

**REGULATION AND INDUSTRIAL COMPETITIVENESS:
A PERSPECTIVE FOR REGULATORY REFORM**

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Paris

55375

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FOREWORD

This report was presented to the Working Party of the Industry Committee and to the Industry Committee at its 89th Session held on 12-13 March 1997. It provided a direct input to *The OECD Report on Regulatory Reform* submitted to the May 1997 Council Meeting at Ministerial Level.

The report was derestricted by the Industry Committee by the written procedure. The report was prepared by Helgard Wienert, Principal Administrator, Directorate for Science, Technology and Industry. It is published on the responsibility of the Secretary-General of the OECD.

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SUMMARY

The objective of the Report is to provide a foundation on which to establish the relationship between regulation/regulatory reform and industrial competitiveness. It is based on a review and analysis of the literature concerned with the effects of regulation on the economy. The directions for future work suggested in the third section are prompted by the gap in the present state of knowledge about the complex systemic relationship between regulatory reform, economic growth and industrial competitiveness, as revealed by the literature reviewed.

○ Focus and approach

The analytical focus chosen reflects the viewpoint that reforms designed to promote overall economic efficiency do not, necessarily, anticipate all the obstacles to enhancing firm competitiveness. Thus, this study focuses on the effects of regulatory policy on those intermediary factors that affect, directly and indirectly, industry performance: the long-term ability of firms to innovate, to maximise operating efficiency, and to react effectively to changes in the competitive environment.

It is vital to understand the effects of regulatory regimes on industry performance because national competitiveness is directly linked to the competitive performance of firms. A sustained improvement in competitiveness is generally viewed as linked to enhanced long-term productivity growth. This, in turn, depends on the innovative capacity of firms, and on their ability to upgrade and/or change their products and processes in order to be able to adapt to the emerging commercial environment.

Reform of the regulatory systems is a key instrument utilised by government to improve the framework conditions for industrial competitiveness. As such, regulatory reform should be viewed as an intrinsic component of economic policy and structural reform. Emphasis should be placed on improving the quality of regulations, designing regulatory institutions that facilitate innovation and stimulate competition, and reforming the regulatory process. The key challenge is not to choose between regulation or no regulation, but to avoid unnecessarily disruptive regulation.

The objectives of regulations are multi-dimensional. Thus, it is difficult to identify what outcome results from what changes in regulation, or to isolate their effects (in themselves interactive, and not, necessarily, predictable) from other economic activities or policy changes. Consequently, any explanation of how a regulation arose, and its likely consequence, depends greatly on the type of regulation, on its institutional setting, and on the direct and indirect impacts of regulation.

○ Why regulatory reform

Government, *not* just market failure, stands behind the on-going debate concerning regulatory reform. Among the constituent factors that underly the recognised need for a fundamental change in the approach to regulatory policy are: efficiency losses ensuing from regulation; poor performance of public sectors; far-reaching technological change in some sectors which, combined with the globalisation of OECD economies, has brought into question the need for traditional regulatory instruments (notably, as regards large scale “natural” monopolies); regulatory failure *per se*; and financial pressure on governments.

○ Costs and benefits of regulation

Assessing the economic costs and benefits of regulation is difficult. While there is agreement that regulations have contributed substantially to the “business conduct cost” of firms, the actual costs -- both compliance and indirect -- and how to assess them, remain a matter of debate. Little information is available on the economic costs of regulation in Europe. Overall cost assessments appear to be available for only Australia and the United States. However, even the data that is accessible precludes any judgement as to the net cost of regulation to the economy. Cost estimates vary widely, reflecting the evident difficulty to provide meaningful estimates. This is linked to the fact that both the manner in which a particular regulation is formulated and how a regulatory rule is implemented, are critical variables that can affect the cost/benefit “equation”.

In the interest of developing/supporting an innovative and competitive economy, a clear regulatory framework is needed: one that takes into account that any change can, in the short term, create uncertainty. Thus, it is vital to reflect on the costs of existing regulations: not just in terms of the costs of operating a given regulatory regime, but also to consider who will gain and lose from any change. In parallel is the need to have on-going assessment of the benefits of regulations. Since regulations do have a number of different effects (some desirable, some not) objective assessment may help in designing more effective regulations so that regulatory reform results in a positive sum game. The returns to regulatory reform will depend on what is done, how it is done, and on the manner in which reform relates to problems that have arisen from existing regulations.

○ Impact of regulation on productivity

At the macro-economic level, empirical studies suggest that regulation does not, necessarily, have an adverse effect on the overall competitiveness and productivity of industries. However, studies also show that changes in regulatory regimes which are designed to increase competition do encourage efficiency and can enhance productivity growth. Regulatory reform in economic regulations can promote cost savings, have positive effects on labour and capital productivity and thus promote productivity growth and increased efficiency.

As to the productivity effects of social regulations the findings are varied. As regards environmental regulations, some studies suggest that environmental compliance costs are not a significant factor affecting performance and competitiveness at the macro level. Moreover, negative effects tend to be offset by such factors as reduced input costs, innovation, and greater efficiency in production. A number of studies suggest that environmental regulation can also enhance international competitiveness, when implemented so as to provide a firm with a strategic advantage in industries where environmental concerns are becoming increasingly important for consumer satisfaction, or because firms have, by means of such regulation, been able to increase efficiency in general.

As regards the productivity effects of regulation at the microeconomic level of the sector or firm, the net positive and negative effects on productivity and competitiveness differ greatly by sector and type of regulation.

○ Implications of globalisation

The globalisation phenomenon, and its interaction with the emerging commercial framework, has changed the concept of competitive advantage: *i.e.* determining “what” actually constitutes competitive advantage is becoming increasingly difficult. Furthermore, globalisation is changing the very nature of competition. Hence, regulatory regimes must be reviewed to ascertain: whether they have become “outdated”, in the sense that they take into account only the national perspective, risking thereby to be out

of synch with those regimes that have a wider outlook; and whether they compromise the competitiveness of those firms (notably, SMEs) that do not have an international outlook.

In the interest of articulating effective regulatory policies, consideration must be given to the following: i) that technological developments and innovations create new markets that fall outside the scope of existing regulations; ii) since markets have become more international, that it is becoming increasingly difficult for domestic regulatory authorities to control the behaviour of their national private sector “actors”; iii) the extent to which regulatory regimes affect the attractiveness of a given country as a location for investment by global firms; iv) the indirect effects of regulation and their impact on input prices, since in global markets firms can engage in regulatory arbitrage by moving their business or capital to the country with the most favourable regulations; and v) to establish the extent to which the effectiveness of regulations is affected by the new forms of interrelationships (*e.g.* networked firms) that are developing.

○ **Impact on innovation**

Innovation is a costly and risky activity, and firms need assurance of some potential pay-off in order to invest the necessary resources. Thus the issue of whether competitive pressures stimulate or impede innovative effort is central to the debate regarding the relationship between regulation and the innovative capability of firms. The complexity of the regulation/innovation debate is illustrated by the telecommunications “case” which suggests that there is a feed-back “loop” between technology and regulatory reform: *i.e.* that new technologies can speed reform and the modification of regulations, while new regulations properly designed can encourage technological developments.

The literature indicates that the dynamic aspects of the relationship between regulations and innovation are crucial. The key variables leading to positive or negative outcomes in this respect appear to be the type of regulation, the regulatory method used, the sector regulated, and the compliance strategy applied by a firm. The assessments made likewise infer that regulations/regulatory reform must take into account a potential trade-off between static and dynamic efficiency. Equally important considerations pertain to: i) the impact of competitive conditions on the rate of diffusion of innovations; ii) the underlying factors that shape both market structure and innovation; and iii) the structure of capital markets.

While the assessments made suggest that regulation both inhibits and distorts R&D and innovation to the detriment of productivity and industrial competitiveness, the actual effects are differentiated by industry, and very much depend on the type of regulation under consideration. Furthermore, different regulatory approaches may be required at different stages of the technological and organisational development of a given branch: *i.e.* a regulation that promotes innovation at one stage might become an obstacle at another.

○ **Access to international markets**

It is hypothesised that there is an interactive relationship between regulatory heterogeneity (notably, as regards differences in enforcement stringency and prescribed standards), and access to international markets.

Some assessments are that firms operating in countries with strict social regulations (*e.g.* environmental regulations) can gain market niches and competitive advantages through being the first to develop and implement new products and processes. Other analyses lead to the conclusion that even though some firms will be able to capture new markets by seizing the initiative, it is unlikely that clear

competitive benefits can accrue to an entire industry. It is argued, instead, that since environmental standards have become a “market component”, in the sense that they mirror consumer demand, companies which do not adapt their product and process development to regulatory requirements risk becoming less competitive.

Stringent regulatory requirements, notably as regards environmental regulations, have likewise been hypothesised to affect plant location: *i.e.* that plants would relocate to areas where the regulatory environment is less strict. The empirical evidence suggests that this is not the case.

○ **Small and medium-sized enterprises (SMEs)**

The adverse impact of regulations on SMEs is particularly harmful. This is because SMEs are less equipped to deal with such problems, and because the inherent strength of SMEs tends to be in flexibility which may be hampered by regulation. A major problem is related to the fact that the cost of administration entailed in compliance has a disproportionate effect on small firms.

Regulatory policy must be reviewed to assess whether, and the extent to which: smaller firms are being excluded from R&D and technology development, due to inadequate resources; are hampered in gaining access to information (including about regulations), and/or lack the resources to assimilate and use it, and are thus unable to respond to changing demand and supply conditions; and have inadequate access to capital markets.

○ **Preliminary inferences for regulatory policy**

Since regulatory reform frequently incurs some short-term adjustment costs, redistributes the costs of public policies among economic actors, and alters established systems of protection for both industry and the consumer, regulatory policy is controversial. Many regulations are good, and many “bad” regulations pursue legitimate policy goals. The challenge for government is to find the right degree and form of regulation: *i.e.* to regulate in more harmony with market forces; to assure that regulations do not affect adversely the competitiveness of firms, inclusive of their innovative capability; to be perceptive to changes in the economic, social and technological environment; to accommodate the requirements of national and international regulatory systems; and to ensure that regulation is not in conflict with the general public interest.

In order to meet the concern that a good deal of regulatory activity continues to be misdirected, notably, that national and firm competitiveness are hindered by excessive and/or inappropriate regulation, a number of generic requirements must be at the forefront of policy-making. These pertain, *inter alia* to the need: i) to clearly understand the problem that regulatory reform is supposed to address, and to clarify the sense in which the concern with industrial competitiveness can be met; ii) to take into account that the behaviour of key individuals in the regulatory bureaucracy shapes, in a very significant manner, the form of regulation; iii) to understand not only what may be desirable or efficient, but also what responses by economic agents will likely be stimulated by the proposed changes; and iv) to design regulatory institutions that not only facilitate innovation and stimulate competition, but promote more effective regulation.

As regards firms *per se*, the regulatory reform agenda should include the adoption of regulations that give firms a sharper incentive for reducing costs. Furthermore, since technology diffusion is a vital component for economic performance (hence competition), regulatory reform needs to address those aspects of regulation that hamper the development and adoption of new technologies. Establishing the

extent to which, and whether, differences in regulatory regimes have an adverse impact on competitiveness, appears to require sectoral analysis.

INTRODUCTION

The aim of this Report is to provide a basis on which to orient and execute the work proposal that had been submitted to the Industry Committee at its April 1996 meeting and to the meeting of the Working Party of the Industry Committee which took place in June 1996.

The purpose of the work to be pursued in the longer term is to clarify and evaluate the effects of regulatory regimes on the competitiveness of the “corporate” sector, and to identify the policy requirements of regulatory reform in light of industrial competitiveness. It is important to better understand the relationship between regulation/regulatory reform and industrial competitiveness in order to shed light on such issues as:

- **whether** to regulate: *i.e.* to determine when alternative measures to regulation may be more appropriate to achieve a given set of policy objectives;
- **what** aspects of economic behaviour government should regulate so as to stimulate economic development and competitiveness;
- **when** to regulate, so that regulations can be matched to technological and social change;
- **how** to regulate and/or change regulations: *i.e.* to ascertain both the most appropriate type of regulation in order to facilitate innovation and stimulate competition and the sorts of regulatory institutions/tools that need to be designed for reforming the process by which future regulations are drawn up; and
- the appropriate **level** of regulation -- local, national, or supranational.

In a rapidly evolving economic environment, an important objective of regulation should be to provide a stable environment for firms: one that does not create uncertainty; stimulates new entry and investment (both tangible and intangible); encourages R&D and innovation; provides appropriate manpower and infrastructure, as well as efficient product and factor markets; and facilitates orderly exit and restructuring.

Reform of the regulatory systems is among the key instruments applied by government to improve the conditions constituting the “business environment”. Regulatory regimes that encourage competition and innovation are particularly important for improving the framework conditions for industrial competitiveness. In this respect, regulatory reform should be viewed as an intrinsic component of economic policy: *i.e.* be treated as an element of structural reform. Consequently, to be effective, regulatory reform requires that a longer-term vision is applied.

A major impetus behind regulatory reform is to safeguard or increase competition, favouring thereby competitiveness and, thus, economic growth and job creation. The difficulty to measure the impact of regulation on competitiveness can be resolved by focusing on the effects of regulatory policy on those intermediary factors that affect, directly and indirectly, industry performance. That is, to ascertain

whether, and how, regulatory policy affects the long-term ability of firms to innovate, to maximise operating efficiency, and to react effectively to changes in the competitive environment.

This focus can establish a link between regulatory reform and competitiveness in light of the very goals of regulatory policy, in that such policy is *intended* to restructure markets, affecting thereby the economic and social conduct of individual firms. It is from this perspective that Vietor (1994), based on his review and discussion of the evolution of economic regulation in the United States, suggested an analytical perspective that regards regulation as a dynamic market-structuring process. This is because “when a firm is deregulated, or at least obtains regulatory relief, its strategic response can reshape the market and determine subsequent market performance” (*Ibid*, p. 20). A similar observation is provided by Vogel (1996) who in his discussion of regulatory practices in a number of advanced industrial countries, argues that “regulatory outcomes ultimately structure market outcomes. That is, by favouring particular modes of reregulation, governments set the terms of market competition” (*Ibid*, p. 261).

As noted, the objective of this Report is to begin to articulate a framework -- a basis -- on which to establish the relationship between regulation/regulatory reform and industrial competitiveness. To do so, it leans on and sums up some of the relevant economic theories and the empirical evidence available in the literature on the economic effects of regulation, and the subsequent pressure for regulatory reform.¹ Although the literature does not, by and large, address directly regulatory reform in terms of impacts on, and interactions with, industrial competitiveness, it does allow one, albeit implicitly, to make some judgements on the basis of which to establish such interlinkages.

The **first section** is designed to provide a perspective on the regulatory “issue”. It briefly sums up the principal viewpoints regarding regulation that have influenced the ensuing approaches toward regulatory reform; inclusive of the standpoint of the private sector. Thus, an overview of the regulatory burden, as perceived by private enterprises, is also provided. An intrinsic part in the evolution of approaches toward regulatory reform are the estimates that have been made of the costs and benefits of regulation. Consequently, such estimates are likewise touched upon.

The **second section** examines the impact of regulation on the economy. The major problems associated with the effect of regulation on various aspects of industrial competitiveness are reviewed: as are the disparity in viewpoints regarding the regulatory impact.

Drawing on the preceding sections, the purpose of the **third section** is to draw some preliminary inferences for regulatory policy, and from this perspective suggest both a direction for future work and the possible means/basis for its pursuit.

I. BACKGROUND

Some definitions

There is no accepted definition of *regulation* that encompasses the differences in the regulatory systems of the OECD countries. In OECD usage, the term refers to the various instruments (both formal legal instruments and such informal tools as ‘guidance’) used by government to control some aspect of the behaviour of a private economic actor. Regulation can also include rules issued by non-governmental bodies (*e.g.* self-regulatory bodies) to which governments have delegated regulatory powers. All regulations are supported by the explicit threat of punishment for non-compliance.

In the literature, reference is usually made to three broad types of regulation: economic regulation; social regulation; and administrative regulation -- see Box 1. *Economic regulation*,

Box 1. Types of regulations

Economic (structural) regulation

Employed by governments to alter the resource allocation decisions by economic agents with the intent to improve the efficiency of markets in delivering goods and services.

-- includes restrictions on market entry and exit, exercise of monopoly or oligopoly power, as well as controls over prices, output, and service provision. Also includes competition law, the protection of intellectual property and company law.²

Social (conduct) regulation

Used by governments to constrain the behaviour of firms in order to protect social values and rights.

-- regulates the terms and conditions under which goods and services may be produced or sold. Includes: promoting health and safety in the workplace; protection of the environment; controlling both labour contracts and employer/employee relationships in order to protect employees; promoting equal opportunities; and consumer protection.

Administrative regulation

Intended to control how government collects, manages and allocates its funds and property, with the goal, *inter alia*, of promoting administrative efficiency by defining the relative roles and responsibilities of the public and private sectors.

-- includes: tax collection; fiscal regulation; health care administration; legislation to control the ‘black economy’; and the provision of information about the performance of businesses.

Source: As given in, and adapted from, UNICE (1995), p. 5.

encompassing an industry's economic conduct, is concerned with the structure of an industry. It generally includes the regulation of specific industries, and is intended to ensure the efficiency of markets. However, not all economic regulation is targeted at specific industries: *e.g.* minimum-wage laws apply, in one form or another, to almost all industries. *Social regulation*, involving an industry's social conduct (the behaviour of those within an industry), is aimed at activities common to several industries. Not directed towards prices and market structure, social regulation is designed primarily to resolve problems that are not adequately addressed by the market place -- *i.e.* problems where there is a perceived "market failure". *Administrative regulation* is designed to ensure the smooth functioning of public and private sector operations.

It is evident that a clear-cut distinction between structural and conduct regulation cannot be made, and that the boundary between them is often blurred. Consequently, this "taxonomy" should simply be viewed as a means of reflecting the goals of regulation -- goals that mirror the primary justifications of government intervention in the economy.

As used in OECD work, *regulatory reform* refers to changes designed to augment the performance or reduce the costs of regulation: *i.e.* improve regulatory quality. *Deregulation*, a subset of regulatory reform, denotes complete or partial elimination of regulation in a sector.

Justification and motivations for regulation

The rationale for government intervention in the economy, either by legislation or expenditure, is justified on both economic and non-economic grounds. The major theoretical approaches to explaining the evolution of regulatory policy rest on public interest justifications, private interest explanations, and the political theory of interest groups/organisational behaviour.

These viewpoints are instructive in shedding light on the economics and politics of regulation, and serve to illustrate that fundamental shifts in the perceived costs and benefits of regulation -- at bottom the heart of the regulatory debate -- influence, in turn, regulatory policy. As Spulber (1989) has pointed out, regulation is frequently an ad hoc response to economic events that affect the economy as a whole or that is confined to specific industries. "The history of regulation is one of shifting emphasis and focus of government activities. As policy objectives change, so do regulatory institutions and the particular markets subject to regulation. ... Thus, while specific regulatory policies may come and go, the form and structure of regulation may be expected to retain familiar characteristics" (*Ibid*, p. 12).

According to the *public interest* school of regulation (prominent in the United States during the 1950s and 1960s), the primary rationale for government intervention in the economy is related to enhancing economic efficiency by correcting some form of market failure (broadly speaking, deviations from the neo-classical model of pure competition) and/or addressing a particular social problem. The underlying reasoning is that by such intercession the public interest -- consumer welfare -- would be served, with the cost of government intervention likely to be offset by the benefits accruing to the public.

A natural monopoly is usually cited as a typical example of market failure. Other relevant market failures that are said to warrant government intervention pertain to externalities (*e.g.* pollution generated by a plant) and information asymmetry (*e.g.* a buyer has less information -- hence capability -- than a seller to evaluate a complex product). In the case of the latter, a typical response by government is to set standards and to require the supplier/producer to furnish information to the consumer

concerning the product (*e.g.* various types of labelling). The perceived need to stabilise economy-wide developments in prices and employment is also a rationale for government control over some industries.

From the perspective of a “networked economy”, and viewed from the context of the structural economic changes that result from technological advances and the emergence of the information economy, new types of externalities and market failure under the form of “lock-in” may arise (on which, see W. B. Arthur, 1988). This could, in future, provide a rationale for government intervention.

The provision of public goods and services, or investment in infrastructure, are likewise justifications used in support of regulation. The need to protect, and/or encourage the development of new industry, is also a common motive for government intervention.

In general, *private interest theories* (which, in the US, began to supersede the public interest view already in the 1960s) evolved on the basis of empirical research that challenged the public interest theory -- initially by seeking to demonstrate that regulation often decreased rather than increased economic welfare. Thus by focusing on the cost of regulation, such research was predicated both on the effects of regulation and on the likely effects of deregulation. It led to the assessment that regulation intended to serve the public interest failed in that, *inter alia*, such regulation: did not lead to firm conduct that was necessarily beneficial to the consumer; imposed enormous cost on the economy by suppressing competition; and did not eliminate inefficiencies but caused them.³

Subsequent research by the ‘Chicago school’ of economists (building on Stigler’s 1971 article⁴) challenged public interest theories on the grounds that public interest-based regulation did not maximise social welfare because it was subject to ‘capture’: in the sense that producer interests gained influence or control over regulators at the expense of consumers. The effect was said to be the creation of ‘economic rents’ (thus also generating economic costs -- dead-weight losses), conducive to catering to the interests of special groups. Put briefly, those economists who opposed the public interest theory sought to demonstrate that neither the government nor the regulatory agencies that represented them were the benevolent maximisers of social welfare that they purported to be. Consequently, they developed an approach to regulation that emphasised the redistributive nature of regulatory practice: a redistribution of resources that did not/could not lead to economic efficiency or social welfare maximisation.

In short, the overall assessment made was that the benefits of regulation (economic and social) were minimal, while the costs were excessively high. This, combined with the fact that many economists associated the economic slowdown that occurred during the 1970s with the increasing regulatory burden, led to growing support for deregulation.

Deregulation continues to be the object of a good deal of debate.⁵ Since the numerous empirical studies that emphasised the costs of regulation played a major role in promoting the cause of deregulation, it is instructive to recall the general concern with the theoretical and empirical framework developed by microeconomists to explain regulation and the likely effects of deregulation. For instance, Winston (1993) notes that deregulation has led to a reduction of costs imposed on the economy, and did, as was predicted, enhance efficiency, raise profits in some industries, and lead to lower prices and significant welfare gains to consumers. However, he also points out that economists had limited ability to predict distributional changes, difficulties in predicting changes in the quality of services, and only modest success in taking into account those effects of deregulation that led to major changes in a firm’s operations and technology. Both assessments are generally agreed to.⁶

Political theories of interest group/organisational behaviour is the third approach to regulation. Overlapping the preceding theories, this approach does not follow the tradition of constructing models as

such. Rather, it seeks to explain the regulatory process more in terms of the behaviour and motives of individuals, and organisational factors within regulatory bureaucracies. It rests essentially on the belief that the evolution of regulatory policy can only be understood by taking into account individual industry characteristics and the perspective of the regulatory agency in question: evoking the need to take into account both sectoral and country specificity. Since this approach encompasses such aspects as the role of bureaucratic behaviour, lobbying by interest groups, the motives of key actors in the regulatory bureaucracy, the culture of the organisation, and entrepreneurial skills, all of which shape the form of regulation very significantly, this is an area which warrants a good deal of attention in future work that may be undertaken.⁷

It is evident that no theory of regulation can be entirely satisfactory or complete in explaining “cause and effect”: *e.g.* why a particular regulation came about. Since the objectives of regulations are multi-dimensional, it is also difficult to identify what outcome results from what changes in regulation, or to isolate the effects of regulation (in themselves interactive, and not, necessarily, predictable) from other economic activities or policy changes.⁸ Consequently, any explanation of how a regulation arose, and its likely effect, depends greatly on the type of regulation, on its institutional setting, and on the direct and indirect impacts of regulation.

Reasons for change

Perceived government (not just market) failure stands behind the on-going debate concerning regulatory reform. Among the constituent factors that underlie the recognised need for a fundamental change in the approach to regulatory policy are efficiency losses ensuing from regulation and poor performance of public sectors.⁹ For instance, there appears to be general agreement that such regulatory intervention as restricting/controlling prices and entry will lead to inefficiencies in industries and discourage innovation.

Far-reaching technological changes in some sectors (*e.g.* telecommunications and electric utilities) which, combined with the globalisation of OECD economies, have also brought into question the efficacy of (or need for) certain traditional regulatory instruments; notably as regards large scale “natural” monopolies. In other words, technological development has led to a reappraisal of the nature and extent of market failure in the economy.

Furthermore, in the context of rapid technological change, effective regulation is difficult, if not impossible. This is because of uncertainties regarding the outcome of competition (*e.g.* in the area of electronic commerce). At the same time, it is vital to provide an environment that will foster innovation, allow for the full participation of new entrants, and safeguard the strategic interests of governments.

An impulse for change consequently relates to regulatory failure *per se*. Some regulations are retained beyond their time, and no longer respond to changed economic or technological circumstances. Faulty design can likewise result in regulatory failure: *e.g.* regulation that allows “capacity competition” without providing for price and entry flexibility -- the regulation of airlines being a case in point. The regulatory process itself (*e.g.* bureaucratic infighting) can prevent a regulation from meeting its intended objectives.

Financial pressure on government has become a major factor in the push for changing and/or streamlining regulatory regimes. For instance, budgetary constraints on governments have led to a situation in many countries where growing demand for government services cannot be matched by an expansion of government resources. Furthermore, in a number of countries economic difficulties

(e.g. growing public debt) become associated with “bloated government” and with excessive regulation of the private sector. Thus, on political grounds alone, cost-saving by means of deregulation or streamlining regulations acquires an intrinsic appeal: not only because it alleviates the financial pressure on governments, but because it can be used to project the image of a more efficient and “equitable” government.

The viewpoint of the private sector: summary of main issues

The perception that regulations and existing regulatory regimes constrain the competitiveness of private enterprises likewise exercises pressure for regulatory reform. The private sector advocates reform on the basis of two, closely related, considerations: as an intrinsic part of the internal restructuring package required for a “well functioning company” (i.e. efficient/profitable business performance); and in terms of the capacity to adjust to the external requirements of the rapidly changing general business environment.

In order to assess the impact of regulations on the competitiveness of private enterprises, the Union of Industrial and Employers’ Confederations of Europe (UNICE) conducted a survey of 2 100 companies, of which 80 per cent were small and medium-sized enterprises (SMEs), and 40 per cent were in the service sector (on which, see UNICE, 1995). The overall conclusion of this survey is that the present European regulatory framework not only affects the nature of competition between companies, but hinders structural adjustment, entrepreneurial activity, and new business formation. The various elements which led to this conclusion are summed up below.

The high cost of regulation (to which the sheer number of regulations and the frequency with which they change are seen as contributory factors) is seen as having a direct adverse impact on the competitiveness of firms. Compliance costs, considered as being merely the tip of the iceberg, are thought to constitute a particular problem.¹⁰ This is because compliance can entail supplementary investment in order to adjust to necessary changes in the production process. The administrative obligations that compliance may entail can also inflate the level of financial outlays.

Apart from compliance costs, regulations are said to hamper competitiveness in that they: divert management time and capital expenditure from activities that could enhance the long-term competitiveness of a firm; slow down the decision-making process; and hinder the flexibility with which a company can operate. The latter concerns the belief that regulations tend to be too prescriptive, in that they frequently specify the “how” of compliance, thereby depriving a firm of alternative strategies to compliance.

Among the indirect burdens posed by present regulatory rules/measures, mention is made of the fact that regulations are enforced inconsistently and that standards laid out in the regulations differ among countries: as does transposition and implementation. One outcome is said to be that firms could be dissuaded from implementing an innovation: in sectors with intense competition, often the crucial variable leading to success or failure. Another consequence is that differences in regulatory stringency and implementation can affect the cost of compliance.

Attention is likewise drawn to the fact that firm competitiveness may be hindered in the long term if regulations impede the ability of companies to fully exploit opportunities stemming from network-type linkages, inclusive of the synergetic relationship between customers and suppliers. These are considered to be vital, particularly when attempting to break into new markets.

Measuring the costs and benefits of regulation: some problems and estimates

Given the very complexity of the regulatory process, it is not surprising that assessing the economic costs and benefits of regulation is considered to be an arduous endeavour. While there is agreement that regulations have contributed substantially to the “business conduct cost” of firms, the actual costs -- both compliance and indirect costs -- and how to assess them, remain a matter of debate.

Little information is available on the economic costs of regulation in Europe (Koedijk and Kremers, 1996). Overall cost assessments appear to be available for only Australia and the United States -- see Box 2.

Box 2. Regulatory costs imposed on the economy

Australia

1986	The total cost of regulation was estimated at 9-14 per cent of GDP. ¹
1992	As part of its new National Competition Policy, the government initiated the National Competition Policy Review (the Hilmer report). It has been estimated that were the reforms proposed in this report (and some related reforms) to be adopted, they would yield potential gains in real GDP of 5.5 per cent: AUS \$23 billion annually (in 1993-1994 dollars) ² .

United States

(Annual cost of federal regulation: billions of 1991 US dollars³)

	Total	Process regulation*
1977	\$313	\$122
1988**	\$343	\$153
1991***	\$413	\$413

* The process regulation component represents the federal paperwork burden.

** Hahn (1990) estimates the cost at \$100 billion annually. He also gives the estimate made by the Office of Management and Budget which places the annual cost of regulation, by 1988, between \$50 and \$150 billion -- some 3 per cent of GNP. Hahn and Hird (1991) estimate the annual net cost of all regulations to be roughly \$44 billion, less than 1 per cent of GNP.

*** Equal to 7.3 per cent of GDP.

Sources:

¹ OECD (1996b).

² OECD (1996c).

³ As given in Viscusi (1995).

As regards Australia, the 1986 data pertain to direct administrative and compliance costs of federal business regulation. As is pointed out, there is a widespread perception among businesses that regulatory costs have increased significantly since 1970. However, it is also noted that given the dearth of indicators on the basis of which to measure the effects of reform on regulatory costs and burdens, it is actually “impossible to estimate whether regulatory costs to the Australian economy are, on net, higher or lower in 1995 than in 1980” (OECD, 1996c, p. 65).

As is illustrated by the U.S. data (see Box 2 and Box 3), the cost estimates vary greatly. In fact, it is argued that since most of the estimates that are made do not assess benefits, the real magnitude of the net regulatory burden of federal regulations is a matter of uncertainty (Hahn and Hird, 1991).

Box 3. Estimated annual costs and benefits of US federal regulation

Economic regulation

1988

Costs	Hahn and Hird (1991)* Viscusi (1995)	Net costs estimated at roughly US\$46 billion: in 1988 dollars. \$73 billion: in 1991 dollars.
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Social regulation

1988

Costs	Hahn and Hird (1991)** Viscusi (1995)	Estimated between \$78.0 and \$107.1 billion: in 1988 dollars. \$30 billion (excludes environmental regulations): in 1991 dollars.
Benefits	Hahn and Hird (1991)**	Estimated between \$41.9 to \$181.5 billion: in 1988 dollars.

1990 to mid-1995

Benefits	Hahn (1996)***	Estimated at \$280 billion: in 1994 dollars.
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Environmental regulation

1988

Costs	Hahn and Hird (1991) Viscusi (1995)	Estimated between \$55.4 to \$77.6 billion: in 1988 dollars. \$87 billion: in 1991 dollars.
Benefits	Hahn and Hird (1991)	Estimated between \$16.5 to \$135.8 billion: in 1988 dollars.

1977 to 1994

Costs	EPA****	Total costs estimated to have risen from \$60 billion to above \$160 billion. Projected to reach nearly \$200 billion by the year 2000.
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* The cost of economic regulation is defined as efficiency losses, plus the transfers resulting from economic regulation. However, the authors point out that their estimate excludes efficiency gains since 1977 that resulted primarily from deregulation of the transport and energy sectors. According to their estimates, these sectors accounted for one-half of the efficiency cost of economic regulation in 1977, or about \$36 billion. For a comparative analysis of efficiency gains ensuing from deregulation of services, see OECD (Høj, *et al.*, 1966).

** The authors note that given the uncertainty of the estimates, the net cost may have been \$65.2 billion, and the net benefit \$103.5 billion. Their "best guess" is that the costs and benefits of the social regulations analysed are, in fact, roughly comparable.

*** The author cites government agency data.

**** Given in Hahn (1995). The author points out that the figures have been converted to 1993 dollars using the implicit price deflators of GDP given in the Economic Report of the President, February 1994. For a general overview of estimates made of the cost of environmental regulation, inclusive of the measurement problems involved, see also Jaffe *et al.* (1995).

In most of the OECD countries the trend is away from economic regulation: presumably reflecting the viewpoint that, on balance, such regulation does not give rise to net economic benefits but entails significant costs.

The appraisal made of social regulations is not so clear cut. While the need for social regulation is not disputed, its economic impact is a matter of disagreement. This is partly due to the measurement technique employed to establish costs (*e.g.* use of surveys, econometric procedures, expenditure analysis, etc.), and partly to the evident difficulty entailed in quantifying benefits.

Hahn (1996) in his discussion of the \$280 billion benefits said to accrue from social regulations during the 1990 to mid-1995 period, points out strong theoretical and empirical sources of overstatement. He notes that agency data rarely take into account long-term impacts on productivity and investment;¹¹ nor are such expenditures as litigation or managerial time spent on compliance usually included in the cost assessment.¹² Furthermore, a bias may arise because agencies have an incentive to overstate benefits and understate costs in order to boost their preferred regulation or regulatory alternative.¹³ He concludes that fewer regulations would pass a more “neutral” cost benefit test than the individual agency analyses suggest.

Mention should also be made of the “environmental component” of social regulations. Not only because environmental regulations have increased rapidly in most OECD countries, but because the cost/benefit estimates made of them illustrate in a striking manner the assessment problem.

As is pointed out by Hahn (1995) in his assessment of the US Environmental Protection Agency’s (EPA) cost projections of environmental regulation for the 1977-1994 period, there are a number of problems associated with the EPA data. The first is that this data is primarily based on compliance expenditures which do not, necessarily, reflect the full impact of regulations on the economy: nor does the EPA quantify the benefits of all of its regulations. Second, the numbers are estimates of direct regulatory implementation and appliance costs: *i.e.* “first order, out-of-pocket costs to those entities that implement control measures and undertake compliance activities”. Third, only the costs of pollution control programmes are included. Furthermore, the EPA’s estimates were made prior to passage of the 1990 Clean Air Act. Hahn estimates that full implementation of this Act would add an estimated cost of \$10 billion.¹⁴ All told, the author calculates that \$14 billion should be added to the compliance cost estimate provided by the EPA.

Apart from the difficulties entailed in quantifying the benefits of regulation, it would appear that it is equally difficult to provide meaningful estimates of the costs of regulation. First, the manner in which a particular regulation is formulated is a critical variable that can affect the cost/benefit “equation”: *e.g.* in the environmental field, requiring compliance that entails a high level of financial cost may be inefficient and stifle innovation, while a marginal tax increase may stimulate improvement. Second, how a measure is implemented is likewise a critical variable. For instance, air pollution control regulations that allow firms some flexibility in implementation (*e.g.* use of such market-based approaches as emissions trading -- a policy that has, however, elicited a great deal of controversy) can reduce cost without decreasing the benefits of regulation.

Given the evident need for regulation, the concern with the potential impact of regulations on firm competitiveness, and the apparent difficulties entailed in establishing reliable (and agreed to) cost/benefit data, most OECD countries have become increasingly concerned with articulating sound Regulatory Impact Analysis (RIA). This is seen as one necessary input for improving public policy, and

for developing a sensible regulatory policy: one that meets the economic and social concerns of all concerned. By 1996, more than half of the OECD countries had adopted RIA programmes.

However, the analysis of these programmes carried out by the OECD also indicates that, to date, outcomes are mixed. The assessment made attests that RIA can improve the cost-effectiveness of regulatory decisions, and provide greater transparency regarding such decisions. On the other hand, RIA continues, *inter alia*, to be beset with quality problems, and problems related to non-compliance. Also, the scope of the programmes varies greatly. For instance, out of 14 countries, six require that all aspects of a regulation be assessed, two focus only on fiscal costs, and two on compliance costs to business. While three countries do require cost-benefit analysis, only Canada and the United States have established strict cost-benefit tests for new regulations (see, OECD, 1995 and OECD, 1996d).

There is widespread agreement that, in the interest of developing/supporting an innovative and competitive economy, a clear regulatory framework is needed: a framework that takes into account that any change can, in the short term, create uncertainty. Thus, in addressing regulatory reform it is vital to reflect on the costs of existing regulations, not just in terms of the costs of operating a given regulatory regime, but also to consider who will gain and lose from any change. In parallel is the need to have on-going assessment of the benefits of regulations. Such assessments may allow that regulations are only implemented/maintained once it is evident that the benefits exceed the costs as judged on the basis of clearly understood and widely accepted definitions of the impacts being measured.

Furthermore, since regulations do have a number of different effects (some desirable, some not) objective assessment may help in designing more effective regulations so that regulatory reform results in a positive sum game. As is suggested by the problems entailed in ascertaining the costs and benefits of regulations, the returns to regulatory reform will depend on what is done, how it is done, and on the manner in which reform relates to problems that have arisen from existing regulations.

II. COMPETITIVENESS AND REGULATION

Reforms designed to promote overall economic efficiency (*e.g.* by means of deregulation) do not, necessarily, anticipate all the obstacles to enhancing firm competitiveness. As Winston (1993) -- among others -- has pointed out, industry performance under deregulation is not only influenced by technical change, but also by public policies that are unrelated to *economic* regulatory reform. He likewise observes that in the empirical work that supported the movement towards deregulation, insufficient account was taken of the importance of supplementary government policies in ensuring the success -- the effectiveness -- of deregulation. Consequently, inadequate attention was paid to major changes in external economic factors that can, sometimes dramatically, affect industry performance.

Such assessments reflect the approach to regulatory reform that places emphasis more on adjustment of regulatory regimes in terms of: improving the quality of regulations; designing regulatory institutions that facilitate innovation and stimulate competition; and reforming the regulatory process. As is pointed out, broadening the scope for competition does not always imply cutting down on regulation. In some cases, market forces are stimulated by new regulation; an example being minimum quality standards which can contribute to market transparency. Even competition policies frequently entail regulation. The key challenge is not to choose between regulation or no regulation, but to avoid unnecessarily disruptive regulation (Koedijk and Kremers, 1996).

It is this approach that is the principal focus of the ensuing discussion since it reflects, by and large, the thrust of the regulatory reform initiatives undertaken (or planned) by a number of countries in order to improve the framework conditions for industrial competitiveness. These stress the necessity for greater simplicity and flexibility, and clear specification of the goals/objectives to be achieved by regulation.

In the subsequent discussion the primary emphasis is placed on exploring some of the most important factors believed to affect the competitive capacity of firms: *i.e.* the effects of regulations on the ability of firms to adapt to the emerging or changing business environment, and to globalisation. To do so, it seems pertinent to first establish operational definitions of key concepts, and to mention some of the elements that characterise the emerging commercial climate and globalisation: elements that are widely viewed as reshaping competition -- thereby influencing both the strategic adjustments of firms to change and the future requirements for regulatory regimes.

This may also help to clarify what regulatory reform can accomplish, and equally important, what it cannot. In this regard, the observation made by Vietor (1994) that in the United States regulation is part of, and operates within, a political economic system is instructive in that it illustrates the notion that a regulated firm must operate effectively in two related environments: the market and the political arena. As he also notes, the regulator must understand both how regulation affects this environment and the behaviour of the regulated firm. In other words, the regulatory "process" is highly political.¹⁵ Obviously, Vietor's observation is relevant not only for the United States, although there are considerable differences among countries in this respect.

New conditions of competition: concepts and implications

Competitiveness

There is no generally accepted definition of the term “competitiveness”. For the purpose of this discussion the working definition implicitly adopted at the OECD’s High Level Forum on Industrial Competitiveness, held in October 1995, will be used: namely, “the ability of companies, industries, regions, nations or supra-national regions to generate, while being and remaining exposed to international competition, relatively high factor income and factor employment levels” (OECD, 1996e).

This definition is adopted because it reflects the notion that national competitiveness is directly linked to the competitive performance of firms. Namely, that under globalisation of product and capital markets, competitive advantage becomes the key source of economic performance: determining both factor income and employment and living standard levels. Of course, national competitiveness is more than an aggregate of firm competitiveness.

Given the disparity of views as regards competitiveness (whether countries, just like firms compete, whether they compete in the same manner, etc.), it was likewise agreed that competitiveness should be viewed as an evolutionary phenomenon, calling for on-going adaptation to a constantly changing environment. The implications for regulatory policy are far-reaching.

Productivity/productivity growth

A sustained improvement in competitiveness is generally viewed as linked to enhanced long-term productivity growth.¹⁶ This, in turn, depends on the innovative capacity of firms, and on their ability to upgrade and/or change their products and processes: in short, to adapt to the emerging commercial environment. While high productivity growth is vital for competitiveness, the cause-and-effect relationship is not a one-way progression from productivity to competitiveness. Rather, the relationship is dynamic, with linkages in both directions. The perceived effects of regulation on productivity are discussed below.

Commercial climate

The emerging business climate is influenced by such trends as: faster technological progress in products, services, and business processes; growing inter-sectoral differences in the pace and rate of technical change; the increasing importance of knowledge and human skills for innovative capacity; and the drive for global economies of scale in R&D, marketing, finance and production.

Globalisation

In OECD analyses, globalisation is defined “as the widening and deepening of the operations of firms to produce and sell goods and services in more markets” (OECD, 1993, p. 7). Technology and the trend towards economic liberalisation (*e.g.* reduced restrictions on foreign investment and trade, fewer constraints placed on capital movements, and reduced regulatory requirements) are the elements that are generally cited as fostering globalisation.

The main features of the globalisation of industrial activities are: the organisation of production on an international scale; the acquisition of inputs and supporting services from around the world; and the emergence, or proliferation, of cross-border alliances and mergers & acquisitions. These international activities enable firms to enter new markets, exploit their technological and organisational advantages, and reduce business costs and risks (OECD, 1996g).¹⁷

Implications for firms

Prior to reviewing some of these implications, two general problems must be mentioned as they are of relevance to the subsequent discussion. The first pertains to the fact that while the level and nature of competition within an industry can be established, a direct link between such competition and the effects on national competitiveness cannot be made. Second, assessing industrial competitiveness within the context of globalisation has become increasingly difficult: *i.e.* traditional measurement tools cannot give a clear idea of whether competitiveness has improved or deteriorated (on which, see OECD, 1996h).¹⁸

The globalisation phenomenon, and its interaction with the emerging commercial framework, has changed the concept of competitive advantage: *i.e.* determining “what” actually constitutes competitive advantage is becoming increasingly difficult. Furthermore, globalisation is changing the very nature of competition. For instance, firms increasingly compete in both domestic and foreign markets. Since investment is no longer geographically constrained, and industry itself becoming increasingly global in orientation, the nature of trade is changing.

In addition, the notion of what constitutes a firm is changing. Picot *et al.* (1996) are among the authors who subscribe to the thesis that, due largely to the new information and communication technologies that make information instantly available, not only are firm boundaries fading, but the boundaries between firms and markets have become more permeable.¹⁹ A corollary outcome is that the time span in which specific know-how (information is deemed to provide a competitive advantage) can actually be used to defend market advantage, is decreasing at a rapid rate.

Based on their analysis of two major US companies in the discount retailing industry (Kmart, which lost its competitive position, and Wal-Mart that has become highly successful), Stalk *et al.* (1992) conclude that the essence of an effective competitive strategy is *not* one that is built around the structure of a company’s products and markets, but on the dynamics of its conduct: *i.e.* a combination of business processes; transforming these into strategic capabilities that ensue in the consistent development of products that are of greater value to customers; and fostering these capabilities by means of strategic investments.

Wriston (1992) associates the fundamental changes that are shaping the competitive environment with the interactive impact of modern communication technologies (which transmit information at an increasingly rapid rate) and of modern computer systems (which process it). The implication is that economic production (and progress) is increasingly dependent on products and processes that are knowledge and skill-based. Consequently, the key components for survival in the global business environment would be technological and commercial alliances. These developments will likewise bring with them new forms of “leaner” business organisation that, in turn, will require very different management skills -- skills that favour knowledge and strategic “global thinking” based on the rapid flow of information. These requirements will also, he argues, necessarily limit the regulatory powers of central governments as regards business/firm activities.

Ohmae (1995) is among the authors who not only agrees with such viewpoints, but takes them a step further: questioning thereby the very utility of regulation. He maintains, for instance, that the operating strategy of modern multinational corporations is no longer shaped by the requirements of the nation state, but by the need to serve attractive markets wherever they exist. Consequently, there is an evolution towards a borderless economy where effective regional clusters will be the driving force for effective competitiveness, hence prosperity: with an industry's or region's success dependent on a specific combination of individuals, institutions, and cultural singularities.

Implications for regulatory policy

The challenge posed to government by this international perspective is arduous, since it is government, or its regulatory authorities, that must forge an approach to regulation that takes into account the above-mentioned developments. Of course, neither the concern with competitiveness, nor with regulatory reform, is new. However, within the context of the globalisation of product and capital markets and of the rapid diffusion of know-how, articulating effective regulatory policies has assumed greater urgency.

For instance, technological developments and innovations have created new markets (*e.g.* satellite communications) that fall outside the scope of existing regulations, challenging thereby the existence/viability of current regulatory frameworks. The ability to access foreign suppliers, especially as regards services, and thus by-pass domestic markets and domestic regulatory control is becoming an important factor in changing domestic regulations and entry barriers. This capacity is also due to the increasing reduction of international trade barriers that have prevented transborder access to services.

A related development is that since markets have become more international, it is becoming increasingly difficult for domestic regulatory authorities to control the behaviour of their national private sector "actors". These changes have, of course, also induced more firms to press for the reduction of barriers that prevent market entry.

Since, in many areas, the impact of regulatory reform varies between domestic and global firms, it is also increasingly difficult for national governments to achieve the intended goals of reform. In the context of globalisation of industrial activities, regulatory reform influences the competitiveness of firms while also affecting the attractiveness of a given country as a location for investment by global firms. Hence, regulatory reform must be approached with circumspection because, in effect, governments cannot effectively regulate the activity of their nationally-based firms, because these firms can circumvent national regulations through their operations abroad (Vogel, 1996).

The author likewise argues that in global markets firms can engage in regulatory arbitrage, by moving their business or capital to the country with the most favourable regulations. He draws the conclusion that "globalisation has produced a competitive dynamic between national regulators that fosters deregulation" (*Ibid*, p. 11).

Thus, the international perspective suggests that current regulatory regimes must be reviewed to ascertain: whether they have become "outdated", in the sense that they take into account only the national perspective, risking thereby to be out of synch with those regimes that have a wider outlook; and whether they compromise the competitiveness of those firms (notably, SMEs) that do not have an international outlook.

Consideration needs also to be given to the indirect effect of regulations and their impact on input prices. The attractiveness of countries for investment by global firms is not only affected in regulated markets, but by suppliers that are regulated (*e.g.* such sectors as electricity, transportation, distribution, and construction) because, due to the generally poor (inefficient) performance of regulated suppliers, user firms are forced to purchase more expensive intermediate goods and services. High costs in such intermediate goods and services not only affects the international competitiveness of firms and has an adverse impact on inward investment by global firms, but drives domestic firms abroad.

Furthermore, attention needs to be paid to the interaction between industry structure and the appropriate form of regulation. Regulatory policy must likewise take into account such phenomena as the changing/emerging nature of the firm -- a transition from entities with clear boundaries to “networked firms”: *i.e.* to establish the extent to which the effectiveness of regulations is affected by the new forms of interrelationships that are developing. Taking this into account is important for governments when deciding whether to adopt more general or more specific rules.

Some issues related to productivity and competitiveness

In reviewing some of the assessments that have been made regarding the relationship between productivity and regulation, some words of caution are in order. Namely, gauging the effect on productivity depends on how one measures productivity: with the measurement tool varying according to the objective of the estimate. The empirical analyses which are devoted to examining whether changes in regulation have affected productivity show that there is little agreement (see Box 4).

Furthermore, analysts do not necessarily agree that regulatory reform as such results in productivity gains, or on whether differences in regulatory regimes affect the development paths of industries in different countries. Taking up these points respectively, Bresnahan, for instance, subscribes to the viewpoint that irrespective of the benefit to consumers, deregulation of airlines had no effect on productivity: *i.e.* did not lead to productivity benefits (as given in Baily, 1993). Nelson (1996) maintains that differences in corporate law and IPR law have, most likely, not had much effect on an industry’s development trajectory. On the other hand, he notes that the variance in regulatory regimes may well have made a difference in biotech and in medical devices: “even though the evidence here is not yet very solid”.²⁰

Finally, and as is pointed out by Viscusi (1995), how one interprets the productivity effects depends greatly on the desirability of a regulation: *i.e.* whether, on balance, benefits to society exceed the regulatory costs. Such a perspective is essential for providing some balance to the debate concerning the effects of regulations on productivity.

It should be recalled that irrespective of the perceived effect of regulations on productivity, productivity increases are also related to a complex mix of factors such as the national/institutional “setting”, the level and pattern of investment (both tangible and intangible), the educational and skill profile of the work force, innovation and technological advantage, etc.

Empirical studies at the *macro-economic level* suggest that regulation does not, necessarily, have an adverse effect on the overall competitiveness and productivity of industries. However, studies also show that changes in regulatory regimes which are designed to increase competition do encourage efficiency and can enhance productivity growth (Koedijk and Kremers, 1996, OECD, 1996*i*). Based on the analysis of the effects of regulatory reform in selected sectors, it was found that reform of economic

regulations can promote cost savings, have positive effects on labour and capital productivity, and thus can promote productivity growth and increased efficiency (OECD, 1996i).

Box 4. Impact of regulation on productivity: some estimates

Measurement method

'Accounting method': Focuses on the effect of regulation on productivity, and restricts the impact of regulation to the measured compliance costs. It requires the assumption that compliance costs are properly measured, and that regulation only affects productivity by the amount spent on compliance inputs.

Findings: These studies tend to find that regulation has little impact on productivity.

- i) Portney (1981), asserts that since under 2 per cent of GNP is spent on pollution control, pollution regulations could have little effect on productivity growth.
- ii) Denison (1979), estimates that 16 per cent, or 0.26 percentage points, of the productivity slowdown that occurred in the US during the 1970s was due to regulation.

Measurement method

'Estimating method': Not restricted to compliance costs, assesses the impact of regulation on productivity growth, and analyses the extent to which high values of regulation measures are associated with low or declining productivity growth. This method is sensitive to how results are interpreted, and could, therefore, either over- or under-estimate the impact of regulation.

Findings: These studies have generally found larger impacts than studies based on the accounting method.

- iii) Christainsen and Haveman (1981), estimate that the increases in regulation during the 1948-1977 period, explain from 12 to 21 per cent of the productivity slowdown in manufacturing.
- iv) Gray (1987), attributes the 31 per cent productivity slowdown in the 1970s in the US manufacturing industry to Occupational Safety and Health Administration (OSHA) and EPA regulations alone.

Source: Gray (1991): See p. 46 for the bibliographical references to the authors cited by Gray.

- i) P. R. Portney, "The Macroeconomic Impacts of Federal Environmental Regulation".
- ii) E. F. Denison, "Accounting for Slower Economic Growth".
- iii) G. B. Christainsen and R. H. Haveman, "Public Regulations and the Slowdown in Productivity Growth". The authors examined the relationship between labour productivity growth in the manufacturing sector and various measures of total federal regulation.
- iv) W. B Gray, "The Cost of Regulation: OSHA, EPA and the Productivity Slowdown". The author analysed productivity growth in 450 manufacturing industries, which included measures of both OSHA and EPA regulation.

As to the productivity effects of social regulations, the findings are varied. Some studies suggest that environmental compliance costs are not a significant factor affecting performance and competitiveness

at the macro level. Moreover, any negative effects tend to be offset by such elements as reduced input costs, innovation, and greater efficiency in production (OECD, 1993a).

The analysis concerning the effect of environmental regulation on the competitiveness of US manufacturing carried out by Jaffe *et al.* (1995), also led the authors to the conclusion that, overall, the adverse impact of environmental regulation on productivity effects appears to be modest, although it varies greatly by industrial sector. The fraction of the decline in the total factor productivity growth rate due to environmental regulations was estimated at 10 per cent in chemicals, and 30 per cent in paper products. They likewise found little evidence to substantiate the hypothesis that environmental regulation would have significant adverse effects on competitiveness as measured by net exports, overall trade flows, changes in direct foreign investment, and plant-location decisions.²¹

A different assessment is provided by Robinson (1995) who analysed the impact of environmental and occupational health regulations on productivity levels and growth rates in 445 US manufacturing industries during the 1974-1986 period. His conclusion is that their costs are much more significant in terms of diminished productivity than in terms of direct compliance expenditures, in themselves onerous.²² His assessment is that the cumulative effect of EPA and OSHA regulations were to reduce multifactor productivity by 11.4 per cent from the level it would have achieved without EPA and OSHA regulation: with larger industries (*i.e.* industries with a greater share in the value of total manufacturing output) tending to suffer greater losses in productivity growth than their smaller counterparts. Gray (1991) shares the viewpoint that regulation does reduce overall productivity growth. However, he attributes this to the adverse impact of regulation on newer and smaller plants.

As regards the productivity effects of regulation at the *microeconomic level* of the sector or firm, the empirical evidence is also mixed. The net positive and negative effects on productivity and competitiveness differ greatly by sector and type of regulation.

For instance, Weidenbaum (1995) concludes that the net impact of the regulatory burden placed on American firms is loss of productivity, hence competitiveness. He attributes this, *inter alia*, to the fact that US companies are faced with higher regulatory costs and with more stringent regulation of production. This, combined with the pervasive tax and regulatory obstacles placed in the way of US firms (especially as regards high-tech companies) would have added significantly to the cost of doing business in the United States.

On the other hand, a number of studies in various countries suggest that environmental regulation can also enhance international competitiveness, when implemented so as to provide a firm with a strategic advantage in industries where environmental concerns are becoming increasingly important for consumer satisfaction, or because firms have, by means of such regulation, been able to increase efficiency in general.

Gray (1991) notes that firm productivity could be adversely affected if regulation limits innovation in new product development because a firm is uncertain about the regulatory constraints a new product may face. The enforcement activity of a regulatory agency (*i.e.* the nature of the particular compliance requirement) may itself reduce productivity. On the other hand, regulation can positively affect productivity by forcing a firm to develop new and more efficient production techniques, or by encouraging it to shed outdated management techniques and to restructure. In the event that regulation imposes enormous compliance costs on firms, it is likely that inefficient plants will simply be forced to close. Research on the effects of this indicates that, as regards the United States, "cyclical increases in

business failures are associated with increases in labour productivity growth as inefficient firms exit” (*Ibid*, p. 36).²³

Using the example of standards, Viscusi (1995) similarly concludes that the cotton dust standard mandated by the OSHA led to the adoption of new technologies utilised by the textile industry. The concomitant effects, in the long term, were to lower production costs, and to render production more efficient. It should be noted, however, that the cotton dust standard is itself an issue of debate, in that it is argued that “the superior productivity performance of the textile industry as compared to the rest of manufacturing pre-dated the imposition of the cotton dust standard in 1978, and was due largely to market-driven improvements in textile machinery” (Robinson, 1995, p. 395).

The fact that regulation may have positive efficiency effects, thus also positive competitiveness implications for specific sectors, is likewise indicated by the OECD (1993a) analysis which points out that environmental regulations can yield advantages with respect to innovation, efficiency, front-runner benefits, and spin-off activity. Citing the case of Japan, it is noted that in response to the pressure to increase energy efficiency and to lower pollution levels, energy and raw material inputs were reduced resulting in competitive cost advantages for Japanese-produced goods in certain sectors.

Some issues regarding innovation, R&D and competitiveness

A major bone of contention in the competitiveness discussion is whether or not regulation has a technology-forcing/innovation-inducing effect. Since innovation is a costly and risky activity, and firms need assurance of some potential pay-off in order to invest the necessary resources, the issue of whether competitive pressures stimulate or impede innovative effort is central to the debate regarding the relationship between regulation and the innovative capability of firms.

This long-standing debate is linked to the fact that a good deal of regulation applies to highly innovative industries where the pace of technological change is rapid. It is also connected to the fact that some regulations are designed to encourage (if not require) technological change: *e.g.* in the automobile industry, regulations for pollution control and energy efficiency; favourable financial measures designed to foster the development of technologies for energy conservation; or regulations to set inter-operability standards for electronic networks. The underlying issue is, of course, the implication for innovation.

A variety of viewpoints underlie the controversy. One is that, in some cases, regulated firms have little incentive to choose an efficient technology and to reduce resource use: hence regulated firms are not very motivated to pursue technological innovations in production or for the creation of new goods and services. Another is that regulation can slow the diffusion of innovations, thus leading to the use of inefficient technologies and operational slack in enterprises. UNICE (1995) affirms that regulations create barriers to innovation when they increase uncertainty and the cost of development, slow down the production process, and restrict, in an excessive manner, the development and exploitation of new technologies.

Implicit in such viewpoints is the notion of cost. One aspect here pertains to direct costs: *i.e.* actual financial outlays for compliance. The other, and considered to be more significant, concerns indirect costs. Such indirect costs involve potentially higher prices that regulation may imply for certain factors of production. Perhaps more importantly (if one takes into account the implications of globalisation), they also concern foregone “opportunity” costs that can ensue if regulation has an adverse

impact on innovative capacity: *i.e.* hinders the ability of firms to adapt to technical change, a vital requirement for accommodating to the changing commercial climate.

Prior to reviewing some of the assessments that have been made, some general considerations must be kept in mind. *Ex-ante* studies of regulatory change frequently do not estimate adequately the impact of regulation on technological innovation. Consequently, the benefits of improved regulation that may lead to rapid technological advances are significantly understated.²⁴ Furthermore, different regulatory approaches may be needed at different stages of the technological and organisational development of a given branch: *i.e.* a regulation that promotes innovation at one stage might become an obstacle at another. Finally, the very complexity of the regulation/innovation debate can be illustrated by the telecommunications “case” which suggests that there is a feed-back loop between technology and regulatory reform: *i.e.* that new technologies can speed reform and the modification of regulations, while new regulations properly designed can encourage technological developments (see also OECD, 1995a).

Impact of regulation on innovation

In order to assess whether or not regulation affects the innovative, hence competitive, capacity of firms, Noll (1996) suggests that regulatory policy should be judged on the basis of whether, and how, regulation: suppresses or promotes innovations directly, by, for example, erecting barriers to new, improved products and production processes; encourages or discourages R&D effort, which will indirectly affect the innovativeness of regulated firms; and whether, holding innovative effort fixed, regulation distorts the choice of technologies that are explored and adopted. Two other criteria are equally relevant. Namely, the effect of regulation on competition among existing firms other than by changing barriers to the development of new products and processes (as when prices are regulated outside of natural monopolies), and on entry of new firms selling existing products using existing technology.

The literature indicates that the dynamic aspects of the relationship between regulations and innovation are crucial. The key variables leading to positive or negative outcomes in this respect appear to be the type of regulation, the regulatory method used, the sector regulated, and the compliance strategy applied by a firm.

Hahn and Hird (1991) maintain that inappropriate regulation can have an adverse impact on innovation, particularly in areas such as telecommunications and pollution control where the pace and rate of technological change is rapid. In such industries it is difficult for a regulator to ascertain which production processes would be least costly, or which products would be ‘best’. Consequently, any attempt made by regulators to “micro-manage the firm’s production techniques, its product offerings, and its pricing decision through, for instance, a command-and-control type regulation, may result in substantially lower performance” (Sappington, 1994, p. 14): *i.e.* slow down the introduction of new products and pricing structures to reflect better production costs.

Robinson (1995) points out that the data he analysed revealed no “technology-forcing” impact of either environmental or occupational health regulation for the manufacturing sector as a whole. He likewise maintains that some regulations (for instance technology-based regulations or regulations which require innovative approaches to pollution reduction) may have the ultimate outcome of diverting managerial and engineering resources away from pursuing cost-reducing innovation.

The UNICE (1995) study found that, in general, regulation stimulates innovation only to an insignificant extent. The preponderant effect of regulatory restrictions is to distort the choice of technologies that are explored and developed, and by increasing the uncertainty and costs of the

development process, create barriers to innovation. In the long term, this is expected to have negative effects on the competitiveness of the firms concerned.

The above-mentioned notion that the relationship between regulation and technological development may be inter-active is illustrated by Viscusi (1995). Using the example of regulation of product safety, he notes that such regulation has undoubtedly raised the cost of products and their prices. Mandated safety standards also open the way for litigation. It is from this perspective that he argues that, overall, the prospect of higher liability costs stimulates new product innovations, and that the average effect of liability has been to increase R&D expenditures in the US economy by 15 per cent. However, Viscusi also points out that at very high levels of liability, the effect is to discourage innovation.²⁵

Some authors attribute the adverse impact on innovation to the regulatory method that is used. The example mentioned by Hahn (1990) pertains to the risk-screening procedures that are used by US agencies. Citing the case of the Federal Drug Administration (FDA), he notes that those studies which attempted to document the impact of the efficacy requirement on the FDA's approval of "new chemical entities", came to the conclusion that the drop in the number of approvals granted led to a decline in new drug innovations. Subsequent streamlining of the screening procedures in both the research and market approval stages, could, he concludes, reverse this trend: provided that the reforms actually reduce the cost to firms of obtaining approval.²⁶ He also maintains that the Drug Export Amendments Act of 1986, which allows exports of drugs that have not yet been approved for the domestic market, will provide additional incentives to pharmaceutical manufacturers to develop and produce new drugs in the United States.

As regards environmental regulations, the possibility that product and process innovation may be hampered, is linked by Jaffe *et al.* (1995) to the type of regulation: *e.g.* regulations which mandate that firms use "best available control technology" for pollution abatement. While this may lead to the adoption of new technologies in the short-run, they conclude that the long-term effect may be to discourage a firm to innovate simply because emission standards could be tightened each time the firm innovates with a cost-savings approach. Consequently, they support the viewpoint that market-based or economic-incentive regulations are likely to be more effective in stimulating innovation than regulations that mandate fixed technological or performance standards.²⁷

Also using the example of standards, Viscusi (1995) maintains that one effect of environmental standards is to encourage innovation in environmental technology. Van der Linde (OECD, 1993a) proposes not only that properly designed environmental standards can trigger innovation resulting in more efficient and less costly production methods, as well as the production of higher quality products, but that this will result in early mover competitive advantage.²⁸

The notion that properly designed environmental standards can trigger innovation is taken a step further in the Porter and van der Linde (1995) analysis which maintains that such "innovation offsets" can not only "lower the net cost of meeting environmental regulations, but can even lead to absolute advantages over firms in foreign countries not subject to similar regulations. By stimulating innovation, strict environmental regulations can actually enhance competitiveness" (*Ibid*, p. 98). However, the authors also point out that if environmental regulations are to foster innovation offsets, they must focus on outcomes, not technologies: *i.e.* incentives for innovation must be built into the regulatory process itself. In other words, regulations should, as much as possible, include the use of market incentives (*e.g.* pollution taxes, tradable permits), and not prescribe such remediation technologies as "best available technology" or "best available control technology". The competitive advantage aspect is taken up in the discussion concerned with trade-related issues.

A somewhat similar reasoning is used by Sanchez and McKinley (1995), though their argumentation centres more on a firm's compliance strategy. Also using the example of product regulation, they challenge the universality of the assumption that such regulation is detrimental to the competitiveness of firms. The authors maintain that if a business uses a differentiation strategy (and, the more it does so), the effect of domestic product regulation on a firm's ability to compete will become increasingly positive. This positive effect will, used in conjunction with a differentiation strategy, likewise be strengthened if there is growing global demand for the firm's product. They point out, for instance, that the global demand for polyvinyl chloride (PVC) resin enabled US firms in the PVC industry to "remain highly competitive despite, perhaps because of, intense product regulation at home" (*Ibid*, p. 299).²⁹ Finally, the authors stress that a crucial variable that influences the effect of product regulation is the attitude of managers: namely, if managers view such regulation as an opportunity and not as a threat, they will come up with innovative responses to regulatory standards.

Impact of regulation on R&D and investment in R&D

The importance attached to the impact of regulation on R&D activities and R&D investment reflects the viewpoint that, over the long haul, a major driver of productivity/competitiveness is a firm's R&D performance. Investment capacity, and its deployment, are critical components for a firm's survival in a competitive environment. Investment ability may be compromised if the cost of compliance to regulation absorbs an excessive amount of resources that would then be deflected from the R&D effort: resources in terms of both capital and current expenditure (*e.g.* such administrative costs as management and engineering staff time, and training).

Innovative/competitive capacity is, of course, also contingent on such aspects as the internal structure and product mix of a firm, and its operating flexibility. However, within the context of globalisation and the emerging commercial climate, other requirements are assuming greater importance. These include, *inter alia*: joint industry research; greater skill-intensity in the production of goods and services; the ability to form co-operative alliances (*e.g.* technological links, R&D partnerships, etc.); and the freedom to take advantage of opportunities that can ensue from network-type linkages, as well as from the new and different forms of co-operative agreements that are emerging. Among such advantages are reduced production costs, access to new production techniques, and diminishing cost (and risk) of R&D for the individual firm.

Weidenbaum (1995) associates the deceleration in scientific progress in the United States both with the adverse impact of regulation on R&D and the fact that regulation slows down the diffusion of innovations. He argues that the primary reasons for this outcome are the diversion of resources from investment to compliance, and the increasing red tape (paperwork) requirements that slowdown the rate of approval. Such regulatory lag reduces the development and diffusion of new and better products.

Robinson (1995) contends that regulatory decrees which, for instance, mandate stricter pollution controls of new or renovated plants, discourage new investment and encourage the retention of antiquated capital equipment.

UNICE (1995) states that among the companies that were surveyed, 46 per cent reported that regulations made it difficult to invest in new plant, considered to be one of the principal determinants of effective structural adjustment. It is maintained that, since regulations either hamper or slow down investment, the ensuing effects are lost market opportunities, higher costs, and lower returns on capital.

Jaffe *et al.* (1995) are sceptical as to whether continually higher regulatory standards mandated for industry to meet environmental standards would, automatically, push firms to search for new clean and

profitable technologies. They likewise maintain that the available empirical data does not support the hypotheses that regulation would, by forcing a re-examination of products and processes, *necessarily* impel firms to increase expenditures devoted to R&D.

Palmer *et al.* (1995) note that appropriate regulations can induce firms to search for cost-saving and quality-improving innovation. They likewise conclude that a greater reliance on incentive-based regulation than on command-and-control regulation will reduce the cost of complying to environmental regulations. However, they also maintain that even incentive-based environmental regulation results in reduced profit for the regulated firm. While such regulations may be more attractive for reasons of dynamic efficiency, they do not minimise the costs of attaining environmental standards at any particular point in time. Thus, they argue that, viewed in the context of general dynamic equilibrium, environmental regulations depress “productive” investment in R&D.

The study concerned with US R&D policy carried out by the Council on Competitiveness (1996), analyses the effect of regulation on R&D and innovation in some of the sectors considered vital for competitiveness. Overall, the assessment is made that some regulations and regulatory procedures have an adverse impact on R&D in the United States. Three illustrative examples are given in Box 5.

Box 5. Regulation: Impact on R&D and Innovation

Aircraft

R&D in the civil aircraft industry is said to be shaped by increasingly rigorous safety regulations and environmental standards that add roughly \$1 million to the cost of developing each airplane. Nevertheless, it is also noted that such regulations serve to stimulate new R&D, and since US firms adhere to the same certification criteria as their European counterparts, safety regulations do not pose a competitiveness problem, as such. However, the Federal Aviation Administration's (FAA) cumbersome certification procedures do constrain significantly the introduction of new general aviation technology into commercial aircraft. Furthermore, the Clean Air Act's permit process is said to lock companies into current manufacturing processes for a five-year period, posing a serious impediment to new aircraft development.

Chemicals

Compliance with environmental regulations is said to be one of the factors that most hinders outlays for R&D. According to data provided by the Chemical Manufacturers Association (CMA), expenditure for pollution abatement was \$4.4 billion in 1992 (5.5 times higher than in 1975), and is projected to reach \$11 billion by the year 2005 -- in constant 1990 dollars: mostly as a result of the Clean Air Act. The chief victim will be long-term R&D; essential, however, if the industry is to sustain a globally competitive position.

Pharmaceuticals

It is claimed that in the area of clinical research, American pharmaceutical companies are conducting an increasing amount of research abroad; mainly because of the regulatory obstacles faced. Regulations governing clinical research are also considered to be one of the primary reasons for increasing R&D costs: chiefly because the FDA is augmenting the scope and number of clinical trials required for marketing approval. Rising research costs are considered to be particularly worrisome as they coincide with intense pressure faced by companies to hold down product prices.

Source: Council on Competitiveness (1996).

While the assessments made suggest that regulation both inhibits and distorts R&D and innovation to the detriment of productivity and industrial competitiveness, the actual effects are differentiated by industry, and very much depend on the type of regulation under consideration. Regulations that provide incentives to reduce costs are generally better than those that prescribe the use of specific technologies. Regulatory methods/procedures also appear to be an important variable. Nevertheless, it is far from evident which forms of regulation have beneficial effects, thus exceeding their costs, and which regulations need modification in order to reduce their costs to the affected firms.

The assessments made likewise infer that regulations/regulatory reform must take into account a potential trade-off between static and dynamic efficiency. Furthermore, the economic performance of most manufacturing and service industries depends on using technology effectively: *i.e.* adopting and utilising ideas and products developed elsewhere. An important consideration for regulatory reform therefore is the impact of competitive conditions on the rate of diffusion of innovations.

Economies of scope are an equally important consideration: *i.e.* under what circumstances is it more efficient to have many firms producing different products versus a few firms each producing a range of products? Economic theory suggests that neither concentrated market structure nor firm size in

themselves determine innovative activity. This suggests, in turn, that regulatory policy should focus on the underlying factors that shape both market structure and innovation.

As regards R&D *per se*, numerous analyses indicate that R&D activities are primarily financed from a firm's internal funds, and that small high technology companies do face liquidity constraints. In such an environment, the structure of capital markets and venture capital financing assume great importance. Given this context, the implications for regulatory reform appear to be the need to address the obstacles to financing R&D: *i.e.* the structure of capitals markets.

Finally, the forging of cross-border alliances is one response by firms to meet the challenges posed by the globalisation of industrial activities. Among these, technology alliances are one of the means for companies in high technology opportunity industries to spread high R&D sunk costs, and to benefit from knowledge (often tacit) available in other firms. How countries deal with such alliances, depends on the type of competition law in effect (Jorde and Teece, 1990). For regulatory reform the challenge is to find a balance between the private and social benefits of technology alliances, and the possible danger that such arrangements may degenerate into abuse of market power.

Some issues associated with access to international markets

The purpose here is not to discuss trade issues as such, but some of the impacts of regulation on the parameters of firm competitiveness that influence a firm's commercial performance. Nevertheless, there is one traditional market access issue that does need to be mentioned because it is intimately related to the international perspective. This is the observation, frequently made, that differences in regulatory stringency and implementation can be used to disadvantage foreign suppliers relative to domestic producers. However, it is only when compliance costs per unit of output are higher for foreign firms than for domestic firms that the 'playing field' tilts towards domestic producers. If foreign firms face the same compliance costs as domestic firms, comparative advantage will dictate who succeeds in the market and who fails (Sykes, OECD, 1996j).

Early mover competitive advantage

Among the competitiveness parameters that were evoked in the previous discussion, is that of early mover advantage. The debate ensues primarily from the hypothesis that there is an interactive relationship between regulatory heterogeneity (notably, as regards differences in enforcement stringency and prescribed standards), and access to international markets. It is argued, for instance, that since the benefits of a regulation may not be immediately apparent, a firm operating in a less stringent regulatory environment may, due to the compliance costs entailed, delay its implementation. This could, in the long term, lead to the loss of a market niche.

Sykes maintains that even if the cost of compliance (*e.g.* in new capital investment or investment for retooling) is the same for domestic and foreign firms, domestic firms are intrinsically in an advantageous position because they will have greater advance notice of an impending regulatory change. This, he argues may, at least for a period of time, confer exclusive access to a regulated market: in a situation where economies of scale are important, this first mover advantage may translate into a long-term competitive advantage.

Viscusi (1995) posits a somewhat different view regarding the effect of regulation on a firm's competitive commercial position. As regards environmental standards, he concludes that such standards

encourage the commercialisation of new technologies in the United States. While he also endorses the notion that some firms will be able to capture new markets by seizing the initiative, he does not support the thesis that, as a result of strict environmental standards, clear competitive benefits can accrue to an entire industry. This is because differences in environmental standards among the United States and most industrialised countries are unlikely to be important. As regards product safety standards, he maintains that to the extent that such standards affect US exports, they may place such products at a comparative disadvantage because they could be forced into a higher price and quality range compared to non-US products.³⁰ However, as is the case for environmental standards, he points out that differences in safety standards are likely to be transitory.

Jaffe *et al.* (1995) do not subscribe to the thesis that stricter environmental regulation can create lasting comparative advantage for US firms, or that there are early mover advantages to be enjoyed by those firms that first enter the markets for producing pollution control equipment. They also conclude that since differences between US standards and those of major industrialised trading partners are not very great, (notably, for air and water pollution control), these differences pose insufficient threats to US industrial competitiveness to justify substantial cutbacks in domestic environmental regulations.

Gallarotti (1995) approaches the first mover issue from the perspective that regulators are neither knowledgeable about, nor necessarily sympathetic to, a firm's requirements. Thus, prescriptive regulations can result in inefficiencies and unnecessary additional cost burdens. Consequently, the author centres his argument on empirical research which suggests that voluntary "green practices" are an efficient alternative to regulation. He likewise maintains that it is through the *voluntary* initiation of an environmental strategy that early mover advantages are accrued. Among the illustrative examples cited are Wal-Mart (which has pursued a green labelling programme) and the Canadian chain Loblaws (which places emphasis on selling environmentally sound products). Finally, he asserts that gearing production to the most regulated national markets not only ensures access to all markets, but maximises international competitiveness. This is because there is an incentive for entire industries' environmental performances to gravitate towards this highest-common-environmental denomination: failure to do so, can affect the competitiveness of an entire product line.

Though not addressing the issue of early mover advantage, Ingenjörsvetenskapssakademien (1996), a Swedish analysis based on a survey response of 120 companies, likewise concluded that since environmental standards have become a 'market component', in the sense that they mirror consumer demand, companies which do not adapt their product and process development to regulatory requirements risk becoming less competitive. In other words, there appears to be an intimate connection between a firm's "environmental performance" and its long-term competitive performance.

Plant location

Apart from considerations related to first or early mover advantages, an industry's competitive commercial position may be affected by the impact of regulation on plant location. The central argument is that regulation affects the cost of doing business, therefore influencing whether a particular country remains attractive as an investment site. This issue becomes all the more important since liberalisation, advancement in information and communications technology, and research mobility make it possible to locate any activity where it is most efficient.

Weidenbaum (1995) argues that due to over-regulation, operating costs in the US have become so onerous that many US companies shift their investment to foreign locations. He likewise asserts that establishing a new industrial facility is very difficult because of the number of permissions required, and

the time delay involved (sometimes years) in obtaining them. He notes, for instance, that a company must obtain agreement from dozens of agencies, from federal, state and local governments, and from the courts: a regulatory maze that led, he asserts, the Dow Chemical Company to cancel its plan for building a \$300 million petrochemical complex in California as the company had obtained only four of the 65 required authorisations.

UNICE (1995) similarly indicates that, on the basis of a survey of European biotechnology companies, it appears that the majority of them are planning to locate their future investment outside of Europe due to the negative views these companies have of the European regulatory framework.³¹ The same observation is made regarding European car assembly companies: *i.e.* that the problems associated with the length of time it takes to complete a research project could very well induce these companies to locate their research facilities elsewhere.

Stringent regulatory requirements, notably as regards environmental regulations, have likewise been hypothesised to affect plant location: *i.e.* plants would relocate to areas where the regulatory environment is less strict. The empirical evidence suggests that this is not the case. For instance, Andersson *et al.* (1995) note that, with the exception of the production of some highly poisonous substances, little comprehensive relocation has been observed. At the same time, they point out that the stringency of regulations may be limited by the risk of relocation. According to Leonard (1988), relocation has only taken place in industries with slow growth and weak domestic demand.

Jaffe *et al.* (1995) similarly found little direct evidence to substantiate the thesis that the stringency of US environmental regulations has a significant effect on the location of new plants in the United States. Rather, the empirical evidence suggests that location decisions are sensitive to such aspects as the level of State taxes, availability of public services, the degree of labour unionisation, and the existing level of manufacturing activity. As Hahn (1995) also points out, the empirical data indicate that environmental control costs are not large enough compared to labour and infrastructure costs to alter the location decision of firms.

Henderson (1996) in his analysis of the effects of air quality regulation, reaches the conclusion that firm location decisions in the United States are affected by local environmental regulation: *i.e.* non-attainment of national quality air standards does lead to a net exit of plants out of a county.³² Furthermore, in counties that do adhere to such standards, the growth rate of new plant location is much higher than in those that do not: *i.e.* if air quality standards are not achieved, plants move elsewhere. This would suggest that “cleaning up” the environment, confers a positive externality.

Bearing in mind the globalisation phenomenon which, *inter alia*, is making investment more mobile, it would appear that for some firms, in certain sectors, gearing production to meet the standards of the most regulated (major) market can be an effective strategy. On the other hand, the assessments made also suggest that, based on the firm/sector under consideration, stiff or unfavourable regulation might deter investment, or encourage firms to move to other locations. Such issues are far from resolved. It would appear that to do so, a corollary problem needs clarification: namely, the proper level (local/regional, national, supra-national authority) at which regulation should be set.

Some issues concerning firm size: SMEs

Establishing a relationship between regulation and a firm’s competitive capacity is particularly arduous as regards small and medium-sized enterprises (SMEs). First, it is difficult to speak about SMEs in generic terms, as the notion of an SME varies from country to country: *i.e.* a firm considered to be

medium-sized in one country, may be considered to be very small in another. Second, SMEs are very heterogeneous as concerns their “occupation”: some are very S&T oriented (*e.g.* in the information and communications technology area), others directed towards retail distribution; some SMEs are internationally oriented, while others serve local markets; some are essentially concerned with supplying very large clients (and may only have one client), while others may serve the consumer market; etc.

The result of all this is that regulatory regimes will have very different impacts from one firm to another. Consequently, while empirical studies may shed light on the problems of a particular category of SMEs, it will be hard to draw general lessons. In the event, empirical analyses of regulatory impacts on the competitiveness of small businesses are extremely rare: reflecting the lack, in general, of operational measures and analytical methods to assess such impacts.³³ This is surprising given the importance attached to SMEs in terms of their ‘place’ in overall economic development: a significance that is reflected in the variety of measures undertaken by a number of OECD Member countries to relieve the regulatory burden on firms, notably on SMEs.

Perhaps another reason why the literature neglects this aspect of regulatory impact is because the fundamental problem of the relationship between firm size and innovation has not been resolved. While, as Symeonidis (OECD, 1996l) points out, small firms do face greater financial constraints than large firms (an important consideration since innovative capability is linked to the availability of financial resources), in most industries there are, most likely, no economies of scale in the production of innovations.

UNICE (1995) emphasises that while both larger-scale companies and SMEs identified the same problems with the current regulatory regime, the adverse impact of regulations on SMEs is particularly harmful. This is because SMEs are less equipped to deal with such problems, and because the inherent strength of SMEs tends to be in flexibility which may be hampered by regulation.

A major problem is related to the fact that the cost of administration entailed in compliance has a disproportionate effect on small firms. Namely, in many cases compliance is based on a fixed, standard cost for all firms, irrespective of size, and a sliding scale subsequently, related to increasing size. This means that average compliance costs per employee are much higher for small firms.

This was shown to be the case in the Netherlands where research on this issue indicates that the cost of administrative obligations are Gld 7 billion annually, with the preponderant share falling on smaller businesses. For instance, “it was found that companies employing between 0-4 staff were being required to pay annual administrative costs of around Gld 4 200 per employee, whereas for companies employing over 500 staff, the equivalent cost per employee was only Gld 200” (OECD, 1995b, p. 80).

The UNICE assessment is that a major consequence of the asymmetric rise in fixed costs is not only the diversion of scarce financial resources away from productive investment, but also the absorption of management time. In the long term, the latter is considered as being the most damaging for the competitiveness of small businesses because SMEs have fewer managerial resources. Hence, the impact of diverting management time is more severe precisely because scarce managerial resources cannot be used for directing the strategy and managing the operations of an enterprise. Nevertheless, the investment issue is also of major concern. This is because SMEs tend to have less capital available than larger companies: due, *inter alia*, to a greater reliance on short-term borrowing and greater restrictions in access to equity capital.

Furthermore, the cost burden (both direct and indirect) is said to affect negatively the extent of entrepreneurial activity and new business formation that are critical for the growth of SMEs. Also, the inauspicious developments regarding R&D and innovation as a result of the regulatory impact will, it is

thought, have a greater adverse effect on SMEs since they are less equipped to adapt rapidly to the changing competitive environment. Consequently, the concern that early mover competitive advantage risks to be ceded to multinational companies will be particularly harmful for SMEs -- in terms of loss of market opportunity.

Finally, the impact of regulation on operational flexibility is also said to have a more negative impact on SMEs. In order to ascertain the validity of this assessment, UNICE conducted a survey of companies in the industrial cleaning sector: a sector that is dominated by SMEs and in which 'success' is determined by flexibility. The survey established that 83 per cent of the companies surveyed linked regulations to the inability to expand their business operations. The primary reasons given are that regulations restrict: recruitment and dismissal of personnel; transfer of activities; and use of part time and temporary labour.

Given the increasing importance that is attached to the role of innovation in furthering economic growth and competitiveness, there are a number of other considerations that must be mentioned because they likewise evoke the issue of size: hence, also have specific implications for regulatory policy as regards SMEs.

The first concerns the *relative cost of R&D and technology development*. In many industries the cost of developing new generations of products, and then designing and building new production facilities is increasing rapidly. In addition, there are regulatory and testing costs associated with health, safety and environmental standards. On the other hand, despite rising costs of R&D and compliance with associated standards, in some industries the dynamics of product development have encouraged the splitting up of R&D projects into smaller constituent parts. To the extent that costs of R&D, technology generation, and meeting associated standards are high or are increasing more rapidly than other costs, then smaller firms and businesses may, due to inadequate resources, be (increasingly) excluded from R&D and technology development.

For regulatory reform this suggests that consideration be given to such issues as: i) ensuring, wherever possible, that compliance procedures associated with R&D and new technologies are not unnecessarily costly, complex, or long; and ii) that, in conformity with competition regulations, small businesses are not prevented from achieving economies of scale in R&D through consortia.

A second issue of importance to smaller firms pertains to *access to, and use of, information*. As competition increases, and as flexibilities and abilities to respond to changing demand and supply conditions become crucial, continuous reconfiguration of enterprise resources must be an increasingly important component of a firm's strategy. This calls for access to information, and the requisite resources not only to acquire it, but to assimilate and act upon it. To the extent that there are high thresholds (both in terms of direct costs and in terms of management effort) and economies of scale in acquiring, assimilating and using information (including about regulations), then these will disfavour those smaller business units which have neither the financial nor the management resources to overcome these thresholds, nor the ability to achieve necessary economies of scale.

The implications for regulatory reform are that attention should be paid to: i) ensuring that information in the public domain which affects firm strategies and behaviour is easily available, and that there are no unnecessary regulatory burdens which are exacerbated by small size that would hinder access to such information; ii) where information is not formalised, that there exist mechanisms to codify and widely distribute such information without regulatory hindrance; and iii) that regulatory procedures do not create needlessly high thresholds to access or use information that is, in principle, widely available and essential for business performance.

A third issue relates to finance and capital markets, since *inadequate access to capital* and other financial and regulatory obstacles not only impede entrepreneurship and the establishment of new innovative firms, but also innovation by existent and new small firms.

As regards regulatory reform, the following areas should receive particular attention: i) that regulations allow for risk capital and other forms of “patient capital” that are geared to the risks and uncertainties surrounding small firm financing; ii) that regulations do not hinder small business owners or managers from obtaining access to expertise or information on sources of financing; and iii) that regulations do not prevent SMEs from pooling such information resources.

III. PRELIMINARY IMPLICATIONS FOR REGULATORY POLICY: POSSIBLE DIRECTIONS FOR FUTURE WORK

General policy considerations

As is evident from the previous discussion, the concern with regulatory reform reflects the belief that a good deal of regulatory activity continues to be misdirected: with some analyses underscoring that national and firm competitiveness are hindered by excessive and/or inappropriate regulation. In order to address such concerns, it would appear that a number of general “requirements” must be at the forefront of policy-making. Some of these will be taken up in greater detail in the subsequent discussion.

It is apparent that just as regulatory systems differ between countries, there is no single “re-regulation/deregulation model” that can guide the reform effort. This is because differing institutional settings in countries, and the distribution of authority over regulation between these institutions, not only determine the country-specific regulatory framework, but also the different approaches to, and methods of, regulatory reform. Nevertheless, there is widespread agreement that, in the interest of developing and supporting an innovative and competitive economy, a clear regulatory framework is needed: one that takes into account that each national regulatory system necessarily operates in synergy with other national systems.

Such a framework must also articulate transparent and long-standing goals. This requires clarity as regards both the goal of regulation and what regulatory reform can, and is trying to, achieve. In other words, in order to conduct an informed discussion about the connections between regulatory reform and competitiveness, it is essential to take a view about the problem that regulatory reform is supposed to address, and to clarify the sense in which the concern with industrial competitiveness can be met. Such an approach might be helpful for policy-makers in deciding whether a regulation is appropriate for achieving its intended goal, and what form of regulation might be most suitable for meeting a given objective.

Another general requirement, and one that has already been emphasised, pertains to the need to have on-going assessment of the costs and benefits of regulations: in the form of periodic stock-taking of the impact of regulations on industrial competitiveness, as well as on the economy and society as a whole. It is only by comparing costs with benefits that the economic and social ‘worth’ of a regulatory measure can/should be determined. After all, as Noll (1996) points out, regulatory policy is a form of collective good, in the sense that the product of the regulatory process is a rule that simultaneously affects all participants in regulated markets. While it may not be possible to arrive at conclusive cost-benefit assessments, such attempts should, nevertheless, be considered as an intrinsic part of regulatory policy.

Furthermore, and taking into account that the regulatory process is highly political, the importance of the winner/loser perspective must be re-emphasised: *i.e.* in addressing regulatory reform, the need to take into account the forces that will support or oppose reforms. Consequently, it is as important to understand not only what may be desirable or efficient, but also what responses by economic agents will likely be stimulated by the proposed changes.

A closely related aspect, and one that appears to be slighted in the rhetoric surrounding regulatory reform, pertains to the actors in the regulatory process. That is, in the design of regulatory policy differences in the form, function, and scope of regulatory policies are *not only* linked to differences in social institutions and to the characteristics of the industries being regulated. As Sappington (1994) has noted, these differences also arise from the regulator's objectives and resources. In other words, not just lobbying by interest groups, for instance, but the behaviour of key individuals in the regulatory bureaucracy shapes, in a very significant manner, the form of regulation. This implies that for regulatory measures to achieve their intended goal in the long term, the regulatory culture must likewise change. One consideration here pertains to the design of specific regulatory policies. Namely, as much attention must be given to the formulation of policy, as to its *ex post* evaluation. This requires not only responsible input from those concerned, but its acceptance on the part of regulatory authorities.

Consideration needs also to be given to the fact that regulations have direct (intended) and indirect (unintended) effects. Thus, regulatory policy must take into account that regulations lead to various (and, sometimes divergent) outcomes: *e.g.* provide opportunities for new and profitable economic activities; raise production costs; enforce more competition; restrict competition by allowing cartels or monopolies to form; stimulate or inhibit the formation of new firms; etc. Hence, regulatory reform requires an integrated policy approach.

Bearing in mind the international perspective, a corollary consideration pertains to the necessity to take into account the levels at which regulations are formulated and implemented, as well as their complex, and sometimes unanticipated, interaction.

In essence, regulation may be regarded as a "process of coalition formation and bargaining involving consumers, firms, and regulatory agencies" (Spulber, 1989, p. 2). Approaching the regulatory issue from this perspective is useful, in that it moves to the forefront the notion that regulatory reform, hence regulatory policy, is a dynamic process.

Regulatory reform is used, *inter alia*, to promote competition, technological innovation, productivity, structural adjustment, and market contestability. By definition, therefore, regulatory policy is multi-dimensional. In that regulatory reform frequently incurs some short-term adjustment costs, redistributes the costs of public policies among economic actors, and alters established systems of protection for both industry and the consumer, regulatory policy is controversial. Many regulations are good, and many "bad" regulations pursue legitimate policy goals. Bearing in mind the above-mentioned notion that regulatory policy is a form of collective good, the challenge for government is to find the right degree and form of regulation: *i.e.* to regulate better and in more harmony with market forces; to assure that regulations do not affect adversely the competitiveness of firms (inclusive of their innovative capability), and are sensitive to changes in the economic, social and technological environment; to accommodate the requirements of national and international regulatory systems; and to ensure that regulation is responsive to the concerns of all social partners, and not in conflict with the general public interest.

Specific policy issues

While the above-mentioned general considerations are obviously vital for regulatory reform, there are a host of more specific issues that need clarification in order to be able to establish a link between regulation and industrial competitiveness. Leaning on the previous discussion, the purpose here is two-fold: to emphasise certain aspects of the challenges confronting regulatory policy that have already been mentioned, as well as to evoke some that have not yet been taken into account adequately; and, in so

doing, indicate possible directions for future work. This “list” is clearly not exhaustive: neither is it intended to be a summary, nor to imply that the gamut of issues for regulatory reform mentioned in the preceding Sections are of lesser importance than the items brought up here.

✧ **Institutional aspects**

The literature that has been reviewed indicates that a critical consideration in meeting the competitiveness challenge is designing regulatory institutions that not only facilitate innovation and stimulate competition, but promote more effective regulation. Such institutions must be designed with two objectives in mind: not preventing markets from functioning, while taking fully into account problems that cannot be solved by the marketplace alone. Attention is likewise called to the need for public policy that not only encourages the design of regulatory measures in support of technological innovation, but that motivates continuous organisational adaptation to the changing economic and social environment. This is one aspect.

Another relates to the problem of implementation. In terms of government behaviour, it is very common for one regulation to be dropped only to be replaced by another with similar effects. Furthermore, since vested interest groups have an interest in maintaining the *status quo*, strong leadership is necessary to both implement and sustain regulatory reform -- even for a reform measure that is clearly appropriate. An equally important consideration relates to the public at large. Namely, and as Hahn (1990) has pointed out, the resistance to change can be counterbalanced if the general public also understands why current regulatory schemes often produce inefficient and ineffective results.

In addition, and as the experience of Australia suggests, the implementation of regulatory reforms in federal states requires the development of an institutional basis for inter-governmental coordination (on which, see OECD, 1996c). Lack of such coordination (particularly in the absence of strong central government leadership) can, as is said to have been the case in the United States during the Reagan administration, lead to regulatory rivalry between central, state and local governments, ensuing in a throng of different rules that are costly for firms selling and producing in many markets (on which, see Ackerman, 1992). Furthermore, and as is evidenced by all OECD countries that are engaged in regulatory reform, reform programmes will fail without an institutional basis.

It is this aspect which evokes a final consideration: one that is related to the interaction between the role of institutions and regulatory outcomes. While not underplaying the part that pressure groups play in the policy process, Vogel (1996) maintains that differences in policy outcomes are primarily related to public institutions: *i.e.* that variations in regulatory policy can only be explained by understanding how government officials in different countries define the public interest. On the basis of his country case studies, he draws the conclusion that it is the role of state institutions which best explains the essential variations in national approaches to regulatory reform, because regulatory reform addresses two issues that are of greater concern to state actors than to private-sector actors: finding new ways to raise government revenues; and designing new mechanisms for policy implementation. This would suggest that for the formulation of regulatory policy, hence regulatory reform, a good deal of consideration needs to be given to the manner in which state actors can, and do, shape the reform process.

✧ **International harmonisation**

It is generally accepted that regulatory differences among countries, particularly as regards standards and enforcement, can have an adverse impact on R&D, on the diffusion of innovation, and on the “flow” of investment. It is likewise recognised that greater inter-country compatibility among regulations could serve to further economic efficiency, promote innovation and its diffusion, and ease

market access. Nevertheless, establishing the extent to which -- and whether -- differences in regulatory regimes have an adverse impact on competitiveness would require sectoral analysis.

In addition, two closely related problems require further clarification. These pertain to the optimal means by which to achieve greater compatibility among regulatory regimes, and determining the appropriate level at which to regulate. Both must be placed within the context of the globalisation of industrial activities.

Given the differences in economic, social, and cultural backgrounds that are echoed in national regulatory jurisdictions, it is generally considered that the option of harmonising regulatory regimes at the international level is achievable only in the very long term. A number of analyses suggest that, in fact, it is neither necessary nor desirable to harmonise policies or to enforce them with centralised bureaucracies. It is argued, for instance, that within the context of globalisation (in which it is difficult to determine the national identity of both products and firms), the optimal approach is likely to be one that focuses on the impact of policies on the operation of global markets. Consequently, consideration should be given to designing regulatory rules that meet the economic requirement of improving static and dynamic efficiency, while meeting the political requirement of ensuring that national interests are being treated fairly by foreign governments (on which, see Feketekuty, OECD, 1996*m*).

It is likewise suggested that, given the globalisation of industrial activities, a conceptual approach towards eliminating regulatory distortions that is based on the notion that “bad” regulation has a purely domestic effect, is increasingly nonviable. Thus, pursuing greater mutuality in regulatory reform may be a more propitious approach in that it also elevates the domestic political debate about regulation to a matter of international policy. As is noted, such an approach implies that regulatory reform should not be addressed to separate areas of regulation. Rather, “the most effective way for defining areas of coordination of regulatory reform is likely to be in the form of cross-cutting issues, such as the relaxation of entry barriers and the active involvement of competition policy” (Noll, OECD, 1996*n*).

While the discussion concerning the merits of harmonisation versus mutual recognition is far from resolved, within the European Union the attempt made to ensure exact harmonisation of regulatory practice between countries (the case prior to the European “Single Market”) has given way to the approach of linking national practices through mutual recognition of regulations and standards.

✧ **Cost of regulation**

Besides the methodological problems associated with measuring the actual cost of regulations, there are a number of other issues that require further attention. One of these relates to the fact that empirical analyses frequently confine assessment to the impact of “large” regulatory changes: *e.g.* the effects of deregulation. However, given the increase in social regulations (notably, as regards environmental regulations and regulations pertaining to health and safety), the literature reviewed calls attention to the need to likewise assess the much larger number of “small” regulations (at whatever level they are formulated) that do impact on industries and firms. The absence of aggregate impact assessments is striking. Also striking is that assessments rarely take into account the cost of losing the benefits of previous regulations that did not, necessarily, only have drawbacks.

The literature likewise suggests that the issue of cost needs to be placed in a wider context. Namely, to take into account the impact of regulation on the innovative process. In this regard, it would appear that reviewing regulations that govern the establishment of an enterprise needs to be in the forefront of the policy agenda, since in a number of Member countries such regulations appear to discourage the creation of new technology-based firms and innovative startups.

As regards firms *per se*, it is suggested that the regulatory reform agenda should include the adoption of regulations that give firms a sharper incentive for reducing costs: *e.g.* greater use of incentive regulation. However, as Sappington (1994) remarks, the success of even incentive regulation depends on two closely related factors. First, regulatory policy can only be effective if it influences the activities of regulated firms: *i.e.* their financial well-being. Second, the regulatory environment must be such that both regulatory threats for undesired performance (*e.g.* financial penalties) and promised financial rewards for desired performance, are enforced.

Due to a variety of pressures this is frequently not the case. The source of such pressures is related to a diversity of factors: *e.g.* the regulatory environment itself which may not accept that a firm's profits increase above an 'acceptable' level; lack of judicial support for a decision unpopular with consumers or a legislative leader; political pressure, etc. Thus limited ability on the part of the regulator to adhere to a commitment, is also a factor that undermines the success of regulatory policy. This would suggest that for regulatory reform to be effective, consideration needs to be given not only to the form of regulation, but to the "commitment capacity" of regulatory authorities.

✧ Regulation/technology linkages

As has been pointed out, *ex ante* analyses of the effect of regulatory change have not paid adequate attention to the impact of regulation on technological innovation. The need to do so is linked to the observation that there appears to be an inter-active relationship between appropriate regulations and technological development.

This is an important consideration, given the increasingly significant role that imported technology plays in the performance of domestic industry. It is particularly significant for smaller countries, where purchases of R&D-intensive intermediate and capital goods from abroad is often more important for their performance than domestic technology acquisition. Since technology diffusion is a vital component for economic performance (hence competition), regulatory reform needs to address those aspects of regulation that hamper the development and adoption of new technologies. In this regard, and given the complexity of the innovation process, it would appear that a focus on long-term objectives, as opposed to prescribing use of a precise regulatory method (*e.g.* "technology-forcing" regulations), may be more effective and less wasteful of economic resources.

For instance, lack of competition and excessive regulation in the services sectors may diminish incentives to modernise by adopting new technologies developed in manufacturing. Consequently, innovation in these sectors may be hindered. Since competition is one element for improving efficiency and stimulating innovation, this would suggest that consideration needs to be given to reform measures that promote competition among firms: an approach that, as is indicated below, requires nuance in application. It would also appear that in the design of regulations, particular attention needs to be paid to approaches that encourage technological development and innovation, and that adequate account is taken of the effects of technical change.

✧ Specificity

That regulatory reform must take into account not only country, but sector/firm specificity, needs to be re-emphasised. One aspect here pertains to the debate concerning the relationship between firm size and innovation. While, as noted, this controversy remains unresolved, there is a good deal of empirical evidence which suggests that the much more fundamental and important issue is which industry characteristics favour either large or small innovators. The data appear to support the conclusion that sector specificities, appropriability and technological opportunity at the firm or business unit level are

more important than size in explaining the variance in innovative performance. Given the close interrelationship between innovative capacity and competitiveness, this would suggest that these variables must be taken into account in the design of regulatory policy.

The characteristics of an industry influence the form, function, and scope of regulation in a very significant manner, thereby also calling for specificity in approach. For instance, Sappington (1994) in his discussion of the interrelationship between regulation and a firm's production technology, points out that just absence or presence of economies of scale can influence whether the chosen form of regulation will be effective: *i.e.* the effectiveness of a regulatory instrument can hinge on whether there is a single supplier in a particular industry or whether there are multiple suppliers. For example, if the objective of a regulation is to control cost, use of command-and-control regulation in industries with multiple suppliers may not be the appropriate instrument with which to influence firm behaviour. Promoting competition among firms by, for instance, permitting subsidisation of R&D to support developing firms, or by enhancing the ability of consumers to switch from one supplier to another (*e.g.* prohibiting fees for switching suppliers) may be. This is because when competition prevails, firms are likely to be more motivated to keep prices close to minimum possible cost.

However, Sappington is in agreement with those analyses which suggest that regulatory policy designed to influence actual or potential competition must be used with caution: particularly in industries where the pace and rate of technological change is rapid. This would suggest that regulatory policy needs not only to be specific, but flexible.

Such caveats are also inferred by the analysis of the deregulation experience in Australia, the United Kingdom, and New Zealand, which highlighted the problems involved in finding competitive solutions to securing effective deregulation. The analysis suggests that "hard and fast" rules in prescribing this measure for improving the efficiency and effectiveness of public sector operations are few: with even competition itself not a guarantee for securing such improvement. The conclusion was likewise reached that the best means to improve public sector operations can only be determined on the basis of specific case studies, "preferably with detailed support from overseas experience which has been carefully evaluated" (Head and McCoy 1991).

Means of analysis: possible approaches and outcomes

◆ Comparison of reform initiatives

The objective here would be to compare the broad regulatory reform initiatives that are being drawn up by governments in terms of content, timing, sectoral focus, and expected positive effects on competitiveness.

It is underlined that a comparative approach should *not*, as was already emphasised at the Industry Committee's October 1995 High-Level Forum on Industrial Competitiveness, be viewed as a target-setting endeavour. Rather it is to be regarded as a benchmarking-type exercise: an outward-looking approach that allows inter-country comparison for the purpose of mutual learning. Such a benchmarking approach could meet the need of understanding what constitutes best-practice policies and provide a tool to focus discussions on the design and implementation of policies. Furthermore, this approach could shed light on the role of institutions in shaping regulatory regimes.

It will, of course, be difficult to identify what "outcome" results from what changes in regulation or from other policy changes. Nevertheless, a comparison of the practices of different countries should

make it possible to derive useful pointers about beneficial directions of regulatory reform. Furthermore, such an exercise can provide the basis on which to identify problematic regulations in different countries with respect to their effects on industrial competitiveness. An effort of this kind, moreover, can identify potentially successful reforms: *i.e.* those that have proven to enhance industrial competitiveness. Finally, the exercise can identify reforms that have not enhanced competitiveness.

◆ **Classification of regulations**

A closely related (in fact, complementary) approach to the above-mentioned, would be to classify regulations according to types, the objectives they were to serve, and their intended effects.

Though difficult, it will be necessary to make as clear a distinction as possible between different kinds of regulations and, in each case, account for different effects. Relative to effect, the following may provide elements of a checklist: i) provide economic agents with information on constraints and margins of freedom with respect to the general environment in which firms operate; ii) establish incentives for certain sorts of economic behaviour, disincentives for others (*e.g.* compensating for external effects); and iii) encourage or discourage competitive market behaviour; etc.

In developing such an analytical framework, it is important to bear in mind that regulations are usually intended to serve a variety of objectives, and that their effects are interactive. For such an exercise to be policy relevant, it will also be necessary to take into consideration the international context of competition and regulation, related to the globalisation theme.

◆ **Impact on the business environment: aspects of competitiveness**

It is generally accepted that the effectiveness of a competitiveness policy depends on how well macroeconomic and structural policies interact in shaping the business environment. As regards regulatory reform, it was noted in the Introduction that such reform should be treated as an *element* of structural reform. Consequently, and bearing in mind the above-mentioned, it would appear that an important part of the analysis to be undertaken should be, for instance, to ascertain: where regulations are hindering economic growth; where regulatory reform would help the growth of new sectors; and where regulations hinder market access. A similar approach had been suggested at the October 1995 High-Level Forum.

Including this type of analysis in work that may be undertaken appears to be a fundamental requirement, particularly if one takes into account that in the emerging knowledge-based economy the industry structure is itself becoming an intrinsic part of the business environment. Such an analysis might also shed light on the extent to which the effectiveness of regulatory regimes is affected by the new forms of interrelationships that are developing, so that governments can gauge whether to adopt more general or more specific rules.

In order to achieve such an objective, there is the parallel need to assess the impact of regulatory reform on those parameters of the business environment that have a bearing on firms' competitive behaviour and performance.

One such parameter might be R&D expenditures: *i.e.* to ascertain the impact of regulations on the size and structure of R&D. For instance, regulations bearing on private sector expenditures for R&D vary considerably across countries as to amounts and types. In all cases, however, governments provide financial incentives under regulations to enhance national and/or firm competitiveness. The amounts and

types of incentives in each country could be correlated with measures of country competitiveness, noting the national regulatory regime (tax credits, loans, grants, etc.) that prevails in this area.

Another parameter might be the cost of investment. Since regulatory arbitrage is one of the major concerns that drives governments to initiate the regulatory reform process, an analysis of the costs that regulation imposes on international investments and on the operations of global firms, appears to be vital.

◆ Focused studies

Given the complexity and diversity of regulatory practice across countries, sectors of the economy, and markets, it is difficult to convey an accurate picture of regulatory impacts on competitiveness without a number of specific analyses. Accordingly, consideration should be given to their inclusion in work that may be undertaken: selected to exemplify the diversity of practice referred to.

Sector studies

The impact of the regulatory framework on a firm's competitive performance can best be illustrated on a case-by-case basis. The range of regulations that have the greatest impact on the costs, behaviour, and performance of *firms* can thus be more concretely analysed, and the importance of international differences in regulatory regimes assessed. Sectoral case studies would also make it possible to identify regulations that have the greatest economic impact: regulations that are not, necessarily, the most visible. Such an approach would likewise identify those regulations that most significantly affect costs, factor incomes, incentives, strategies, and firm performance in a particular *sector*.

For studies that are sector based and extend over several countries, it is also important to identify areas where regulatory practices, and differences between countries, are likely to inhibit efficient trade, slow innovation, confound efforts to improve efficiency, and decrease value-added in the industries concerned.

Country studies

As a complement to the benchmarking type exercise, a particular country's experience with regulatory reform might be analysed in a more focused manner. By taking into account country specificities, this could clarify why some reform programmes are successful and others fail.

For such studies, it is likely that relevant ministries and other public agencies carry out periodic surveys of their own. Even when not collected with competitiveness as the central focus, much of the information will bear on that concern. This could provide a rich source of relevant information.

NOTES

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1. Issues related to competition policy and public ownership vs. privatisation/deregulation are not treated.
 2. Regarding services, direct government provision of services to the exclusion of private providers, represents an extreme form of price and entry regulation.
 3. For a review and assessment of this vast literature see, for instance, Winston (1993), Hahn and Hird (1991), and Spulber (1989). For an analysis that places the public interest theory of economic regulation within a non-US context, see Utton (1986), and Head and McCoy (1991).
 4. See, for instance, the writings of George Stigler, Sam Peltzman, Harold Demsetz and Richard A. Posner, in Stigler (1988), Chapter 2.
 5. For a discussion of the effects on overall economic performance of deregulation and privatisation in the service sector (generally positive), see J. Høj, T. Kato and D. Pilat in OECD (1996), and OECD (1992). For an analysis that emphasises the difficulties in finding competitive solutions to securing effective deregulation, and that advocates improved and flexible approaches to regulation rather than the abolition of regulation, see Head and McCoy (1991).

The need for flexibility in correcting market failure may also be exemplified by the position of the United Kingdom's Monopolies and Mergers Commission (MMC). The MMC is concerned with preventing exploitation of market power with respect to market entry conditions and price-based competition. Its opinion is that while competition is superior to regulation, if competition cannot work, or be made to work by the encouragement of new entrants, regulation may be the only answer. Choice of the regulatory technique is, of course, crucial (OECD, 1996a).

6. The author calls attention to the fact that while he uses the term "deregulation", it should be frequently interpreted as indicating regulatory reform or partial deregulation as opposed to complete deregulation.
7. For instance, Miller (1995) may serve as an example to illustrate the notion of industry specificity. Based on her analysis of whether the public utility concept has become obsolete (concluding that it has not), she urges that regulatory reform proposals take into account specific structural conditions (*e.g.* technical barriers to entry) that preclude the emergence of competition. Derthick and Quirk (1985) argue that neither regulation nor deregulation can be explained primarily in terms of economic events: *i.e.* technological and economic changes that alter the terms of competition within regulated industries. Their viewpoint is that this line of thought is too simplistic in that it overlooks the political forces underlying both the support of regulation and reform. Sappington (1994) in his discussion of regulatory policy design, observes that differences in the form, function, and scope of regulatory policies are linked to differences in social institutions, to the characteristics of the industries being regulated, and to the regulators' objectives and resources.

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8. For instance, and taking into account the increasing inter-dependencies of markets, on what basis is one to determine whether a particular regulatory policy instituted for a specific market will worsen or improve performance in that market, or overall economic performance?
 9. Efficiency analysis of regulatory policies, the basis on which the need for regulatory reform is essentially grounded (though the findings are themselves a matter of much debate), pertains to production, allocative, and dynamic efficiency.
 10. Compliance costs are usually considered as direct costs. These are costs that businesses must incur in order to meet the obligations arising from economic, social and administrative regulations. Typical examples are training, equipment, and paperwork costs.
 11. Another problem relates to discounting of costs and benefits since the discount rate used varies across regulations and agencies do not, necessarily, indicate the timing of costs and benefits: *i.e.* instead of showing the entire “flow”, agencies may only indicate the costs and benefits for particular years.
 12. Viscusi (1995) reports that in the United States general (not net efficiency) liability insurance costs were just under \$17 billion in 1991 -- \$20.9 billion in 1987.
 13. Of course, and as Hahn (1996) points out, industry also has an incentive to overstate costs, though the regulator need not, and frequently does not, use the industry cost estimates.
 14. The author notes that this additional estimated net cost makes it difficult to reconcile the estimate made by the government agency data that gave a value of \$50 billion in net benefits associated with regulations based on the 1990 Clean Air Act Amendments (Hahn, 1996).
 15. This aspect has been touched upon (see, note 7 above). It is vividly illustrated by the regulatory reform efforts undertaken during the period of the Reagan presidency, usually considered as the era of deregulation. Such reform was, in fact, judged as having failed. The stated reason is that “there was no real strategy that took seriously the political appeal that public interest groups supporting regulation could bring to bear” (Ayres and Braithwaite, 1995, p. 10).
 16. Productivity growth can be ascertained by measuring labour productivity (the measure most commonly used) or total factor productivity (TFP). TFP, or multifactor productivity, in that it measures the improvement in production efficiency (*e.g.* improvements in the production process or the development of new production processes), is considered by some authors to be a more exact measure of productivity growth. This is because it “allows the evaluation of an industry’s overall efficiency of production by relating output to the use of numerous inputs simultaneously” (on which, see OECD, 1996f).
 17. For a detailed analysis of the effects of globalisation and the policy issues raised by the globalisation of industry, see OECD (1993), OECD(1994), and OECD (1996g).
 18. The author suggests that the limitations of traditional ways of measuring competitiveness could be overcome if, in future, effort were to be directed to: establishing a link between trade and direct investment; analysing the extent to which the relocation of production is followed by the relocation of R&D centres, in what countries and in what sectors; and to supplement macroeconomic and sectoral information with results for individual firms.
 19. It should be noted that Gilson, in his review of this analysis, suggests that a good deal more empirical work is needed to confirm the authors’ thesis regarding the blurring of firm boundaries, and the concomitant shift of activities from the firm to other organisational forms: *e.g.* hybrid organisations that shift their activities outside the boundaries of their constituent firms. He notes, for instance, that in the entertainment industry, where information is the dominant input, we appear to be witnessing a massive

wave of vertical integration, not a replacement of large companies with smaller hybrids linked by contract (see, *op. cit.*, pp. 80-83).

20. This assessment is challenged by both the UNICE (1995) analysis and that of Weidenbaum (1995). The UNICE study attributes the fact that R&D activities in biotechnology risk being located outside of Europe directly to the European regulatory regime. Weidenbaum asserts that the biggest obstacle to the development of a new biotechnology industry in the United States is regulatory.
21. However, the authors also cite a number of caveats relative to these conclusions. These pertain to: the manner in which costs are measured, with comparative expenditure data being rather poor; the fact that only two of the studies reviewed controlled for differences in the 'regulatory climate' between jurisdictions; and the difficulty of measuring the effectiveness of enforcement efforts.
22. The author notes that regulatory compliance costs are said to have grown in both absolute terms and relative to overall manufacturing costs and revenues: from 0.46 per cent in 1974 to 1.14 per cent in 1986.
23. The author refers to the research carried out by E. Montgomery and W. Wascher (1988), "Creative Destruction and the Behaviour of Productivity over the Business Cycle". See p. 45 of Gray (1991), for the bibliographical reference.
24. The debate surrounding the issue of whether regulations may favour or hinder technological innovation is linked to the unresolved problem of balancing the risks and costs entailed in striving for an optimal rate of technological innovation. The biases concerning the rate and nature of technological change are built into the regulatory process (Hahn, 1990).
25. The author notes that liability costs have discouraged R&D and new product innovation in the following categories of industries: "composition goods (*e.g.* asbestos); miscellaneous chemical products; rubber products; pottery and related products; miscellaneous fabricated metal products; metalworking and machinery; special machinery; laboratory apparatus; and miscellaneous manufacturing (*e.g.* cigarette lighters)." *Op. cit.*, p. 33. He also points out that since liability actions are most frequently directed against pharmaceutical products, almost all US firms have left the market for producing vaccines, and research on new contraceptive products has declined. In this aspect of pharmaceutical research, the US has fallen behind Europe.
26. However, while the author finds the evolution in screening procedures to be a positive development, he also points to a fundamental flaw in the current approach to screening: *i.e.* that regulators have little incentive to expedite approval procedures because it is they who are blamed if a health problem develops after a new product has been approved. Until this basic problem is addressed, he contends that screening procedures are likely to reinforce the status quo, with the effect that the rate of technological innovation will be below the optimal.
27. For a discussion of such market-based regulations (*e.g.* emissions trading, taxes and charges, deposit-refund systems, etc.), as well as their utilisation in the Netherlands, see H. Verbruggen, "The Trade Effects of Economic Instruments", in OECD (1993a), pp. 55-62.
28. See, "Micro-economic Implications of Environmental Regulation: A Preliminary Framework", in OECD (1993a), pp. 69-77.
29. As noted by Sanchez and McKinley, they have adopted the concept of "differentiation strategy" as developed by M. E. Porter (1980), *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, New York, The Free Press, and M. E. Porter (1985), *Competitive Advantage: Creating and*

Sustaining Superior Performance, New York, The Free Press. As regards the PVC industry, the authors have used the research and conclusions reached by H.J. Leonard (1984), *Are Environmental Regulations Driving U.S. Industry Overseas?*, The Conservative Foundation, Washington, D.C.

30. Presumably, Viscusi assumes fixed exchange rates.
31. Reference is made to the survey conducted by Ernst & Young (1994), *Biotechnology's Economic Impact in Europe: A Survey of its Role in Competitiveness*.
32. The author examined five industries which are major volatile organic compound emitters in total tons in 742 urban counties: industrial organic chemicals; petroleum refining; miscellaneous plastics; plastic materials and synthetics; and blast furnace and primary steel.
33. It should be noted that Public Management Service (PUMA) is launching a multi-country business survey designed to develop comparative qualitative and quantitative indicators of key aspects of national regulatory systems and general business environments in OECD countries. This survey attempts to establish sector-specific information that is comparable across OECD countries (on which, see OECD, 1996k).

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