

Commentary: The Future of Economic Convergence

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The current growth environment shows a two-speed global economy with emerging economies growing at a much higher speed than advanced economies. Is this pattern sustainable? Many long-term projections point to sustained long-term growth in emerging economies.¹ Professor Rodrik suggests in his paper that emerging economies can continue to catch up if they implement the right policies to foster growth. This is important because rapid growth in the developing world could well be the only propeller for the world economy.

In a “distance to frontier” framework (Acemoglu, Aghion, Zilibotti 2006) emerging economies will continue to grow as long as they are able to close the gap with advanced economies. What about advanced economies? Countries on the frontier grow to the extent that they can move the frontier itself. A key question, therefore, is how fast can countries on the frontier continue to grow? Professor Rodrik accepts conventional wisdom that, as events over the recent weeks seem to confirm, growth in advanced economies will be sluggish at best.

There are several reasons to support this view: demographics, high public debt, and the aftermath of the financial crises seem to be the most relevant. Indeed the crisis has left deep scars. Organisation for Economic Co-operation and Development (OECD) has estimated

that potential output losses for the OECD as a whole, is around 2.5 percent lower in 2012 when compared with projections made prior to the crisis. This represents a loss of more than a year's growth for the region as a whole. However, the view that advanced economies cannot sustain and possibly increase their growth rates should not be taken for granted.

In the rest of my comments I will argue that there are three important "sources of growth" that can contribute to moving the frontier, and boosting growth both in emerging and advanced economies: structural policies, innovation (especially through intangible assets), and green growth. Space limitations do not allow me to look into the general macroeconomic conditions that are needed to support growth in advanced and emerging economies, but other papers in this symposium touch upon these issues.

I. Structural Reforms

Structural reforms boost growth through several channels: they improve the functioning of markets (product market liberalization), they improve the functioning of institutions (in labor markets), they enhance the availability of growth factors (education policies). What evidence do we have with respect to the impact of structural reforms on growth? Three elements are worth highlighting: the identification of priorities in structural policies, the timing of the impact of structural policies on GDP, and the impact that similar structural policies have on different countries.

Structural priorities: As Professor Rodrik documents in his paper, getting priorities right is essential for the success of growth policies. This is clearly the case for structural reforms. They encompass many different policy areas, which need to fit country specific characteristics and which reflect different history (and geography), institutions, and policy preferences. The OECD produces a regular assessment of structural policy priorities and implementation through its *Going for Growth* publication, which also covers a number of large emerging economies.

As one might expect, priorities differ among groups of countries. As shown in Table 1 advanced economies should do more in policies that boost labor utilization while BRIICS (Brazil, Russia, India,

Table 1
Reform Priorities for Advanced and Emerging Economies

<i>Going for Growth</i> edition	2007	2009	2011	2011	
	Pre-enlargement OECD			OECD in 2011	BRIICS
Productivity					
Product market regulation	25	25	24	26	33
Agriculture	5	5	5	4	0
Human capital	14	15	15	15	17
Other policy areas	15	14	18	17	30
<i>Total</i>	59	58	61	61	80
Labor utilization					
Average and marginal taxation on labor income	7	8	8	8	0
Social benefits	20	17	17	17	7
Labor market regulation and collective wage agreements	12	13	11	11	10
Other policy areas	2	3	3	2	3
<i>Total</i>	41	42	39	39	20
Overall	100	100	100	100	100
<i>Overall (number of priorities)</i>	155	155	155	175	30

Source: Data OECD

Indonesia, China, South Africa) need to do more in policies that boost productivity. This is not surprising given that emerging economies, being further away from the technology frontier, have more to gain in terms of productivity increases, including measures to boost innovation and eliminating barriers to FDI inflows.

***The impact of reforms, size and timing*²**

Structural measures also differ with respect to the size and timing of impacts on per capita GDP. Drawing from OECD analysis, the largest long-run GDP per capita gains (Table 2, drawn from Barnes and others 2010) are obtained from reforms that would raise the quantity and quality of education, strengthen competition in product markets, reduce the level and/or duration of unemployment benefits, cut labor tax wedges, and relax employment protection legislation.

Reforms in these areas might have contributed to as much as half of GDP per capita growth in OECD countries in the decade prior

Table 2
The Effects of ‘Unit’ Reforms on GDP Per Capita
(Percent Change) Average across OECD Countries

	Definition of unit shock	OECD average level	OECD standard deviation	After 10 years	Steady state
Percent Change					
Labor market policies					
Average replacement rate	-10 ppt.	54.5	18.1	2.9	4.7
Employment protection legislation (EPL)	-1 index point	2.1	0.7	1.6	3.0
Maternity leave weeks	+10 weeks	27.0	20.2	0.2	0.2
Childcare benefits	-1 ppt.	0.6	0.1	0.1	0.1
Childcare support	+10 ppt.	0.6	0.1	0.0	0.0
Standard retirement age	+1 year	63.8	2.1	0.1	0.3
Implicit tax on continued work	-10 ppt.	21.7	21.2	0.3	0.6
Average weekly normal hours and overtime	+1 hour	44.3	4.6	0.1	0.1
Taxation					
Average tax wedge	-10 ppt.	28.5	9.7	4.6	7.3
Marginal tax	-10 ppt.	45.9	11.3	1.1	1.2
Share of consumption and property taxes	+10 ppt.	36.2	7.2	1.0	2.5
Product market regulation – REGREF					
Gas	-0.1 index points	2.4	1.1	0.1	0.2
Electricity	-0.1 index points	2.0	1.3	0.1	0.2
Road	-0.1 index points	1.3	1.1	0.1	0.2
Rail	-0.1 index points	3.6	1.2	0.1	0.2
Air	-0.1 index points	1.4	1.1	0.1	0.2
Post	-0.1 index points	2.7	0.9	0.1	0.2
Telecommunications	-0.1 index points	1.4	0.6	0.1	0.2
Overall	-0.1 index points	2.1	0.6	1.0	1.7
Openness					
FDI restrictions	-0.5 index points	1.5	0.7	0.0	0.1
Tariff barriers	-2 ppt.	5.8	1.5 ¹	0.0	0.1
R&D incentives					
R&D tax subsidies	+0.1 index points	0.1	0.1	0.8	1.9
R&D direct subsidies	+10 ppt.	0.1	0.0	0.0	0.1
Human capital					
PISA score	+10 points	496.4	21.0 ²	0.1	1.1
Average years of schooling (15-24 cohort)	+1 year	12.6	1.0	1.1	5.2

¹Excluding Mexico and Poland.

²Excluding Mexico and Turkey.

Source: Data OECD

to the financial crisis. Simulations indicate that addressing all policy weaknesses in each OECD country by aligning policy settings on the OECD average could raise GDP per capita by as much as 25 percent in the “typical country” once the full benefits of reforms are allowed to unfold.

The time it takes to obtain the full benefits of reforms in terms of higher GDP per capita differs across policy areas. Labor markets and tax reforms work relatively fast, with an annual convergence rate to steady state productivity of 10 percent for reforms operating through employment, and instantaneous adjustment for reforms affecting hours worked. Productivity-enhancing reforms converge on steady state productivity levels at a rate of 5 percent per year in the average OECD country. On the other hand, human capital reforms produce the strongest impact but also take around 50 years to be realized for all cohorts and even longer to have their full effects on GDP per capita. This is based on the assumption that policy can only influence the length of education and the outcome of improved education systems (measured through PISA scores for the 15-24 age cohort).

The impact of reforms, country specific features

The GDP-per-capita impacts of policy reforms of equal sizes vary markedly across countries, although the effects of reforms on performance areas directly associated with them are assumed to be identical. Factors such as the composition of the labor force and employment, the demographic structure, and how far the economy is from its long-run potential labor productivity, translate identical policy reforms into sometimes very different GDP-per-capita impacts.

In the simulation carried out in Barnes and others, (2010) the effects of labor market institutions and policies on employment differ across groups. Some policies, such as those that influence the implicit tax on continued work and maternity leave weeks, are targeted at specific groups and, consequently, they affect employment rates disproportionately across groups. Also, some groups are more sensitive to some policy reforms than others. For instance, prime-age females are more likely to respond to changes in marginal tax rates than prime-age males and older workers. Consequently, the overall

GDP effects of policies differ to the extent that shares of different groups vary across countries. Chart 1 offers an example of how large the variance of the impact can be.

The short-term impact of structural reforms

Typically, structural reforms produce long-term benefits and short-term costs, which make it politically difficult to implement them. Recent OECD research, however, suggest that in some cases the short-term impact of structural reforms may be much more positive than what usually is believed, although findings differ across types of reforms.

For example, unemployment benefits reform can boost employment relatively quickly, plausibly because they boost job search and hires without affecting many layoffs. Consistent with their employment effects, such reforms are also found to be associated with stronger investment and output growth.

Product market reforms can bring short-run output and employment gains, especially so in labor-intensive industries with strong demand potential, such as retail trade and professional services.

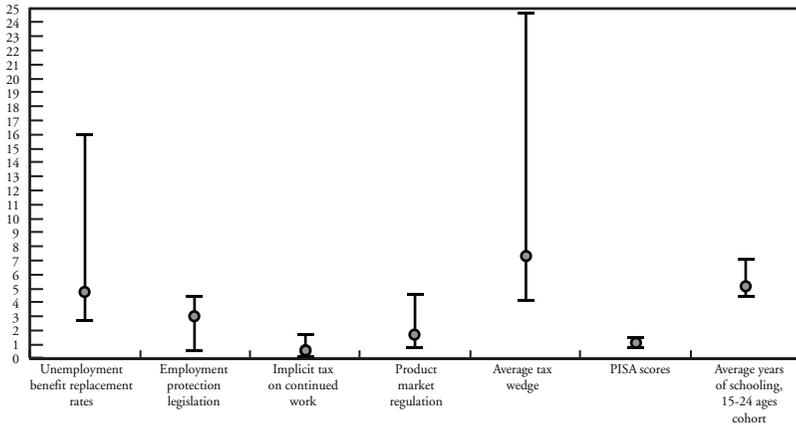
The financial crisis as a driver of structural reforms³

As the space for macroeconomic policies has rapidly faded away, structural reforms efforts have accelerated after the crisis in both advanced and emerging economies and in both labor utilization and labor productivity enhancing areas.

The pace and the nature of reforms have varied markedly throughout the phases of the crisis. The onset of the recession first gave a halt to structural reform in advanced countries due to the need to stabilize aggregate demand and provide income support to the unemployed. As economies recovered and the need for medium-term fiscal consolidation became more pressing, bolder reforms were implemented in areas that could help the fiscal adjustment process. This was the case in both labor utilization (retirement and welfare systems) and labor productivity (public sector reforms and privatization programs).

The impact of the crisis has been both milder and shorter in the BRIICS, but it has also made more apparent the necessity of

Chart 1
Impact of Unit Reforms of Selected Policies:
Cross-Country Difference in GDP Per-Capital Effect¹



¹The circle shows the cross-country average; the upper and lower bounds show the strongest and weakest country effects. Source: Data OECD

structural reforms. In particular, there is a need in several cases to expand social protection systems in order to support workers in times of crisis and—in a longer term perspective—achieve more equitable and sustainable growth.⁴

One question that arises when looking at structural policy action in emerging (but also in some advanced) economies is to what extent such policies allow for more efficient innovation efforts as countries move closer to the technology frontier. The process is nonlinear. As discussed in Aghion and Howitt (2005) countries below the frontier are best served by institutions that favor implementation innovations (based on innovation diffusion). However, as they move close to the frontier, countries should shift to institutions that favor leading edge innovation. Failure to do this could lower their growth rate. Some limited evidence supporting this view is in Bouis, R., R. Duval and F. Murtin (2011).

Crises, as we know, are among the major drivers of reforms. We should not underestimate, however, the impact of past reforms on current performance. Germany and Brazil, for example, stand out as cases of relatively better performance among advanced and emerging economies, respectively. They are countries where significant reforms

were carried out some years back, long before the crisis broke out. We do not need to wait for major crises to implement the right policies.

II. Innovation and Growth

Moving the frontier requires innovation efforts, which in turn can be supported by structural reforms (see Howitt 2000; Aghion and Howitt 2005; Bouis, R., R. Duval and F. Murin 2011). However, policies for innovation cover a much broader spectrum.

Innovation-led growth is a concept as old as growth theory. What has evolved over time is the way in which innovation and innovation activities have been conceptualized and incorporated in growth models. Over the recent past, attempts have been made to provide a unifying concept, perhaps the most relevant one being that growth is driven by ideas, and ideas derive from the interaction of people who can share ideas (Jones and Romer, 2010). This is a powerful concept, which, however, needs to be made operational. We need to understand the conditions required for ideas to translate into growth.

To do so we need to take a broad view of innovation. The OECD Innovation Strategy (OECD 2010b) takes the view that innovation encompasses a wide range of activities, including organizational changes, training, testing, marketing and design, and others, in addition to R&D. This implies that innovation is an interactive process that occurs through collective or collaborative processes as well as through competition, involving a range of actors: from firms to users, consumers and nonprofit organizations.

To be successful innovators, firms must mobilize and integrate a wide set of knowledge and competencies often extending beyond the boundaries of the firm.

But provided we have in place an effective mechanism to produce ideas, what is the impact on productivity growth of ideas-driven innovation? Space allows for dealing with this issue only by considering a specific case as an example: intangible assets, which have become an increasing factor in innovation and that both produce and are facilitated by interactions of ideas (Charts 2, 3, and 4).

Evidence on the role of intangible assets suggests the following⁵: In a global world economy, innovation-based competitive advantage is driven, in large measure, by investments in intangibles such as R&D, employee skills, software, design, and marketing.

Many products are becoming more knowledge intensive. Investment in intangibles is becoming key to maintaining and advancing technological leadership. For instance, in the automotive sector, manufacturers now view leadership in control software as strategically vital.

With rising educational attainment, advanced economies, but also increasingly some emerging economies, have accumulated a growing stock of human capital, which permits and complements the production and use of intangible assets.

The fragmentation and geographic dispersion of value chains—as well as the increased sophistication of production processes in many industries—have accentuated the importance of intangible assets, in particular organizational capital (for instance, Wal-Mart's computerized supply chains).

New information and communication technologies may themselves make some intangibles more valuable to firms. When consumers can buy online rather than face-to-face a reputation for reliable service gains in importance.

Last but not least, the growth of the services sector has amplified the importance of intangible assets, given that many service-sector firms are highly reliant on the use of intangibles.

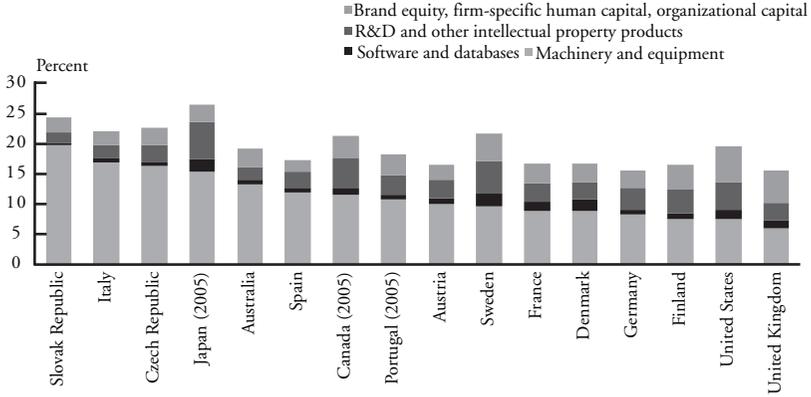
Policy Implications

Fostering knowledge-driven growth requires both public and private investment in knowledge creation and diffusion, including:

- a) excellent and effective (public) research
- b) a modern and reliable knowledge infrastructure, including policies to foster ICT and other general purpose technologies (such as broadband networks)

Chart 2 Innovation Matters Because it is Already a Fundamental Investment...

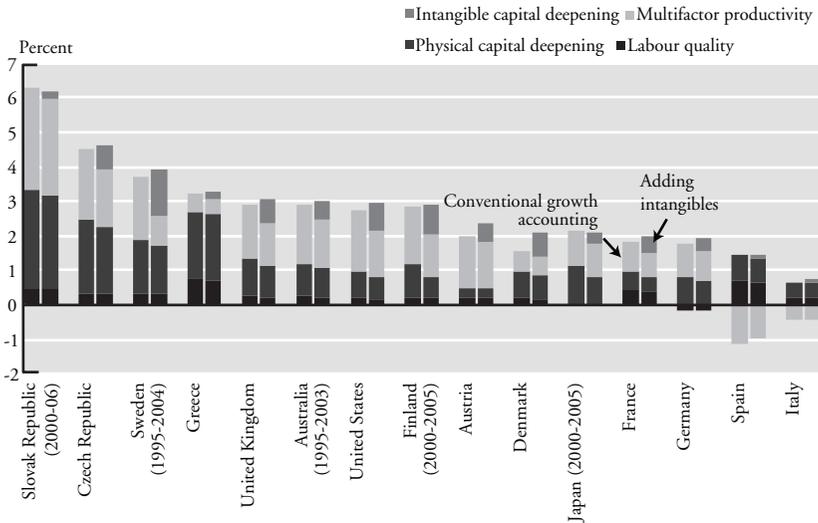
Investment in Fixed and Intangible Assets as a Share of GDP, 2006



Source: OECD

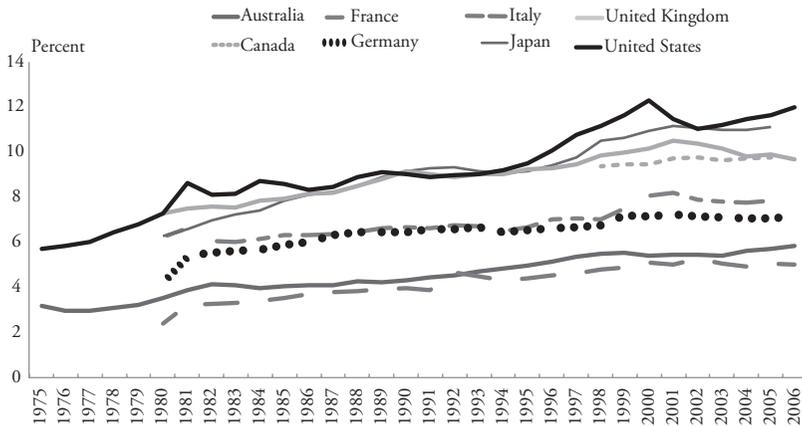
Chart 3A Driver of Productivity Growth

Contributions to Labor Productivity Growth, 1995-2006 - in percent



Source: OECD

Chart 4
... With Increasing Importance....
 Investment in Intangible Assets as a Percentage of GDP



Source: OECD

c) well-functioning markets for knowledge and Intellectual property rights that help generate knowledge and intellectual property and generate value from it

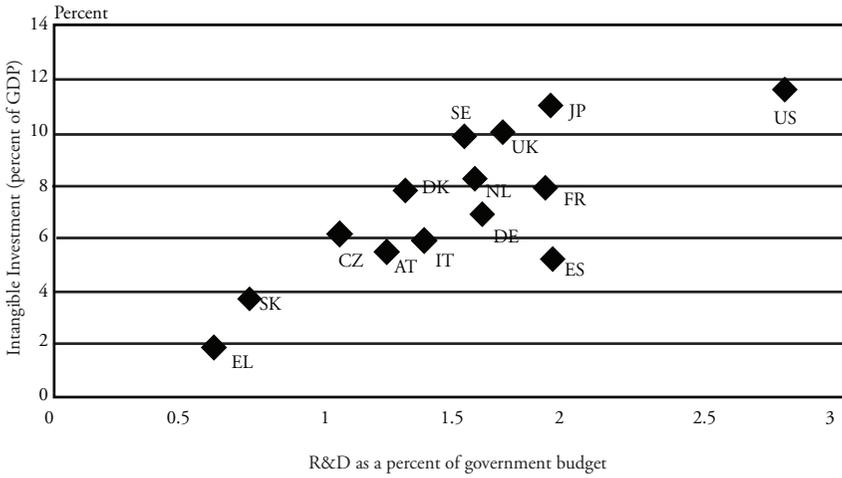
d) last, but not least, the role of markets can be strengthened to boost demand for innovation, such as through getting prices right, regulatory reform, smart use of public procurement, consumer involvement, strong competition.

Such policies can be made to interact with more traditional structural policies to boost growth. For instance product market reform, by increasing competition, fosters innovation, active labor market policies, by fostering skill reallocation facilitate expansion of new firms and sectors, education policies, by increasing the stock of skills clearly support innovation. Indeed, traditional policy efforts are correlated with expansion of intangibles (Charts 5 and 6).

III. Green Growth⁶

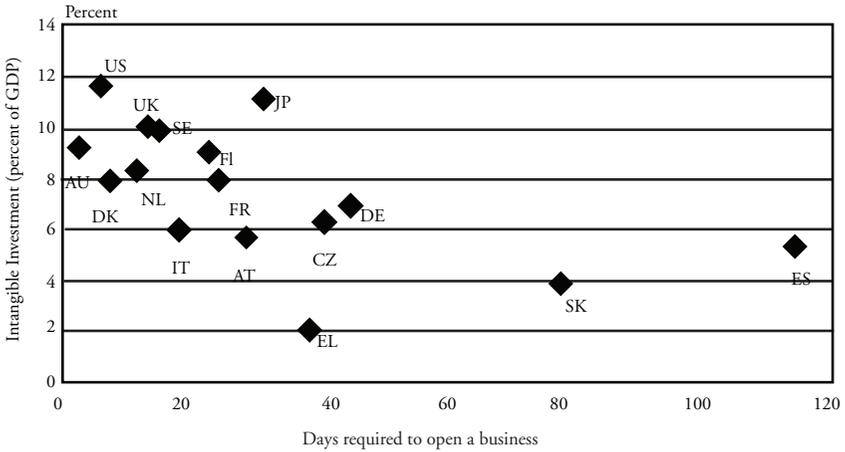
Putting ideas at the center of growth policies may not be enough. In the post-crisis world the challenge is not just about restoring growth

Chart 5
Intangibles and R&D in Government Budget



Source: OECD

Chart 6
Intangibles and Barrier of Entrepreneurship



Source: OECD

but moving toward greener growth—fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies (OECD 2011d).

Green growth has the potential to address economic and environmental challenges and open up new sources of growth through several channels:

- Productivity growth fostered by incentives for greater efficiency in the use of resources and natural assets, reducing waste and energy consumption, and making resources available to highest value use.
- Creation of new markets by stimulating demand for green technologies, goods, and services; creating potential for new job opportunities.
- Boosting investor confidence through greater predictability and stability around how governments are going to deal with major environmental issues.
- More balanced macroeconomic conditions, reduced resource price volatility and supporting fiscal consolidation through, for instance, reviewing the composition and efficiency of public spending and increasing revenues through the pricing of pollution.
- Last, but not least, innovation spurred by policies and framework conditions that allow for new ways of addressing environmental problems.

However, innovation is also where longer term obstacles to green growth may arise. Path dependence may complicate the way through which the technology frontier is both moved forward and made greener. The market for green innovation is affected by specific barriers, notably the prevalence of dominant designs, technologies and systems in energy and transport markets, which can “lock in” to “brown” technologies, and generate entry barriers for new technologies and competitors due to, for example, the high fixed costs of developing new infrastructures.

Policy for green innovation therefore needs to consider the innovation time frame and the respective benefits and risks of specific policies. Some innovations are already available commercially and can be deployed rapidly, and some win-win options may exist, too; these may need no or only limited policy action to become effective in improving environmental performance. Other technologies are still under development, and may be in a demonstration or pre-demonstration phase. Yet others will only emerge over a much longer term horizon and will require further research and development. The policy efforts will differ over this time frame, ranging from basic research to pre-competitive research and demonstration efforts, to policies aimed at developing or shaping the market.

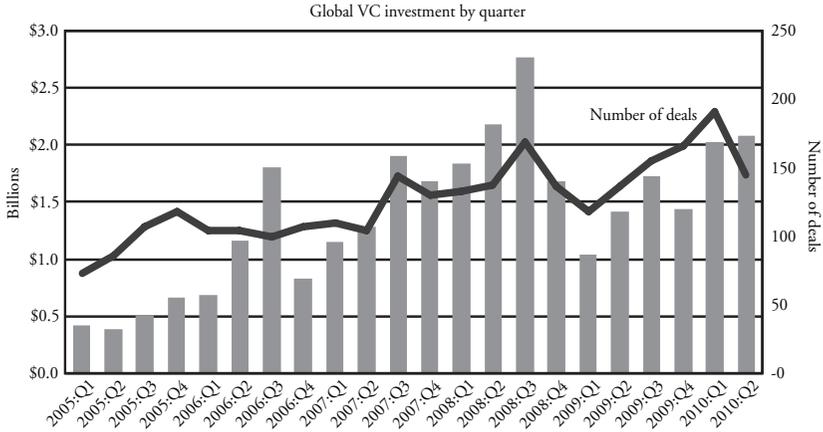
However, even if green innovation is still in its early stages, evidence of innovation efforts in green technologies are encouraging. While data on R&D and patenting point to the upstream aspects of green innovation, information on the financing of innovation, involving risk or equity capital, can help point to innovation that is already closer to commercial application in the marketplace. Available data on venture capital investment in green technology (or clean tech), for example, points to strong growth over recent years, from about \$500 million per quarter in 2005 to about \$2 billion per quarter in 2010 (Chart 7).

IV. Conclusions

We live in interesting and often paradoxical times. Even if emerging economies can continue to catch up successfully to countries at the frontier, growth in the latter may become sluggish, and remain so for a long time. More efforts are needed both at the analytical and policy levels to understand which are the appropriate policies for new sources of growth.

To keep global growth going in a sustainable way, the technology frontier must be moved forward. Moving the frontier implies structural change that would boost growth in both advanced and emerging economies. Structural reforms, innovation, and green growth are three strategies that can help achieve these long-term targets. They can be implemented in isolation (or even partially).

Chart 7
Global Investments in Clean Tech, 2005-2010



Source: OECD

They would yield the best results if complementarities were taken into account. For example, benefits from product market reforms are magnified if complementary labor market reforms are implemented. Reforms that boost competition and education also support innovation. ITC diffusion favors interaction and the production of ideas, which also boosts growth. Carbon pricing supports investment in green technologies. But significant public policy action may be needed to overcome path dependence. Lack of human capital and adequate infrastructure, or regulatory uncertainty will prevent green innovation from taking place.

In both advanced and developing economies the choice of the policy tool kit will inevitably be country specific. But this should not prevent us from looking for general lessons.

Author's note: This commentary represents personal views and not necessarily those of the OECD.

Endnotes

¹For a recent contribution see Buiter and Rahbara, 2011.

²This and the next section draw on Barnes and others (2010).

³This section draws on OECD (forthcoming).

⁴See Chapter 2 of OECD Employment Outlook 2010 (OECD, 2010a) for a discussion on the impact of the economic crisis on emerging economies and the role of labor market and social policies to support affected workers and their families.

⁵This section is based on OECD 2011b.

⁶This section draws on OECD 2011c.

References

- Acemoglu, D., P. Aghion, and F. Zilibotti. (2006). "Distance to frontier, selection, and economic growth," *Journal of the European Economic Association*, 4(1) pp 37-74.
- Aghion P., and P. Howitt. (2005). "Appropriate Growth Policy: An Integrating Framework," *Journal of the European Economic Association*, vol. 4, pp 69-314.
- Barnes, S., Romain Bouis, Philippe Briard, Sean Dougherty, and Mehmet Eris. (2011). "The GDP Impact of Reform: A Simple Simulation Framework," *OECD Economics Department Working Papers*, No. 834.
- Bouis, R., R. Duval, and F. Murtin. (2011). "The Policy and Institutional Drivers of Economic Growth across OECD and Non-OECD Economies: New Evidence from Growth Regressions," *OECD Economics Department Working Papers*, no. 843.
- Buiter Willem, and Ebrahim Rahbari. (2011). "Global Growth Generators: Moving Beyond Emerging Markets and BRICs," CEPR Policy Insight, no. 55, April.
- Hausmann, Velasco, and D. Rodrik. (2008). "Growth Diagnostics" in J. Stiglitz and N. Serra, eds., *The Washington Consensus Reconsidered: Towards a New Global Governance*.
- Howitt, Peter. (2000). "Endogenous Growth and Cross-Country Income Differences," *American Economic Review*, vol. 90, no. 4, pp 829-846.
- Jones, Charles I., and Paul M. Romer. (2010). "The New Kaldor Facts: Ideas, Institutions, Population, and Human Capital," *American Economic Journal: Macroeconomics 2010*, 2:1, 224-245.
- OECD (2010a), *Employment Outlook 2010*.
- OECD (2010b), the OECD innovation strategy, *Fostering innovation to Strengthen Growth and Address Global and Social Challenges*.
- OECD (2011a), *Going for Growth 2011*.
- OECD (2011b), *New Sources of Growth: Intangible Assets, Preliminary Evidence and Policy Issues*.
- OECD (2011c), *Fostering Innovation for Green Growth*.
- OECD (2011d), *Towards Green Growth*.
- OECD (forthcoming) *Going for Growth 2012*.

