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A European perspective

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Introduction: Reconciling creative change with the rules of markets

Promoting the national or regional economy is a fundamental ambition of economic policy and, since the influential writings of Josef Schumpeter, innovation policies have been seen to be integral to entrepreneurship and economic growth. However, there has been little consensus about what exact policies and practices in the powers of governments can act to promote innovation and entrepreneurship. The basic concept is straightforward and has become well recognised in recent years, at least within management studies. That hinges on the balance that is intended to be struck between the conditions of stability within which investments in innovations can be recouped, and those conditions in the economy that stimulate innovative activity. This especially holds for technical change, where risks abound, some of which can be mitigated by appropriate public policy.

The first of these is a matter of respecting property rights, seen usually in terms of patent and copyright protection as well as the ability to maintain trade secrecy when appropriate. It also includes actions associated with setting of standards, both those that relate to technical features and functions and those that relate to procedures and procurement. A further implication of the need for stability is the exercise of competition law, where the innovation effects of choices to intervene or not are often, if rather superficially, taken into account.

The second imperative, that of stimulating the supposed public good that innovative activity provides, is also acted upon in a wide variety of ways, often apparently independently of each other. For example, tax incentives, or favourable accounting allowances and conventions, often take into consideration, or have inadvertent effects upon, innovative activities. These are most apparent with regard to research and development investments, but competition law, especially when contentious mergers are considered, are often swayed on the basis of the public welfare effects of innovation where disincentives are likely to appear. Underlying this is the tension between the idea that innovation is best enhanced by competition and the notion that innovation can be managed through regulation. In practice this is not a dichotomy, since all markets are controlled to some degree, so the challenge is to understand what the knock-on effects are of intended market controls, corrections, strategizing, and other forms of distortions.

Large-scale governance establishes the background within which firms develop and execute corporate strategy. While firms are opportunistic and will assess the relationship between external governance and their own capabilities in making decisions on investing in innovation, the aggregate effects can not only shape regional and national economies, they also feed back to the firm and affect its strategizing. The core issue for the political economy of regulation is the question, "who governs the market and its innovative capacity", not "should markets be governed"? The crucial determinant then is, where the boundary lies between industry and governmental actions, for example in the setting of standards or in the protection of property while ensuring maximum social benefit. It is these questions that our study sheds new light on.

Firms are opportunistic and will assess the relationship between external governance and their own capabilities

Our approach in this report

In this report we offer a critical review of academic and policy thinking about innovation and regulation, considering in particular the challenge that traditional concepts of regulation as a response to market failure place on networked and digital industries. We reconsider what this means for social welfare and how effective the policy tools are. We place this in the context of technological goals and what this means for the various schemes intended to emulate the successes of Silicon Valley.

We go on to consider the European context in some detail, considering the broad goals of the European Commission and contrasting the practices in national innovation systems. We assess the European activities in regional development and in particular "innovation zones" in light of the rapid changes that are taking place in India, by contrast. We consider what it means for such a "zone" or cluster to be insulated from the rest of the economy, and contrast internal dynamics with the external context.
The next two sections place these views in the context of organisations and consider the impact of regulation on the innovative behaviours of firms, in particular their investment behaviour in relation to property rights and incentives. We take into account also the perception of firms of clustering and "zoning" schemes. We consider the differences between European and non-European firms, in particular Indian companies, in their views of the policy environment as it affects the infrastructure for innovation.

In the next two sections, we focus on the relationship between property rights and competition as they confront regulatory powers and comment on effective managerial responses in terms of routines and strategies, especially as it affects their view of standards setting and interoperability. We then conclude with an application of these ideas to European innovation policies and identify what implications our analysis holds especially for regional policies and markets, including cluster and "innovation zone" policies, and for competition law and practice.

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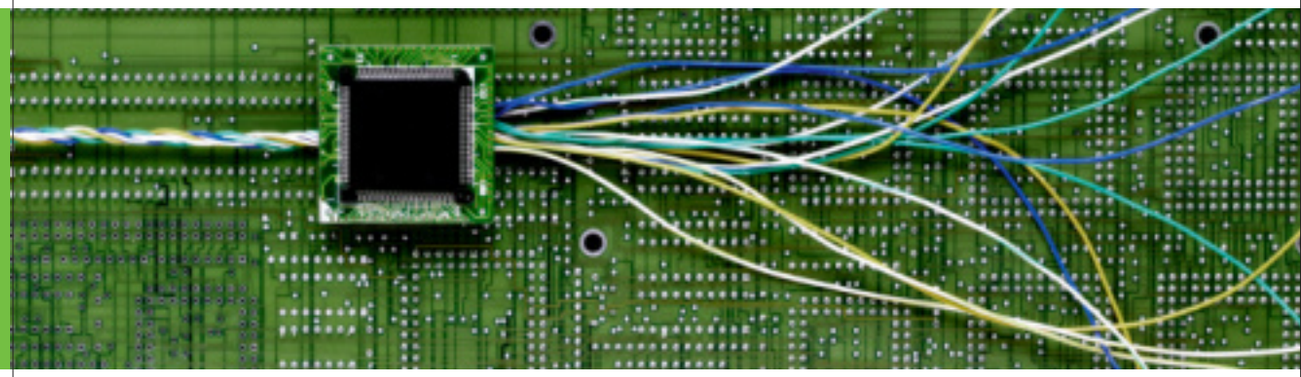
The problematic relationship between innovation and regulation

Not all forms of exchange are equally effective in promoting virtuous goals



All forms of exchange are regulated, some through intricate codes, some through customary, perhaps even instinctual behaviours. Most forms are roughly suited for their context and so, for example, we find the exchange between public disclosure and monopoly opportunity offered through patent protection, between licensing arrangements and servicing mass markets, between valued services and exposure to advertising.[1] But not all forms of exchange are equally effective in promoting virtuous goals such as those associated with economic growth and social justice; some foster economic stagnation, social and environmental degradation, or hamper creativity. While ideologues may argue between laissez faire versus thoroughly regulated systems, in practice all economic activities result from the construct of some mix of tight and loose controls and it should be the job of those devising public policy instruments to marry their powers with social welfare goals, and it is the job of those engaged in commerce and other forms of exchange to conduct their affairs to maximize their legitimate gains. In extreme economic systems of any form, governance powers are commonly seized by those who pervert the system, usually for their own nefarious purposes. In advanced capitalist economies governance is usually interpreted to mean that public policy should in general be used to promote virtuous economic activities and that regulators should intervene where market failure threatens. It seems that where technical innovation is concerned, market failure threatens frequently and it requires considerable effort to understand the scale and significance of those threats.

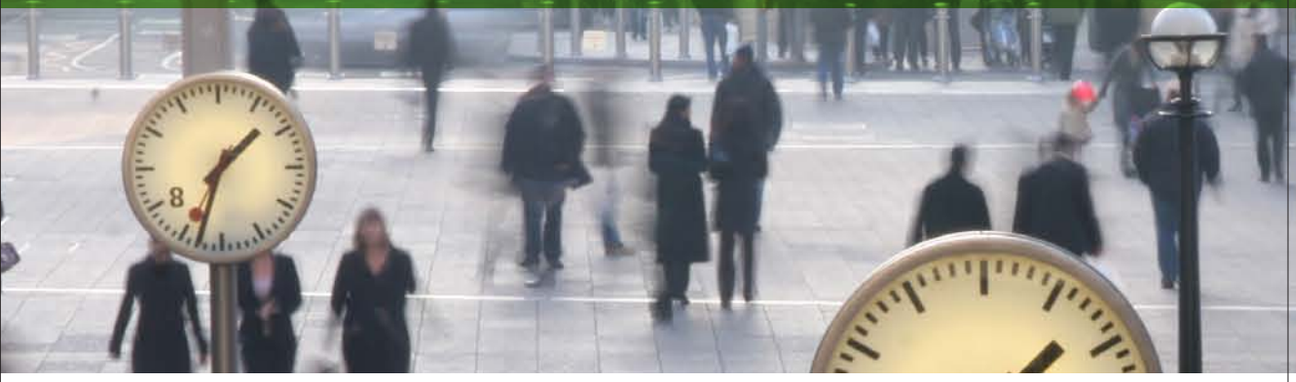
Economists regard market failure to have occurred wherever distortions arise in economic relations. Common examples of this include situations where bottlenecks arise in systems such as transportation networks that would allow predatory pricing along monopolized routes or where infrastructure is uniquely operated in such a way as to allow functions to be offered only by favoured suppliers. Other examples include where price fixing or price warring is used to manipulate markets, such as when market leaders or incumbents act to block newcomers. All of these examples arise in relation to technical innovation and underlay frequent debates about, for example, whether there exist equitable means to ensure that incumbent telecommunications operators don't stifle technical or services innovation, or that start-ups aren't squashed by firms with market power. Another form of market failure occurs where employees or consumers have too little information or too few persuasive powers to protect themselves adequately from hazards such as dangerous workplaces or impure foods. Regulations, then, can be categorized into a few types. There are those that ensure pricing is fair under conditions where competition is not available or effective in balancing costs and values. There are those that protect health and safety and ensure high standards are maintained for the efficacy of drugs and the cleanliness of foods. There are also those that ensure that social benefits from innovation will be unhindered. This latter priority, especially, prompts us to consider not only what forces hinder innovation but also what actions might be taken to promote it.

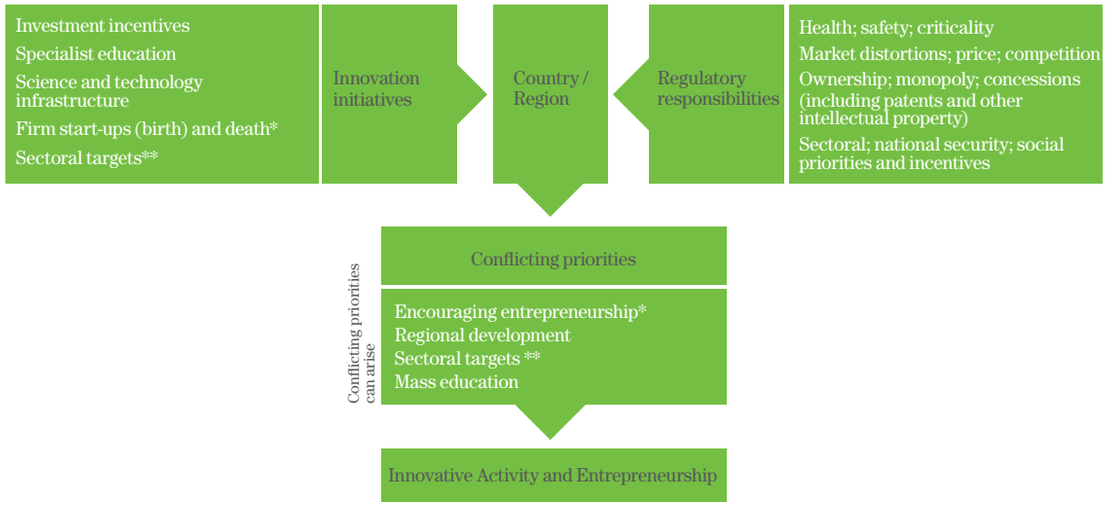
Market failure also has distinct temporal and geographical characteristics; exchange regimes might work well at one time and place but not another. Incumbency is temporal and advantages that accrue from monopoly or other forms of market distortion are limited to one location or region. For these reasons it is appropriate for regulations usually to be regarded as temporary and limited to specific jurisdictions, and that is the logic of price stabilization programmes, tax holidays or fiscal boosts, and of local development schemes such as technology clusters and innovation zones.

It makes sense that regulatory practices should work with other public policy initiatives. These are generally agreed to include educational achievement and even less tangible outcomes such as improved health, cultural attainment, etc. and the advantages that innovation in technology can bring to all these areas.

The form of public policy action rests on what we believe about the character of technology, its features, goals and capabilities because if we believe that technology has transcendent features or dynamic imperatives, we can imagine solutions to technological problems to emerge in a way similar to the ways that market corrections are supposed to occur, according to those who believe in a strong version of Adam Smith's notion of the invisible hand of the market. In other words, if by some inner, invisible force, efficient solutions to design problems will naturally emerge and superior systems will continuously emerge and prevail, then the public policy prescription should be to minimize interference. If we take a contrary view that technical solutions are shaped by the political, social and economic forces that surround them, then we should ensure that those contextual features are amenable to innovative activities.

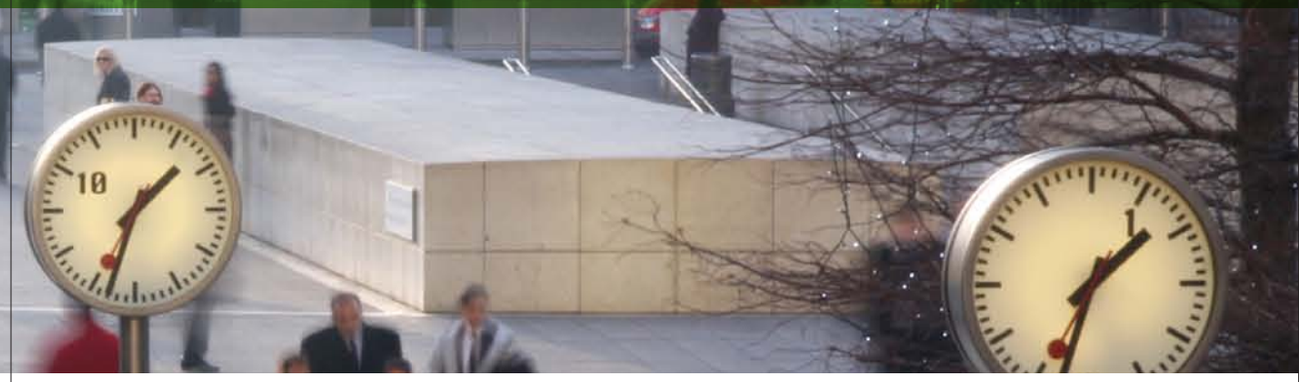
A framework for assessing the interplay among innovation, policy and organisational behaviour





This framework of relationships can serve as a starting point to assessing where regulatory responsibilities interact with innovation initiatives/ incentives. There are numerous situations where conflicting priorities arise and where either political criteria will be applied, or other criteria for trade-offs prevail. There are also priorities that can "cut both ways", as is evident for example in the history of policies that champion the interests of certain sectors. Sometimes it is apparent that subsidies support economically inefficient activities, generally either in pursuit of a short period of protection sufficient for the firm(s) to catch up and compete. However, many studies have shown that such initiatives tend to extend too long and in the process foster inefficiencies, and in most cases they create disadvantages for competitors, who might themselves have promoted useful innovations. While European Union competition law is intended to stop such practices, they tend to re-emerge in the guise of regional development initiatives or tailored standards. It is to allow this kind of analysis of "trade-offs" that our framework is intended

The European Context



No two innovation systems are the same, with the interplay between regional policies and country-specific factors determining the final form of an innovation system. Nevertheless, most fully-formed innovation systems consist of a portfolio of fiscal initiatives, regulatory regimes and a policy environment that includes: tax incentives for investment in research and development; employment incentives (including targeted visa and work permit arrangements) for high technology employees and/or employers; education and training policies including specific standards and budget provisions; technical standards setting; monitoring and enforcement; intellectual property regimes; regional, local and industrial policies to boost investment.

Denmark is amongst the 'innovation leaders' in Europe, and exemplifies an innovation system that has adapted and prospered by exploiting structural attributes: (i) a high degree of social cohesion that offers security of income for employees, whilst providing flexibility to employers to adjust their labour pool, and, (ii) the dominance of low-tech SMEs that have embraced a multi-dimensional improvement mode encompassing a high degree of learning by doing and interacting (Lundvall, 2002). Despite the lower rate of R&D in many of these firms, the level of innovation for SMEs is higher than large firms,[2] with patent applications also above EU25 levels.[3] At a macro level, Denmark's regulatory structure has been conducive to innovation, fostering innovation consortia, science parks, cooperation between institutions and other initiatives, combined with significant public technology procurement initiatives.[4]

The UK is also amongst Europe's leaders in innovation, sharing these initiatives, but contrasting Denmark with an emphasis on entrepreneurship and access to early stage venture capital.[5] An updating of the UK's innovation policy in 2008 also includes boosting the ability of firms to compete for EU grants, providing

No two innovation systems are the same

a voucher scheme to fund collaboration between SMEs and universities and providing free access to intellectual property protection.[6]

Germany's innovation environment also places it amongst Europe's innovation leaders, which in addition to Denmark and the UK, includes Sweden and Finland. Finland is especially interesting in that it faced an economic crisis in the late 1980s which was addressed in 1991 by the establishment of a particularly effective innovation agency, Tekes, that became directly associated with the turn-around achieved by support for new high technology ventures and later came to influence Britain's National Endowment for Science, Technology and the Arts. Germany mirrors many of the innovation-fostering programmes in these countries such as a close cooperation between industry and universities and the generation of patents above the average for EU25. The German government's innovation system is undergoing changes as it strives to meet EU averages in science and engineering graduates by providing financial assistance for tertiary education, and by increasing the participation of SMEs in early-stage funding[7] with improved tax rules for venture capital. The innovation performance of a number of countries such as the Netherlands makes them 'innovation followers' with government attempting to reverse declining R&D investment through incentive schemes for the private sector and increased investment in university R&D, and by emulating other policy measures from leading innovation systems.

A further innovation system is witnessed amongst 'catching-up countries' that include Romania, Malta, Lithuania, Hungary, Greece, Slovakia, Poland, Portugal, Bulgaria and Latvia. Romania is typical of the challenges faced by policy makers, with the innovation performance amongst many of these increasing at a faster rate than the EU average, but still exhibiting a low R&D base and lower than EU25 average for most innovation elements.[8] Recent policy initiatives include the upgrading of public scientific equipment and facilities; fostering collaborative R&D between industry and universities; providing SMEs with greater access to technology and R&D services; establishing science parks, and others. The challenge of these initiatives is compounded by the requirement to develop information society infrastructure that currently lags EU countries with leading innovation systems.

The European context in worldwide perspective

Comparison with US practices and policies

The EU25 lag the leading international innovation systems of the US and Japan in terms of overall innovation, particularly in innovation initiatives such as knowledge creation and intellectual property.[9] Europe leads the US in the number of annual science and engineering graduates produced, but is marginally behind Japan. Europe lags both countries in other key indicators including patent applications, access to early stage venture capital, business and public R&D, and others.[10]
A further driver of innovation is access to broadband, with US policy makers creating a moratorium on taxing internet access in order to stimulate take-up. Despite this, EU15 broadband penetration marginally surpassed the US in 2007 at 19%, which is only slightly less than Japan (20%).[11] Access to broadband in the US is integral to the federal innovation programme, with the National Innovation Act 2005 establishing a number of initiatives designed to advance the country's competitive position. These include the establishment of an innovation acceleration grants programme allowing federal agencies to allocate 3% of their R&D budgets towards higher-risk 'cutting edge' projects, and a doubling of the amount of funding for the National Science Foundation.[12] Both the US and many of the leading nations in Europe provide tax credits for R&D, which has contributed to the US spending 1.7% of GDP on business R&D in 2005, compared with 1.1% for the UK, 1.3% for France and 1.5% for Germany.[13] Current results indicate that Europe is not on track to achieve the Lisbon target for 3% of GDP being allocated to public and private sector R&D.

Despite many common initiatives in the innovation policies of the US and Europe, the latter continues to lag in numerous innovation indicators, including output per hour worked ('productivity').[14] The accessibility of technology internationally has reduced the need for many European firms to undertake development activity domestically, but it has not negated the requirement for some local R&D effort in order to facilitate implementation. This has increasingly focused attention on skills, which are being recognised as one of the most significant factors driving the adoption of product and process innovations.[15] OECD data reveals three times as many low skilled individuals in employment in EU25 in 2004 than in the US, and twice as many as Japan. The European Centre for the Development of Vocational Training estimates that 80 million EU citizens are low-skilled, and that by 2010, half of new jobs created will require tertiary education, with the remainder requiring at least upper secondary level education. The European Commission's 2003 *Employment Guidelines* represents a key EU initiative to increase the adaptability of workers in order to foster better innovation. This has been partly constrained by a more rigid labour market than the US, and a significantly higher proportion of GDP spent on public sector employment. The EU is playing 'catch-up' to the US and Japan with despite member innovation-leading countries and 'followers' undertaking similar initiatives that include establishing skills training centres, providing greater funding to universities for research and to students for tertiary studies. These initiatives have not bridged the 'productivity gap' and other approaches will be need to overcome the rigidity of the European labour market compared to Japan and the US, and the existence of a less mobile labour force.

Despite many common initiatives in the innovation policies Europe continues to lag

The challenge from India: workforce, clustering and research

The EU continues to face challenges on skills and globalisation from India, which possesses a large educated population and has successfully used public policy, largely at the local level, to create world-leading service industries. With a workforce of over 430 million people, and 300,000 engineering graduates every year, India continues to be a global centre for business process outsourcing and offshore software development. Indian policymakers are emulating a number of initiatives from leading innovation nations in the West but often extending these in scale and scope. One key initiative designed to overcome a lack of capital for early-stage investment in businesses has been the obtaining of funding from the World Bank to create a risk-capital fund for innovation.[16] More recently, the federal government has publicised its intentions to create and promote knowledge clusters and greater public-private cooperation for R&D,[17] with the 2008-09 budget also boosting science spending by 16% to US$6bn.[18] As part of its innovation policy, the government has stated its intentions to construct 63 major educational institutions, including 30 universities and other specialised science and technology centres. In order to diffuse skills to the broader population, the plan includes opening 50,000 skills development centres, new polytechnics and vocational schools over the next five years, whilst making available over one million science innovation scholarships to schoolchildren and 10,000 tertiary scholarships for students enrolling in science degrees.[19]

If Indian policymakers implement their stated innovation policies, India will continue to produce a large tertiary qualified labour pool annually across specialties, in addition to improving basic literacy levels. A significant contrast between EU and Indian skill initiatives is the lack of passive employment measures in the latter. In 1997, the EU adopted a four point employment plan calling on member countries to decrease passive employment measures such as unemployment benefits, which continue to be prevalent amongst leading EU innovation systems, and concomitantly increase positive measures including vocational training. This has had some effect in lowering unemployment in some EU countries, but the initiatives depend on the willingness of the member countries to make changes, with passive measures still widely prevalent.

The combined effect of India's lower costs, large graduate population and the wide diffusion of English has been its development as a leading global process-oriented hub of activity. As a result, the cost-benefit decision of many foreign firms located in leading innovation systems in the EU and the US has continued to swing in favour of India. Indian policy makers are reluctant to relinquish this position and continue to take initiatives which if implemented could maintain not only the current levels of skills in engineering, but increase these and those in science and technology disciplines. The scale of India's innovation initiatives exceed those of the EU, and when combined with more flexible labour market characteristics, result in the country's labour force aligning closer with its innovation aspirations to create a significant competitor to other leading innovation nations. There remain a number of bottlenecks, however. The most significant may be the inability to produce sustainable high level research capabilities domestically. Despite the large number of research-oriented higher education institutions such as the great national universities, network of Indian Institutes of Technology and the Indian Institute of Science & Technology (Bangalore), the total output of doctorates in all fields related to electrical engineering, information technology and software engineering remains well below 100 per year in recent years. Other emerging bottlenecks include the very slow rates of improvement in physical infrastructure, especially in and around rapidly growing high technology clusters including Bangalore, New Delhi and Hyderabad, and increasing income disparity in those cities and nationally.

Indian policymakers are emulating a number of initiatives but often extending these in scale and scope

The European Commission

80%

There will be an increased level of investment in research on ICT by 80%.

€2.17bn

The EC has allocated €2.17 billion of investment incentives to assist SMEs gain access to capital throughout their life-cycle, from birth to mature firms, with this to be managed by the European Investment Fund (EIF).

€35m

€35 million has been allocated by Denmark's Lundbeck fund to attract and retain R&D researchers in the country.

Regional policies are increasingly creating such clusters

Where "innovation" policies appear: (1) SME Policies

SME policy is ensconced in the European Commissions (EC) Lisbon Agenda and is integral to reaching the 2010 targets for enhanced competitive ability. This reflects the Commission's recognition of the economic and social significance of SMEs with 99% of EU businesses being SMEs, and providing two thirds of all private sector jobs.[20] The EC's *European Charter for Small Businesses and Entrepreneurship*, launched in 2000, has provided a framework for innovation initiatives, in addition to the adoption by the EC in 2005 of Lisbon initiatives within the 'modern SME policy for growth and employment' policy. These initiatives have led to the targeting of SMEs with the Competitiveness and Innovation Framework Programme (CIP), designed to run in 2007-13. Two of the three areas of activity include entrepreneurship and innovation, and ICT support. Within the former, commencing in 2008, the EC has allocated €2.17 billion of investment incentives to assist SMEs gain access to capital throughout their life-cycle, from birth to mature firms, with this to be managed by the European Investment Fund (EIF). This is expected to provide funds for an estimated 400,000 SMEs.[21] This budget will also fund additional innovation-driven activities for science and technology infrastructure including the establishment of a network of business and innovation centres, and support for entrepreneurship and innovation through networking and benchmarking amongst trans-national companies.[22] The ICT support programme will utilise a budget of €730 million to enhance the uptake of ICT by SMEs in particular, spearheaded by the "i2010" initiative, launched in June 2005. The policy initiatives will be segmented across a number of priorities, including the modernisation of electronic and digital communications legislation and an increased level of investment in research on ICT by 80%.

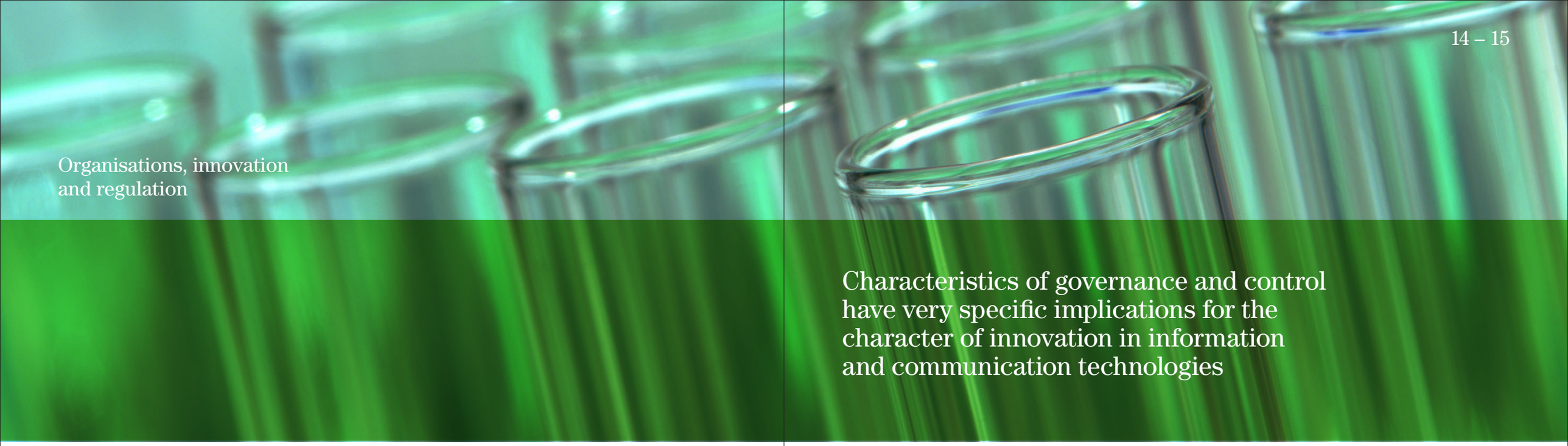
The Government's innovation-driven SME initiatives are also supported at a sectoral level with an additional €200 billion in 2007-13, to be distributed through a regional development fund, with SMEs the intended recipients of a major portion of this funding. The EC's "FP7" Programme will also provide SMEs with €6 billion intended for research and technological development.

(2) Regional policies and "innovation zones"

One of the EC's stated aims is to foster innovation through the development of regional clusters of excellence using the Competitiveness and Innovation Programme's €3.6 billion budget for 2007-13, and the Europe INNOVA initiative. These investment and sectoral initiatives bring together companies, investors, and research organisations, allowing them to exchange best practices in a number of identified sectors that include automotive, ICT, biotechnology, food and drink and textiles.[23] Over 22 clusters and networks have been created so far throughout Europe, with the participation of 23 Member States. Regional policies are increasingly creating such clusters, with a growing recognition by EC member countries that this requires specialist technical skills. A recent example of this is the €35 million allocation of funds by Denmark's Lundbeck fund to attract and retain R&D researchers in the country, and Swedish policymakers' changes to intellectual property law, allowing scientists, and not the university where they are employed, to own full rights to their discoveries.

The development of European innovation zones continues to occur, with an enhanced understanding by policymakers in recent years of the required success factors in a progressively more globalised environment. This has resulted in the first Max Plank Institute outside of Germany being located in Denmark, and a number of innovation zones being established close to elite universities, such as in Munich. The high-technology industrial innovation zone of Sophia Antipolis in France, established in 1969, was Europe's largest, with over 1,100 companies located there. Smaller and prolific examples of innovation zones were subsequently replicated throughout both France and other European countries, including Finland's Oulu Technopolis, Scotland's 'Silicon Glen', the Thessaloniki Innovation Zone in Greece, and others. The current focus on sustainable energy is resulting in the establishment of new innovation zones, including a recent cluster established in Dundalk in Ireland, which is being mirrored by two further developments in Austria and Switzerland. These examples of regional innovation policy amalgamate universities, private investment, and government and have won the support of the EC, with funding divided between European (EC) sources, local government, and some private participants.

It is not entirely clear that this policy will remain the most effective form of stimulation to innovation, given the increasing ability of high technology sectors, such as aerospace, to free themselves from geographical constraints through advanced logistics, outsourcing, and enlightened employment practices. Academic literature remains ambivalent about the efficacy of such regional policies for innovation clusters, especially in cases where development has been forced as opposed to coaxed, as was the case with arguably the most successful outside the United States, the Cambridge High Technology Business Cluster in England. The Cambridge cluster, however, has perhaps half the number of high technology companies (or less) than Silicon Valley, employing around 5% of the California cluster. [25]



Organisations, innovation and regulation

Characteristics of governance and control have very specific implications for the character of innovation in information and communication technologies

Given that governance in the form of regulation and standards are ubiquitous, the challenge is to ascertain what forms of regulatory responsibilities are most effective and how to go about designing governance that best promotes innovation. In theoretically perfect markets there would be no need for regulation but in the imperfect conditions that characterise the world of commerce the choice is between market distortions that in the long run increase costs of doing business versus the imposition of rules that may be expensive to implement but which in the long run reduce the burdens of transactions.

An excellent example of this conundrum emerges from the practice of patenting. Patents are respected everywhere as the best means of recognizing intellectual property and at the same time providing incentives for continuing innovation by the simple trade-off between revealing novel ideas and receiving limited monopoly (although there are a few eccentric scholars who have called for the abolition of the whole patent system on the grounds that there can be no equitable protection and monopoly holders stifle more innovation than they stimulate). Patenting, however, has long attracted two kinds of criticisms that legislators and administrators constantly try to accommodate. One is the veracity and dimensions of claims to novelty and the other is the appropriate length that should be granted, and these two features can be seen to be linked. Patent inspectors are expected not only to verify that a claim to novelty really is new, but that it conforms to rules about what can be patented and that it makes claims that are specific enough to the idea or design that granting a monopoly covers the patent completely but does not at the same time infringe on the ideas of others, either past or possible future. Occasionally a claim is made to cover ideas that are broader than one type of product, or even generic in nature and, even if novel, might block off large areas of future investigation, even ones unimagined by the patent holder. A patent claimant may wish to argue that greater incentive to work out ideas would accrue if a broad area is protected, justifying investment in expertise and capital outlay. A similar argument can be mounted for a longer versus a shorter time of monopoly, and this has been adjusted at various points in the history of patenting. Claimants occasionally argue that the development costs are so high that they are unable to recoup their investment in the normal period of monopoly. A similar argument is occasionally made, for example in relation to pharmaceuticals, that protection needs to be sought long before the product can be marketed because of the time necessary to go through the extensive testing and licensing procedures required by regulators of medicines.

One way to express this is as an argument between short and fat forms of protection versus long and thin.[26] Clearly, patent adjudicators can err when assessing applications, leaving problems to be resolved in courts, but as a general policy matter, adjusting between broad areas of protection and long periods of monopoly can have significant effects on innovation incentives.[27] Those effects could take the form of levels of investment, longitivity of commitment to research programmes, and the breadth of activities committed to.

These characteristics of governance and control have very specific implications for the character of innovation in information and communication technologies, especially as regards the duration, pace and investment in innovative activities. In the telecommunications industry, for example, the incentives for innovation in fixed line services largely came from an interest in increasing the efficiency of telephone systems and building new services onto the infrastructure such that new sources of revenue could be raised. With liberalisation and the accompanying regulatory reforms, telecommunications shifted its emphasis to innovative activities of other kinds. We benefit from this shift especially in the extensive mobile services we have enjoyed since the late 1990s.

The key to understanding where innovation policies and associated regulations have an impact is in the behaviour of organisations. We can see many examples where predicting the proclivities of regulators has become an essential element of corporate innovation policy. Sometimes this takes the form of particular kinds of "bets" on what areas are likely to garner official support in the form of subsidized research, fiscal incentives, or where alternatives might be bogged down by onerous standards or other restrictions on business. Sometimes it takes the form of highly developed, and usually expensive, lobbying activities to educate and convince legislators of the appropriateness of one course of policy versus another. In many cases such "gaming" activities diverts resources away from potentially more productive innovation activities and can be regarded as a form of costly transaction.

Conclusions

Regulation and public policy initiatives in Europe, as elsewhere, are expected to enhance innovative capacity. Even if our minimal expectation is that firms and or other organizations should operate in an environment free from inhibitors and disincentives, we need to address the interrelated effects that courses of market distortion have on the public welfare characteristics of innovation.

The danger that is frequently lost on legislators and civil servants is that some initiatives turn out to be ineffectual, misguided or even counterproductive. Sometimes this occurs because conflicting or alternative initiatives take precedence, as seems to be the case with certain regional development policies that prioritise employment or local infrastructure improvements over maximising broader innovative capacity. Sometimes this occurs because in optimizing one element other elements fail to reach their potential. This is the case with patent law, where the principle of equal treatment for all kinds of patents inevitably means that periods of monopoly protection and claims to breadth tend to work differently for pharmaceuticals then for software or business models.

The European Union is right to seek to chart out its own course for innovation policies, since there is no international consensus on how to maximize innovative potential. Even more importantly, however, is the need to create the conditions for an orderly transition from an unruly collage of policies and practices nationally and regionally, into a set of Union-wide policies. Political expediency dictates, however, that there will be some areas where concessions will have to be given to interests that might counter innovative capacity for the sake of other priorities. Our analysis should provide a framework where such trade-offs can be simultaneously assessed.

The European Union is right to seek to chart out its own course for innovation policies, since there is no international consensus on how to maximize innovative potential.

Footnotes

1 Fontenay & Liebenau on the economics of the commons, etc.
2 As measured by the number of products produced per employee.
3 2004 European Innovation Scoreboard covering both EPO patents and EPO hi-tech patents.
4 http://www.oti.globalwatchonline.com/online_pdfs/36500X.pdf
5 http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/87&format=HTML&aged=0&language=EN&guiLanguage=en
6 http://www.dius.gov.uk/docs/home/ScienceInnovation.pdf
7 http://www.bmbf.de/en/1869.php
8 http://www.rosteu.net/docs/RDI_Report_policy_mix.pdf?PHPSESSID=4i3tqodcu2rosk5l6hvvcujrk0
9 http://www.proinno-europe.eu/doc/EIS2006_final.pdf
10 Ibid.
11 http://www.ectaportal.com/en/
12 Section 2109 [109th]: National Innovation Act of 2005
13 CEP Policy Analysis: UK productivity during the Blair era, at xxxxx.com
14 Ibid.
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