

How much does Europe's innovation deficit matter?

- Europe's innovation deficit matters most for the EU15, and so it also matters for the economies of emerging Europe because they are closely integrated.

Why does Europe do less R&D than the United States, Japan, and the Republic of Korea?

- European enterprises do less R&D than American firms because they tend to be in sectors that are not as innovation-oriented.

What are the special attributes of a successful European innovation system?

- The most innovative European economies such as Switzerland spend a lot on R&D, but also share key attributes with the United States—tight business–university links, good management skills, and top universities.

What should European governments do to increase innovation?

- Measures to fully integrate the Single Market for Services will provide the scale, more privately funded universities will supply the skills, and regulations that foster competition will create the incentives for European enterprises to innovate.

Chapter 6: Labor

Is there a European work model?

- European economies generally have more stringent employment protection and more generous social benefits than their peers in North America and East Asia.

Given demographic changes, how can Europe achieve a stable and more productive workforce?

- Increased participation can help stem the decline of the workforce, but more competition for jobs, greater mobility within Europe, and measures to attract global talent will still be necessary.

Are employment and social protection practices inhibiting labor participation and efficiency?

- Employment protection gives too much power to those with jobs while banishing others to the fringes of the labor market, and generous social benefits weaken the incentives to work.

Is Europe taking full advantage of the benefits associated with internal labor mobility?

- Migration among and within countries in Europe is still low, and even intra-EU migration falls short of the European Union's aspiration of a fully integrated labor market.

How can Europe become a global magnet for talent?

- Europe needs an approach to global talent with policies that link immigration to labor markets, and a business climate that rewards skills and entrepreneurship.

Chapter 7: Government

Are governments in Europe bigger than elsewhere?

- Governments in Europe spend about 10 percent of GDP more than their peers, and this is almost entirely because they spend more on social protection.

Is big government a drag on growth in Europe?

- Controlling for other differences, European economies with government spending greater than 40 percent of GDP have had much lower growth rates during the last 15 years.

If big government impedes growth, how do countries such as Sweden do so well?

- Countries like Sweden have big governments, but they deliver high-quality social services, make it easy for citizens and enterprises to comply with taxes and regulations, and have high levels of social trust.

How can governments be made more efficient?

- Countries where government works have made their bureaucracies leaner, fiscal institutions more reliable, public services competitive, tax administration effective, and citizens more empowered.

Should fiscal consolidation be a top policy priority in Europe?

- To respond to market pressures and aging populations, almost every country in Europe must make big fiscal adjustments to reduce public debt to precrisis levels.

Chapter 8: Golden growth

How can Europe make the single market more efficient?

- Greater labor mobility and more uniform national regulations for modern business services are making the single market more efficient.

How can Europe maintain the momentum for regional economic integration?

- Sustaining economic integration requires making the single market efficient, crisis-proofing financial flows, and facilitating production networks through improved public services in emerging Europe.

What is needed to maintain Europe's global leadership?

- To remain a global economic leader, Europe has to sustain regional integration, reduce public debt, reform social security, revamp employment protection laws, and institute policies to attract talent from around the world.

Source: Chapters 1–8.

Spotlight One

Europe—convergence machine

Economic growth has helped Europe rise from the devastation and misery of World War II to unprecedented wealth, technological sophistication, and the world's best quality of life. Since the war, Western Europe's output has tripled and Eastern Europe's doubled. The European Union, itself an unprecedented achievement, is in many ways the world's largest economy. European societies have developed market-based systems combining high levels of economic activity with equity and social inclusion.

Growth rate

1950 to 1973

Western Europe converges toward the living standards of the United States

1974 to 1993

Northern and Southern Europe converge toward the income levels of Continental Europe

1994 to 2010

Eastern Europe converges toward the incomes and institutions of Western Europe

Annual average growth of GDP per capita, percent

< 0.9 | 1 – 1.9 | 2 – 2.9 | 3 – 3.9 | > 4

These developments are all the more remarkable when considering the poor conditions—social, political, and economic—that prevailed at the end of what has been called Europe's second Thirty Years' War. From 1913 to 1950, the continent's growth rate was half its long-run trend. Europe entered the twentieth century as the richest region in the world, but by mid-century, retaining this distinction was anything but assured. Fewer than six decades later, however, an American economist would write:

> *In the second half of the twentieth century, the lives of Europeans were transformed beyond recognition. In 1950, many of the continent's residents heated their homes with coal, cooled their food with ice, and lacked even rudimentary forms of indoor plumbing. Today, their lives are eased and enriched by natural-gas furnaces, electric refrigerators, and an array of electronic gadgets that boggles the mind. Gross domestic product per capita, what the income of a typical resident of Europe will buy, tripled in the second half of the twentieth century. The quality of life improved even more than suggested by this simple measure. Hours worked declined by one-third, providing an enormous increase in leisure time. Life expectancy lengthened as a result of improved nutrition and advances in medical science* (Eichengreen 2007, p. 1).

By 2008, on the eve of the financial crisis, Europe was the envy of the world. The United States had the might and China the momentum, but Europe had the highest living standards. Even with average incomes about a quarter short of the United States's, Europe had become the "lifestyle superpower" that in 1992 Prime Minister Kiichi Miyazawa had promised to make Japan. Millions of people from around the world flocked to Europe to see this economic miracle and taste European life (figure S1.1).

This six-decade run of prosperity breaks neatly into three periods—each about two decades long—of changing economic growth patterns:

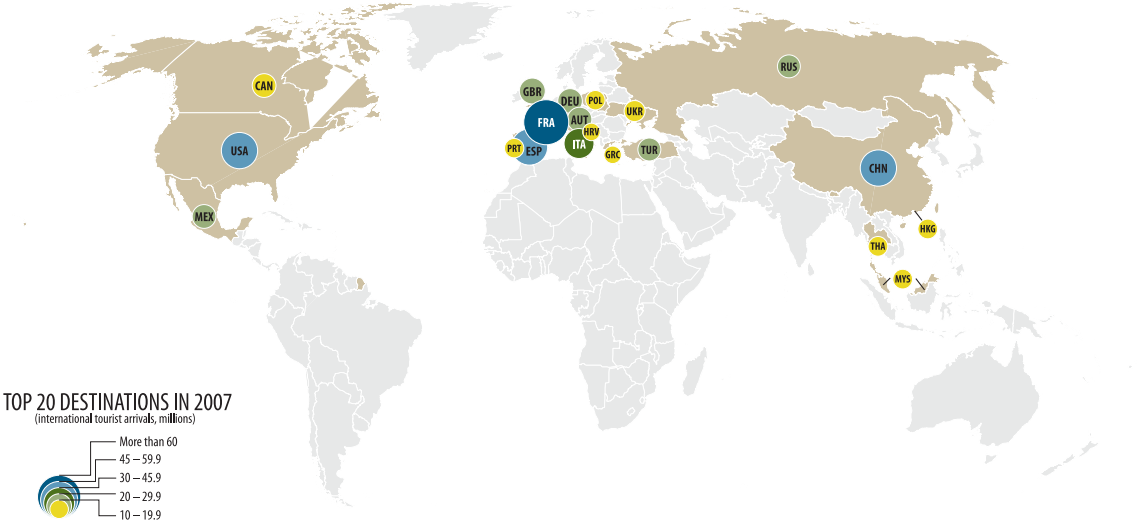
- From 1950 until 1973, Europe exhibited historically high rates of economic growth, nearly full employment, and convergence to the United States. This period of accelerated growth—a "Golden Age" in Western Europe and a "Silver Age" in centrally planned Eastern Europe—ended for most of the continent in the early 1970s (Crafts and Toniolo 1996).
- From 1974 until 1993, Northern and Southern Europe continued to converge to the levels of living in Europe's core. Yet despite continued growth, Europe's largest economies stopped catching up to the United States, the world's technology leader. Meanwhile in the east, growth first slowed and then collapsed along with the Berlin Wall and central planning during the early 1990s.
- With the signing of the first EU Association Agreements by countries in Eastern Europe in 1994, growth accelerated quickly in the east until the economic crisis in 2008. Convergence proceeded across the continent. This period saw more than a decade of convergence in living standards in the 12 new EU member states and the 8 Balkan economies aspiring to join them. In the south, convergence was reignited during this period, though at a slower pace than in the east.

These patterns evolved alongside, and were influenced by, growing economic cooperation across Europe. Beginning with the 1949 Council for Mutual Economic Assistance in the east and the 1950 European Payments Union in the west, the continent pursued near-constant—if not always linear—economic integration. Political integration eventually followed, resulting in a European Union that merged east and west. The impetus for these regional agreements was geopolitical, but the outcome was regimes that facilitated economic integration and growth, particularly in Western Europe.

Figure S1.1: Europe—the lifestyle superpower

(top 20 international destinations for tourists, 2007)

Source: World Bank staff, using data from the UN World Tourism Organization.



1950 to 1973: golden, with a silver fringe

Europe's growth from the first few years of postwar reconstruction until the oil crisis of 1973 was its fastest ever recorded. Growth in real GDP per person was over 3.5 percent in Western and Eastern Europe and 4.5 percent in Southern Europe during this period (table S1.1). The average growth rate for all of Europe had not exceeded 1.5 percent in the previous 130 years. The expansion was even more remarkable because it came after four decades of subtrend growth below 1 percent caused by destruction and depression.

For the first time in the twentieth century, Europe outperformed the United States (which grew at 2.3 percent) and every other major economy except Japan. Growth in every European country save the United Kingdom exceeded U.S. growth. Labor productivity growth was 2 percentage points higher a year in the west and 8 points higher in the south. The top performers in Western Europe (Austria, Germany, and Italy), Southern Europe (Greece, Portugal, and Spain), and Eastern Europe (Bulgaria and Romania) had growth rates that exceeded U.S. rates by 2 percentage points or more. The gap in GDP per capita between Western Europe and the United States closed from 48 percent in 1950 to 28 percent in 1973. A similar pattern of convergence occurred in Southern Europe, with the gap closing from 79 percent to 65 percent over the same period. Slightly slower growth in Eastern Europe resulted in a slower pace of convergence with the United States, with the gap falling from 78 percent to 70 percent.

Table S1.1: Relentless growth in the United States, a miracle in Europe, and resurgence in Asia, 1820–2008

(average annual compound growth rates, GDP per capita, US$ 1990 Geary-Khamis PPP estimates)

Period	Western Europe	Southern Europe	Eastern Europe	Former Soviet Union	United States	Japan	East Asia	Latin America
1820–1870	1.0	0.6	0.6	0.6	1.3	0.2	–0.1	0.0
1870–1913	1.3	1.0	1.4	1.0	1.8	1.4	0.8	1.8
1913–1950	0.8	0.4	0.6	1.7	1.6	0.9	–0.2	1.4
1950–1973	3.8	4.5	3.6	3.2	2.3	7.7	2.3	2.5
1973–1994	1.7	1.9	–0.2	–1.6	1.7	2.5	0.3	0.9
1994–2008	1.6	2.7	4.0	4.2	1.7	1.0	3.9	1.6

Note: Regional aggregates are population-weighted. Western Europe refers to Austria, Belgium, Denmark, Finland, France, West Germany, Italy, the Netherlands, Norway, Sweden, Switzerland, and the United Kingdom. Eastern Europe refers to Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and Yugoslavia. Southern Europe refers to Greece, Ireland, Spain, and Turkey. After 1989, West Germany becomes Germany, and the data reflect the newly independent countries in Eastern Europe that emerge from Czechoslovakia and Yugoslavia.

Source: Maddison 1996; Conference Board 2011.

At the beginning of World War II in 1939, per capita GDP was about $5,000 in Western Europe and $2,000 in Eastern and Southern Europe. By contrast, per capita GDP in the United States was more than $6,500. By the end of the war in 1945, per capita GDP had fallen to $4,000 in Western Europe and to under $2,000 in Eastern and Southern Europe. But by the first oil price shock in 1973, per capita income was more than $12,000 in Western Europe, just under $6,000 in Southern Europe, and around $5,000 in Eastern Europe. Per capita income in the United States also grew, from $11,700 after the war to around $16,500 in 1973.

Europe's productivity surge was multifaceted. From an accounting perspective, much of the surge in the 1950s reflected higher labor productivity, originating in capital deepening and heightened total factor productivity. Factors of production destroyed or misallocated as a result of the war were allocated more efficiently, incorporating new technologies and improved scale economies.[1] Eichengreen and Vazquez (2000) describe a period of "extensive growth," driven by additions to the stock of labor and capital and helped by stable returns to capital and labor. By imitating U.S. production practices and importing American technology, European countries experienced further productivity growth.

Growth accounting reveals that in the 1960s labor productivity in most countries grew from both applying more capital ("capital deepening") and improving total factor productivity (largely "technical progress"; figure S1.2, panel A).[2] These patterns held across Western Europe and were even stronger in Southern Europe. By contrast, higher total factor productivity and (to a lesser degree)

more work drove the United States's comparatively slower growth. Europe, unlike the United States, had countries to rebuild after the war and reallocated labor accordingly. This was a time of "classical catch-up." Countries improved productivity by bringing unexploited technology into use rather than through innovation. Europe realized productivity gains by rebuilding destroyed capital and importing technology from the United States (Abramovitz 1986). After 20 years of war and economic depression, there was finally room for large productivity gains.

European countries also integrated into a relatively stable global economy. After World War II, policymakers tried to understand the sources of the global economic disorder of the 1930s and apply its lessons[3] A relatively liberal regime of international trade underpinned by fixed but adjustable exchange rates was one result. The Marshall Plan, which acted as a "structural adjustment" program and anchored postwar trade liberalization, may have initiated Europe's commitment to trade. The Marshall Plan may have even helped create the early formal mechanisms of European integration (De Long and Eichengreen 1993). Beginning with the European Coal and Steel Community in 1951 and the European Economic Community in 1958, formal agreements led to significantly expanding intra-European trade.

Europe's trade openness may have both triggered more efficient allocation of investment and accelerated technology transfer from the United States. International integration's importance is evident from growth patterns in Portugal and Spain, which were less closely integrated with other Western European countries until the mid-1950s and early 1960s. Spain saw no major acceleration until it entered technological aid arrangements with the United States in the early 1950s, and Portugal's growth rate doubled after it joined the Bretton Woods system in 1960.

In many countries, an "ever closer union" went hand in hand with a domestic political economy of growth that permitted high investment in those catch-up years (Eichengreen 1994). The social market economy led to moderated wage demands in exchange for commitments from firms to reinvest profits. The high postwar investment rates are derived from a complex network that bound labor's participation in firms' production and investment decisions with relatively generous unemployment benefits and limited industrial policy supports. Growth rates were lower in countries that did not strike these labor-firm bargains—such as the United Kingdom.

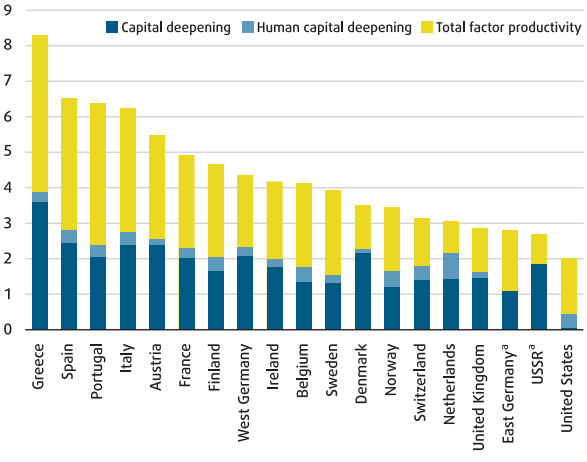
Despite a different economic philosophy, international integration proceeded apace in Eastern Europe. From a growth accounting perspective, the former Soviet Union's pattern was similar to that of other parts of Europe, with productivity growth driving much of the postwar boom. The high rate of capital accumulation in the former Soviet Union's postwar program did result in a large capital-deepening effect, though (Crafts and Toniolo 1996). Eastern Europe grew by different means: communism fueled an "extensive growth" driven by more labor and capital instead of improved technology or efficiency. But multifactor productivity—crudely estimated since the data are deceptive—was lower in the communist countries than in any economy in Western Europe, even when compared with countries with similar per capita income levels, such as Ireland or Italy (Crafts and Toniolo 2008).

1974 to 1993: convergence in the north and south, collapse in the east

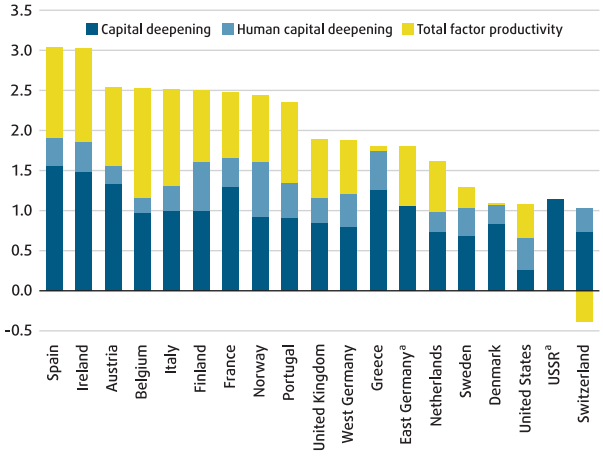
Rapid postwar growth ground to a halt in the early 1970s. The slowdown was widespread and affected market and socialist economies alike. Growth rates across developed and developing economies were at least 2 percentage points lower from 1973 to 1990 than from 1950 to 1973 (table S1.1). The collapse of the Bretton Woods international monetary system and the first oil price shocks

Figure S1.2: Decomposing the growth in worker productivity

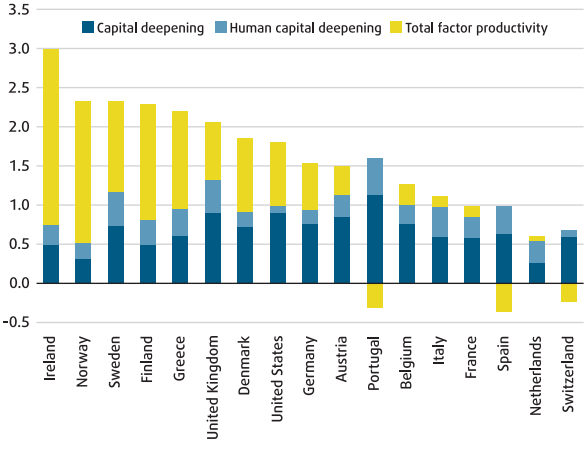
A. Big postwar increases in productivity, especially in the south, percent, 1960–70



B. Productivity growth weakens across Europe, but outstrips the United States, percent, 1970–90



C. Productivity growth drops below the United States, except in Northern Europe, percent, 1990–2003

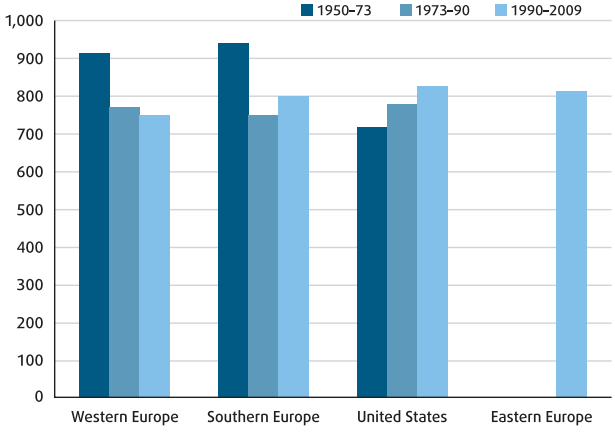


* Data on human capital deepening are not available.

Source: Crafts and Toniolo 1996 and 2008.

Figure S1.3: Europeans work fewer hours while Americans work more

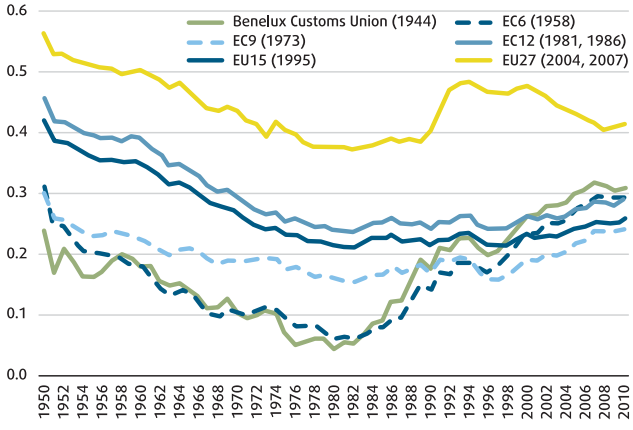
(annual hours per worker, 1950–2009)



Source: Conference Board 2011.

Figure S1.4: Convergence until the 1980s, divergence since

(coefficient of variation of GDP per capita in Europe, 1950–2010, US$ 1990, Geary Khamis PPP estimates)

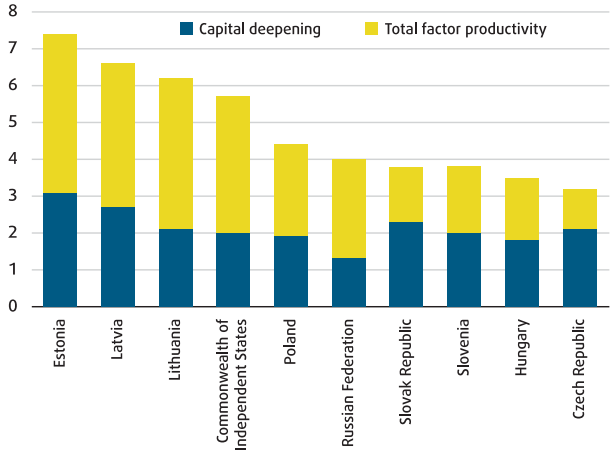


Note: The aggregates illustrate the EC or EU membership for the identified period regardless of whether that unit has been created or not. For example, the EU27 reflects data for Eastern European countries for 1950, though these countries did not join the European Union until 2004 or 2007. The aggregates reflect West Germany until 1988 when a unified Germany is added in its place.

Source: World Bank staff calculations, based on Conference Board (2011).

Figure S1.5: Big increases in productivity during the transition, especially in the former Soviet Union

(decomposition of labor productivity growth, percent a year, 1990–2006)



Source: Iradian 2007.

were associated with the interruption of the rapid trajectory of total factor productivity growth across Europe. Growth in the west fell from almost 5 percent in 1973 to 1.5 percent in 1974, and has yet to surpass 3.5 percent. The driver of the postwar boom—improved factor productivity—weakened across the region, along with capital accumulation and improvements in workers' skills (figure S1.2, panel B). Every country experienced declines in total factor productivity growth.

Even so, from a longer historical perspective, growth in Western Europe was reasonably impressive, averaging 1.7 percent over a 20-year stretch. But convergence to U.S. income levels stopped. In 1982, Western Europe's per capita income was about 77 percent of the United States's. By 1990, it was 72 percent and by 1999, 69 percent. Although the United States also saw an interruption in growth that slowed productivity increases, it continued to accumulate capital and improve skills. Once again, Western Europe was falling behind the United States. The prospective cohesion countries were a bright spot. Since 1945, Southern Europe—the poorest part of noncommunist Europe—has consistently grown faster than the rest of Western Europe. The prospect of membership in the European Community generated incentives for structural reform. Southern Europe grew at an average annual rate of 2.3 percent, compared with less than 2 percent in Western Europe. Yet, even in the cohesion countries, growth dropped off steeply.

The decline in Eastern European performance over this period was even steeper. Growth averaged just 0.8 percent in Eastern Europe and 0.9 percent in the former Soviet Union from 1974 until the end of central planning in 1990. During this period, the Soviet economy experienced an enormous decline in labor productivity, and total factor productivity growth may have even been negative over this period. Central planners ploughed back the earnings of large enterprises: investment-to-GDP ratio doubled from 1950 to 1970 while the capital stock grew 8.5 times. But the inefficiencies of heavy industrialization and forced capital accumulation became apparent by the 1970s (Crafts and Toniolo 2008). The collapse of central planning resulted in a free fall in output, and annual average compound growth from 1990 to 1993 was –3.5 percent in Eastern Europe and –6.5 percent in the former Soviet Union.

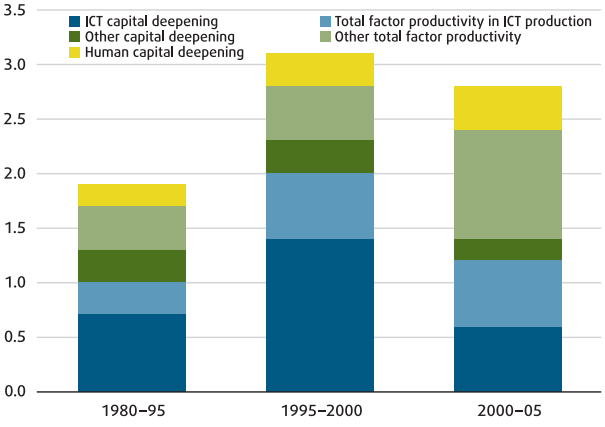
Perhaps the simplest explanation for this decline across Europe is that the inputs for catch-up growth had been exhausted. As the technology gap between the United States and countries such as France and Germany narrowed, the low-hanging fruit of imported productivity gains was plucked. Southern and Northern European countries that were slower to integrate into the European economic system benefited from productivity growth somewhat longer; they still had room to catch up to advanced Europe and the United States. It is also possible that the domestic and international institutions that so successfully supported rapid growth in Western and Southern Europe locked in a growth model that became progressively less suited to a changed global economy. The institutions that had underpinned extensive growth based on capital accumulation and imported American know-how were less suited to the intensive growth requirements of the period after the early 1970s (Eichengreen and Vazquez 2000).

Figure S1.6: Productivity got a big boost from ICT in the United States, not so much in Europe

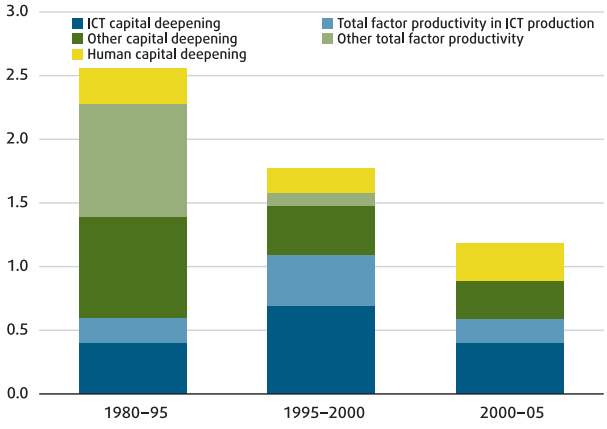
(contributions to labor productivity growth, 1980–2005, percent per year)

Source: van Ark, O'Mahony, and Timmer 2008.

A. Labor productivity went up in the United States in the mid-1990s—and stayed high



B. Labor productivity fell in the EU15, and ICT's boost was small



Among these outdated institutions were the mechanisms that facilitated a wage restraint and reinvestment consensus. As the potential for catch-up growth was exhausted, the demands for higher wages increased amid heightened union activity. And investment slumped. Whether this regime could sustain the existing rate of productivity, much less develop into a dynamic innovation engine, was questioned. The United Kingdom's relatively good performance during the 1970s and 1980s is sometimes attributed to the fact that it had not developed the same corporatist arrangements. The social market economy had started to show its weaknesses. It was good for countries catching up, but not for countries in the lead. It could take advantage of benign global conditions, but it would not adjust well to big changes in the world economy.

A range of labor market practices that may have dampened growth accompanied the postwar settlement. Two seemingly contradictory developments are particularly noteworthy. The gap in per capita incomes between the United States and Europe increased, but Europe continued to close the gap in labor productivity. The combination of a persistent gap in GDP per capita and increasing output per hour worked reflected a decline in work: lower labor force participation rates and a drop in working hours. Over time, Europeans have worked fewer and fewer hours than Americans (figure S1.3). In the 1950s, Western Europeans worked the equivalent of almost a month more than Americans. By the 1970s, they worked about the same amount. Today, Americans work an extra month compared with the Dutch, French, Germans, and Swedes, and work noticeably longer than less well-off Greeks, Hungarians, Poles, and Spaniards.

Put differently, the ratio of hours worked per capita fell from 127 percent in the west and 131 percent in the south in 1950–73 to 91 percent and 97 percent by 1990–2009. The lower opportunity costs of unemployment in a social market economy, longer holidays, and lower female labor market participation may explain this. Or it may simply be that Europeans value leisure more than Americans—chapter 6 further investigates this (Blanchard 2004). But the effects of Europe's declining work hours are clear: capital intensity increased as the slowing growth of labor led to a rise in real wages and a general substitution of capital for labor (van Ark, O'Mahony, and Timmer 2008). By the mid-1990s, many Western European countries had capital stocks per hour worked that were 10 percent higher than in the United States. When taken with the lower levels of multifactor productivity in Europe during this period, Europe's seemingly superior labor productivity performance is worrying. Its cause may lie not in innovative enterprises but in labor market rigidities resulting from the postwar consensus (van Ark, O'Mahony, and Timmer 2008).

1994 to 2009: convergence in the east

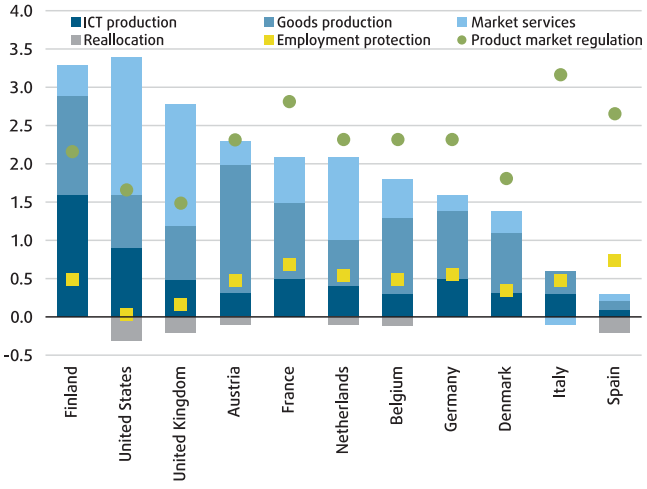
The general decline in performance from the 1970s gave way to considerable diversity by the 1990s. Output in Europe began to vary from the early 1980s and continued to do so through the 1990s and early 2000s, particularly in the west and south (figure S1.4). Between 1990 and 2009, Greece, Ireland, and the Netherlands experienced growth at or above 1989–2010 levels. By contrast, Denmark, Italy, and Switzerland experienced growth under 1.5 percent.

For most of Western Europe, catch-up with the United States continued to slow between 1990 and 2009. The average gap in per capita output was almost unchanged from 1973 to 2008 and closed at a diminishing rate in Southern Europe. In most European countries, labor productivity was below the United States's. Similarly, total factor productivity rates were lower in about three-quarters of European countries as European productivity continued to fall while the United States recovered. But again, the picture is varied. Denmark, Finland, Greece, Ireland, Norway, Sweden, and the United Kingdom had relatively rapid productivity growth during this period (figure S1.2, panel C).

In the newly independent countries of Eastern Europe, catch-up growth was based mainly on reallocating factors. After the massive collapse in output immediately after the end of central planning, Eastern Europe recorded faster GDP per capita growth than the rest of Europe and the United States. With the signing of the first EU Association Agreements in 1994 by Hungary and Poland, Eastern Europe began to integrate with the rest of Europe. This integration of markets and institutions propelled the convergence of east with west as Eastern Europe grew more than 4 percent from 1994 to 2008. Productivity growth reflected patterns from the Western and Southern European high-growth era and was driven by large total factor productivity gains, particularly in the Baltic

Figure S1.7: Policy affects the pace and composition of productivity growth

(sectoral contributions to labor productivity growth and regulatory burden, 1995–2004, percent per year)

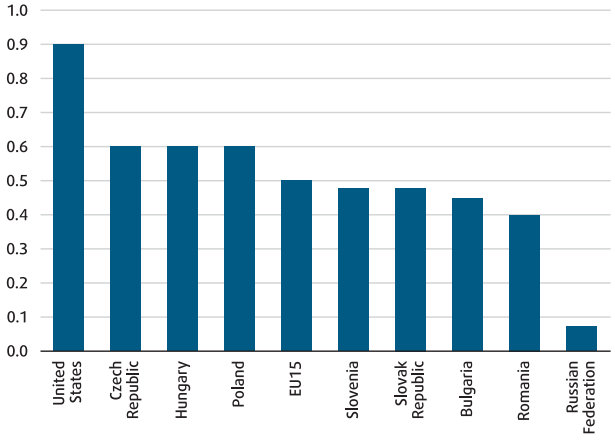


Note: The "Reallocation" identity reflects the effects of reallocations of labor among sectors. The underlying Employment Protection Index was transformed so that it ranges from 0 to 1, where higher values reflect higher levels of protection. The Product Market Regulation Index ranges from 0 to 10, where lower values reflect higher levels of regulation.

Source: Timmer, O'Mahony, and van Ark 2007 (for productivity data); Crafts 2006 (for Employment Protection Index); and Conway, Janod, and Nicoletti 2005 (for Product Market Regulation Index).

Figure S1.8: Information technology played a bigger role in Eastern Europe

(contribution of ICT to labor productivity growth, 1995–2004, percent per year)



Source: Alam and others 2008; Timmer, O'Mahony, and van Ark 2007.

economies (figure S1.5). The overindustrialization of the centrally planned economies had led to massive misallocations of labor, particularly in industry. The posttransition shift in workers from manufacturing to market services, small in the Soviet era, was major. From 1990 to 2005, the share of services in employment grew 16 percentage points in Eastern Europe and 9 percentage points in the former Soviet Union (Alam and others 2008). Eastern Europe and the former Soviet Union also benefited from some of the same gains from integration as Western Europe. Expanded trade and financial links between east and west anchored reforms at home, provided access to service and merchandise trade markets, and loosened the link between domestic savings and investment through capital flows.

The United States's ability to again outpace Europe in productivity growth reflected Europe's inability to adapt to structural changes in the global economy. Productivity growth in services and industry required information technology. In the mid-1990s, innovations in information and communication technology (ICT) produced a highly productive and capital-deepening sector with large positive externalities for improving productivity across the economy. Labor productivity growth shot up in the United States from 1980–95 to 1995–2000. Productivity enhancements in the ICT sectors and large gains in capital deepening were not the only benefit—multifactor productivity in other sectors also grew. These spillover effects continued to drive total factor productivity growth in the United States during the early 2000s when the initial burst of ICT-specific contributions to labor productivity began to diminish. By contrast, Western Europe's labor productivity fell steadily during this period, with considerably smaller share contributions from ICT. By the early 2000s, Western Europe faced almost no measured productivity growth (figure S1.6).

What explains the reemergence of the productivity gap between the United States and Europe? And why did new information technologies' power grow in North America but not in Europe? The components of the postwar

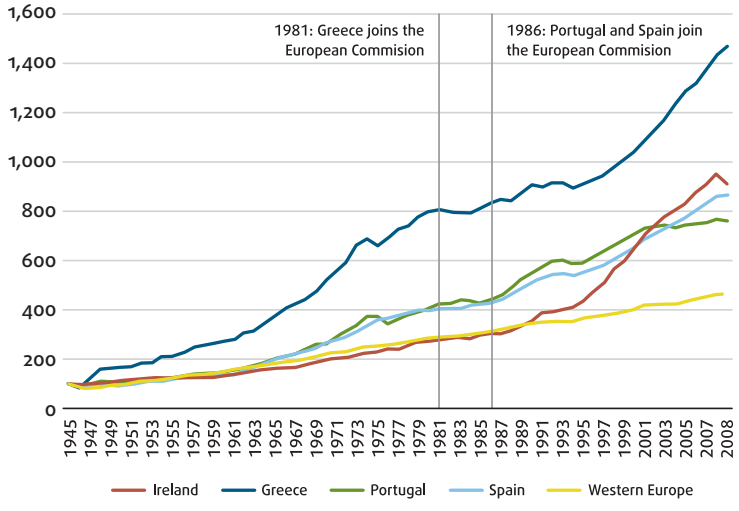


Figure S1.9: Growth has been greater in Europe's southern states

(growth in real GDP per capita, 1945–2008, 1945=100)

Note: Western European aggregate reflects a population-weighted average.

Source: Maddison 1996; Conference Board 2011.

European model that led to higher employment protection probably prevented the development and exploitation of new technology. Higher employment protection correlates with lower overall productivity growth and ICT deepening (figure S1.7).[4] Employment protections may deter investment in ICT equipment because practices central to developing this technology—such as flexible working and hiring practices—are more expensive (Gust and Marquez 2004).

The higher-performing Western European economies that regulated their labor markets more lightly (Finland and the United Kingdom) generated large ICT-related productivity gains. In Finland, these effects were even larger than those in the United States. Likewise, heavy-handed general product regulation may deter ICT capital investment, either directly or through a more general increase in costs.[5] Some of the Eastern European countries without the legacy of the Western European model were able to start from scratch and better exploit ICT (figure S1.8). Prospective EU member states should take note.

Afterglow

The nexus of political institutions and market practices that developed in Europe after World War II lifted the continent to the heights of global prosperity. European integration not only headed off conflict, but also anchored trade and factor liberalization that bound Europe and brought the world together. Modern Europe's most attractive feature may be the prospects it offers poorer countries. The European economic model has served as a "convergence machine," taking in low- and middle-income countries and helping them become high-income countries. The machine can even count the currently troubled EU15 southern states among its successes (figure S1.9).

The European convergence machine continues to anchor productivity-enhancing reforms and policy integration across Europe and even into Central Asia. But this machine cannot continue to deliver rapid growth and improved quality of life in the advanced economies of Western Europe. European policymakers have assembled protocols and commitments to encourage more innovation and dynamism. Yet, the policies at the center of Europe's postwar growth model are not flexible enough for European economies to benefit from the technologies that supported high productivity growth in the rest of the world over the last 15 years. As Crafts and Toniolo (2008) note, the problem is not that European product market regulation and employment protections became more stringent, they just became more costly. The Western European model so effective in supporting catch-up has created "afterglow" institutions that are hindering growth in a new era.[6]

In areas aspiring to become part of the machine—notably the Balkan states and the eastern partnership countries—Europe's afterglow structures will probably not preclude the many benefits of greater economic union. And as ties to advanced Europe become stronger and more sophisticated, the afterglow structures may not prevent productivity gains in the new member states. By contrast, these legacy structures must quickly become more flexible in Western Europe. Convergence to a rigid core will soon lose its appeal.

Bryce Quillin contributed this spotlight.

Notes

1 There are numerous studies that employ growth accounting approaches to understanding the components of economic growth in postwar Europe. Some landmark studies include Denison (1967) and Maddison (1987).

2 In this picture, human capital formation plays only a small role and it is not clear whether this reflects the tendency of growth accounting to underestimate human capital or whether the already high-quality human capital that persisted in Europe at the start of this period left little room for further contribution to productivity. See Crafts and Toniolo (1996).

3 Eichengreen (1994) makes the case for the domestic and international institutional underpinning of postwar growth.

4 In a model fit with ordinary least squares: OVERALL PRODUCTIVITY GROWTH = 3.1 – 2.6 EMPLOYMENT PROTECTION INDEX (t = –2.0), where higher values on the employment protection index reflect higher levels of protection.

5 In a model fit with ordinary least squares: OVERALL PRODUCTIVITY GROWTH = 4.7 – 1.2 PRODUCT MARKET REGULATION INDEX (t = –2.4), where higher values on the regulation index reflect more stringent regulation.

6 The term "afterglow" is here adapted from some political science literature to refer to institutions and obligations that governments continue to support even after such policies may no longer appear rational. For other applications of the term and concept see Lake (1993).

Spotlight Two

Greening Europe's growth

Europe's success in adopting an environmentally sustainable growth model depends on companies developing cutting-edge products, generating jobs at home, and competing successfully abroad. Gamesa, a Spanish wind turbine manufacturer, is considered a European green growth success story.[1] Founded in 1976, the company moved into wind energy in 1994, and within 10 years it became the world's second-largest turbine maker. Gamesa's experience shows how growth comes with both opportunities and challenges.

Emissions

Past to 1990 **Present to 2008** **Future to 2030**

The maps show per capita CO_2 emissions from fuel combustion. 1990 and 2008 data by country are from the International Energy Agency's World Energy Outlook 2010. The 2030 map is based on an IEA scenario that limits atmospheric CO_2 concentrations to 450 parts per million (ppm), consistent with a global temperature increase of 2 degrees centigrade.

Very high High Medium Low

Three points stand out:

First, Europe's production is greening thanks to popular policies.[2] Consumption is becoming cleaner too, but less than one might think. Structural change plays an important role in these shifts. In much of Europe, the rise of high-tech companies making green products contrasts with an overall decline in manufacturing. Between 2000 and 2010, the manufacturing employment share in Spain dropped about 20 percent, while imports of consumer goods from China increased eightfold. Polluting industries left, reducing local emissions, but emissions embedded in products imported from China rose. Spain's net emissions imports increased almost fivefold between 1998 and 2008, similar to those of many other European countries (figure S2.1). For a truly green economic model, Europe needs even cleaner production, but it also needs cleaner consumption.

Second, green policies and investments will create growth opportunities for European countries, but not all countries will benefit equally. Ambitious national and EU policies, motivated by environmental and job-creation objectives, encouraged Gamesa to enter the wind turbine business. These policies created a large home market for Gamesa's products, which also helped enter export markets. By the mid-2000s, Gamesa had created more than 5,000 jobs, most of them in Spain. Besides Spain, Denmark and Germany were Europe's main wind turbine manufacturers, together accounting for more than half of global production by 2007. These countries used incentives to create domestic demand and develop research and innovation capacity. As national green policies expand in Europe, will many countries see growth and jobs benefits? Or will such benefits be confined to a small group of early market leaders?

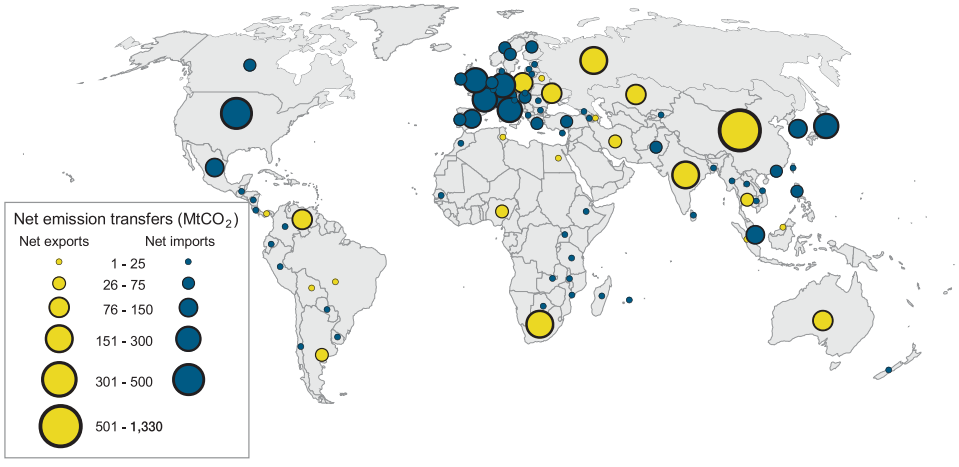
Third, some economic benefits of EU green policies will leak outside the European Union. This leakage is expected and should be welcomed. Addressing global environment imperatives requires that many countries contribute, especially the world's largest economies: the European Union, the United States, and China. Gamesa's experience is illustrative. In 2005, Gamesa held a third of the Chinese wind turbine market. Five years later, its market share was down

Figure S2.1: Europe is the world's largest importer of carbon dioxide

(net carbon dioxide emission transfers [territorial minus consumption emissions], 2008)

Note: $MtCO_2$ = million tons of carbon dioxide.

Source: World Bank staff, using data from Peters and others (2011).



to 3 percent. The company entered the Chinese market early, but as green technology became a higher priority for the Chinese government, preferences for domestic industry forced Gamesa to transfer know-how and technology to Chinese suppliers. Some of the policies that helped Gamesa in Spain—including local content requirements and cheap land and credit—now helped Chinese wind turbine manufacturers. Today, some of Gamesa's products are 95 percent Chinese, and 4 of the 10 largest wind turbine makers in the world are Chinese. Despite its shrinking market share, Gamesa's Chinese business grew, and the company did not protest Chinese policies. In 2010, Gamesa opened its fifth manufacturing facility in China, from where it now ships equipment to North America. While Gamesa dropped to sixth place among global wind turbine companies, its revenues increased from $1.7 billion in 2005 to $3.3 billion in 2009. During this time, globally installed wind energy capacity rose from 60 gigawatts to 160, and by 2010 reached almost 200. Helped by technological progress and economies of scale, the price for wind power dropped about 27 percent.[3]

Europe's efforts alone are not enough to tackle global environment problems like climate change. Green technology investments will happen sooner if global innovation and manufacturing networks are mobilized. Europe will not always be able to compete in mass-producing standardized green products. It will need to retain its strength in knowledge-intensive green services and technology and rely on cheaper production in places such as the EU12, the EU candidate and eastern partnership countries, and even in East Asia. If Europe succeeds, its growth model will not just be the best in the world in helping its poorer parts and neighbors prosper, it will also lead the world to a greener future.

The green golden rule

Environmental policies have been essential in Europe since the early 1970s (Hey 2005). They have been outlined in six environmental action programs and formalized in numerous directives.[4] Early policies focused on local environmental quality: highly visible but mostly reversible environmental problems that could be eliminated or reduced by strict emission and effluent standards, such as air and water quality. More recently, Europe has focused on environmental problems with less visible impacts but nonetheless severe and potentially irreversible effects. Global threats such as climate change, biodiversity loss, and nuclear waste now command Europe's attention.

This second type of environmental problem poses new challenges. These complex problems resemble other large societal problems, like poverty or public health, with long-term consequences and no easy solutions (Hulme 2009). There is great danger in postponing action until future welfare diminishes and the ability to manage or reverse harmful trends is lost. These long-term threats call for a "green golden rule"—achieve the highest level of growth and welfare that does not diminish future generations' ability to benefit from environmental goods and services.[5]

Considering the welfare of both current and future generations means that environmental policymaking must walk a fine line. Reducing carbon emissions, for instance, costs both firms and consumers. Given the uncertainty about the

effectiveness of policies and the impacts they avoid, determining the level of climate action that reduces emissions enough to avoid future damages without unduly affecting economic growth will be difficult. It implies determining the "optimal" or acceptable level of pollution—a controversial task.

Following the green golden rule, Europe has embarked on an ambitious program to ensure continuing growth with fewer environmental side effects. Policymakers still worry about employment, social stability, and fiscal balances, but protecting natural resources long considered practically free and inexhaustible is now prominent and, in some countries, just as important. If Europe overcomes the significant technical, financial, political, and social barriers to implementing a green economy, it will become a world model—one with lessons for both developed countries that urgently need to reduce their environmental impacts and developing countries that need to achieve higher incomes without excessive environmental degradation.

Greening

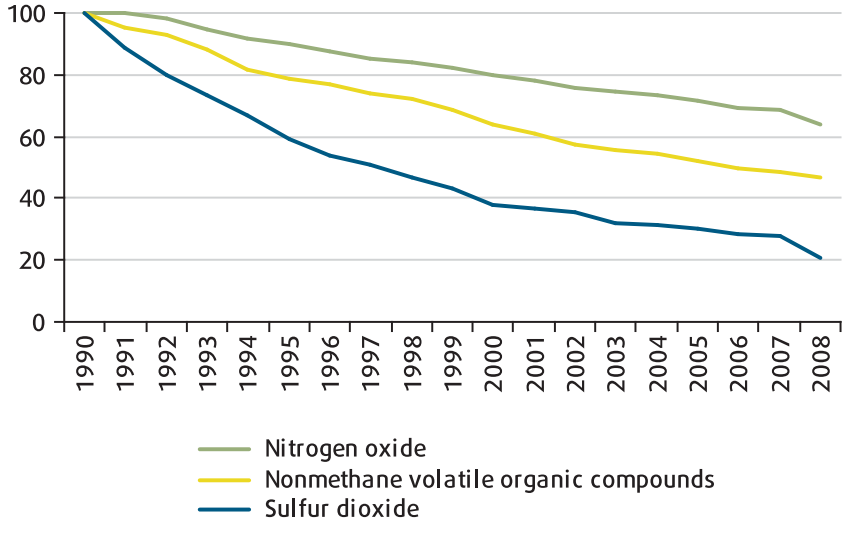
Over the last two decades, Europe has improved environmental quality in many areas and reduced the impacts of its production. Europe measures its environmental progress in climate change, environmental health, nature and biodiversity, and natural resources and waste. Major sources of local air pollution in the EU15 dropped 30–70 percent over 1990–2008 (figure S2.2). Organic water pollution dropped almost 20 percent since 1998, and fine particulate matter dropped 20 percent on average (European Environment Agency 2010). Despite a commitment to reduce waste generation and materials consumption, both have increased modestly, but far less than economic output. But Europe's progress on biodiversity conservation has been mixed. It did not reach its goal of halting biodiversity loss by 2010, despite making progress in habitat conservation and introducing biodiversity concerns in sector policies, such as the Common Agricultural Policy.

Figure S2.2: Advanced Europe has cut air pollution in half since 1990

(trends in air pollution in the EU15, 1990–2008, 1990 = 100)

Note: Excluding the United Kingdom (no pre-2000 data).

Source: European Environment Agency 2010.



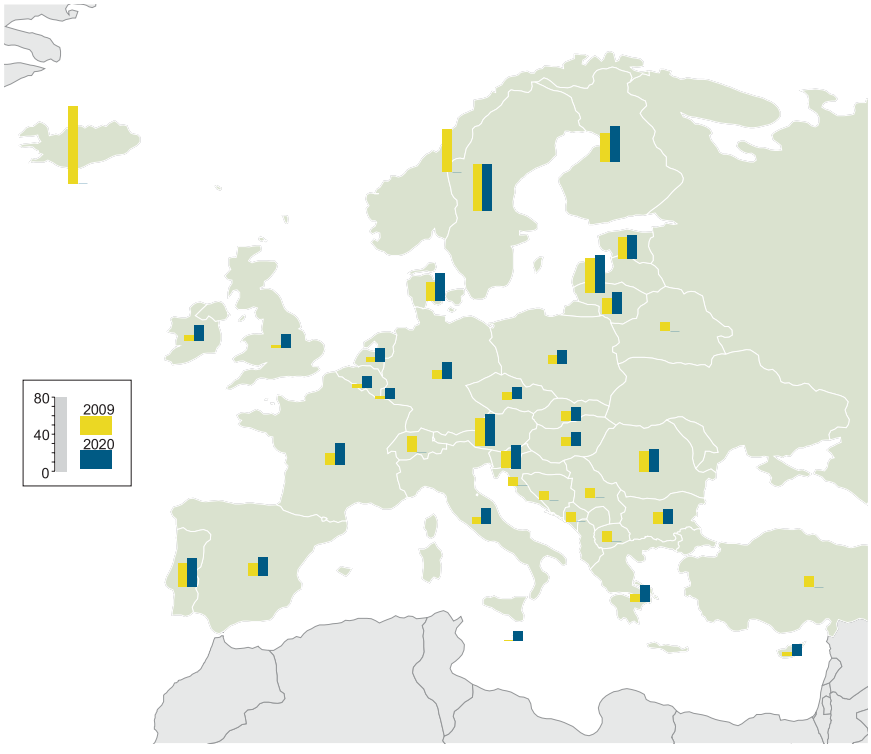


Figure S2.3: Europe's north is leading the push for cleaner energy

(percentage of final energy from renewables in 2009—and the targets for 2020)

Source: REN21 2011.

EU climate policies sometimes veer into micromanagement (a recent directive limits carbon dioxide emissions in producing a ton of toilet paper to no more than 334 kilograms), but they have been effective. While in most parts of the world, greenhouse gas emissions have increased, over 1990–2008 they dropped 7 percent in the EU15 and 11 percent in the EU27, despite a considerable increase in economic activity (European Environment Agency 2010).[6] Europeans are also using energy more efficiently. Europe's 2008 economic output per unit of energy was twice that in 1990. By further decoupling economic growth from energy use and emissions, the European Union is on track to achieve its climate policy goals for 2020: reduce greenhouse gas emissions 20 percent below 1990 levels, lower primary energy use to 20 percent less than "business as usual," and obtain at least 20 percent of energy from renewable sources. Some member states have already met some goals, for instance on renewable energy (figure S2.3). The targets are more ambitious for 2050, as the European Union aims for an 80 percent reduction in emissions.

These gains have come from popular policies. One instrument for climate action is the European Emission Trading Scheme, introduced in 2005. Despite criticism of the scheme's effectiveness and susceptibility to windfall profits and fraud, industries now know there will be a long-term price on atmospheric carbon emissions. The scheme encouraged private investments in abatement technology and upgrading equipment. Europeans have shown a willingness to share the cost of environmental action. Indeed, 64 percent of EU15 residents believe that protecting the environment should be a priority, even at the

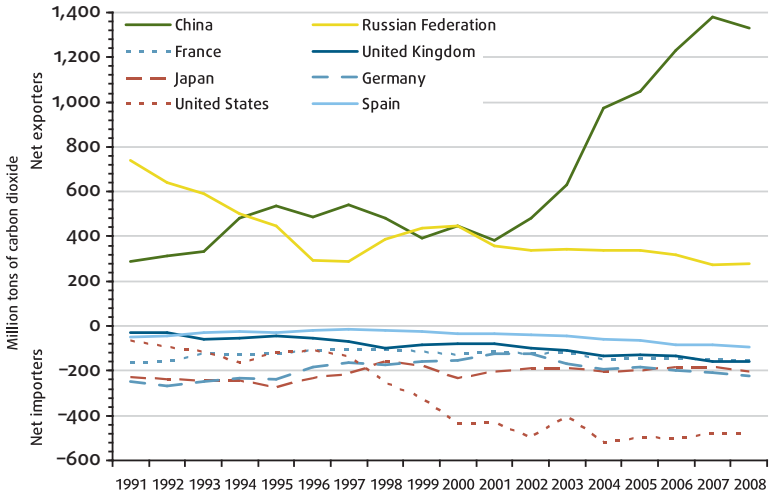
expense of job loss and slower economic growth, compared with 58 percent in the rest of the world (World Values Survey 2005–2008).[7] Environmental policies can win increased popular support by spreading financial benefits. Many Danish wind turbines are owned by local cooperatives, preempting "not-in-my-backyard" opposition. And feed-in tariffs for renewable electricity generation have been turning home-based solar systems into investment opportunities.

Europe's progress in reducing local air pollution and the climate impacts of production is substantial, but its gains in shrinking the environmental footprint of consumption are more limited. Lower industrial pollution is due at least in part to major structural economic shifts and trade expansion. As traditional, energy- and emission-intensive economic activities (such as iron and steel manufacturing) became uncompetitive in higher-wage European countries, they moved to other parts of the world, especially Asia. The EU15's total steel output has stagnated since 1980, when Europe moved into more specialized and cleaner steel production. By contrast, India's and the Republic of Korea's output increased some 600 percent, China's by almost 1,600 percent.[8] Europe's environmental dividend reduced local pollution from dirty industries and generally decreased use of local resources, a contrast with the increase in other regions.

Figure S2.4: Western imports, Eastern emissions

(net emission transfers, 1991–2008)

Source: Peters and others 2011.



Sometimes polluting industries quite literally moved to developing countries. In the late 1990s, Chinese companies purchased dozens of German industrial plants and dismantled, shipped, and rebuilt them in China. A Dortmund steel mill, for example, became a 250,000 ton three-dimensional puzzle (Kahn and Landler 2007). Air quality improved in Germany, but the shift increased air pollution in China (Chen, Hong, and Kan 2004).[9] Many Asian products are made for European markets, leading to rising emissions embedded in imports. Between 1990 and 2008, the United Kingdom's net imports of carbon dioxide emissions increased from 29 million tons to 159 million tons (figure S2.4). Overall, when considering only carbon dioxide emitted in rich (Kyoto Annex B)

countries, there has been a 3 percent drop. By contrast, consumption-related emissions in those countries increased 11 percent (Peters and others 2011).[10] China alone has more than tripled its exports of emissions since 2000.

Europe has made progress in greening its production and has led the world in formalizing and implementing regional emission-reduction policies. But more action is needed. Marginal abatement costs will increase as cheaper clean-up solutions are implemented first, and tightening environmental regulations will become politically more difficult, especially at a time of economic uncertainty. Beyond its borders, Europe needs to green its consumption. One approach is to help other countries reduce the environmental impacts of their production while accelerating resource use. The European Union, already providing technical assistance for pollution and emission control, recycling, and other environmental priorities through bilateral and multilateral efforts (including through the World Bank), could do more by supporting European exports of environmental technology and more efficient capital goods to developing-country producers, through export credit guarantees, for example. Measures that encourage green foreign direct investment would help develop domestic environmental technology firms.

A more coercive approach would be to extend the reach of European emission policies to other countries through border tax adjustments (Umweltbundesamt 2009). This would level the playing field for domestic companies, and foreign firms exporting to Europe would then have the same incentives to reduce emissions as do domestic producers. The debate about the inclusion of foreign air carriers in the European Emission Trading Scheme in 2012 shows that this approach is controversial, but it might encourage domestic carbon restrictions so that revenues stay in the exporting country. The European Commission and several European countries contributed to the World Bank–led Partnership for Market Readiness, which helps countries set up carbon markets. The first round of countries includes China, Turkey, and Ukraine.

Green growth

Moving toward a European economy that puts a price on environmental goods and services involves a substantial structural shift. Further reducing local pollution and preventing global environmental problems from severely affecting current and future generations require massive transformations in energy, transport, and housing. Some observers have called for an energy industrial revolution.[11] But change of this magnitude is not unprecedented. Both the information technology revolution and the invention of the steam engine triggered upheaval far greater than what one might expect from a green-growth transformation (Fankhauser, Sehlleier, and Stern 2008). An energy industrial revolution will impose costs on some businesses but benefit others. How these costs and benefits are distributed will determine whether green growth will be a broadly accepted economic model in the EU27 and beyond.

Tighter environmental standards will be costly, at least in the short to medium term. Unilaterally internalizing the cost of environmental degradation will render European firms less competitive than firms not subject to strict pollution controls. The money that consumers and firms spend on pollution charges or

energy will not be available to spend or invest elsewhere (though these costs can be partly neutralized through appropriate revenue recycling). Predicting these costs of green policies is difficult. The costs of a proposed carbon cap-and-trade system in the United States, for instance, would range from $69 to $808 per household by 2020 (Winchester and others 2010). A study for the European Commission estimated firm-level costs of environmental compliance at 0.25–2 percent of production value (Vercaemst and others 2007). In Poland, the average cost to implement a comprehensive greenhouse gas abatement package is about 1 percent of GDP over 20 years, after which net benefits accrue (World Bank 2011). These costs, though significant, are not enough to explain the exodus of energy-intensive and polluting industries out of Western Europe. High labor costs and other production factors have likely played a larger role. Energy prices are already high, and most EU15 countries moved out of energy- and emission-intensive industries some time ago, such as the United Kingdom, with its 1980s decline in the coal and steel industry. The impact will be larger in Eastern Europe, where economies have not yet completed structural shifts and where national environmental policies are more lenient.

Environmental action comes with costs, but so too does inaction.[12] And sometimes doubted decisions become obvious in retrospect. The automobile industry and many consumers initially rejected catalytic converters as too expensive. But the averted costs of respiratory illnesses and other benefits from reduced urban smog have been significant. With increased production and technical progress, a catalytic converter today is a tiny fraction of the cost of a car. Proponents of stricter environmental standards argue that green policies have sizable growth effects. Vehicle pollution abatement has generated new business opportunities—for example, the global catalytic converter industry is worth $20 billion today. And because green technologies are less mature, they require more innovation and research and development, which generate high-value jobs. At the lower end, investments in energy efficiency and cleaner energy generate jobs in installation, operation, and maintenance that cannot be outsourced.

The job gains in green industries are not small, though they are as difficult to determine as the costs of environmental regulation. By the late 2000s, the wind energy sector was thought to have generated some 100,000 jobs in Germany, 42,000 in Spain, and 22,000 in Denmark, and for the solar photovoltaic (PV) sector, some 70,000 jobs in Germany and 26,000 in Spain (REN21 2011). European firms are highly competitive in such areas as pollution-abatement technology and solid waste management, and job gains in these sectors are significant as well. Experience shows that policies matter. An ecological tax reform is credited with helping Germany reduce emissions and increase employment. The reform raised the cost of energy, triggering large efficiency gains. The increased revenue was used to reduce nonwage labor costs, which helped create 250,000 jobs (Rayment and others 2009, Iwulska 2011).

Economic gains have been concentrated in a few countries, mostly in the EU15. These countries have had government support, large home markets for green products, and the capacity to take advantage of green growth opportunities (figure S2.5). Denmark, France, Germany, Spain, and the United Kingdom, each accounting for between €5 billion and €15 billion in clean energy technology

sales in 2008, were far ahead of Poland (the leader in Eastern Europe), which had less than €300 million (van der Berg and van der Slot 2009). Figure S2.5 shows a similar pattern in value added from renewable power technologies. The market leaders ensured domestic demand through, among other steps, feed-in tariffs for clean energy and supported technology development. In 2009, Germany alone spent about €64 million on publicly funded research and development for solar PV technology, complementing €163 million in private research (Wissing 2009).[13] Employment and economic opportunities also exist in other EU countries. With carbon trading, one would expect abatement investments to flow to EU12 countries, where energy and emission intensities

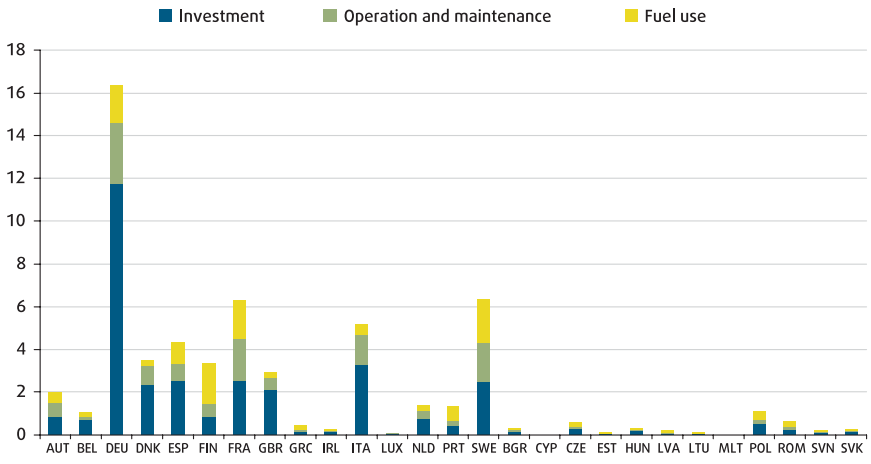


Figure S2.5: Germany, France, Sweden, and Italy have helped business by encouraging renewable energy

(total gross value added induced by renewable energy deployment in 2005, by expenditure category, billion euros)

Source: Ragwitz and others 2009.

remain higher than in the EU15. But the resulting jobs will likely be smaller in number and lower in skill and value added. Examples include manufacturing and assembling green products, upgrading building energy efficiency, and producing biofuel. High-value-added activities, green intellectual property, and earnings from green exports will likely remain concentrated in today's leading green economies.

All EU countries must adhere to the same environmental standards and carbon policy. While all EU countries bear the costs of green growth policies, not all have the structural endowments to take advantage of the opportunities these policies generate. An analogy to the eurozone is illustrative. Countries adopted a common currency without first resolving structural differences. The countries shared the benefits of adopting the euro, such as low interest rates and reduced trade friction. They also faced the constraints imposed by a single currency, but with different structural and economic capabilities to adjust to the loss of monetary flexibility. Over the last several decades, EU interventions (such as the structural funds) have tried to reduce these differences—but with limited success.

A single carbon price has similar advantages and drawbacks. The effectiveness of the European green-growth model—especially in Southern and Eastern Europe—will depend on policy instruments that help countries cope with the

burdens and share the benefits of the transformation to a cleaner economy. Besides external support (through carbon finance, for instance), green growth requires political commitment by countries that, rather than embrace new opportunities, often cling to sunset industries and fossil fuel–based energy systems. Europe missed many of the efficiency gains of the infotech revolution. It will have to be smarter to prosper in the green technology revolution.

Global green growth

Europe is serious about greening its economy. Strong policies opened economic opportunities that European firms like Gamesa were quick to exploit. But in an open economy, the incentives that benefit domestic producers also benefit foreign producers who export to the European market. This increases competition for European firms and implies a leak of taxpayer-funded subsidies and other support. If the goal is to tackle global environmental challenges, however, these leaks will be beneficial even as they make it more difficult for Europe's green enterprises to compete.

By far the biggest barrier to a green transformation is cost. Environmentally friendly technologies are often more expensive than conventional alternatives. For example, electricity from coal-fired power stations costs about $0.06 per kilowatt hour (kWh), while the price of wind energy ranges between $0.08 and $0.14 per kWh. Solar photovoltaic power (PV) costs more than $0.20 per kWh (REN21 2011). Even where life-cycle costs are lower—as with the new generation of energy-efficient lighting—high initial costs deter consumers. Reducing costs requires research and development, innovation, and economies of scale. With every doubling of production, wind energy is expected to become 15–20 percent cheaper, and solar PV prices to drop 25 percent (Neij 2008). Regulation, taxes and subsidies, and public investments that reduce the price of clean technologies (or increase the cost of dirtier ones) trigger private investment and lead to increased scale. These interventions are justified because they compensate for nonpriced costs incurred by conventional technologies, such as the health effects of air pollution, the loss of such environmental services as natural water filtration, and the damages from a warmer, wetter, more variable climate.[14] The opportunity to get a foothold in emerging markets for green goods also motivates many countries.

Through EU directives and national policies, European countries have made credible commitments to support clean growth. These commitments should encourage investors to risk funding new products that are not profitable according to current market prices. Generous subsidies and tariff guarantees have been effective, helping European leaders emerge in many green technology areas. By the late 2000s, environmental technologies accounted for almost 10 percent of GDP in Germany, and German firms held global market shares of 6–30 percent in key green markets (BMU 2009).[15]

Public incentives have worked for European companies, but with open trade they are also attractive to foreign firms. U.S. companies, such as General Electric and smaller high-tech firms, quickly established distribution systems in Europe. As some green technologies move from research labs to mass production, Europe's comparative advantage vanishes and low-cost producers enter the

market. Solar PV panels are an example. Generous feed-in tariffs in Germany, Spain, and other European countries initially benefited domestic firms, even causing a bubble in solar company stocks. This attractive market triggered large investments in production capacity in China. Between 2006 and 2010, China's PV production increased twentyfold, from 400 megawatts to 8,000. During this time, the export share of panels in China never dropped below 94 percent, because the high price and low local subsidies meant that there was almost no domestic market.[16] In wind energy, which is more cost-competitive with conventional sources, Chinese firms have also increased production. Most of the demand so far is domestic, as China deploys the largest installed wind capacity in the world. But that will change as producers increase capacity and eye new markets. European firms, such as Gamesa, should expect more competition.

Europe should welcome these developments. Competition and rising capacity have substantially reduced the prices of some green products. China's solar expansion coincided with a price drop of more than 40 percent,[17] making it cheaper for Europe to reach its "20-20-20" targets (a 20 percent cut in greenhouse gas emissions by 2020, a 20 percent increase in the share of renewable energy, and a 20 percent cut in energy consumption) and creating room for cuts in subsidies. By indirectly contributing to faster price declines, European policies benefit green investments in the rest of the world, accelerating greener industrialization in developing and emerging nations.

The EU27 accounts for just 13 percent of global emissions (International Energy Agency 2010). This share will drop as the populations and economies of other regions grow faster than Europe's. To limit global warming and reduce other global environmental threats, Europe must spread technology and know-how to places where environmental pressures will be most severe. Sharing technology with other regions will also reduce the emissions embedded in European imports. Even if much of the resulting economic activity takes place elsewhere, Europe is positioned to capture a large share of what some expect to be a €3.1 trillion market for green technology by 2020 according to a study by Roland Berger Strategy Consultants in 2007.[18] This will include exports of advanced green-tech products to China, which will require environmental technology investments estimated at 12 percent of GDP. Chinese solar panels, for instance, are produced with machines made in Europe.

Rather than compete on price, Europe should accept that manufacturing and assembly of basic green technology will move to countries with lower factor costs—including perhaps the EU12 and eastern partnership countries. Europe should promote innovative, high-tech companies that create green products and services that are less price-sensitive and less easily reproduced elsewhere. Europe needs "Green Apples"—the green-tech equivalents of an innovative info-tech company. Apple Inc. profits from innovation and design, not from manufacturing. Similarly, European green technology firms should focus on developing and retaining intellectual property and on specialized manufacturing, engineering, and related high-value-added activities. This focus will require support for applied research in Europe that makes the region attractive for non-European companies. Suzlon, a large Indian wind turbine manufacturer, maintains six of its eight research centers in Europe because of Europe's accumulated know-how.

Needed: will, ingenuity, and efficiency

Europe is already the leader in the transition to a greener economy. But environmental impacts, especially greenhouse gas emissions, are still too high per capita to reach global targets. And the picture is even grayer when considering the complete consumption footprint. In recent years, European policies have moved global climate goals forward. But the world's second- and third-largest economies might soon match Europe's green ambitions.

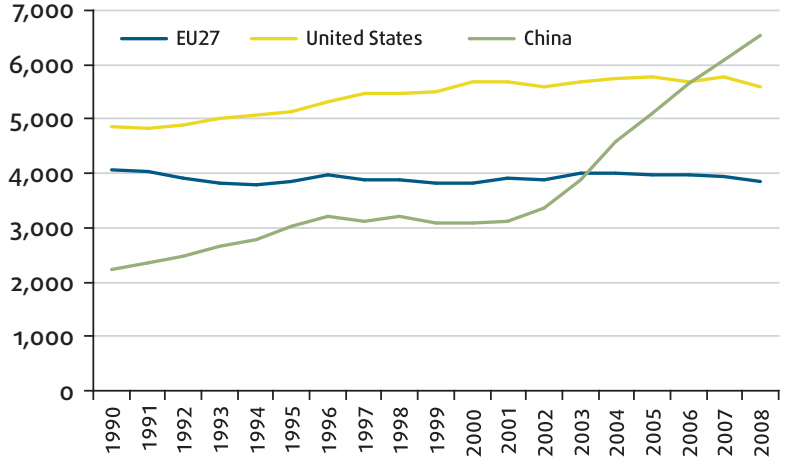
The United States has one of the largest environmental footprints. But it also has the most effective academic research capacity—and huge innovation potential. Much of basic climate-change science and many technical innovations —such as solar, wind, and battery technology—originated in U.S. labs. The United States is strong not only in technical innovation but also in financial and policy innovation. Venture capital funds in the United States channel vast resources to promising firms, including those in green technology. While Europe is strong in process innovation and technological improvement, U.S.-style risk-taking is more likely to lead to the breakthrough technical innovations that many believe are necessary to solve the climate problem.

Federal climate action in the United States has been inadequate, but state and local policies show American potential. California's air pollution standards have affected car manufacturing globally, and the state's energy policy began decoupling power consumption from growth in the 1970s (Iwulska 2011). Concerns about acid rain in New England spurred the development of a sulfur dioxide allowance trading system, which showed the feasibility of market-based instruments for pollution control. Ten eastern states joined the Regional Greenhouse Gas Initiative, a cap-and-trade mechanism to reduce carbon dioxide emissions from the power sector. Twenty-three states and many local jurisdictions have set quantitative targets to reduce their greenhouse gas emissions, and more than thirty states have adopted renewable energy portfolio standards for utilities (Pew Center on Global Climate Change 2011).

Figure S2.6: China now emits the most carbon dioxide

(total carbon dioxide emissions from energy use in the three largest global economies, million tons of carbon dioxide)

Source: International Energy Agency 2010b.



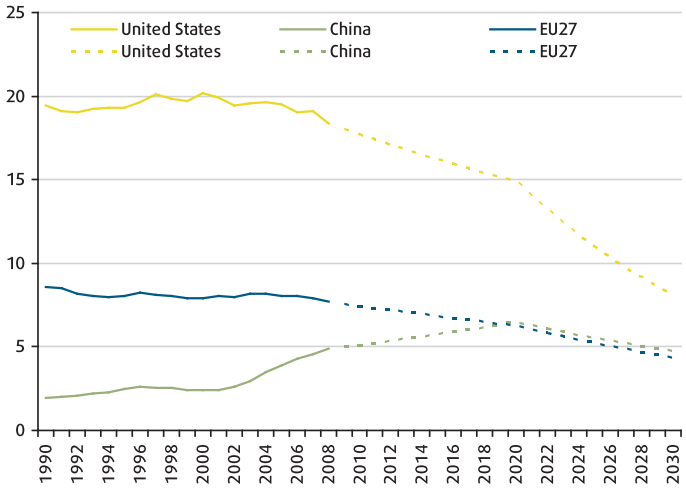


Figure S2.7: But China's per capita carbon dioxide emissions may not significantly grow beyond the European Union's

(per capita carbon dioxide emissions from energy use in the three largest global economies, tons of carbon dioxide per capita)

Note: Solid lines show observed per capita emissions, and dotted lines show a per capita emission scenario based on 450 ppm with ambitious mitigation.

Source: World Bank staff calculations based on International Energy Agency (2010) and UN (2011).

The capacity for policy experimentation and implementation at the state and local levels can lead to new, effective, and socially acceptable approaches to environmental management. When successful, innovation spreads quickly and regulatory diversity helps lift standards elsewhere. The "California effect" works even without strong federal action (Vogel 2000). But in the long term, state action cannot substitute for national policies.

China, the world's largest emitter of greenhouse gases, faces severe problems from air and water pollution. But to further reduce poverty, China's economy must continue growing—even if double-digit growth rates will become harder to achieve. At current emissions per unit of GDP, China's economic growth implies that by 2030 the country would account for the entire global emission allowance —30–35 billion tons of carbon dioxide equivalent—that is consistent with the target of keeping Earth's temperature from rising 2°C higher than preindustrial levels (Stern 2010). China has started tackling this enormous challenge. Aware of its own susceptibility to climate change, the country has embarked on an ambitious domestic greening program. The twelfth Five-Year Plan calls for a 15–17 percent reduction in energy and carbon dioxide intensity by 2015, expansion of wind farms, new solar capacity of more than 5 gigawatts, construction of a smart grid to integrate a larger share of renewables, an emissions cap-and-trade system, and a tax on coal.

China already contributes to global greening by lowering the cost of existing environmental technology, from light bulbs to solar water heaters to wind turbines. All seven strategic industries in the Five-Year Plan move the country from low-end manufacturing to a less resource-intensive economy. And three are explicitly green: new energy, new-materials and new-energy cars, and energy saving and environment protection. China's huge market for green products will also reduce the price gap between clean and conventional energy and technology. Its goal is to become the world leader in green products like solar panels and electric cars, whose markets must grow if global emission targets are to be reached. China's environmental impacts will continue to rise. But with strong commitments and better technologies, it could reverse the rapid

growth of emissions (figures S2.6 and S2.7) and reach higher incomes at lower levels of per capita pollution and atmospheric emissions than many of today's industrialized countries.

Europe can help the global environment by continuing to pursue a greener growth model. The region's continuing green growth will improve the quality of life for its current and future citizens, contribute to global sustainability, and offer economic opportunities for European firms. Europe will incur short-term costs, although the implications of failing to deal with long-term global environmental threats are less severe for Europe than other regions. Europe has already dealt with most local pollution and will be less severely affected by global climate change than many other regions.[19] European leadership on environmental action is, therefore, even more remarkable. But despite Europe's leadership, solving the toughest global environmental problems will require all three major economies to accelerate the transition to greener growth and nudge the world forward. Indeed, global green growth requires European political will, American innovation, and Asian efficiency.

Uwe Deichmann contributed this spotlight.

Notes

1 Based on Lewis and Wiser (2007), Bradsher (2010), Gamesa annual reports, and market share information from Make Consulting and Emerging Markets Energy Research.

2 There are numerous definitions of "green growth" (OECD 2011b) or "green economy" (UNEP 2011). This spotlight uses the term "greening" in a broader sense of reducing the environmental impacts of human activity; it uses "green growth" in a narrower sense of recognizing a shift to greater environmental sustainability as an opportunity for growth—through innovation and development of new products and markets. Both terms refer to traditional environmental problems (like water pollution or excessive resource use) as well as climate change.

3 Consistent cost estimates for wind power are hard to find. This figure assumes the widely accepted learning rate of 20 percent reduction with a doubling of capacity.

4 Refer to the European Commission's website on environment policies for a list of directives, available at ec.europa.eu/environment/policy_en.htm.

5 Beltratti, Chichilnisky, and Heal (1995) note that this is "the highest indefinitely maintainable level of instantaneous utility, in a framework where environmental goods are valued in their own rights, i.e., are a source of utility, and are used as inputs to the productive process" (p. 151).

6 Part of that decrease was due to industrial restructuring and inefficient socialist-era industries closing.

7 In the EU12, just 50 percent agree.

8 World Bank staff calculations based on data from the World Steel Association (www.worldsteel.org).

9 There appear to be no estimates of displaced industries' contributions to China's local air pollution. But it is likely significant through increased energy demand (much of it from coal) and direct emissions from industrial processes. More recently, China has reduced urban air pollution substantially, including through the World Bank–supported China Air Pollution Management Project.

10 Aggregate estimates for EU15 or EU27 are unavailable, because the data set does not allow netting out intra-European trade-induced emissions. Annex B countries are high- and middle-income countries subject to emissions reductions in the Kyoto Protocol, including Russia and Ukraine. See http://unfccc.int/kyoto_protocol/items/3145.php for a list.

11 For example, Nicholas Stern (presentation at the High-Level Dialogue on Low Emissions Development Policy Implementation, July 13, 2011, World Bank, Washington, DC. Available at climatechange.worldbank.org/content/climate-change-thinkers-converge-high-level -dialogue-low-emission-development).

12 See the extensive literature on the health burden of environmental pollution and the emerging literature on climate change adaptation costs (for instance, World Bank 2010a).

13 The private sector figure is for 2008. Globally, spending on clean energy research and development is considered far too low to support the kinds of technological breakthroughs needed to achieve climate goals (World Bank 2010b).

14 See, for instance, Gillingham, Newell, and Palmer (2009) for a discussion of market failures in energy efficiency that justify government intervention.

15 These markets include energy efficiency, sustainable water, sustainable transport, energy generation, waste management and recycling, and natural resources and efficiency of materials use.

16 International Energy Agency 2010c.

17 Price data are available on the website of Solarbuzz, an NPD Group Company, at solarbuzz.com/facts-and-figures/retail-price-environment/module-prices.

18 Presentation is available at www.rolandberger.com/media/pdf/rb_press/RB_Wirtschaftsfaktor_Umweltschutz_20071127.pdf.

19 For evidence of Europe's generally lower climate change risk compared with those of other regions, see Buys and others (2009) and the Climate Change Vulnerability Index released by Maplecroft, available at maplecroft.com/about/news/ccvi.html.

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