

Restoring European economic and social progress:  
unleashing the potential of ICT  
Executive Summary



A report for the Brussels Round Table  
by Indepen  
January 2006

ICT

This report was prepared by Indepen for the Brussels Round Table. Members of the Brussels Round Table are: Alcatel, BT, Deutsche Telekom, Ericsson, France Télécom, Philips, Siemens, Telefónica and Telecom Italia.

The views expressed in this report are Indepen's and do not necessarily represent the views of Brussels Round Table members individually or collectively.

Indepen is an economic and management consultancy that understands and has experience of government, regulation and investors, as well as business and other forms of enterprise. We work to make business sense out of better regulation to produce better results for all stakeholders, and improved services for everybody. We use our knowledge to challenge constructively and our thinking is independent, distinctive and rigorous. We work in this way to promote both public and private value, with clients in the UK, EU and elsewhere in the world. Further information can be found at [www.indepen.co.uk](http://www.indepen.co.uk)

Indepen  
Diespeker Wharf  
38 Graham Street  
London N1 8JX  
T +44 (0)20 7324 1800  
F +44 (0)20 7253 4949  
W [www.indepen.co.uk](http://www.indepen.co.uk)  
E [info@indepen.co.uk](mailto:info@indepen.co.uk)

## Introduction

This report considers the evidence in relation to the decline in Europe's labour productivity growth, and proposes policies that could lead to better outcomes.

Productivity growth in Europe has declined over the past decade whilst productivity growth in the US has increased. In the US, information and communications technology (ICT) production and use accounts for much of this increase, whilst in Europe the contribution of ICT has remained almost unchanged for the past 20 years. The only reason the contribution of ICT to productivity growth in Europe has grown is that overall productivity growth has declined.

Europe invests substantially less than the US in various forms of “knowledge”, including IT and software, communications infrastructure, R&D and higher education. ICT investment is now half the level in the US as a share of GDP – with the gap having widened in recent years.

We identify a lack of market flexibility required to allow the reorganisation of economic activity, or “creative destruction”, as a key factor – and argue that the opportunity cost of economic rigidities rose during the 1990s. If there is no change, the outlook is for low growth and relatively high levels of unemployment. To be more profitable and to contribute to productivity growth, capital and knowledge investment needs to take place in an environment where “creative destruction” can occur.

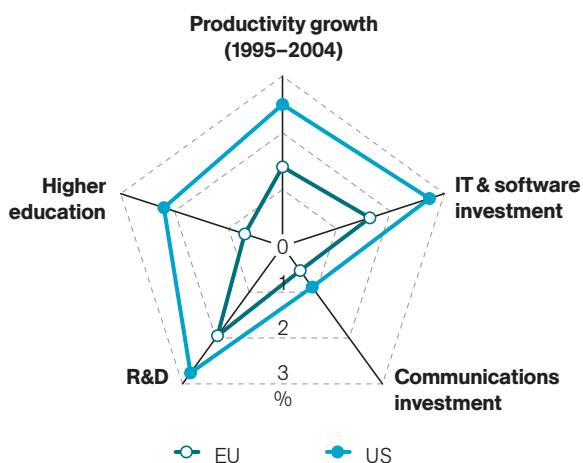
We also identify investment in communications infrastructure as a key ingredient of the knowledge economy, and find that European investment has been significantly lower than that in the US for over two decades. Changes in the communications sector driven by technology convergence and consumer preferences require regulation to change to facilitate investment and innovation. The review of the European regulatory framework for telecoms during 2006 provides an opportunity to implement much needed reform.

The full report can be found on the [Indepen website](#).

## Europe has relatively low productivity growth and low levels of knowledge investment

Europe is currently investing significantly less than the US in various forms of knowledge (IT and software, communications infrastructure, R&D and higher education) all expressed as current investment as a share of GDP, and had around half the annual rate of labour productivity growth compared to the US over the period 1995–2004, as shown in Figure 1.

Figure 1



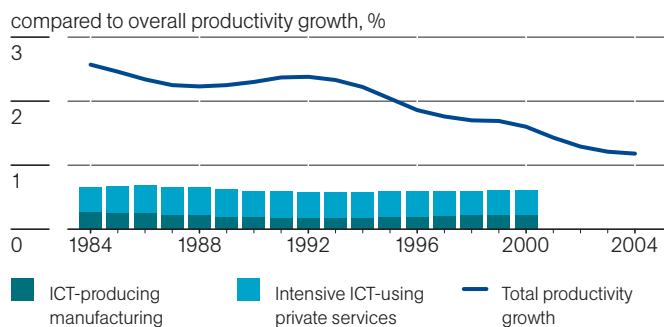
## ICT has not increased its contribution to growth in Europe

After 50 years of catching up, since the mid-1990s Europe has steadily fallen behind compared to the US. Productivity growth in Europe has fallen whilst that in the US has risen.

The only reason the contribution of ICT to productivity growth has risen in Europe is because overall productivity growth has fallen, as shown in Figure 2.

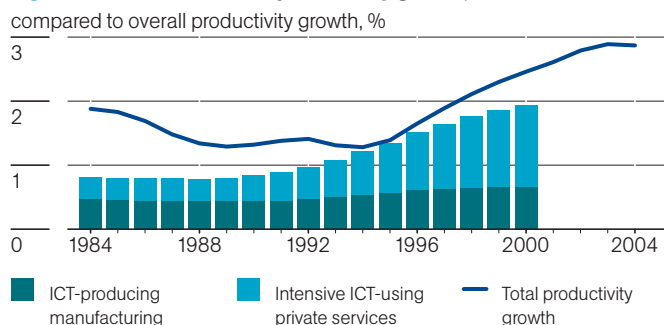
The contribution of ICT to productivity growth in the US has risen, with a growing contribution coming from the intensive ICT-using services sector, as shown in Figure 3.

Figure 2 ICT contribution to productivity growth, EU-15



Source: DG for Economic and Financial Affairs (Feb 2005), Indepen

Figure 3 ICT contribution to productivity growth, US



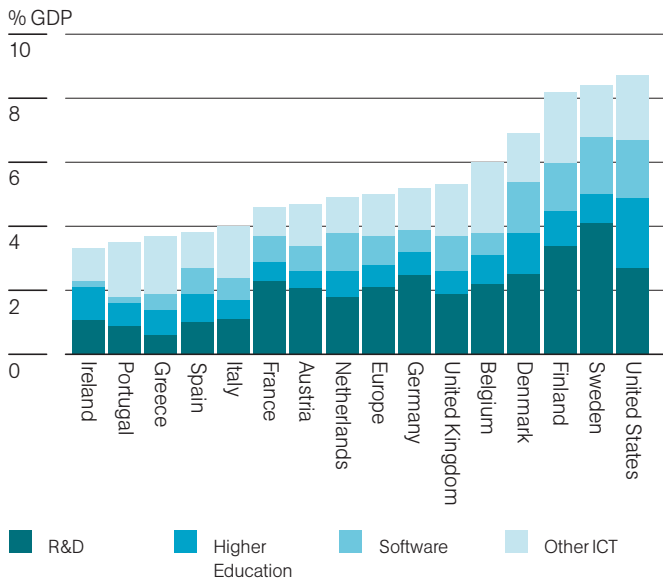
Source: DG for Economic and Financial Affairs (Feb 2005), Indepen

The decline in Europe's productivity growth is concentrated amongst the large Euro area countries (particularly Germany, Italy and Spain during the most recent period). Further, persistent high unemployment in Euro area countries suggests that the unemployment problem is structural.

## Europe invests approximately half as much as the US in knowledge

As a share of GDP, average knowledge investment in Europe is just over half the level in the US – taking account of R&D, higher education, software and other ICT investment. However, differences are even greater within Europe itself, again suggesting that there may be lessons to learn from within Europe.

**Figure 4 Investment in knowledge**



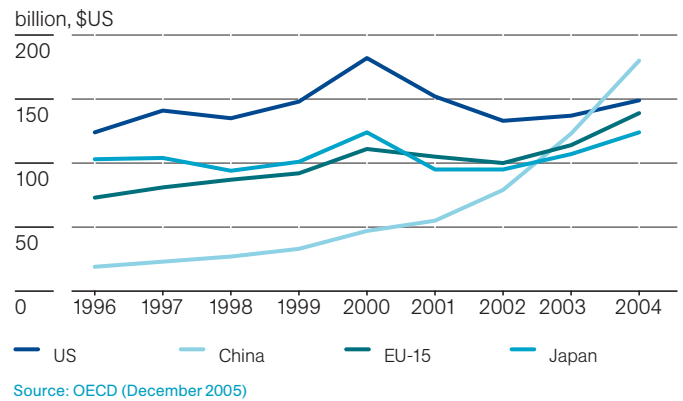
Source: OECD & GGDC (2005)

To the extent the knowledge deficit occurs in the private sector it implies that expected returns from investment in knowledge are lower in Europe.

## China has overtaken the US, Europe and Japan in terms of ICT exports

China overtook the US in terms of exports of ICT goods in 2004, having overtaken Japan and Europe in 2003. Chinese ICT goods exports grew by approximately 50 per cent per year between 2002 and 2004.

**Figure 5 Exports of ICT goods**



Source: OECD (December 2005)

In 2003 China also had the second highest number of researchers in the world after the US. During the period 2000–2003 the number of researchers in China grew at an annual average rate of 7.4 per cent, while R&D expenditure grew at an average annual rate of 18.6 per cent.

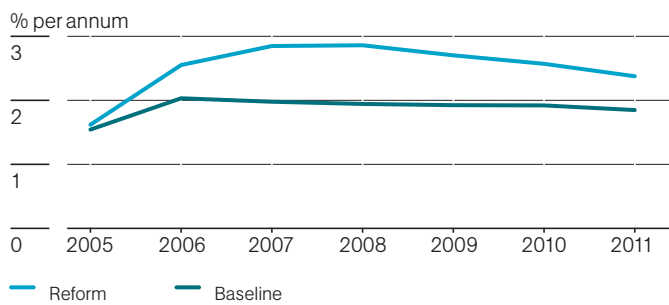
## Resumption of economic and social progress requires reform

OECD, IMF and European Commission medium term outlooks for Euro area countries paint a picture of static or declining growth over the coming two decades.

We have conducted our own simulation modelling using the National Institute for Social and Economic Research (NIESR) global economy model under baseline and reform assumptions. We considered a package of reform measures including liberalisation of labour, product, service and financial markets; removal of regulation from telecoms services with a shift to *ex ante* regulation focused on established infrastructure bottlenecks along with general competition law applying to services markets; a more market based approach to radio spectrum management and clarity over support for R&D.

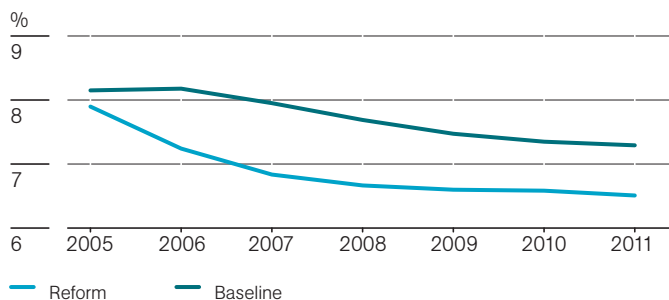
The results of the modelling to 2011 under baseline and reform scenarios for GDP growth and unemployment are shown in the Figures 6 and 7.

**Figure 6 EU-15 GDP growth rate**



Source: Indepen, 'NiGEM' model

**Figure 7 EU-15 unemployment rate**



Source: Indepen, 'NiGEM' model

GDP growth is significantly higher, and unemployment significantly lower, with reform.

## More effective use of ICT requires “creative destruction”

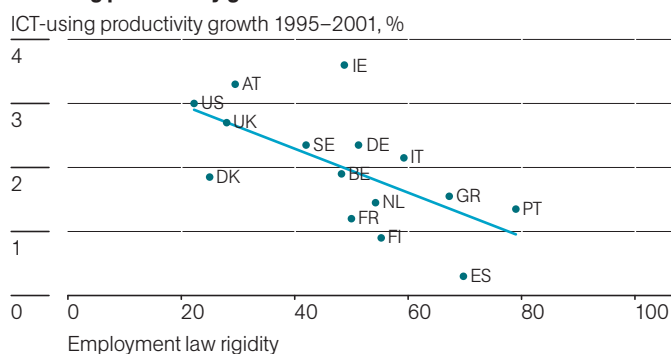
In February 2005 the EC Directorate General for Economic and Financial Affairs noted that:

“[ICT] provides a striking example of the need for policy makers to promote entrepreneurship and a healthy process of “creative destruction”.”

Achieving the full benefits of ICT requires institutional and organisational change. For example, the introduction of barcode scanning allowed for more efficient check-out systems, but barcode technology also enabled reorganisation of the supply chain – a far more substantial change.

Such change is more readily introduced if there is economic flexibility and scope for “creative destruction” – changes in the location, organisation, inputs and outputs of enterprises. Figure 8 shows that countries with greater employment law rigidity tend to have lower productivity growth in intensive ICT-using services.

**Figure 8 Labour market rigidity is related to ICT-using productivity growth**



Source: IMF, World Bank

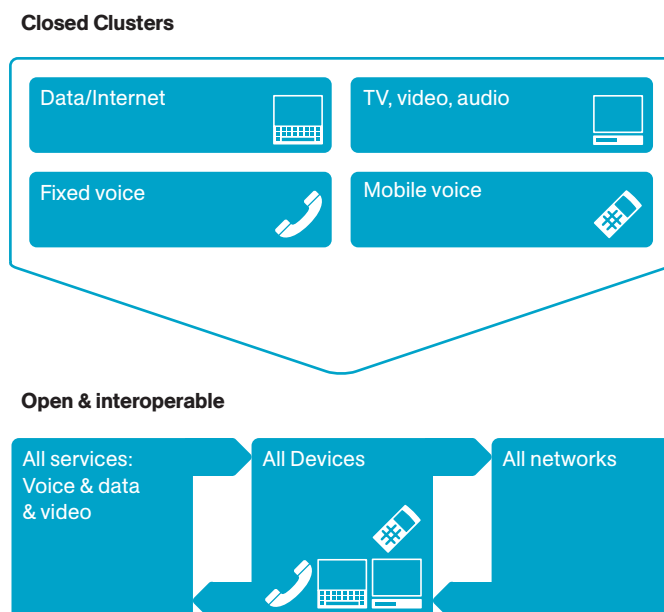
The costs of economic inflexibility may have risen substantially during the 1990s. As Nobel winner James Heckman put it:

“The opportunity cost of security and preservation of the status quo – whether it is the status quo technology, the status quo trading partner, or the status quo job – has risen greatly in recent times.”

## Technology and consumer preferences are driving market convergence

The acceleration in productivity growth attributed to ICT corresponded to the widespread networking of computers and the growth of the internet during the 1990s. The current wave of transformation involves technology convergence leading to market convergence. Figure 9 illustrates this ongoing transformation. In turn, this transformation requires next generation regulation.

**Figure 9**



## The internet is fundamentally changing the nature of the communications market

During 2005 the pace of change quickened noticeably with a wave of announcements and acquisitions. Internet, media and telecoms players are entering one another's traditional markets as they seek to offer bundles of services to consumers, and in effect place bets on alternative outcomes. The following illustrates some of these transactions.

Google Talk	August 2005	Google announces combined instant messaging/internet phone system
Microsoft & Telio	August 2005	Microsoft acquires Telio in order to provide VOIP services
eBay & Skype	Sept 2005	eBay acquires Skype to offer VOIP services in a \$2.6 billion deal
Microsoft & Yahoo	October 2005	Microsoft MSN and Yahoo plan to link instant messaging platforms
TIM & Mediaset	October 2005	Telecom Italia Mobile (TIM) and local media firm Mediaset announce agreement to launch digital terrestrial TV on mobile phones in 2006
BSkyB & Easynet	October 2005	Satellite TV provider BSkyB acquires internet service provider Easynet
3 Italy & Canale 7	November 2005	3 Italy announced its acquisition of Canale 7, an Italian TV channel, to deploy a DVB-H network for mobile broadcasting

The above developments represent a step change in terms of the pace of convergence. These developments were not anticipated when the current communications regulatory framework was implemented.

## Competition in the communications sector is taking new forms

Legacy regulation has distorted the development of competition in telecoms by promoting duplication of leading operators' service offerings. A fragmented market structure with limited investment and innovation by [arbitrage-based competitors](#) is the outcome.

New forms of [applications-based competition](#) are now emerging based on broadband access and IP transport, including VOIP and video communications services. These developments are global in nature, build on established customer relationships and have introduced a completely new form of competition and innovation.

Finally, access [infrastructure-based competition](#) has increased with the move to IP platforms which can carry any service, and the development of new wireless access technologies.

## Convergence and new forms of competition require new forms of regulation

Reform of the European Communications Framework is required to promote investment and stimulate innovation in network infrastructure and services. The existing framework provides insufficient assurance of returns for investment and innovation, leads to an excessive focus on legacy services and has resulted in overly prescriptive regulation. Telecoms investment in Europe is half that in the US, and Credit Suisse First Boston noted in July 2005 that:

[“We...see little incentive from a regulatory perspective for incumbents in Europe to pursue FTTP \[Fibre to the Premises\].”](#)

The prospect of regulation of on-demand content, much of which is and will be distributed over new distribution platforms (e.g. internet, mobile TV), based on regulatory models developed for “traditional” broadcasting under amendments to the Television Without Frontiers Directive could slow the growth of innovative new content based services. In turn, the business case for high speed broadband may be delayed.

The objectives of the regulatory framework should be more clearly focused on the interests of European citizens, rather than on means to an end including competition and investment. The wider economic benefits of the communications sector to the economy as a whole should be considered, and social and economic objectives and instruments should also be more clearly separated. Monitoring of market and regulatory developments should include comparisons with developments outside Europe to provide a context for assessing not only national regulatory outcomes, but the framework for regulation as a whole.

Three key changes to regulation are required

- The withdrawal of *ex ante* regulation of all [consumer services](#) to enable the full potential of new forms of innovation and competition in the development of applications to be realised.
- A narrow focus for *ex ante* regulation on established [infrastructure](#) bottlenecks with competition law and voluntary solutions applying to replicable facilities and services.
- Clarity over the treatment of “emerging markets” to support investment in next generation core and access networks and the emergence of voluntary access arrangements.

The approach to emerging markets could take one of two forms – both of which are designed to raise expected returns and allow greater scope for innovation, investment and the development of private approaches and contracts in relation to non-discriminatory access. Either returns could be raised to reflect investment risk and any asymmetry in the costs of errors; or a “wait and see” period adopted. The credibility of either approach to investors will determine the extent to which incentives for investment and innovation are improved in practice. In the US, the Federal Communications Commission chose to forbear rather than raise returns by modifying the approach to setting access prices.

The balance of commercial incentives is arguably shifting towards voluntary access arrangements, due to increased infrastructure competition and more diverse downstream service offerings. The internet has remained an open and interconnected network without regulation, and network operators find that they need to work with others to maximise the use of their facilities and develop new markets.

Figures 10 and 11 illustrate our proposed approaches for deciding the nature and extent of regulation of emerging and established markets.

Figure 10

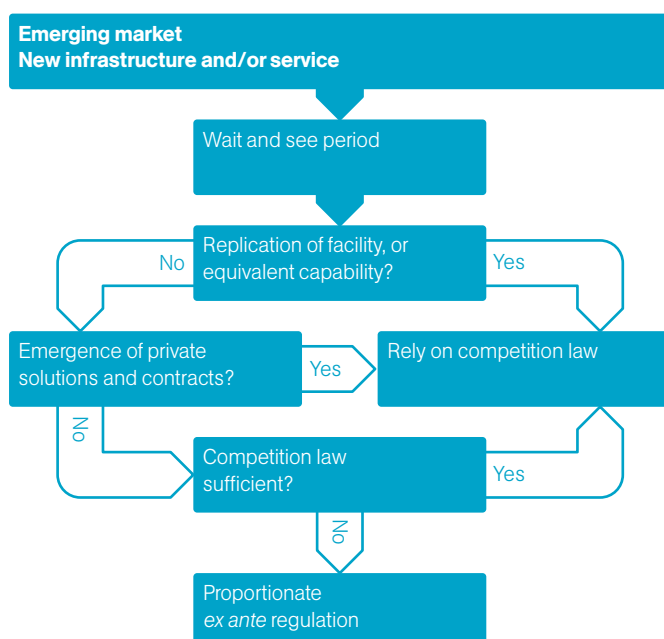
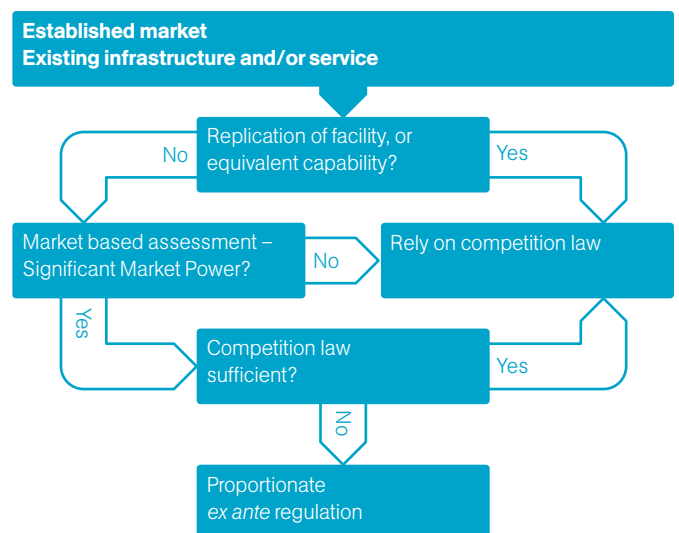


Figure 11



Implementation of the two approaches would allow a transition away from the current “markets based approach” to one focused on regulation of non-replicable facilities, but only where the benefits of *ex ante* regulation are expected to exceed the costs compared to reliance on private negotiated solutions and competition law.

The focus on replication requires a focus on specific network elements. The markets based equivalent therefore requires a focus on geographical sub-national markets. If the relevant market were defined in terms of the national market, then the relevant test would be replicability, including potential and prospective replication, rather than actual replication *per se*. This approach would support convergence of regulation by rationalising the roles of *ex ante* regulation (non-replicable assets) and competition law (markets and services). The approach is compatible with, but could ultimately supplant, the current “market based” approach.

Transitional measures may also be required. One option would be to reduce the list of markets judged susceptible to *ex ante* regulation by the Commission to promote a converged approach to regulation, and to raise the burden of proof for *ex ante* intervention. The status of the existing three criteria used to assess contestability of a market should be reinforced, and the Framework should make it clear that the criteria must be applied.

## Promoting flexible and efficient spectrum use

We welcome the Commission's proposed measures and initiatives in radio spectrum policy of September 2005. We suggest that the Commission adopts a staged approach for the transition from the current regime to the introduction of trading and liberalisation measures, to ensure the confidence of investors in radio equipment development and infrastructure to the benefit of the European single market. A range of complex transitional issues (concerning competition, windfall gains, interference management and the interaction with non-liberalised bands) will need to be addressed if the objective of low cost, flexible access to spectrum across Europe is to be achieved. We suggest the Commission adopts harmonisation measures only when these can be shown to offer net societal benefits, and considers building in some flexibility so measures can be readily changed if market developments do not turn out as expected.

New measures should be focused on bands that offer the greatest net benefits and should be kept sufficiently general as to allow member states to determine the detail of spectrum rights so that this is matched to local circumstances, as is currently the case under the Framework Directive. Digital switchover will free up valuable spectrum for new and existing uses. Seven member states have announced they plan to switch-off analogue services by the end of 2010 and six more plan to switch-off by the end of 2012. In the US, the Senate gave preliminary approval to a 2009 switch-off date in December 2005, with an expectation that freed spectrum will be auctioned.

Thus far the EC's proposals explicitly exclude consideration of the use of spectrum by government users. These users occupy a significant proportion – around 40 per cent in the UK – of the readily usable (and hence most valuable) spectrum. Some of this use is on a pan-European basis, such as spectrum used by aeronautical services and NATO. There is an economic cost to the denial of access to this spectrum by commercial users. We therefore encourage the Commission to initiate action to promote efficient spectrum use by government users in order to release some of this valuable spectrum for commercial use.

## Promoting productive R&D

In addition to promoting ICT investment and use, a policy environment that supports "creative destruction" would promote R&D by increasing the rewards to innovation. Policies that helped to close the gap between European and US levels of ICT use could also be expected to increase demand for ICT capital goods and therefore incentives for R&D.

Comparisons of R&D spending across time and countries are hampered by a lack of information on productivity levels and growth in the R&D sector itself, and by a lack of systematic data decomposing R&D differences into within-sector R&D intensity differences and sectoral mix differences. Evidence for some member states suggests the latter is important at the member state level. The productivity of R&D, and its relationship to ICT inputs, should be a focus for analysis by the Commission.

ICT is also raising the productivity of R&D in some areas, for example the biosciences. The same input in terms of expenditure may therefore be producing a changing level and quality of output (innovation), which could lead to an increase or decrease in overall R&D expenditure depending on the marginal value of additional R&D relative to the reduction in costs for existing R&D.

The European target of increasing R&D from the current level of 2 per cent of GDP to 3 per cent by 2010 now appears unattainable within that timeframe. It is unlikely to be possible to increase both public and private R&D quickly, due to constraints and lags in relation to the supply of scientists and engineers required to conduct productive R&D. This highlights the importance of removing constraints on the potential for the supply of engineers and scientists, through responsive immigration policies and a responsive higher education system. The proposal for EU-wide work rights would assist with the former.

The European Union budget announced on 17 December 2005 demonstrates the inability of European level institutions and processes to re-prioritise expenditure (the Common Agricultural Policy stays at 40 per cent of the budget for 2007–2013, whilst research receives less than 8.4 per cent of which 17 per cent is for ICT-related research). Priority should be given to ICT in the Framework Programme budget (FP7), and to the use of structural funds for R&D. In addition, the rules in relation to state aid for R&D should be relaxed to allow member states to take the initiative in relation to R&D where spill over benefits are anticipated.



Indepen  
Diespeker Wharf  
38 Graham Street  
London N1 8JX  
T +44 (0)20 7324 1800  
F +44 (0)20 7253 4949  
W [www.indepen.co.uk](http://www.indepen.co.uk)  
E [info@indepen.co.uk](mailto:info@indepen.co.uk)

