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Editors

Foreword

The research assembled in this volume has been undertaken by academic and government researchers writing in a personal capacity. Foreign Affairs and International Trade Canada managed and assembled this volume with the objective of contributing to, and encouraging, debate on an issue of major importance to the Department, to the Government of Canada, and to Canadians. The views expressed in this volume, however, are those of authors and do not reflect the views of the departments represented in this volume or of the Government of Canada.

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International Competitiveness and Regulatory Framework: A Canadian Perspective

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Introduction

Although Canadians enjoy one of the highest living standards in the world, there is about 15 percent per-capita income gap between Canada and the U.S., and the gap has widened since 1990. Research done for Industry Canada suggests that close to 85 percent of the Canada-U.S. per-capita income gap is due to the productivity gap between the two countries, and the rest of the income gap is due to the differences in the employment to population ratio in the two countries.¹ Industry Canada research also implies that the productivity gap can be largely explained by the gaps in innovation, capital intensity and skills.²

In recent years, the OECD has done a good deal of research in quantifying various product and labour market regulations in the OECD countries. They have also examined the role of differences in regulations in explaining differences in competitiveness across OECD member countries. Their findings suggest that regulatory differences explain a significant part of the inter-country differences in innovation and productivity – key drivers of long-term competitiveness.³

The main objective of this chapter is to examine the relationship between regulatory framework and competitiveness, with a focus on Canada. We aim to address the following four policy research questions:

- How does Canada's regulatory framework compare with other G7 countries?
- Is there a regulatory gap between Canada and the U.S., and has it widened or narrowed in the 1990s?
- What are the main sources of the Canada-U.S. regulatory gap? and
- How much of the Canada-U.S. innovation and productivity gap can be explained by the regulatory gap?

¹ Someshwar Rao, Jianmin Tang and Weimin Wang, *Measuring the Canada-U.S. Productivity Gap: Industry Dimensions*, International Productivity Monitor, Ottawa: Fall 2005.

² Mun S. Ho, Someshwar Rao and Jianmin Tang, *Sources of Output Growth in Canadian and U.S. Industries in the Information Age*, in Dale W. Jorgenson (ed.), *Economic Growth in Canada and the United States in the Information Age*, Industry Canada Research Monograph, Ottawa: 2004.

³ Stefano Scarpetta and Thierry Tresselt, *Productivity and Convergence in a Panel of OECD Industries: Do Regulations and Institutions Matter?*, OECD Economics Department Working Paper (2002) 28, Paris: September 2002. Also, Sanghoon Ahn, *Competition, Innovation and Productivity Growth: A Review of Theory and Evidence*, OECD Economics Department Working Paper (2002) 3, Paris: January 2002.

We tackle the above policy research questions using two approaches: first, we rely on the existing research, particularly the OECD work; and second, using the International Institute for Management Development (IMD) survey data on regulations, we construct time series data on different types of product market regulations in G7 countries for the period 1991-2003. These regulatory variables in turn are used to explain differences in productivity among G7 countries.

Regulatory Framework

Regulation refers to rule-making activity by governments and the courts. Constitutions, parliamentary laws, subordinate legislation, decrees, orders, norms, licenses, plans, codes, and even some forms of administrative guidance can all be considered "regulation". Canada, like other advanced industrialized countries, has over the course of a century and a half constructed an elaborate and complex regulatory system to provide Canadians a wide range of vital services and protections, ranging from accessible buildings to safe food to universal healthcare to a cleaner environment. For markets to function efficiently some regulations, such as framework or market organizing regulations, are necessary. The regulatory framework is a set of the rules within which individual actors operate and includes contract, tort and property law, competition law, bankruptcy law, securities law and intellectual property law.

The use of regulation by governments has both costs and benefits. The OECD estimates that the cost of regulation might be as much as 10% of GDP for some countries.⁴ In light of such costs of regulation, many OECD countries are examining ways to improve the cost-effectiveness of their regulations.

Regulatory reform refers to changes that improve regulatory quality, that is, enhance the performance, cost-effectiveness, or legal quality of regulations and related government formalities. Governments in advanced economies are implementing regulatory reforms to make the regulatory environment friendlier to domestic and international competition. The regulatory changes are aimed at boosting productivity growth by providing incentives for incumbent firms to adopt innovative technologies, and encouraging the entry of new and innovative firms in the market place. Governments have also adopted deregulation policy, whereby regulation in a sector is completely or partially eliminated to improve economic performance.⁵

Governments use a variety of regulatory instruments to implement programs and other agendas. The OECD classifies regulations into three categories: economic, social and administrative.⁶

⁴ Organization for Economic Co-Operation and Development, *The OECD Report on Regulatory Reform Synthesis*, Paris: 1997, p. 14.

⁵ Rauf Gonenc, Maria Maher and Giuseppe Nicoletti, *The Implementation and the Effects of Regulatory Reform: Past Experience and Current Issues*, OECD Economics Department Working Paper (2000) 24, Paris: June 2000.

⁶ For a more detailed description, please see Annex B.

- **Economic regulation** can include restrictions on entrepreneurship, firm decisions over prices, quantity, service, entry and exit, ownership restrictions, tariffs, quantitative restrictions, inward and outward investment policies, antitrust regulations, and regulations of natural monopolies.
- **Social regulation** can include protection of the environment, health and safety in the workplace, protection of worker rights, rules for industrial relations (e.g., labour market regulations such as hiring and firing restrictions), and protection of buyers from fraudulent or incompetent behaviour by sellers.
- **Administrative regulation** can entail regulations relating to state control of legal framework regulations, taxes, business operations, distribution systems, health care administration, and intellectual property rights.

Different types of regulations

Product market institutions and policies affect firm governance and ownership structures, entrepreneurial incentives, and the ability of firms to enter markets (e.g. by creating fixed costs) or compete effectively with other firms (e.g. by distorting market mechanisms). We describe below various summary indicators of product market regulations. Product market reforms would include privatization, liberalization of potentially competitive markets and pro-competitive regulation of natural monopoly markets.

Labour market regulations in most countries encompass three bodies of law: employment law, industrial and collective relations law, and social security law.

- *Employment laws* govern the individual employment relationship, including the formation of the individual labour contract, the mandatory minimum terms and conditions of such contracts, and the termination of contractual relations.
- *Occupational licensing regulation* deals with entry and standards of practice in such professions as medicine, law, teachers, engineers, dentists, and accountants. Professional societies regulate their own practices by determining standards of entry and by developing a code of ethics. Local and state governments often delegate the regulatory powers of professional licensing to representatives of the professions themselves.
- *Industrial relations laws* aim at collectively protecting workers from employers. They govern the balance of power between labour unions and other forms of organized work, and employers and associations of employers.
- *Social security laws* across most countries address old-age pensions, sickness and healthcare coverage, and unemployment.

Environmental and health and safety regulations impose a variety of direct and indirect costs on regulated firms, consumers, and workers. The environment consists of a large number of attributes (anything affecting the well-being of Canadians) such as clean air and clean water. Environmental policy aims to produce the socially optimal quantities of these attributes, given that market forces alone might not bring about such outcomes in the presence of externalities.

Main characteristics of a good regulatory system

The OECD Report of 1997 on Regulatory Reform suggests that “good regulation” should include the following key features:⁷

- Be needed to serve clearly identified policy, and effective in achieving those goals;
- Have a sound legal basis;
- Produce benefits that justify costs, considering the distribution of effects across society;
- Minimize costs and market distortions;
- Promote innovation through market incentives and goal-based approaches;
- Be clear, simple, and practical for users;
- Be consistent with other regulations and policies; and
- Be compatible as far as possible with competition, trade and investment-facilitating principles at domestic and international levels.

Canada's regulatory framework

Canada has a mature and well-functioning system of regulatory governance. It has been consistent in the pursuit of efficient, transparent and accountable regulatory institutions and procedures. Canada's regulatory evolution has been characterized by important regulatory quality principles, such as the role of efficient markets and the need for benefits to exceed costs. A law, dating back to 1950, requires that every regulation be published and tabled in Parliament. In 1977, regulatory agencies were required to perform periodic evaluation of regulatory programs.⁸ The Department of Justice drafts legislation and reviews draft regulations for internal consistency. In passing statute law, legislatures may consider distributive and efficiency aspects. Common law reflects past judicial decisions, which some interpret to be concerned with facilitating efficient allocation of resources by firms and households.⁹

In a series of studies in 1978 on the effects of regulation, the Economic Council found “regulation inflation” on account of an increase in federal regulations by almost 350% between 1955 and 1975. In response to such a growth in regulation, the Regulatory Reform Strategy of 1986 saw deregulation in a number of sectors, and regulatory quality became an important policy goal in Canada. A number of institutional, guidance and process reforms were put in place. The trend that started in 1986 was expanded in 1992, when an explicit policy was adopted which set out the overall objective of “maximizing the net

⁷ OECD, *The OECD Report on Regulatory Reform: Synthesis*, (Paris: 1997).

⁸ Serious economic problems in the 1970s that resulted in structural reforms (including tax, labour market and sectoral reforms, free trade agreements with the U.S. and Mexico, and measures to tackle the fiscal deficit) also led to an appraisal of the regulatory system in Canada. Among the OECD countries, starting in the 1950s Canada is viewed as being in the vanguard of having integrated regulatory considerations in its policy making process.

⁹ OECD, *OECD Reviews of Regulatory Reform: Canada – Maintaining Leadership Through Innovation*, (Paris: OECD, 2002), esp. pp.32-34.

benefit to Canadians”. The Regulatory Affairs and Orders in Council Secretariat (RAOICS) of the Privy Council Office (PCO) supports the Treasury Board Secretariat, the Cabinet-level Committee responsible for the oversight, review and overall government co-ordination of federal regulation making in Canada. Both general-purpose and industry-specific regulations exist. General-purpose regulations tend to affect all industries alike, as would be the case for administrative restrictions or antitrust exemptions for public enterprises. Industry-specific regulations are tailored to specific industries or set of industries, such as manufacturing and non-manufacturing industries. Industry level regulations can have economy-wide effects.¹⁰

Although provinces have exclusive legislative authority in such matters as education, transportation, social services, health and safety, there are also a number of important areas of shared jurisdiction, including agriculture, environment and some aspects of natural resources (federal law prevails in case of conflict). A large body of technical regulation is developed and implemented at the provincial level. It is within provincial powers to adopt laws that might represent barriers to the free movement of products, services, investment and workers, and impair competition in local markets and that inhibit inter-provincial trade and competition. The Agreement on Internal Trade (AIT) of 1994 has a formal and detailed program (including a dispute resolution mechanism) to remove barriers but progress has been limited.

Recent trends in Canada's regulatory framework

Over the last quarter-century, Canadian governments have made several efforts to refine the regulatory regime and have remodeled certain statutes. The major thrust of existing laws and regulations is largely reflective of Canada's domestic orientation rather than forging a competitive position in global markets from a Canadian-base of operations. Regulations in Canada that limit foreign investment constrain the ability of firms in Canada to access foreign-based knowledge and technology, which narrows the scope of innovation achievements in Canada. For example, Canada retains a range of foreign investment ownership restrictions, sclerotic market approval systems for drugs, chemicals and food, continuing barriers to internal trade, and sub-optimal restrictions on financial services.

In a survey of economic and administrative regulations, the OECD distinguished between regulations affecting domestic firms from those affecting foreign firms in an economy.¹¹ In terms of friendliness of various types of regulations to competition, Canada's regulatory regime ranked in the middle of the 10-country comparison and significantly behind that of the United Kingdom, Australia and the U.S.

¹⁰ *Ibid.*, esp. pp. 35-36 and 46-80.

¹¹ Nicoletti, Scarpetta and Boylaud, *Summary Indicators of Product Market Regulation with an Extension to Employment Protection Legislation*, Economic Department Working Paper No. 226 (Paris: OECD, 2000).

- By international standards, Canada's economic and administrative regulatory climate for incumbent firms compares favourably in terms of its friendliness to competition.
- However, Canada's regulatory regime is relatively more restrictive with respect to foreign businesses considering new investment or trade in Canada. That is, overall product market regulations in Canada are more favourable to Canadian firms than to foreign firms.

To review and reform Canada's regulatory regime, the Government of Canada introduced a smart regulation strategy in 2002. In an increasingly knowledge intensive economy, new approaches to regulation need to enhance the climate for investment and trust in the markets to better achieve the public good. Using a smart regulation strategy the Government of Canada aimed to accelerate reforms in key areas to promote health and sustainability, to contribute to innovation and economic growth, and to reduce the administrative burden on business in both domestic and international environments to obtain desired outcomes.¹²

Starting in the late-1980s and continuing over the past several years, there has been a marked general downward trend in the annual rate of increase of regulations (including new, amended, repealed, and revised). The OECD notes that it appears that Canada has been unusually successful in tackling regulatory inflation.¹³

There is an ongoing debate in Canada pertaining to regulation in sectors such as banking, telecommunications and foreign direct investment. At this time, it is not clear whether the government will consider a total review of these regulations, a review of some specific sectors or industries, or take no action.

Foreign direct investment regulations

Research done at Industry Canada, Statistics Canada, the OECD and elsewhere clearly shows the importance of inward FDI for trade, innovation and productivity in Canada. Therefore, all types of barriers and restrictions, formal and informal, that impact on attracting and retaining FDI need to be assessed. Canada has one of the highest levels of FDI restrictions among OECD countries, especially in the telecommunications, finance and air transport sectors. An OECD study computed an FDI restrictions index by assigning varying importance (weights) of statutory restrictions such as: (a) limits on foreign equity/ownership; (b) screening and approval procedures; and (c) constraints on foreign personnel and operational freedom.¹⁴ The study found that across OECD countries, the most heavily restricted sectors are those that are highly sensitive to national security or national sovereignty considerations: telecommunications, air and maritime transport, finance, public utilities and media. Table 1 shows that Canada was more

¹² Government of Canada, *The Canada That We Want*, The Speech From the Throne 2002, Ottawa: 2002.

¹³ *OECD Reviews of Regulatory Reform: Canada – Maintaining Leadership Through Innovation*, (2002), *op. cit.*

¹⁴ Stephen S. Golub, *Measures of Restrictions on Inward Foreign Direct Investment for OECD Countries* by, OECD Economics Department Working Paper No. 357, (Paris: OECD), 2003.

restrictive than the U.S. in areas such as telecommunications, finance, business services and manufacturing; while, the U.S. was more restrictive in transport.

In addition, Industry Canada researchers, in a study published by the C. D. Howe Institute in 1996, found that the impact of *informal* barriers to FDI, such as impediments arising from differences in market structure, corporate governance practices, unpublished policies, and non-transparent administrative procedures and actions of government and private, has to be considered because the importance of informal barriers may be gaining importance in making the Canadian investment market place less attractive for foreign investors.¹⁵

Table 1: Discriminatory Foreign Direct Investment Restrictions, by sector		
Sector	Canada	US
Business Services	.225	.025
Telecommunications	.525	.375
Construction	.225	.025
Distribution	.225	.025
Finance	.506	.125
Hotels and Restaurants	.225	.025
Transportation	.590	.690
Electricity	.725	.475
Manufacturing	.225	.025
Total	.352	.173
Note: Indices of FDI Restrictions, by competing regions for N.A-bound FDI and major source countries of FDI to Canada, 1998 (0=no restriction, 1=complete restriction)		
Source: <i>Policies and International Integration: Influences on Trade and Foreign Direct Investment</i> , Annex 4: <i>Foreign Direct Investment Restriction Indexes</i> , (Paris: OECD), March 2003.		

Competition policy

The 1986 Competition Act broadened the objective of competition policy in Canada to include consumer interests and the promotion of sectoral pro-competitive reforms. As of the early 1970s, direct economic regulation of price or output (or both) had an impact on about 29% of the Canadian economy. That share has decreased as a result of subsequent deregulation and reform in transport, energy, telecoms, and financial services. However, the impact of reform on competition policy is diluted by a near-monopoly airline and foreign ownership restrictions to protect Canadian-based companies from international competition.¹⁶

Intellectual property protection policy

Intellectual property rights (IPRs) are legally enforceable instruments designed to provide protection for investments in innovations. IPRs include patents, copyrights, trademarks, trade secrets (a product or process kept secret

¹⁵ Someshwar Rao, and A. Ahmad (1996), *Formal and Informal Investment Barriers in the G7*. in Pierre Sauvé and Daniel Schwanen (eds.), "Investment Rules for the Global Economy: Enhancing Access to Markets", C.D. Howe Institute, Policy Study no. 28. 1996.

¹⁶ *OECD Reviews of Regulatory Reform: Canada – Maintaining Leadership Through Innovation*, (2002), *op. cit.*

from competitors), industrial designs, plant breeder's rights, and integrated circuit topographies. This view encapsulates the argument that entrepreneurs would see increased profitability resulting from expanded IPRs, giving them incentives to come up with innovations. IPRs, such as patents that entail new information disclosure, would also encourage diffusion of new knowledge and would boost social benefits.¹⁷ Moreover, evidence suggests that foreign direct investment in R&D flows to locations where IPRs are securely protected and strongly enforced.¹⁸

Although Canada's IPRs regime has become somewhat stronger since the late 1980s, tracking the global trend toward stronger IPRs system, Canada's IPRs regime appears not to have followed the trend, as exemplified by the Ginarte-Park index that placed Canada's patent system second last, behind the U.S. and the U.K., and seven other countries.¹⁹

Telecommunications regulations

Telecommunications infrastructure is a significant driving force of economic growth. Numerous studies have been conducted to quantify the contribution of telecommunications services to economic growth. Despite its rapid growth, Canada's telecommunication services industry fell behind the average of the OECD countries during the 1990s, with telecommunications infrastructure declining from the second place to 23rd place among the 29 OECD countries. In recent research done for Industry Canada, Professor Chen found that two factors mainly contributed to this decline in Canada's relative standing.²⁰

- Canada's highly developed fixed-network services, in particular, a well developed payphone system, reduced the need for cellular mobile services and thus slowed down its adoption; and
- Relatively high barriers to ongoing operations and direct investment hindered the growth of cellular mobile services.

If these barriers were reduced to the average restriction level of OECD countries, Canada's telecommunications penetration rate would have been above the OECD average. Furthermore, estimates from Professor Chen's analysis show that Canada's GDP per working-age person would be increased by about 1.7% over a ten-year period if Canada were to remove all barriers to foreign direct investment in telecommunications services.

¹⁷ However, as an anonymous referee points out, the impact on profits of the innovator/patent holder is clear, but the net impact on the economy or innovation is not.

¹⁸ Porter and Stern, *The New Challenge to America's Prosperity: Findings from the Innovation Index*, Washington, D.C.: Council on Competitiveness, 1999.

¹⁹ Ginarte and Park, *Determinants of Patent Rights: A Cross National Study*, Research Policy, vol. 26, 1997.

²⁰ Zhiqi Chen, *Liberalization of Trade and Investment in Telecommunications Services: A Canadian Perspective*, a paper presented at the Industry Canada conference in October 2003, Winnipeg, on "Service Industries and Knowledge-Based Economy", in Richard Lipsey and Alice Nakamura (eds.), an Industry Canada research volume, (forthcoming).

Labour market regulations

The labour market and its reforms have a major impact on an economy's performance. Canada's unemployment rates have been higher than in a number of advanced countries, such as the U.S. Labour market policies have generally not brought about incentives to observed labour mobility, though the amount of human capital embodied in the workforce has increased substantially over the last two decades. After several modifications in the 1990s, the unemployment-insurance system (now Employment Insurance) was restructured in 1996 to restore the insurance principle which had been undermined over time. At the same time, Employment Benefits and Support Measures (EBSMs) restructured employment benefits such as job subsidies and various forms of job search assistance. The management of these programs has been largely decentralized to the provincial level, through Labour Market Development Agreements. The EBSM, though expensive, has been largely successful.²¹

A National Bureau of Economic Research study found that patterns of labour regulations across 88 sample countries generally support the view that regulations across countries are shaped by their legal structures, most of which are adaptations of Europe's common and civil law traditions. Moreover, the study pointed out that the historical origins of a country's labour laws also correlated with other measures of regulations. For example, countries that regulated business entry also regulated labour markets and judicial proceedings. The study concluded that countries have regulatory styles that are pervasive across activities and are shaped by the origin of their laws.²²

Trends in regulatory burden

One can take the pulse of regulatory activity over time in a number of ways. One is to calculate the rate of growth in government regulatory expenditures (in real terms) over time. Another is to calculate the rate of growth in the number of regulations or in the number of pages of regulations.

The Fraser Institute estimated that between 1975 and 1999, over 117,000 new federal and provincial regulations were enacted, an average of 4,700 every year. Over this period, the federal government alone enacted 25,000 regulations. Between 1975 and 1999, the three levels of governments published over 505,000 pages of regulations (or an average of over 20,000 pages per year), of which the federal government accounted for more than one-fifth.²³

Accurately measuring the cost of regulation to the entire economy is almost impossible. The Fraser Institute has collected from the public accounts the amounts federal, provincial and local governments spend, or what it calls the public sector "administration costs", to design and implement regulations. It found that in fiscal year 1997/1998, the federal government and provincial, territorial, and local governments in Canada spent \$5.2 billion administering their regulatory

²¹ OECD, *OECD Reviews of Regulatory Reform: Canada – Maintaining Leadership Through Innovation*, (Paris: OECD, 2002).

²² Botero, et al., *The Regulation of Labour*, NBER Working Paper 9756, June 2003.

²³ Laura Jones and S. Graf, *Canada's Regulatory Burden: How Many Regulations? At What Cost?*, Vancouver, BC: The Fraser Institute, 2001, p. 9.

activities, down from a price-change adjusted \$5.3 billion in 1995/1996. Moreover, it estimated that in fiscal year 1997/1998, the private sector spent \$103 billion or \$13,700 per family of four to comply with federal and provincial government regulations.²⁴ Earlier, Milhar had estimated that complying with regulations in 1996 exceeded \$83 billion, or just over \$11,000 per family of four.²⁵

In attempting to obtain crude estimates of additional indirect costs of regulations, the Fraser Institute considered three categories of lobbyists under the *Lobbyists Registration Act*. (a) Consultant lobbyists who lobby on behalf of a client and might include government-relations consultants, lawyers, accountants; (b) In-house lobbyists are corporate employees managing public affairs or government relations; and (c) Non-profit organizations who must register when one or more employees lobby federal politicians. The Fraser Institute reported that between 1998 and 2000:

- The number of consultants lobbyists increased 20 percent from 584 to 702;
- The number of in-house lobbyists fell from 367 to 335; and
- The number of organizations registered increased roughly 15 percent from 322 to 370.

These estimates of the cost of regulation are to be relied on less for the dollar figure but rather to underscore the point that regulation is costly and that it might be growing increasingly costly.

Comparison of Regulations among G7 Countries

In this section, we turn to discuss the OECD work that compares regulations across G7 countries and industries. The OECD has compiled summary indicators of *product market regulatory systems* across countries and industries. Product market regulations consist of: (a) inward-oriented policies, and (b) outward-oriented policies. Each indicator is ranked on a scale ranging from 0 to 6, reflecting the least to the most restrictive regime. The data can be divided along three alternative formats:

- (a) the economy-wide or industry-specific **scope** of regulations;
- (b) the “**thematic**” domains or types of restrictions that indicate channels through which regulations may restrict market mechanisms; and
- (c) “**functional**” regulations.

The *thematic domains* consist of three broad categories:

1. **State control over business enterprises** consisting of: (a) public ownership; and (b) involvement in business operation.
2. **Barriers to entrepreneurship** consisting of: (a) administrative burdens on start ups, including burdens at both the economy-wide and sectoral

²⁴ L. Jones and S. Graf, *ibid*, p. 24.

²⁵ Fazil Milhar, *The Cost of Regulation in Canada*, Public Policy Sources, Number 12, Vancouver, BC: The Fraser Institute, 1998. Milhar used a multiplier derived by Widenbaum and DeFina (1976), who estimated for the U.S. that for every dollar that the public sector spent to administer regulatory activity, the private sector spent \$20 in compliance costs.

levels; (b) regulatory and administrative opacity, including the features of the licenses and permits system and the communication and simplification of rules and procedures; and (c) barriers to competition, including legal limitations on the number of competitors and exemptions to competition law provisions for public enterprises or state-mandated actions.

3. **Barriers to international trade and investment** consisting of: (a) explicit barriers, including average tariffs, discriminatory procedures and restrictions to foreign participations in domestic companies; and (b) other regulatory barriers.

Under the alternative *functional compilation*, data fall in two categories:

- **Administrative regulation** consisting of: (a) administrative burdens of start-ups, including economy-wide and sector-specific burdens; and (b) regulatory and administrative opacity, including the feature of licence and permit system and the communication and simplification of rules and procedures.
- **Economic regulation** consisting of: (a) regulation of economic structure, including the size and scope of public ownership, legal barriers to entry and control of public enterprises by the legislature; (b) regulation of economic behaviour, including command and control regulations, and special voting rights; and (c) regulation of competition, including competition law exemptions and price controls.

In addition to the above product market regulatory indicators, the OECD studies often factor in *employment protection legislation* (EPL) consisting of:

- Regular contracts, including procedural requirements, notice and severance pay, and prevailing standards of and penalties for “unfair” dismissals; and
- Temporary contracts, including “objective” reasons under which a fixed-term contract could be offered, the maximum number of successive renewals, and the maximum cumulated duration of the contract.

In our review of the OECD work below, we will return to the above description of regulatory indicators.

Product Market Regulations

Countries differ much more in the degree of state control than in the extent of barriers to entrepreneurship, partly reflecting differences in the timing and scope of privatization and in the extent to which past regulatory reform has been successful in shifting from command and control to incentive-based regulations. Economic and administrative regulations shape the inward-oriented regulatory environments. Table 2 shows that among G7 countries:

- Overall, Canada’s product market regime was inward-liberal and outward-restrictive, whereas the U.S. was characterized by a combination of relatively liberal inward and outward-oriented regulatory policies.
- The United Kingdom was the least restrictive country.
- The United Kingdom, the United States, and Germany had fewer barriers than Canada in the overall product market regulatory regime.

- Canada had the most barriers to trade and investment of all G7 countries, making it the least outward-oriented regulatory system in G7.
- The United States had less restrictive regime than Canada with regard to state control and overall economic regulations.
- Canada had less restrictive regime than the U.S. in such domains as entrepreneurship and overall administrative regulations.
- The friendliness of regulatory environments to product market competition still varies substantially across countries, in particular for inward-oriented (economic and administrative) regulations.

Table 2: Synopsis of summary OECD indicators of product market regulation by domain

<i>Overall indicator</i>		<i>Domains</i>				
	Product market regulation	State control	Barriers to entrepreneurship	Barriers to trade & investment	Economic regulation	Administrative regulation
Canada	1.5	1.3	0.8	2.2	1.1	0.9
United States	1.0	0.9	1.3	0.9	1.0	1.2
Japan	1.5	1.3	2.3	1.0	1.4	2.7
Germany	1.4	1.8	2.1	0.5	1.4	2.7
France	2.1	2.6	2.7	1.0	2.3	3.1
Italy	2.3	3.9	2.7	0.5	3.5	3.0
United Kingdom	0.5	0.6	0.5	0.4	0.6	0.5

Source: Nicoletti, Scarpetta & Boylaud, OECD Working Paper 226, (2000), Table A2.7.

State Control Regulations: Provisions that aim at establishing partial or full state control over resources or economic activities could be managed, in principle, by agents (e.g., public ownership and/or control, restrictions on price setting and/or other firm's choices). Table 3 shows that:

- Canada was more restrictive than the U.S. and U.K. in the use of (a) command and controls; (b) price controls; and (c) the size of the public sector.
- The U.S. was more restrictive in regard to the scope of public enterprises.
- Overall, the U.S., U.K. and Canada were less apt to resort to state controls than the other G7 countries.

	Scope of public enterprise sector	Size of public enterprise sector	Special voting rights	Control of public enterprises by legislative bodies	Use of command and control regulation	Price controls
Canada	1.8	1.4	2.0	0.0	1.6	1.0
United States	2.0	0.0	2.0	0.0	1.1	0.0
Japan	1.5	0.0	2.0	0.0	1.4	2.9
Germany	1.8	1.4	2.0	0.0	3.4	1.7
France	3.8	2.6	3.0	0.0	4.8	0.9
Italy	5.3	2.3	6.0	5.3	3.1	2.2
United Kingdom	0.0	0.0	0.0	0.0	2.3	0.6
Source: Nicoletti, Scarpetta & Boylaud, OECD Working Paper 226, (2000), Table A2.2.1						

Barriers to entrepreneurship: Table 4 shows that:

- Canada was more restrictive than the U.S. in regard to administrative burdens on: (a) corporations; (b) sole proprietor firms; and (c) specific sectors.
- The U.S. had a less liberal regime than Canada in the use of (a) licenses and permits; (b) communication and simplification of rules and procedures; (c) legal barriers to entry; and (c) antitrust exemptions.
- Overall, the U.K., the U.S., and Canada had a more liberal regulation regime pertaining to entrepreneurship of all the G7 countries.

	Licenses & permits system	Communication & simplification of rules and procedures	Administrative burdens for corporations	Administrative burdens for sole proprietor firms	Sector specific Administrative burdens	Legal barriers to entry	Antitrust exemptions
Canada	0.0	0.3	1.5	1.5	1.0	0.7	0.5
United States	4.0	0.6	0.5	1.3	0.5	1.0	1.3
Japan	6.0	1.5	2.3	2.3	1.5	2.3	0.3
Germany	4.0	1.3	2.5	3.3	2.3	0.5	0.0
France	4.0	0.9	3.3	3.8	3.6	2.0	1.1
Italy	0.0	0.8	5.3	4.3	4.5	3.0	1.3
United Kingdom	0.0	0.0	0.8	1.3	0.4	1.3	0.0
Source: Nicoletti, Scarpetta & Boylaud, OECD Working Paper 226, (2000), Table A2.2.2							

In **barriers to trade and investment**, the message that jumps out of table 5 is that Canada had the most restrictive regulatory regime of all the G7 countries. Considering all the other OECD regulation indicators, Canada could be found in the company of less restrictive countries such as the U.K. and the U.S. among the G7 countries.

- Canada broke ranks with its liberal-regulatory cohorts by turning out to be the most restrictive country in regard to all the three indicators of: (a) tariffs; (b) ownership barriers; and (c) discriminatory procedures.

Table 5: The Composition of OECD Barriers to Trade & Investment Indicator				
	Ownership barriers	Discriminatory procedures	Regulatory barriers	Tariffs
Canada	3.6	1.4	0.0	4.0
United States	2.2	0.3	0.0	1.0
Japan	1.9	1.4	0.0	1.0
Germany	0.0	0.5	0.0	2.0
France	1.8	0.5	0.0	2.0
Italy	0.0	0.3	0.0	2.0
United Kingdom	0.0	0.0	0.0	2.0
<i>Source: Nicoletti, Scarpetta & Boylaud, OECD Working Paper 226, (2000), Table A2.2.3.</i>				

Employment Protection Legislation (EPL)

Table 6 shows that Canada, United Kingdom, and the United States, are at the one end of the spectrum, with relatively lax EPL systems, while continental European countries and Japan have a much more stringent EPL system. Although the EPL regimes in Canada and the U.S. remained stable in the 1990s, the composite EPL indicators show that:

- The gap between Canada and the U.S. of EPL system continues, with the U.S. being more liberal in employment protection regulations.
- Overall, the U.S., followed by the U.K. and Canada had the least restrictive EPL system, while all the other the G7 economies had more restrictive labour market regimes.

Table 6: Synopsis of OECD summary indicator of employment protection legislation (EPL)						
	1990			1998		
	EPL	EPL regular contracts	EPL temporary contracts	EPL	EPL regular contracts	EPL temporary contracts
Canada	0.6	0.9	0.3	0.6	0.9	0.3
United States	0.2	0.1	0.3	0.2	0.1	0.3
Japan	2.6	2.5	2.7	2.6	3.0	2.3
Germany	3.6	2.9	4.2	2.8	3.0	2.5
France	2.7	2.4	3.0	3.1	2.5	3.7
Italy	4.2	3.0	5.3	3.3	3.0	3.6
United Kingdom	0.5	0.7	0.3	0.5	0.7	0.3

Source: Nicoletti, Scarpetta & Boylaud, *OECD Working Paper 226, (2000), Table A3.11.*

In summing up, Canada among the G7: The available “subjective” data from IMD and the “objective” data from the OECD point to a similar overall conclusion concerning Canada’s regulation system among the G7, and particularly in comparison to the U.S.

- The overall Canada-U.S. gap regulatory gap exists in both the production and labour market regulation system;
- The U.S. edges out Canada in being more liberal in product market regulations, particularly in regard to barriers to ownership, discriminatory procedures and tariffs; and
- The U.S. has consistently maintained a much more flexible labour market regulatory environment than Canada throughout the 1990s.

Canada-U.S. Regulatory System Comparisons: Recent Trends

The overall comparison of regulatory systems in Canada and the U.S. can be done using data published by international organizations such as the OECD, the World Economic Forum, and the International Institute for Management Development (IMD). In this study, we use annual IMD indicator data over the 1991 to 2003 period compiled annually from surveying responses from over 3,000 top business executives of large international and domestic firms in about 50 countries.²⁶ Following Koch et al, we consider the following indicators of regulations across the G7 economies:

²⁶ The IMD publishes in the *World Competitiveness Yearbook*, its annual survey data on national economic competitiveness, which include some regulation indicators. The discussion of IMD indicator follows closely the discussion in, Kevin Koch, M. Rafiqzaman, and S. Rao, *The Impact of Regulatory Policies on Innovation: Evidence from G7 Countries*, Industry Canada Working Paper (mimeo.), Ottawa: Industry Canada, 2003.

1. **INVREG** compiled to measure the intensity of **inward foreign direct investment** restrictiveness by asking: “Are foreign investors free to acquire control in a domestic company?”
2. **IPRLAW** set out to measure the effectiveness of **intellectual property rights** by asking: “Is intellectual property adequately protected in your country?”
3. **COMPLAW** aimed to measure the effectiveness of **competition policy** or antitrust laws by asking the question: “Do antitrust laws prevent unfair competition in your country?”
4. **TRANS** aimed to measure the degree of **transparency of government communications** by asking: “Does the government communicate its policy intentions clearly in your country?”
5. **LABREGS** designed to capture the degree of effectiveness of **labour market policies** by asking: “Are labour market regulations (hiring and firing practices, minimum wages) flexible enough in your country?”

The IMD indicator data range from a value of 0, reflecting disagreement with the question, to a maximum value of 10, indicating strong agreement. Notice that the above indicators include both product market and labour market regulations. Koch *et al.* report that despite the “subjective” nature of the IMD data, the above listed indicators are statistically significantly correlated with the “objective” type data collected by the OECD, which we will have an opportunity to analyze below.

Figure 1: Canada -U.S. Regulatory Gap, IMD Indicators Aggregated, 1991-2003

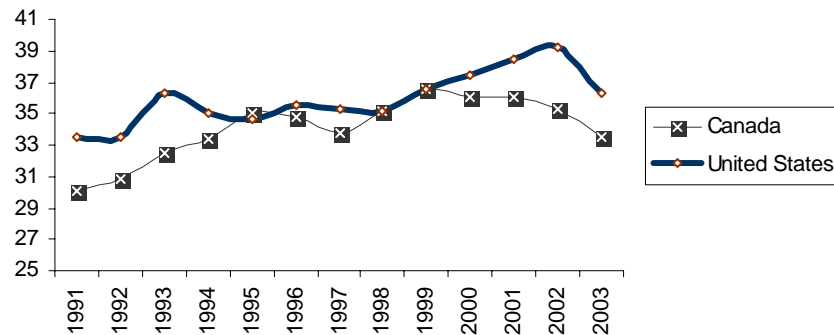


Figure 1 presents the results of aggregating the IMD indicators for Canada and the U.S. The early 1990s were marked by a regulatory gap between Canada and the U.S., when the U.S. regulatory regime was more liberal than that in Canada. In the mid-1990s, the Canada-U.S. regulatory gap narrowed as the Canadian regulatory regime moved in the more liberal direction while the U.S.

turned less liberal. By the late 1990s, the Canada-U.S. regulation gap reemerged and continued into 2003, as regulations in the two countries turned less liberal. Our reading of the overall picture is that there exists a regulatory gap between Canada and the U.S., with the U.S. system continuing to be more liberal than the Canadian regulatory regime.

Below, we present Canada-U.S. regulatory comparisons based on individual IMD indicators in Figure 2 to Figure 5.

Figure 2: IPLAW - Effective Intellectual Property Protection

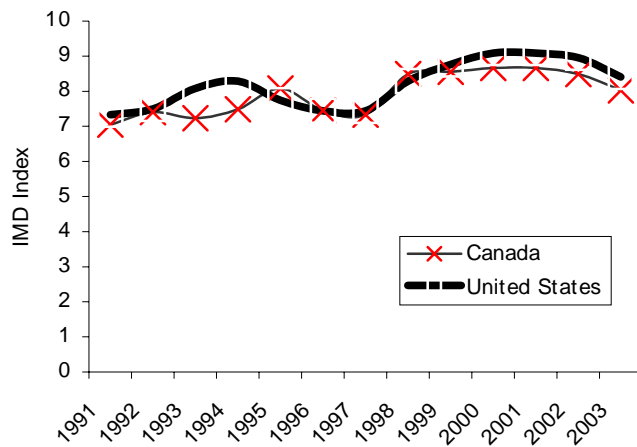


Figure 3: COMPLAW - Effectiveness of Competition Law

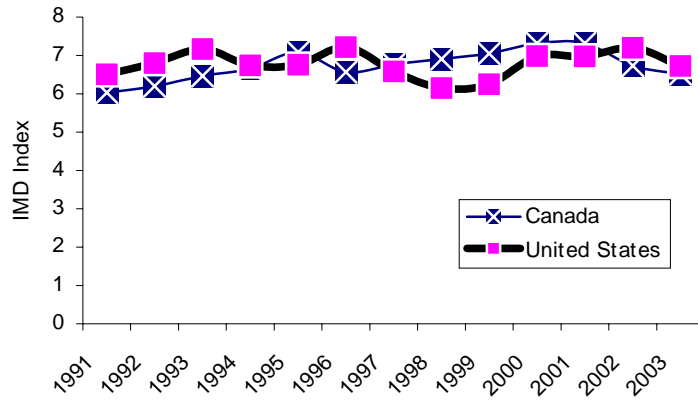


Figure 4: Flexibility of Labour Regulations (hiring/firing)

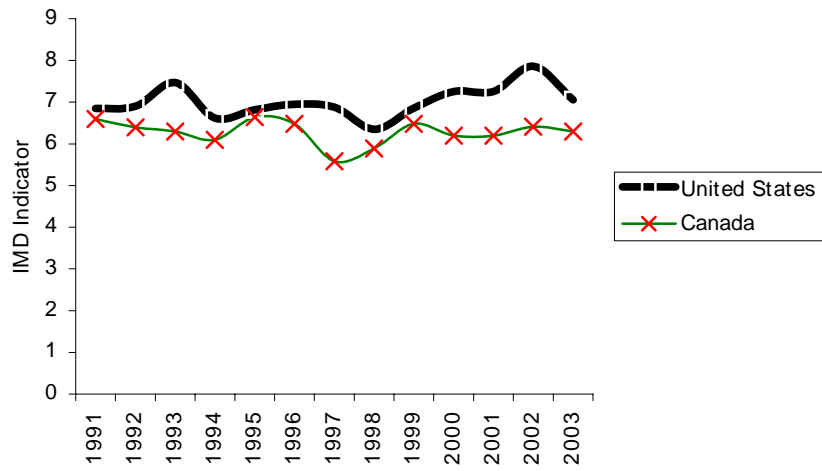
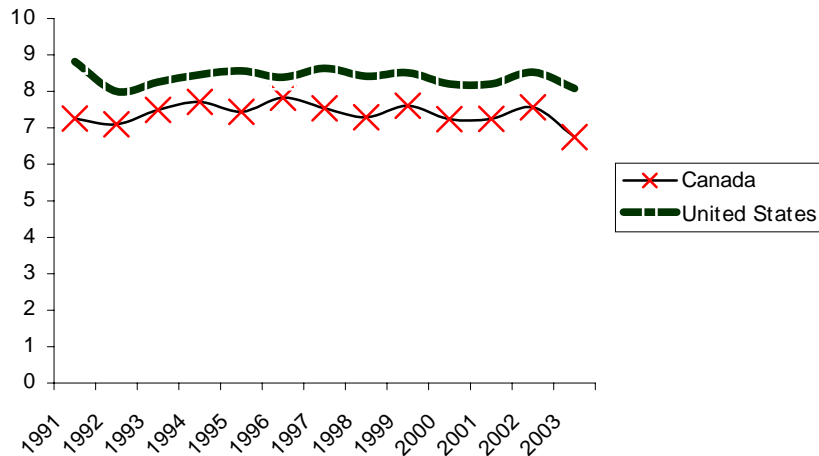


Figure 5: INVREG - Foreign Investors Free to Acquire Control of Domestic companies



To explain the overall Canada-U.S. regulatory gap we observe the following trends, using the IMD data:

- A significant part of the regulatory gap is associated with the less liberal foreign direct investment regime in Canada than the U.S.²⁷
- A good part of the regulatory gap is accompanied by the relatively less flexible labour market regulations in Canada than the U.S. Moreover, the gap with respect to Canada-U.S. labour market regulation has widened over the past half a decade.
- Canada, having narrowed the regulatory gap in the mid-1990s, has re-opened the deficit gap with the U.S. in intellectual property rights and in competition policy regulations.

Competitiveness and Regulatory Framework

Competitiveness is the efficiency with which an industry or an economy uses its productive resources, such as natural resources, physical and human capital, in maintaining and expanding real incomes. Competitiveness plays a key role over time in determining how successful a country is in achieving high and rising real wages and incomes. A fundamental objective of regulation is to improve the efficiency of the Canadian economy, while remaining flexible enough to adapt to change and sustain international competitiveness. In this sub-section of the paper, we argue that Canada's international competitiveness is shaped by Canada's productivity performance vis-à-vis its trading partners, and the U.S. in particular. Canada's relative productivity performance, in turn, is driven in part by Canada's regulatory regime. A key hypothesis of this paper is that the impact of regulation

²⁷ The evidence presented in Table 1 above reinforces this observation.

on Canada's relative productivity performance will also shape Canada's international competitiveness.

What is international competitiveness?

International competitiveness of a country is determined by how much more efficient it is, compared to competitor economies, in using its resources in meeting the test of international competition. In other words, total factor productivity (TFP) is an ideal measure of the overall health of a country. TFP is measured as the weighted sum of all individual input productivities – natural resources, capital and labour.²⁸

In international competitiveness comparisons, labour productivity is commonly used as a good proxy for TFP, given that the two measures are related and over time tend to move closely across countries. The patterns of international trade are governed by comparative advantage that a country enjoys on account of how efficient the country is in using technology to transform its natural resources, human and physical capital relative to its trading partners. A significant improvement in productivity, unmatched by competitors abroad, not only will sustain an industry's comparative advantage but also will enhance its international competitiveness.

Cost competitiveness: Competitiveness is often also expressed in terms of cost competitiveness of one country relative to competitor countries. It is easy to show that Canada-U.S. relative unit labour cost equals the difference between the relative wage rate and relative labour productivity. If labour compensation in Canada and the U.S. is the same, then relative productivity directly determines the relative unit labour cost. Should there be exchange rate swings in the short-term or prolonged deviations from purchasing power parity, unit labour costs would be distorted. In general, sustained improvements in cost competitiveness and living standards can only come from continuous improvements in Canada's productivity performance relative to that of the U.S. and its other trading partners.

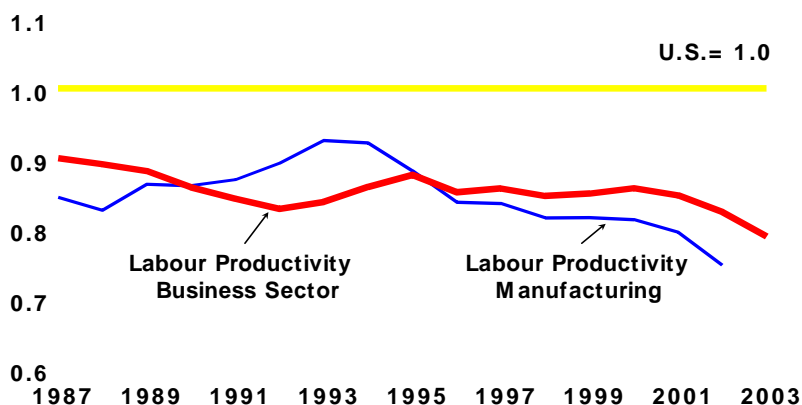
Canada's productivity performance

Between 1995 and 2003, real income per capita in Canada grew at 2.5% per year, compared to 2.2% in the U.S. But, in 2003, the real per capita income gap with the U.S. was \$5,810. Per capita income in the U.S. on average was about 15% higher than in Canada. Lower productivity explains about 83% of the Canada-U.S. income level gap. The remainder is due to fewer people working and fewer hours worked per person employed. The Canada-U.S. aggregate labour productivity level gap increased from 10% in 1995 to 17% in 2003, as illustrated in Figure 6. Productivity in manufacturing, the key to international competitiveness, and the Canada-U.S. productivity gap widened to 23 percent, in 2001, from 17% in 1995. Research done at Industry Canada suggests that differences in capital intensities in the two countries can explain about 60 percent of the aggregate Canada-U.S. labour productivity gap. In the manufacturing

²⁸ Someshwar Rao and Jiamin Tang, *Competitiveness Challenges Facing Canadian Industries*, Industry Canada Research Paper, Government of Canada, Ottawa: Industry Canada, 2003 (memo.), pp. 5-6.

sector, more than 80 percent of the gap can be attributed to the capital intensity gap.²⁹

Figure 6
Relative labour Productivity in Canada, 1987- 2003
(U.S.= 1.0)



Note: Labour productivity is defined as real GDP per worker, PPP based.
 Source: Figure 1 in Rao, Tang and Wang, May 2004.

Industry Canada research suggests further that the innovation and skills gaps, the larger role of the small medium sized enterprises (SMEs) in the Canadian economy and the smaller size of the high-tech sector explain the remaining Canada-U.S. labour productivity.³⁰

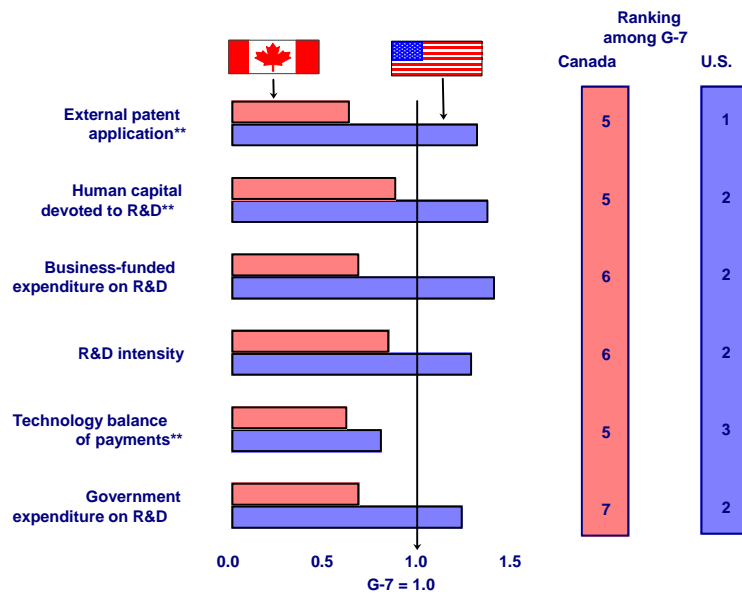
Canada’s innovation performance

Canada lags behind the U.S. in all indicators of innovation. Canada also ranks 5th to 7th among the G7 countries in all the innovation measures (see figure 7). Canada’s business R&D intensity is still only slightly more than 50 percent of the intensity level in the U.S. But, Canada has narrowed some of the R&D-intensity gap in the 1990s. The same is true for other indicators of innovation. As well, since 1990, Canada made progress compared to other G7 countries.

²⁹ Someshwar Rao, Jianmin Tang and Weimin Wang, *Productivity Levels Between Canadian and U.S. Industries*, mimeo., Industry Canada, May 2004.

³⁰ For example, Rao and Tang (2003), *ibid*, pp. 16-20; Richard G. Harris, *Determinants of Canadian Productivity Growth: Issues and Prospects*, in Someshwar Rao and Andrew Sharpe, eds., *Productivity Issues in Canada*, Calgary: University of Calgary Press, 2002.

Figure 7: Canada's Innovation Performance Relative to G7, 2002



Productivity and regulatory framework

The impact of regulations and institutions on productivity and economic performance depends on market and technology conditions. The link between employment protection legislation (EPL) and productivity is also complex. Over the 1984-98 period there was evidence, across 18 OECD countries, of multifactor productivity (MFP) catch-up in most industries, with a stronger effect in service than in manufacturing.³¹ An OECD paper found that:

- Anti-competitive product market regulations had a negative effect on productivity by reducing incentives to adopt better technology thereby catching-up the technological leader;
- Stringent employment protection legislation had a negative effect on productivity growth in countries where wages or internal training did not offset the adjustment costs associated with high firing costs;
- R&D intensity had a positive impact on productivity growth;
- Three countries – the U.S., Canada and Japan – exhibited the highest level of multi-factor productivity in each industry at the beginning and at the end of the sample and were often at the frontier (or close to it) in most industries;

³¹ Stefano Scarpetta and Thierry Tresselt, *Productivity and Convergence in a Panel of OECD Industries: Do Regulations and Institutions Matter?* OECD Economics Department Working Paper No. 342, Paris: OECD, September 2002.

- A one standard deviation increase in product market regulations would lead to a decrease by 2.2 percent of the long-run level of MFP (relative to the frontier) in the U.S.; and
- The long-run impact of a one standard deviation increase of EPL was such that it would lead to a decrease of 10.8 percent of the level of MFP.³²

Another recent OECD study examined the link between product market regulations and productivity performance. Regression results suggested that:³³

- An anti-competitive regulatory environment and delays in implementing pro-market reforms, including improved market access and state retrenchment, were associated with relatively poor multifactor productivity performance.
- Countries in which public ownership in the business sector was limited and barriers to entry were low have been more successful in improving multifactor productivity than countries in which regulations curb competition and public enterprises were widespread.
- Both privatization and entry liberalization were estimated to have a positive impact on productivity.
- The negative effects stemming from a more timid regulatory reform might have been particularly strong in those industries where European countries had a significant technology gap (e.g., ICT-related industries).

Innovation and regulatory framework

Innovation, the development and implementation of ideas which lead to new or improved products and processes, is widely recognized as a driver of productivity, and hence competitiveness, and economic growth. Public policy across countries often use the regulatory framework to effect economy-wide and specific industry innovation performance.

As noted above, recent research at Industry Canada found that regulatory regimes were important determinants of innovation activity, as measured by R&D intensity, in Canada and G7 economies.³⁴ The authors found that intellectual property rights (IPRs) and competition policy accounted for about 60 percent of R&D-intensity in Canada from 1991 to 2000. IPRs and competition policy, found to be substitute policies, had a positive impact on innovations. Flexible labour market regulations, in terms of flexibility in hiring and firing as well as the minimum wage restrictions, increased innovation activity. More importantly, the study concludes that differences in regulations (or the regulatory gap between Canada and the U.S.) were responsible for one-third of the R&D intensity gap between the countries.

³² *Ibid*, pp. 17-18.

³³ Nicoletti and Scarpetta, *Regulation, Productivity and Growth: OECD Evidence*, The OECD Working Papers No. 347, January 2003, *op. cit.*, pp. 11-12.

³⁴ Kevin Koch, M. Rafiquzzaman, and S. Rao, *The Impact of Regulatory Policies on Innovation: Evidence from G7 Countries*, Industry Canada Working Paper (mimeo.), Ottawa: Industry Canada, 2003.

Productivity and a regulatory framework: An empirical analysis

In this section, we pursue regression analysis to examine whether differences in labour productivity across G7 countries could be explained by differences in economic regulations across these countries. Towards this objective, we use the IMD survey data on five types of regulations for the G7 countries over the 1991-2003 period. We discussed the IMD data above in section 5.

Industry Canada's research suggests that the Canada-U.S. labour productivity gap can be explained by the gaps in capital-intensity, innovation, and human capital. In this section, we examine directly the impact of regulations on labour productivity via their impact on capital-intensity, innovation and skills. We estimated the following reduced form equation, using the data on G7 countries:

$$LP_{it} = \alpha_1 KL_{it} + \alpha_2 IPRLAW_{it} + \alpha_3 IPRLAW_{it} * COMPLAW_{it} + \alpha_4 FDIRESt_{it} + \alpha_5 LABREGS + \alpha_6 LP_{it}(-1) + \varepsilon_t \quad (\text{Eq. 1})$$

where LP_{it} is labour productivity for country i at time t ; KL_{it} is capital-labour ratio; $IPRLAW_{it}$ is an indicator for intellectual property law; $COMPLAW_{it}$ is an indicator for competition laws; $FDIRESt_{it}$ is a foreign direct investment restriction indicator; $LP_{it}(-1)$ is lagged labour productivity; and ε_t is the error term. The equation is estimated using the aggregate time series data over the period 1991 to 2003.

Intellectual property rights protection (IPRLAW) improves resource allocation by enabling inventors to capture more of the profits from their inventive activity. As protection of intellectual property rights increases, the profits from secure proprietary knowledge that a business sources from outside or within the firm would allow a firm to achieve efficiencies and higher productivity.³⁵ The hypothesis here would be that a strong protection of IPRs will be positively associated with productivity.

The interaction term between competition policy and the intellectual property regime ($IPRLAW * COMPLAW$) is added to capture the complementarity or substitutability between the two policies. Their complementarity implies a positive coefficient. On the other hand, a negative coefficient would suggest substitutability between IPRs and competition policy.

Inward foreign direct investment adds to capital formation, transfers and diffuses technology, skills, innovative capacity, and organizational and managerial practices – all activities leading to productivity enhancements. In addition, research done for Industry Canada and by others suggests that foreign-owned

³⁵ Although the IMD data are based upon perceptions by business decision makers of our regulatory system, they are highly correlated with the objective OECD data set. Due to limited data availability, we neither analyze the particular form (copyrights, patents, trademarks, trade secrets, etc.) of intellectual property protection nor aspects of each form (the framework laws, their enforcement, or their administration). The conclusions that we offer from our analysis should be interpreted with this limitation in mind. Further research is required to determine these specific relationships.

firms on average are more productive than domestically controlled firms.³⁶ Therefore, it is hypothesized that fewer restrictions on FDI (FDIRES) would positively impact labour productivity.

Labour market regulations (LABREGS), such as hiring/firing and minimum wage rules or strict statutory employment protection legislation increase the cost of production and introduce labour market rigidity which may not allow firms to achieve optimal and most efficient capital to labour combination in producing output and, thus, would limit productivity growth that firms may realize. Therefore, the lower the impact of employment protection legislation, the smaller the distortions and higher the scope for productivity growth. It is hypothesized that there would be a positive link between lower employment protection legislation and productivity.

The capital to labour ratio (KL) measures the capital-intensity with which production is characterized in the economy. Capital deepening is essential to productivity and economic growth. Therefore, it is hypothesized that a higher capital to labour ratio would be positively related with productivity. We do not expect KL variable to be significant in the presence of regulatory variables, because the latter would capture the influence of KL, since KL it self will be influenced by these variables.

The lagged dependant variable (LP-1) is included to take into account the lagged effect of independent variables on labour productivity. The larger the coefficient on the lagged dependent variable, the longer it takes for independent variables to have their full impact on labour productivity, and vice versa.

Regression results

The empirical estimation of the above regression equation is based on a cross-section of the G7 countries over the 1991-2003 period. We followed a standard pooled cross-country time series analysis.

In both the regression equations, the coefficient on the lagged dependent variable is over 0.9 and is statistically highly significant. The large coefficient on the lagged dependant variable suggests a lengthy lag, about ten years, between the independent variables and labour productivity, which is not unreasonable. The regulatory variables we considered might also be picking the influence of other framework conditions that are not considered here.³⁷

As expected, the coefficient on capital-intensity is positive in the two regression equations. But, the coefficient is not statistically significant. This is not surprising, because the regulation variables are expected to capture much of the impact of capital-intensity on labour productivity. Differences in regulations are expected to explain differences in capital formation in G7 countries.

The regression coefficients on intellectual property protection and foreign direct investment regulations, as expected, are positive and statistically significant,

³⁶ Someshwar Rao and Jianmin Tang, *Are Canadian-controlled manufacturing firms less productive than their foreign-controlled counterparts?*, Industry Canada Working Paper Number 31, Ottawa: February 2000.

³⁷ Koch, Rafiquzzman and Rao, *op. cit.*, (2003) also reported similar results, where the R&D intensity served as a proxy for innovation.

implying differences in these two variables explain much of the variation in labour productivity between G7 countries.

The coefficient on competition policy and intellectual property protection interaction term is negative and statistically significant, suggesting substitutability between the two policy variables. This result is consistent with the findings an earlier Industry Canada study.³⁸

The coefficient on employment regulations (see the first equation) is negative; this result is much in contrast to the OECD work. Large differences in the interpretation of good labour market regulations across G7 countries perhaps explain the unexpected negative coefficient. But it is not statistically significant. Furthermore, the coefficients of other independent variables are not impacted by the inclusion or exclusion of labour market regulations variable.³⁹

In short, differences in regulations and policies with regard to intellectual property protection, competition and FDI explain much of the variation in labour productivity across G7 countries. More importantly, the regression coefficients imply that 55 percent of the Canada-U.S. labour productivity gap can be explained by the regulatory gap between the two countries.

Variable	Parameter estimate (Eq.1)	Parameter estimate (Eq.2)
KL	.019 (0.828)	.0285 (1.277)
IPRLAW	.009*** (3.108)	.0094*** (3.014)
IPRLAW_{it} *COMPLAW_{it}	-0.0007** (-2.187)	-0.0007** (-2.244)
LABREGS	-0.002 (-1.385)	
FDIRES	.0075** (2.188)	.0074** (2.185)
LP(-1)	0.903*** (30.364)	.907*** (30.125)
Adj. R-squared	.995	0.99
Observations	91	91
***, ** = Significant at 1% level and less, and 5% level and less. Fixed country effects not reported here.		

³⁸ Koch, Rafiquzzman and Rao, *op. cit.*, (2003).

³⁹ We ran additional regressions, not reported here, that largely confirmed our hypotheses: (a) without the regulation variables, K/L variable is highly significant; and (b) the regulatory variables explain very well the variation in K/L and the signs of the variables are the same as in the productivity equation.

Conclusions

The principal goal of this study has been to analyse the impact of various types of product market regulations on innovation and productivity performance in OECD countries, with a special focus on G7 countries. Towards this goal we have drawn on available research as well as some new research.

Using IMD survey data, which are highly correlated with the objective OECD data, we developed time series data on several types of economic regulations for G7 countries over the period 1991-2003. These in turn are used as explanatory variables in the innovation and labour productivity regressions.

The following are the key findings of our study:

- Regulation frameworks generally improved in Canada and in other G7 countries;
- There is a regulatory gap between Canada and the U.S. and the gap widened since 1999;
- Differences in intellectual property protection and FDI appear to have largely contributed to the Canada-U.S. regulatory gap;
- Differences in economic regulations, particularly FDI and intellectual property rights, appear to be correlated with R&D-intensity and labour productivity differences among G7 countries; and
- The Canada-U.S. regulatory gap explains about one-third of the innovation gap and over 55 percent of the labour productivity gap between the two countries during the 1991 to 2003 period.

These findings in general are consistent with the conclusions of other research, especially the OECD cross-country evidence. The findings on FDI regulations and productivity are consistent with the conclusions of Rao and Tang (2004) with regard to FDI's positive impact on capital accumulation, R&D, trade flows and productivity.

Our results imply that by closing the regulatory gap with the U.S., Canada could narrow significantly the real income gap with its southern neighbour. Therefore, Canada should undertake a through review of the costs and benefits of its regulations and policies with respect to FDI and intellectual property protection with the objective of closing this gap. Future research should undertake an in-depth industry analysis of specific components of various regulatory variables and the linkages between the Canada-U.S. regulatory gaps, and the innovation and productivity gaps between the two countries.

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Annex A: International Patterns: Regulation in Services

Service industries have traditionally been a highly regulated area internationally. Regulation has typically concerned entry, output and/or price choices of firms, restricting actual and potential competition. Since 1980s, many service markets have been extensively liberalized and elsewhere service regulation has often been overhauled. However, initial conditions differed a lot across countries, and the pace and extent of regulatory reform has been variable internationally. An OECD study of potential efficiency gains in several service industries in eight countries reported that:⁴⁰

- Long-run potential output gains ranged from 3 to 6 percent in some European countries and Japan, and about 1 percent in the U.S.

The OECD report summarized empirical studies covering competitive and network industries in different countries and concluded the following:

Retail distribution: Regulations in retail distribution are legal or administrative entry barriers. Studies point to potentially large gains from liberalization of entry and prices in retail trade:⁴¹

- Distribution systems become more efficient (as large outlet restrictions are removed);
- Employment and the volume of sales increase; and
- Margin decline putting downward pressure on consumer prices.

Road freight: Road freight restrictions include discriminations against foreign haulers, limitations on own-account transport and price controls. The effect of reform on a cross-country basis point to:⁴²

- Industry employment and output rise;
- Productive efficiency and the quality of services are enhanced, partly due to network rationalization and an increased rate of innovation; and
- Fares fall by a significant amount.

Mobile telephony: There has been ample evidence of the benefits of competition in the mobile telephony industry. The empirical findings show:⁴³

- Productivity increases (defined as cellular subscribers per industry employee) increases as liberalization approaches; but
- Average prices (defined as mobile revenue per cellular subscriber) decline only as competition in the market unfolds; and
- Neither ownership nor prospective privatization per se has positive effects on the performance variables.

Air passenger transportation: Cross-country examinations of the relationship between regulatory frameworks, market structures and performance

⁴⁰ OECD, *The OECD Report on Regulatory Reform, Volume II Thematic Studies*, Paris: 1997.

⁴¹ Giuseppe Nicoletti, *Regulation in Services: OECD Patterns and Economic Implications*, Economics Depart Working Paper No. 287, (Paris: OECD), February 2001.

⁴² *Ibid.*, p.14.

⁴³ *Ibid.*, p. 15.

in air transportation have been few given the complexity of analysis involved. Nonetheless, the following results stand out:⁴⁴

- At the national, restrictive regulatory and, especially, market environments are associated with lower overall efficiency of the domestic industry;
- Efficiency (as measured by the highest load factor) improves significantly in competitive markets, but entry deregulation by itself may have adverse consequences, as incumbents adopt pre-emptive strategies against potential new entrants;
- Business and economy fares tend to decline significantly when the route-specific regulatory environment is relaxed; and
- Business and economy fares tend to rise with the tightness of infrastructure access conditions at route ends, the capacity share of airline alliances and the role of government-controlled carriers on the route.

Railway transportation: Because of economies of scale leading to natural monopoly, railway is a highly regulated industry. Reforms have concerned mainly the reorganization of the industry, with attempts at separating various functions and opening up of the rail freight business. The available evidence suggests that:⁴⁵

- The U.S. reform had led to a significant reduction in rail passenger transportation and a relatively strong growth in freight services, with fare declining by 30 to 50 percent in certain markets and efficiency and quality of service being enhanced; and
- The Mexican reform has led to a moderate decline in freight fares and an improvement in the quality of service, but the effects on efficiency are unclear.

Electricity supply: Some countries are beginning to consider changing the regulatory environment of the electricity supply industry by reforming functions that do not possess natural monopoly component, while other countries are contemplating opening up to competition the generation segment of the industry. An OECD study looked in a sample of 19 countries over the 1986-1996 period at the impact on electricity prices and industry efficiency of privatization, liberalization, vertical separation, third party access to the grid, creation of an electricity pool and the degree of consumer choice of supplier and offered the following conclusions:⁴⁶

- Electricity prices (measured as the ratio of industrial to residential end-user tariffs) tend to fall when generation and transmission are unbundled, third party access to the grid is expanded and an electricity market is created;

⁴⁴ *Ibid.*, p. 16.

⁴⁵ *Ibid.*, p. 18.

⁴⁶ F. Steiner, “*Regulation, Industry Structure and Performance in the Electricity Supply Industry*”, OECD Economics Department Working Papers, No. 238, (Paris: OECD), 2000.

- Productive efficiency of generation plants (measured by both the rate of capacity utilization and reserve margins) tends to increase when ownership is private and generation and transmission are unbundled;
- Private ownership, or the prospects of privatization, tend to increase industrial end-user prices; and
- In countries, such as the United Kingdom, New Zealand and Norway, which have reformed extensively their regulatory framework had the positive impact of liberalization.

Telecommunications industry: Liberalization of entry into long-distance (trunk and international) telecommunications is already progressed well in most advanced industrialized countries. However, the debate is still open on the best kind of interconnection pricing rule and the degree of network unbundling to be ensured by the incumbent. The available empirical cross-country analysis of economic benefits of entry liberalization and competition in long-distance fixed telephony suggest that:

- Anticipated entry liberalization (measured as the time remaining to announced liberalization) has a significant impact on the performance of trunk and international services, leading to increases in productivity, improvements in quality and lower prices;
- Competitive pressures following liberalization (measured by the share of new entrants) further increase productivity and lower prices of both trunk and international services; and
- The effects of ownership and privatization per se are unclear.

In general, to take full advantage of the reform process, policies in network service industries would have to consider regulatory settings that impinge on incentives to invest and innovate:

- Structural interventions in these industries, such as vertical separation of infrastructure and services, need to strike a balance between the incentives to encourage competition and the incentives to encourage investment and innovation by the owner of the non-competitive component;
- The design of network access provisions needs to seek to prevent inefficient bypass while maintaining (or creating) sufficient and correct investment incentives for network operators; and
- Institutional design and regulatory policies need to avoid cross-sector inconsistencies to avoid distortions in the allocation of capital.

Annex B: The OECD Regulatory Indicators

To make cross-country comparisons of regulatory regimes, the OECD has compiled summary indicators, which are further classified in three broad regulatory domains and ranked each on a scale ranging from 0 to 6, which reflects the least to most restrictive nature of the regulatory regime:

- **State control** over business enterprises consisting of:
 1. The overall size of the public enterprise sector;
 2. The scope of the public enterprise sector;
 3. The existence and extent of special rights over business enterprises;
 4. Legislative control over public enterprises;
 5. The existence of price controls in competitive industries; and
 6. The use of command and control regulations, both economy-wide and at the industry level.
- **Barriers to entrepreneurship** consisting of:
 1. The features of the licensing and permit system;
 2. The communication and simplification of rules and procedures;
 3. Economy-wide administrative burdens on startups of corporate firms and sole-proprietor firms;
 4. Industry-specific administrative burdens on startups of retail distribution and road freight companies;
 5. The scope of legal barriers to entry; and
 6. Exemptions from competition law for public enterprises or state-mandated behaviour.
- **Barriers to trade and investment** consisting of:
 1. Barriers to share-ownership for non-resident operators (economy-wide and in the telecommunications and air travel industries);
 2. Discriminatory procedures in international trade and competition policies;
 3. Regulatory barriers to trade; and
 4. Average tariffs.

Moreover, the state control and barriers to entrepreneurship are classified in the following two alternative broad regulatory areas:

- **Administrative regulation** consisting of (a) administrative burdens of startups, including economy-wide and sector-specific burdens; and (b) regulatory and administrative opacity, including the feature of license and permit system and the communication and simplification of rules and procedures.
- **Economic regulation** consisting of (a) regulation of economic structure, including the size and scope of public ownership, legal barriers to entry and control of public enterprises by the legislature; (b) regulation of economic behaviour, including command and control regulations, and special voting rights; and (c) regulation of competition, including competition law exemptions and price controls.
- **Product market regulation** consisting of (a) inward-oriented policies; and (b) outward-oriented policies.

- **Employment protection legislation** consisting of (a) regular contracts, including procedural requirements, notice and severance pay, and prevailing standards of and penalties for “unfair” dismissals; and (b) temporary contracts, including “objective” reasons under which a fixed-term contract could be offered, the maximum number of successive renewals, and the maximum cumulated duration of the contract.